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Intellectual Property: Issues of Introduction into Circulation

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ABSTRACT

The article discusses organisational and economical methods of implementing intellectual property into civil circulation. The introduction of intellectual property will be legal and can be used for commercial purposes in the future. The ultimate goal of commercialisation of intellectual property is to profit from scientific, technical and innovative activities by organising the production of high-tech competitive products. It is necessary to have a qualified team of managers capable of developing and implementing the most optimal business strategy, within which a large number of tasks related to market research (marketing and patent research), the formation of a portfolio of intellectual property objects, the choice of economical ways of their maximum legal protection will be solved, as well as the choice and implementation of specific ways of introducing the IPO into civil circulation, continuous monitoring on the market and, if necessary, the adoption of protective measures.

Keywords: intellectual capital; intellectual asset; copyright; intellectual property; intellectual property; results of intellectual activity; commercialisation

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The practice of the developed and developing nations of the world demonstrates that the commercialization of R&D should be undertaken by technology transfer professionals working in the structures directly created for the task. They were named TTO [Technology Transfer Offices]. TTO perform the following functions:

- pay annual fees for patents, fees for services charged on patent applications;
- protect property rights against possible violations of these rights;
- issue licenses for patented IP;

Assign royalties in relation to a previously defined distribution pattern between the inventor(s) IP and TTO, the university or institute where the IP was created [1].

European practice shows that, hypothetically, after 6–9 years, TTO can become self–sufficient, although they are not created as self–supporting centers. The gross collection of royalties and royalties may amount to 1–3% of the annual budget for the R&D of the respective university, institute or other research centres with a well–functioning TTO. The economic benefit of the work of TTO is not in the form of substantial royalties, but in the fact that new high–technology medium — and small–sized organizations end up with commercialization procedures, for high–quality jobs are created with high pay, and tax revenue increases as a result of additional economic activity. In the Russian Federation the development of TTO is just beginning. In the USSR, patent offices and other structural units of research institutes and universities were the prototype of the TTO. But these departments did not look for buyers, partners, and commercialization. Their function was to file patents, obtain patents, assess the patentability of inventions. This list of functions has been retained to date. In fact, the number of technologies purchased remains very low, despite the successful development of the patenting process [2].

Currently, the Russian Federation makes extensive use of various State regulatory mechanisms in the field of science and innovation (*see fig. 1*). As can be seen from Fig. 1, these mechanisms are mainly of a legal nature.

However, the establishment of economic and institutional mechanisms to regulate the introduction of intellectual property into economic circulation should not be overlooked. The establishment of an economic mechanism is closely linked to the cost–effectiveness of the introduction of intellectual property into economic circulation, profitability and profitability in their direct operation, the way

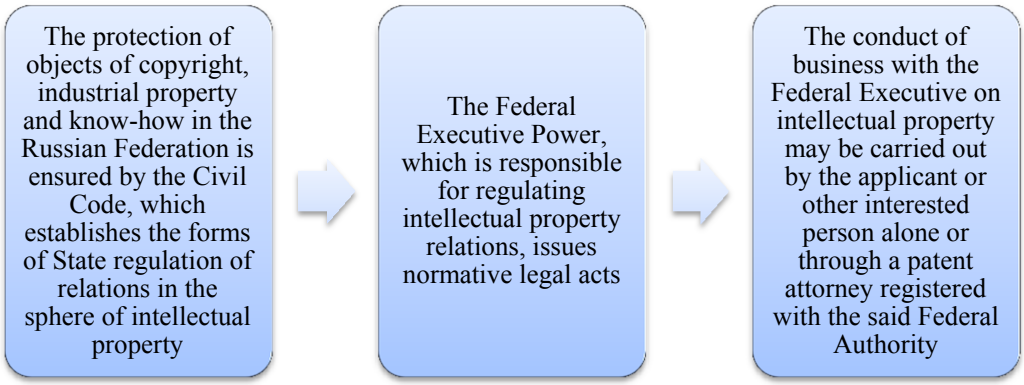

Fig. 1. **The legal mechanism for regulating relations in the field of intellectual property**

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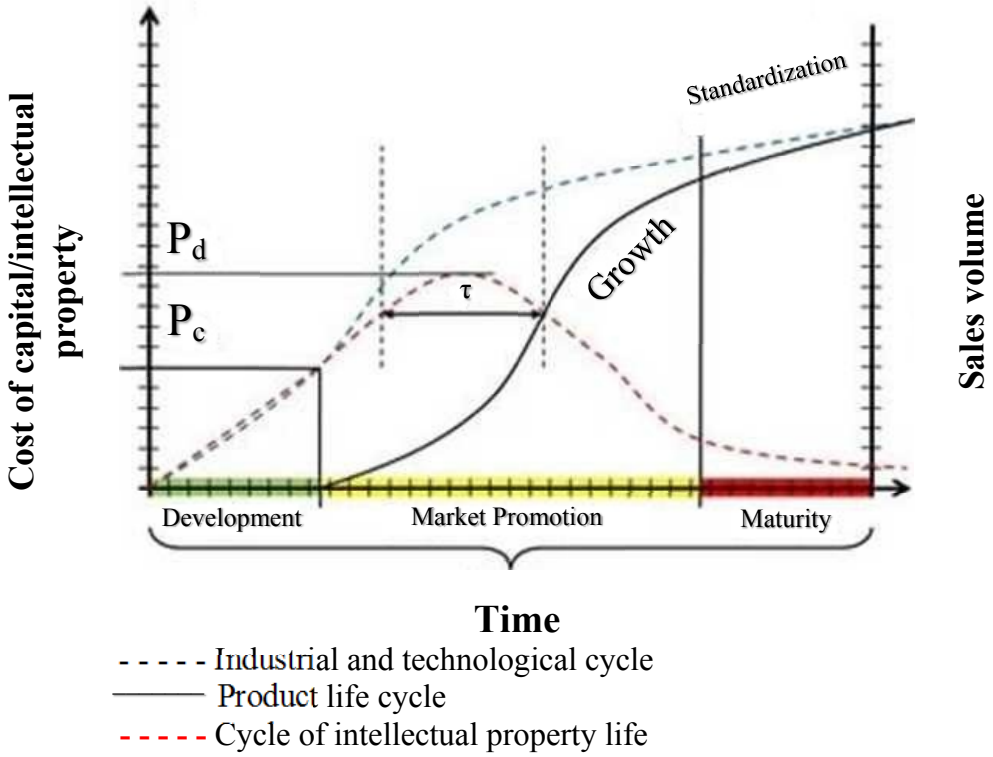

Fig. 2. **Changes in the value of IP and technology over the life cycle**

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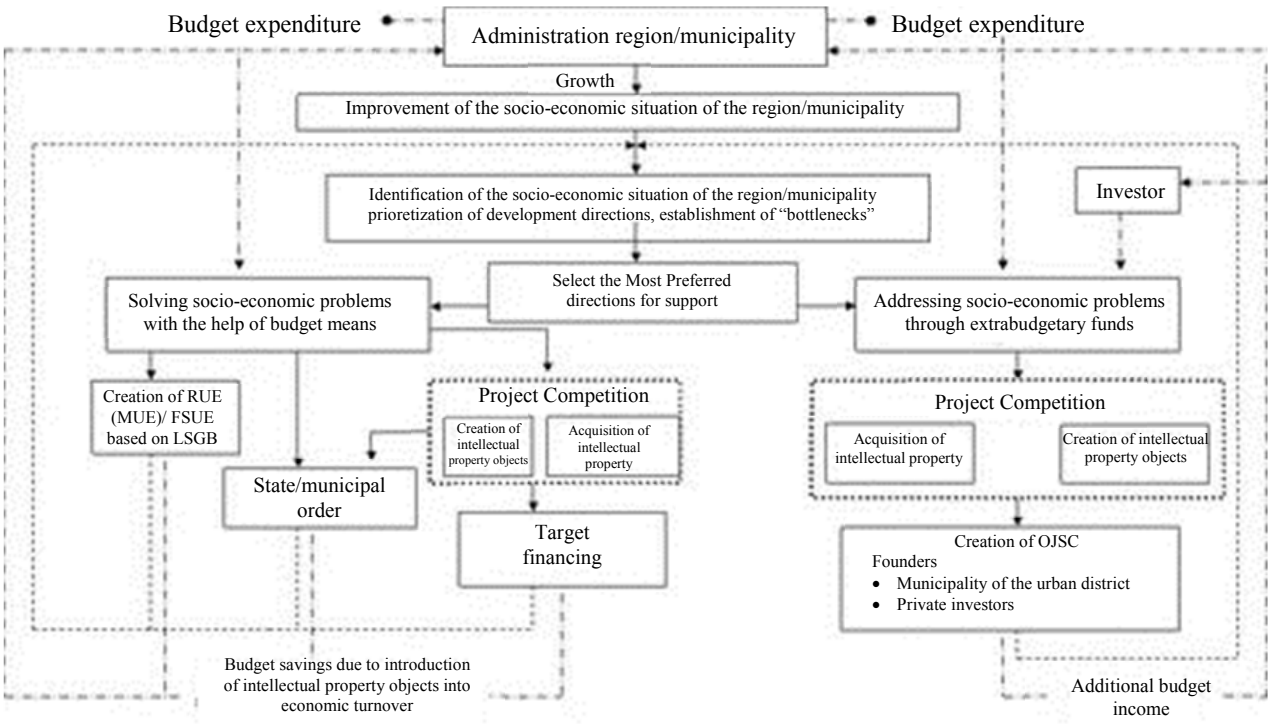

Fig. 3. **Participants in the process of introducing IP into circulation**

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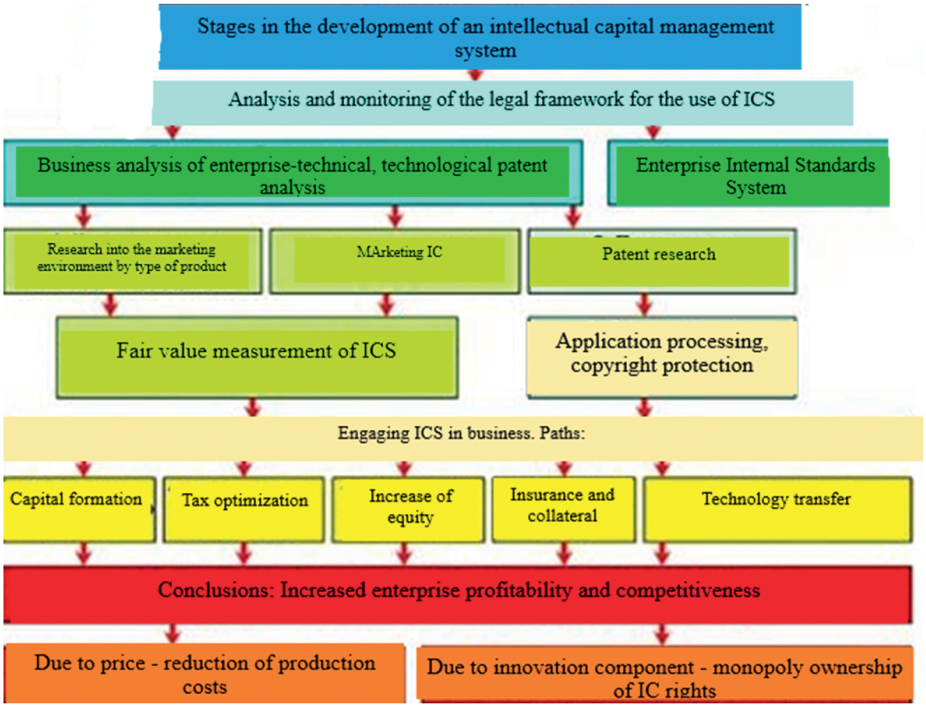

Fig. 4. **Management system for intellectual property objects at a single enterprise**

Source: URL: https://im0-tub-ru.yandex.net/i?id=6a2d00f09dae13624b0fcc3f7b65a58b&n=13.

in which intellectual property objects are valued and revalued, with changes in the cost of IP and technology over the life cycle (*see fig. 2*).

The institutional mechanism should identify organizational structures and their relationships with each other, stakeholders, sources of resources, documents, documents circulation and job descriptions with deadlines for the processing of documents on the introduction of intellectual property objects into the economic turnover (*see fig. 3*).

It is also a matter of principle to establish a system for managing the intellectual property of a single enterprise (*see fig. 4*).

To date, it can only be said that intellectual property objects are related to a certain type of document (*see fig. 5*).

The current set of mechanisms, fundamentally different in nature from one another, illustrates the ambivalence and degree of imperfection of current public innovation policies.

Improvement of Russian science and strengthening of its innovation orientation should be based on effective legislative and regulatory application of commercialization of intellectual property (CIP).

Incorporation of intellectual property rights into civil circulation is considered an integral part of the intellectual property management process [3].

The process of introducing intellectual property into civil society in the world is developing rather intensively. As the world practice demonstrates, the price of some CIPs reaches up to tens of billions of rubles.

Intellectual property accounts for more than 50 per cent of the total money of industrial companies and organizations, and the amortization of intangible assets can be considered a sustainable source of funds for reproduction on a current technological basis.

The establishment of a suitable legal framework for the promotion of CIP civil traffic, created with public funds, purposefully requires special mechanisms (methods) to ensure cooperation between developers and customers, as well as legal

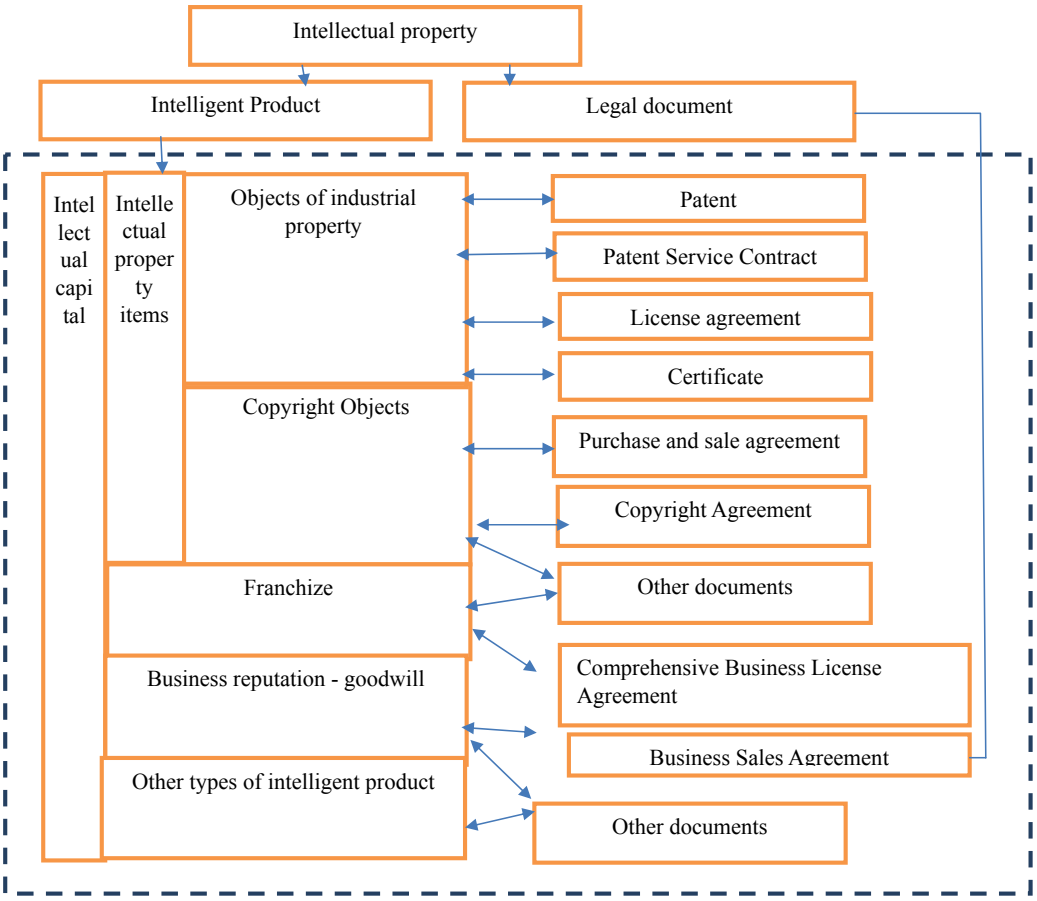

Fig. 5. **The interrelation of intellectual property objects with issued documents**

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mechanisms for the transfer of innovations that promote the effective commercialization of CIPs. The main variations of the introduction of intellectual property in civil traffic are considered to be:

- transfer of rights to implement CIPs in coordination with licensing agreements, right to use business secrets (know–how) and complex business licensing agreements (franchising);
- increase in equity capital from intangible assets;
- pledge or surrender of rights.

Next, consider in more detail how to introduce intellectual property objects into civil circulation (*see fig. 6*).

Forms of introduction of CIP may include manufacture, use, storage, offer for sale, import, sale, repair, lease, maintenance, leasing, etc.

One way is to use CIP in their own production, usually as part of a defensive and motivational strategy, as well as a strategy to optimize financial and economic activities. This method is aimed at increasing the competitiveness of the enterprise as well as stimulating the creative activity of the staff. It allows full control over the use of the results (including the necessary adjustments for any stage of production), and maximize economic benefits in the production of final products [4].

The creation of an intellectual property licence contract enables:

- establish a statutory fund of a sizeable size, without drawing on money or other property;

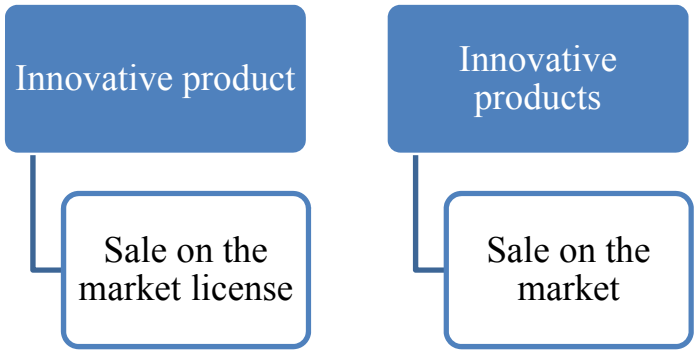


Fig. 6. **Methods of conducting intellectual property objects into civil circulation**

Source: the authors' compilation.

• amortize intellectual property and replace it with real money;

• use intellectual property in their activities, including in the form of credit security or rights of use to third parties.

If the company or firm has decided to transfer the rights to use the intellectual property under a licence or other agreement, they should take the following actions:

• to ensure once again that they are the sole rights holders of CIP;

• where there are several CIP rights holders, each right holder must give written consent to the licensing;

• to estimate the value of CIP rights and the value of the licence, for which purpose to hire an experienced valuer;

• recognize the value of CIP in accounting as intangible assets if they have not been previously recognized;

• to draw up a licence or other contract for which an experienced professional or contract preparation is to be contracted by a consulting company specializing in this field;

• draw up an agreement on the right to use CIP itself (recommended if the owner has experience);

• register a license agreement signed by the parties for the right to use industrial property [5].

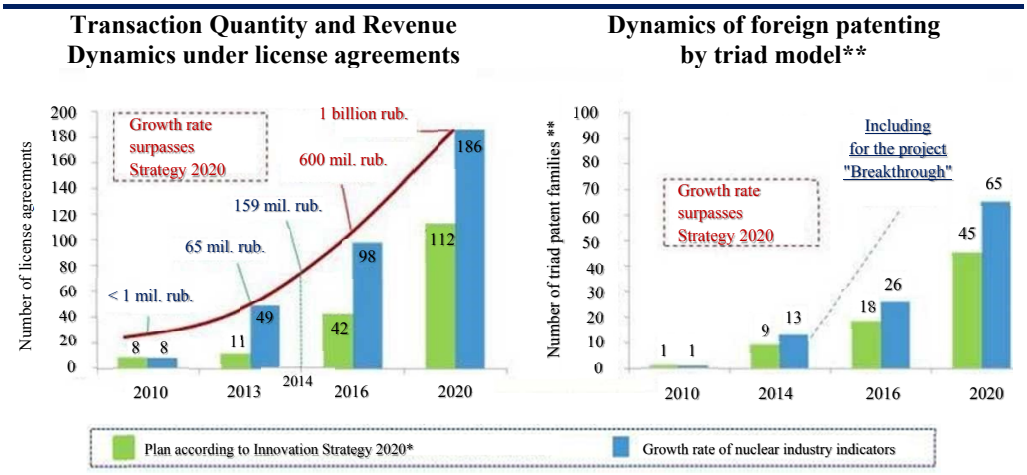
The need for a monetary assessment of such intangible contributions leads to the need to verify the valuation of property contributed as a non–monetary contribution to the statutory fund of the legal entity. In addition to including a specific reference to the nature of the contribution in the statutes, either a licence agreement or an assignment of an exclusive right under the law is negotiated.

Proper valuation of intellectual property rights and their reflection in the accounting of an enterprise are considered important requirements for entry into civil circulation [6].

The pledge of rights in some intellectual property may be made for the purpose of obtaining loan funds from the right holder, but this practice has not yet been widely applied. Intellectual property rights are granted under a patent and licensing strategy. This means transferring CIP property rights to a new right holder.

Documentary evidence of the creation of CIP, the valuation of CIP and the competitiveness of the CIP product, the existence of CIP rights are considered important for the introduction of intellectual property into civil circulation. Documentary evidence of the formation of an intellectual property object means that the CIP should be described in an amount sufficient for its practical realization or be materialized in some other known way.

The right to the outcome of scientific and technical work (including intellectual property) must be evidenced by documentary evidence:



«Historical» risks		New Intellectual Property Management Rules	
A.	Non-availability of patent portfolio of technologies and products	A.	All decisions regarding the results of intellectual activity are made taking into account the appearance of the final product
B.	A substantial amount of information disclosed	B.	Strategy of protection and commercialization of the results of intellectual activity already at the stage of ordering products of research and development works taking into account corporate and state interests
C.	Terms of patent protection abroad expired	C.	The decision to obtain a patent is made taking into account foreign patenting in all potential countries of supply (competition)
D.	Legal risks: relations with authors and third persons are not settled	D.	Building an efficient corporate IP management system

* The level of growth envisaged by the strategy of innovative development of the Russian Federation for the period up to 2020
** Triad Patent Families - patents obtained in the USA, Europe and Japan and applications filed for patenting in the territory of these countries

Fig. 7. **New IP management model until 2020**

Source: URL: http://images.myshared.ru/24/1272142/slide_4.jpg.

- license contract;
- contract for the creation of scientific and technological products;
- contracts with the municipal customer or other administrator of municipal funds for the management of the scientific and technical work generated from these funds; договора уступки прав;
- other treaty(s) affirming the rights of an individual or organization to CIP [7].

The assessment of the competitiveness of a product containing CIP is developed through promotional and patent research to determine the financial feasibility of placing it on the market.

Results of intellectual property valuation are reported in the evaluation report: evaluation task, method of estimation, basis of estimation (type of estimated value), evaluation characterization (calculation and initial data, characterization of the object and results of its use), value of intellectual property.

It is important to provide comprehensive support for the implementation of intellectual property. For example, Rosatom proposes a new IP management model (*see fig. 7*), assessing the negative side of the existing practice (which includes historical risks) and inviting all decisions on Results of Intellectual Activity (RIA) only taking into account the final product and foreign patenting in all potential competitor countries under a rigid corporate system of intellectual property management. This proposal is the same as the authors' submission.

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Risk Management as a Key Element in the Digital Transformation of an Industrial Enterprise

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ABSTRACT

The Russian industry is entering digital transformation with some delay, and the implementation of accompanying large-scale changes contains a significant number of specific risks. Creating a promising business model and the technological outline of an industrial enterprise that implements it takes place under conditions of high uncertainty. The article proposes a general approach and elements of a practical risk model for planning and carrying out an industrial enterprise's digital transformation to reduce the uncertainty of the process in its significant aspects. The proposed management solutions help reduce the likelihood of a negative impact of accompanying general and specific risks, build a formalized model of risk management, and increase transparency in managing relevant practical projects. The article also discusses financial reserves usage as a tool for active risk management.

Keywords: risk management; financial management; digital transformation; change management; financial reserves

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INTRODUCTION AND PROBLEM STATEMENT

Practical implementation of the digital transformation of the industrial enterprise covers all phases of strategic management: from business planning to long–term development programmes monitored at the operational level [1]. Risk management in digital transformation is complex because it involves a variety of factors: from high levels of environmental uncertainty and variability to the need for specialized knowledge of applied technologies (necessary investments, end–to–end efficiency) [2]. It should be noted, however, that there are several hierarchical levels of risk management: on the one hand, there is a need to manage strategic risks at the enterprise level (group of companies), and on the other hand each project application requires its own operating procedures.

The main challenge addressed in this article is to reduce uncertainty in business planning and the digital transformation of an industrial enterprise and to find adequate methods to manage a variety of risks. The proposed risk models address the management of a variety of risks: both internal (primarily organizational resistance) and external environmental resistance. The typical algorithm for the digital transformation of an industrial enterprise, presented below, involves risk management at all stages — from targeting and assessment of enterprise readiness for digitization to operational risk management models in project applications. The relevance of this issue is linked to the insufficient level of development of digital transformation in industry, both in theory and in practice. It should be assumed that as the number of

successful long–term digitization programmes in industrial enterprises grows, the importance of risk management in formalized management processes will increase.

KEY ELEMENTS OF A DIGITAL TRANSFORMATION ORGANIZATION IN AN INDUSTRIAL ENTERPRISE

In assessing an organization's development prospects, balancing objectives and benefits with costs and risks is always important. This correlation is reasonably performed in the form of full–fledged business planning at the strategic level. Such planning as part of strategic and tactical management has a set of key elements that need to be understood in the preparation and adoption of management decisions.

A strategy — is essentially an extended business plan for a company based on a variety of models of its current and prospective work. However, it is not the starting point in development management, but rather documents the necessary steps and resources to fulfil the mission and vision of the company. The following figure shows a typical 4 –level corporate governance structure: from the company's mission to the implementation of operational management. *Fig. 1* also provides a vision of the place of strategy and long–term business planning in such a structure.

Thus, a company–wide risk management model is an essential element of corporate governance. Risk management towards the digitization of an industrial enterprise is an integral part of such a model.

Considering the processes of digital transformation as the most efficient (yet costly) way to implement long–term enterprise development plans and to gain unique competitive advantages, the following key elements should be identified:

1. **Transformation method and algorithm.**
2. **Economic modelling of the course and results of transformation.**
3. **Risk Model.**

Consider these elements, focusing on the analysis of the structural links between them. This focus allows to understand the role of risk management at each stage of planning and implementing a digital transformation. For example, certainly, risk management is part of active business planning at the strategic level, and therefore the establishment of a regular monitoring and risk management process should go hand in hand with the start of the business planning and strategic targeting cycle. When a process approach is applied, risk is identified "the processes of developing and implementing strategic plans, the quality of which primarily determines the balance and realism of the strategic plan, as well as the level of risk of hidden errors" [3]. Part of the current risk–management model is the prevention of substitution in purpose and the consistent maintenance of focus in the strategic planning of digital transformation on economic parameters — growth of company value, increase of profit and turnover, reduction of production costs, etc. The strategic risk management model aims to "minimizing the likelihood of failure to achieve the goals and objectives, as well as minimizing the probability of loss of part of income and capital, customer base, market niche, slowdown or loss of reputation of an industrial enterprise" [3]. Thus, the first significant part of the risk model — are the risk groups directly related to targeting and planning digital transformation as an effective method of achieving the long–term business plan targets.

On the other hand, the introduction of large–scale changes accompanying the digital transformation contains significant uncertainties in economic parameters: from assumptions at the time of initial budgeting to multiple cost increases due to delays in implementing digitization programmes. According to a number of researchers, much of this potential cost is related to organizational resistance, leading to possible loss of staff

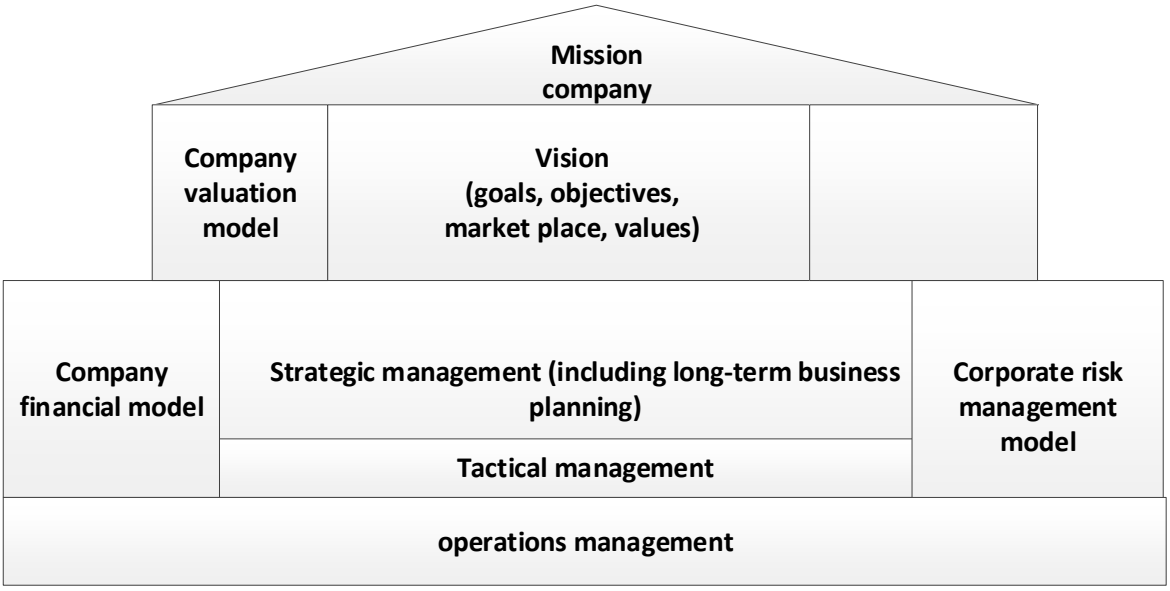

Fig. 1. **The structure of modern corporate governance**

Source: the authors.

productivity, delayed delivery of tasks and even sabotage of changes [4, 5]. Equally important is the variability of the external environment: technologies, consumer expectations, the actions of regulators that also influence the evolution of an industrial enterprise. Risk management, however, affects the operational, tactical and strategic levels of governance, meaning that understanding of its role in digital transformation must be achieved early in the planning of change.

The complexity of economic analysis of digital transformation also entails a high degree of uncertainty in both budgeting and return–on–investment models. Both the estimation of the programme budget of projects and the estimation of the potential growth of economic indicators need to be compared by case studies that simply do not exist in Russian practice. In addition to internal and external resistance to change already noted, a key feature of economic modelling in digitization is the increasing uncertainty of the competitive environment. These include the acceleration and desynchronization of cycles of changes in the influence of competitive forces — supplier capabilities, level of demand and consumer power, level of competition in each market, changes in accessibility and opportunities for innovative change methodologies. Thus, creating a sustainable economic model of digital transformation also needs active risk management. Timely risk management reduces the level of uncertainty in the estimation of the total transformation budget as an investment element that fulfils the key innovation function [6]. On the other hand, the complexity of return–on–investment models, which is consistent with real competition, also needs to be analysed and actively managed in relation to significant risks. Finally, risk management and modern financial management practices imply the creation of a system of financial reserves — sufficient to mitigate the negative impact of realized risks and liquidity to reconcile such reserves with the financial policies of the enterprise. Another key feature is that the boundaries of digital transformation are fluid, and the effectiveness of applied technologies is not deterred, which means that the "flexibility" in managing risks and associated financial reserves must be maintained.

Finally, taking an even broader view of the problem, it should be noted that effective

management of the risks of timely change — is a competitive advantage and a new competitive force in much of the "new economy" [7]. This is also true for knowledge–intensive industrial activities that generate high value–added products with low resource dependency (e.g., organic raw materials, metals, energy). Thus, the risk model itself is also a key element in the organization of digital transformation. This element involves both significant preparatory work (risk identification and ranking), and continuous monitoring of the probabilities of realization of risks and the application of appropriate management plans (mitigation, emergency). As stated earlier, risk management towards digital transformation should be part of a corporate risk model.

Consider these key elements of planning and implementing the digital transformation of the industrial enterprise in more detail, focusing the analysis on the significant role of risk–management.

TYPICAL ALGORITHMS FOR ECONOMIC MODELLING AND PRACTICAL IMPLEMENTATION OF DIGITIZATION

A typical method of planning and organizing digitization sees it as a way of achieving the strategic goals of an organization based on a promising business model of an enterprise and providing its technological contours. In summarizing the Russian experience of large industrial groups, it is important to note the need to formalize the organization of transformation in a separate document, often as an integral part of the strategy. Realization of long–term goals involves creation of technological contours by execution of projects programs in business and technological directions, automation objects (factories, production complexes), echnological stacks within contour. For example, the "Rosatom" corporation began its digital transformation in mid-2017 with the development of a detailed the Digital Single Strategy (DCC) document, which in 2020 contains ideas about the transformation of 10 industrial divisions into the structure of "Rosatom" [8]. The implementation of DCC required the consolidation of seven corporate units into a special digital unit, which conducts dozens of projects on the introduction of promising technologies within the framework of a common vision.

Economic modelling of the costs, financing and return on investment in a digital environment is a justification not only for the respective project programmes but also for the corporate development strategy as a whole. In the corporate governance framework presented in *fig. 1*, such data form part of the financial model of a company and determine the long–term growth of its valueThe calculation of transformation budgeting is based on project programmes, in accordance with the composition of the technological framework being implemented and taking into account the necessary financial reserves to eliminate the negative effects of realized risks. Funding model is mixed: other than related financial flows, to programme projects should be funded for special organizational unit, which management of digitization at the corporate level. Also included in the funding model are components related to the "flexible" management of financial reserves [9] — creation of reserves, transfer of funds from reserves to operational management, control of expenditure of reserves, etc.

Digital Transformation Return Model is a key issue in both its planning and in the summing up of each iteration. This model is based on economic targets identified in the course of business planning and agreement on the final version of the strategy: turnover and profit of the enterprise, cost of production, speed of production of a unit of a good, etc. Whether or not an enterprise achieves a return on investment model in practice determines not only the success of the

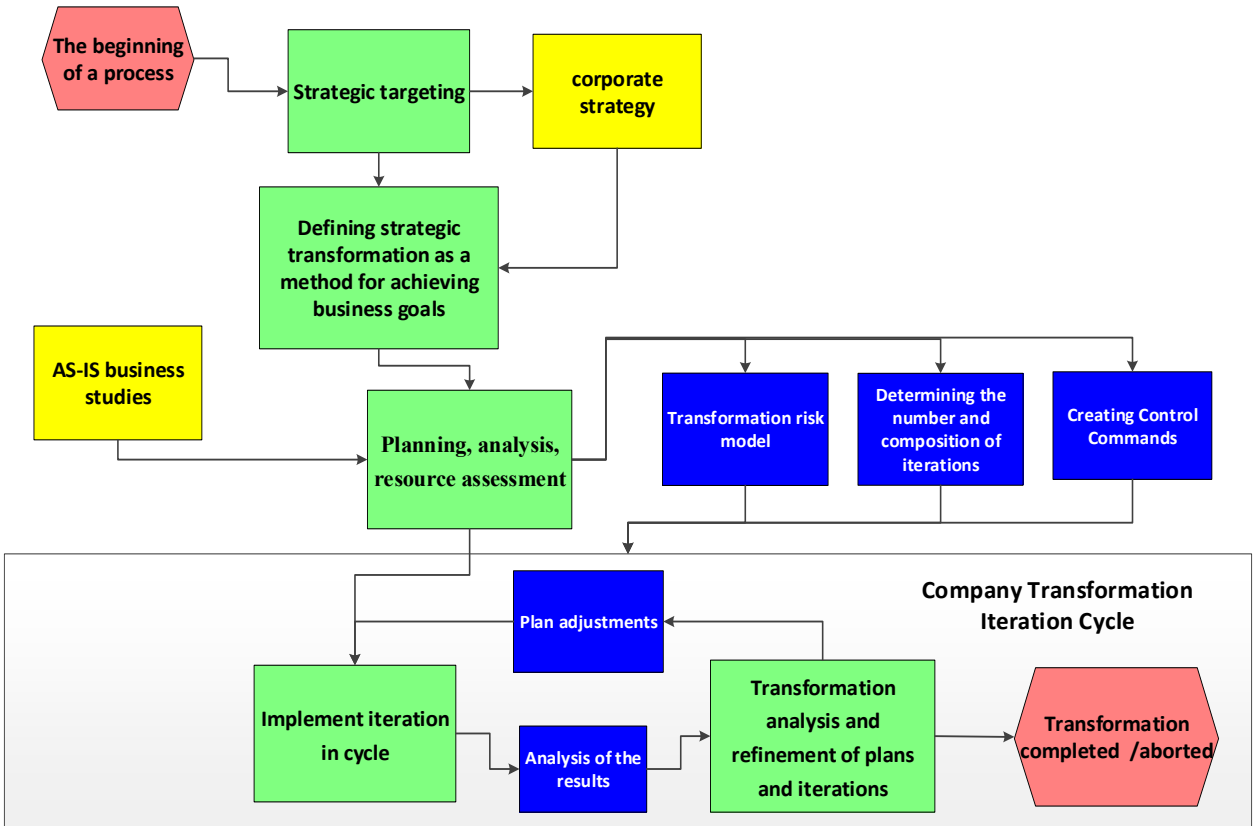

Fig. 2. **A typical algorithm for the digital transformation of an industrial enterprise**

Source: the authors.

investment already made, but also seriously influences the readiness of the company's top management to continue to digitize and develop the target business model and the corresponding technological contour [10]. The risks associated with an enterprise's economy during digitization form another important group requiring active management.

Implementing strategic transformation (and not just planning, analysing and assessing costs and risks) — it's the toughest issue in modern strategic management [11]. It requires in–depth analysis at all levels of activity, a combination of process and project approaches, substantial investment, knowledge and readiness of top managers and enterprise owners. The most logical option is to develop a road map for strategic transformation that includes not only processes for targeting but also the choice of methods for implementing change, monitoring progress and evaluating its cost–effectiveness. By default, the road map consists of a set of steps presented in *fig. 2*. It should be noted that the scale of the business and the industry impose substantial conditions on the preparation and implementation of such a road map.

Of course, taking the need for strategic business planning as an initial phase in the formulation of objectives and success criteria, the following practical stages of industrial enterprise transformation should be briefly considered. Implementing large–scale changes in an industrial enterprise within a digital transformation can be simplified into four phases:

1. Enterprise readiness assessment ("AS–IS") by categories: finance, technology, human capital, management competencies;
2. Modelling forward–looking development ("TO–BE") related to value chain renewal in

client–centred, extended product life cycle and evidence–based decision–making;

3. Creation of technological contours, teams of specialists and bases of applied knowledge, implementing a forward–looking development model;

4. Iterative launching of elements of the future development model: by products, geographical locations, elements of value chains.

Despite the late start of the digital transformation in Russian industry and the possibility of benchmarking this process (including using external consulting and experience from completed projects of global corporations), the dynamics of the introduction of individual technologies in Russian industry are contradictory. The market of Russian suppliers of IT–solutions from the concept of "Industry 4.0" for industry is rather limited, and the vast majority of Russian solutions depend on hardware produced abroad.

The set of ready/unprepared status of an industrial enterprise for digital transformation forms a significant part of the model of its current activity — "AS–IS". Next, the modelling of future development related to value chain upgrading should start. This "TO–BE" target model is the next step in the digital transformation and includes:

1. Prospective economic performance sought by an industrial enterprise cascaded from the level of enterprise strategy.

2. Model of business and production process to be started and implemented.

3. Methods, objectives, specific objectives and transformation plan, taking into account specific and general sectoral risks and influences.

Among the influencing factors is the need to place the client at the centre of the industrial enterprise's efforts and to support the extended product life cycle (ideally — for each item and for the product as a whole).

It is very useful to rely on the methodology of the digital economy to create forward–looking models. This is how banks and financial institutions have been digitally transformed: famous concepts "Bank 2.0/3.0/4.0", "Bank as IT–company", "Omni –chanell self–help for clients" and others allowed each organization to see the final milestones in digitization. In industry, similar concepts are found at the very beginning of development, for example the "autonomous robotic plants Industry 4.0". The most complete concept in 2020 (in the technological part) — is the creation of reference models of objects by branches of industry: "digital factory", "digital drilling tower", "digital logistics chain". The concepts of such models are now well advanced, but the development (and, more precisely, the cost) of appropriate technologies does not yet allow such concepts to be considered fully optimal. An example of a transformation already implemented according to the reference model — is the Mercedes–Benz Factory 56 in Zindelfingen[1]. It is probably — one of the most autonomous and robotic industries today, realizing significant competitive advantages of digitization.

The next stage in preparation of the digital transformation of the industrial enterprise is creation of technological contours, teams of specialists and bases of applied knowledge, implementing the approved forward–looking development model.

Process or production contours — are the sum of the various technologies that provide the production function,— from planning to launching and performance analysis. The contour needs to take into account information, production and management technologies that enable research, design, production, marketing, service, industrial recycling. Of course, the choice of technologies to be integrated depends

[1] Official opening of Factory 56. Official Report. URL: https://www.mercedes-benz.com/en/innovation/connected/official-opening-of-factory-56/.

on the long–term development model and the goals chosen in the previous phase. In addition, the first experience of the efficiency of particular technologies by industry and specific production functions is now available. On the other hand, such a contour is an integral part of the "TO–BE" model, and its design is complicated by the facts of readiness/unpreparedness of production of enterprises and technologies to each other. This complication should be reflected in the planning of transformation iterations and risk management.

A non–exhaustive list of most successful technologies and applications in industry should be provided (*table 1*). These technologies are generally grouped into logical groups (clusters) and form the contour of the digital transformation. As can be seen from the *table 1*, quite often the use of a certain technology means that "neighboring" innovations have to be mastered. This is due to the already existing experience with technology adoption in industry and the emphasis on the economic benefits of innovation.

The creation of the technological contours of digital transformation in a specific industrial enterprise has a set of constraints:

- device and software technology readiness without major modification to achieve transformation goals;
- staff readiness of the enterprise's employees to realize transformation goals with this technological contour.

Of course, in the course of transformation, because of the speed with which the technologies themselves change and the expectations of their adoption, significant changes in the composition of the production contour can be made, but splitting into iterations in digitization makes such changes smoother and associated with specific tasks and goals. The introduction of innovative technologies into relevant project programmes implies active risk management and forms another important group of risks.

Equally important at this stage is to form teams of specialists whose efforts will be directed to detailed planning and implementation of changes. The competence and authority of a formal business–unit responsible for the entire transformation of an enterprise may not be sufficient in complex nodes: integration, technological expertise and introduction of changes directly in workshops, geographically distributed production facilities and remote facilities. It is equally important to manage organizational resistance in the workplace: automation, robotization and any other innovation are always surrounded by fears of job losses, areas of responsibility in production and the power of line managers [4, 12]. The associated risks form another group related to the internal organization of the digital transformation.

From this stage onwards, the development of knowledge bases should not be neglected. Practice shows that digital transformation is spread out over years and in large companies is unevenly distributed across production and over time. Accumulation of best practices and experience in dealing with new technologies, accounting for errors and analysis of results should be recorded in knowledge bases [13]. The distribution of experience makes it possible to avoid the repetition of typical risks, to reduce the labour cost of introducing changes, to accelerate the scale of already introduced innovations to other markets, products etc.

Finally, the last part of the process — is the iterative launching of elements of a forward–looking development model. As shown above, virtually every enterprise creates its own unique contours related to the specific geography and technology of production, consumer expectations, competitive pressures and the amount of planned spending on key resources.

The most important role of risk management in digital transformation is precisely at this last stage — direct iterative implementation of change. Typical risks include those already

Table 1

Using applied technology clusters

No.	Technology	Project applications and examples
1	Internet of things, including digital logistics and IT — solutions like SCADA	Interaction of machines and mechanisms between itself — system of accounting of electric power in corporation "Rosseti". Data collection on processes and facilities — "Inter RAO — Electrogeneration" — data collection and processing from power plant facilities.
2	Specialized mobile software and hardware systems	Data collection at the sites — monitoring of repair and maintenance at the Smolensk NPP. Equipment Parameter Control — Samara Oblast Bezymyanskaya Thermal Power Station.
3	Artificial intelligence, including neural networks, predictive and expert models, computer vision	Analysis and synthesis of data — system of analysis of samples of aviation fuel in "Gazpromneft–Aero". Expert and recommendatory decisions — service to speed up operation of hot rolling mill in NMLK.
4	Industrial robots	Production functions — production of agricultural machinery in the company "Promparts". Auxiliary functions — supplying of blanks in production of brass products in the company Brassko (Orenburg). Transport functions — transport of cargo inside the warehouse at the Moscow refinery.
5	Virtualization of processes and objects, including "digital doubles"	Design and production processes — simulation of geological works in difficult oil production — Kiber GRP 2.0 in Gazpromneft, simulation of car crash tests in "AvtoVAZ". Other business processes — "digital double" processes of optimization of procurement activities and management of external road transport logistics in Severstal.
6	Big data processing	Advisory and expert solutions — advice on optimum ferroalloy consumption in steel production in NLMK.

Source: the authors.

described: financial (transformation finance), market changes (affecting strategic targeting), and organizational resistance. The specific risks associated with this last phase should also be highlighted:

1. Finding the right way to innovate in extended product life cycles.

2. Complex coordination of modernized elements of value chains of production during digital transformation to avoid "bottle neck" of innovation.

Both risks are closely related to the environment in which the enterprise operates and form another significant group — almost every element is to some extent related to external parties, regulators, and current customers.

THE ROLE OF ACTIVE RISK MANAGEMENT IN DIGITAL TRANSFORMATION

Note that the risk model is also an essential element in the planning and implementation of the digital transformation of an industrial enterprise. Risk management covers all stages of the process and aims at a consistent reduction of uncertainties. Some risk groups have been identified in the past and their generalization seems to be universal for most digital transformations in the industry:

- risks related to targeting and business planning;
- financial and economic risks;
- risks related to the external environment of the enterprise;

• technological risks within the chosen contour;
• risks associated with the organization of large–scale changes.

Consider a general approach to risk management in the digital enterprise. Thus, strategic planning in this context involves two sets of work:

• formalization and assessment of risks, development of management plans and allocation of reserves for risk management;
• determining the impact of the risk reserve on the budgeting and financing of the digital transformation (both at the planning stage and in future budget execution).

Initial formalisation and risk assessment shall be carried out by the method described in [3], shall cover the full first group of risks and shall include the following steps:

1. Identification of factors that make it difficult to define the organization's strategic goals within the framework of digital transformation;
2. Ranking of factors according to two parameters: level of destructive effects and probability of realization of risk;
3. Development of management plans: measures and organizational arrangements to limit the impact and reduce the likelihood that the identified factors will be met;
4. Carrying out a balanced analysis of the developed business plan of digital transformation and presenting its results to the company's top management.

It should be noted that this group of work includes a focus on risk management in the process of strategic digital transformation planning, namely: the division of strategy development functions and the final analysis (expertise) function into errors between different, independent groups of specialists in the company.

The use of financial reserves in risk management is equally important. On the one hand, the spending of financial reserves — is a natural response to the realization of risk, not to slow down the pace of change, not to change goals, not to accept additional iterations. On the other hand, earmarking has an impact on overall budgeting processes — it is not simply the imposition of additional ratios on objects of expenditure. First of all, it is the construction of a complex system of liquidity reserves, which are introduced "into battle" on the formalised process.

Risk management continues to be implemented during the creation of the business plan through detailed identification, classification and prioritization. As the outcome document should be proposed a risk, normally containing:

1. Group and risk name.
2. Priority.
3. Reserves and/or damage assessment when the risk is realized (usually a figure or function from time to time).

As we move forward on the transformation road map (*fig. 1*), as we study the enterprise's readiness for digitization (within the framework of the "AS–IS" model), and as we prepare the future business development model ("TO–BE"), the identification of risks reveals more and more types of risks, which must be analyzed using the algorithm already specified above. Thus, it is possible to group risks according to different unifying characteristics, such as belonging to a particular system, according to the objects of damage, by the nature of the risk, etc. In the case of default digital transformation project programs, the following list can be proposed that expands the previously identified risk groups:

• inclusiveness of business strategy;
• financial and economic risks;
• technological risks;
• risks of a competitive environment;
• organizational risks, including the operation of change management teams and the need to overcome team resistance in a group of companies.

Table 2

Sample part of a digital transformation risk plan

No.	Risk profile for "organizational risks"	Response plan	Emergency plan
..	...	...	...
1.5	Possible non-implementation of changes in Department A. Declaratory motive — backlog in their own projects. The real motive is the resistance of the head of department A	Avoid risk. Involve the head of department and the whole team to interact. Learn more about the personal motivation of project team members to resist	Engage top management of the company. Include the head of the department in the change management team Financial reserves — 5000 USD
1.6	Difficulty of involving khabarovsk branch employees in the management of changes (geographical distance, time difference)	Attract the most active staff of the branch in the format of one-day sessions. Use remote communication channels for regular meetings. Financial reserves — 500 USD	Organize travel to the branch at key points of iteration with discussion of intermediate results and feedback Financial reserves — 2000 USD

Source: the authors.

Depending on the industry and the details of the digital transformation, it is also possible to separate groups for regulatory, environmental, social risks.

The next step — is to prioritize and rank risks within the group. It is clear that the higher the probability of realization of the risk and the associated potential damage, the higher the risk in the ranking. The definition of potential harm can be computed as a simple product of the probability of realizing risk (in %) by the amount of damage to business (maximum, expected, minimal in risk management). In more complex risk management models, damage can be defined as a function from time to time, such an approach shows daily losses while ignoring the resulting risk.

The risk register should then be supplemented by appropriate management elements:

1. Response (Mitigation) Plan
2. Emergency plan.
3. Reserves.

For each risk, it is necessary to formalize a risk response plan — a set of organizational measures to reduce the potential damage and/or the likelihood that the risk will be realized. As a general rule, a response plan involves formalizing the necessary minor cash outlays provided for in the respective reserves. Virtually every response (mitigation) plan contains reasonable signs of success/failure, expressed in terms of timing, financial loss or other parameters. Such criteria govern the need to move to an emergency plan, which also needs to be prepared in advance for high–priority risks. Emergency plans — are management actions aimed at minimizing the already real and significant damage to the business after the risk has been realized. In the case of a digital transformation with significant investments,— significant liquidity reserves should be available for such risks, which will be spent during the implementation of the emergency plan to support the set rate (schedule, teams, effort) of the enterprise's digitization. A typical template for the risk register, combining the above information, is shown in *table 2*.

It follows from the authors' personal practice that some universal risks related to the groups already described in the general risk register need to be identified. For the group related to the very possibilities of agreeing on and implementing a business strategy, it is necessary to highlight:

- Insufficient level of expertise among the enterprise managers in determining the time and scope of business planning tasks;

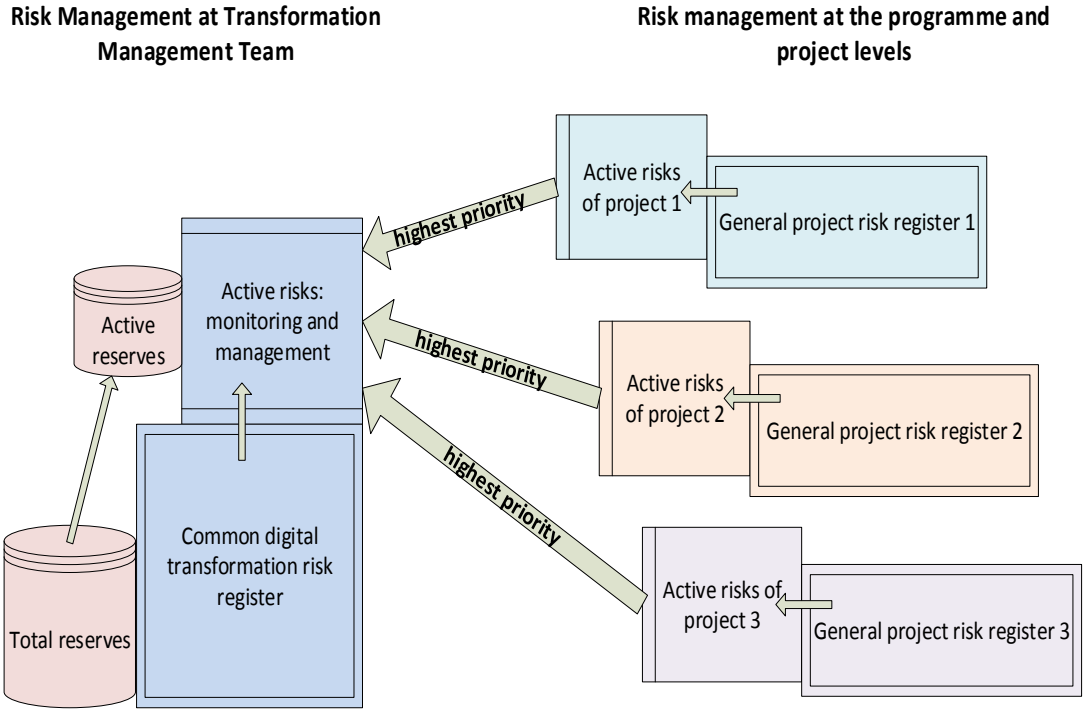

Fig. 3. **Operational and tactical risk management model**

Source: the authors.

• unjustified cost savings in key areas of digital transformation built into initial planning;

• Establishment of formal numerical benchmarks that do not reveal the economic essence of successful transformation of production and technological processes.

Among the risks in the group of financial and economic aspects of transformation, attention should be paid to:

• the need for continuity and synchronization of financing of technology project programmes;

• a low level of attention to the investment return model being created and agreed upon (realism, consistency in achievement, connection with the enterprise's promising business model);

• a low level of attention to the economic results of each digital transformation iteration (investment accounting, performance, parameters, etc.).

Among the most universal technological risks:

• the need to analyse the dynamics of changes in the basic parameters of innovative technologies, including their cost, technological maturity, market availability, etc.;

• difficulties in integrating innovative technologies among themselves and into the current IT — landscape of the enterprise;

• the capabilities of the enterprise's own engineering teams in the practical use and maintenance of technologies in production and business processes.

It should also be noted that the most common competitive environmental risks affecting the planning and implementation of the digital transformation of an industrial enterprise are:

• taking into account the pressures of the competitive environment, including an analysis of the methods used and the speed at which the closest competitors achieve the same economic performance;

• changing the expectations of consumers, counterparties, investors associated with the

products, services and business processes of the enterprise;

• changes in the regulation of industries by State bodies, including foreign and international organizations.

The cross–cutting and frequent threats from the organizational risk group are presented as follows:

• spontaneous introduction of large–scale changes without clear planning, automation and informing of staff;

• the emergence and spread of serious organizational resistance;

• "piecemeal" implementation of changes with numerous backsliding and existence of parallel and duplicative business processes.

Thus, in moving from business planning and targeting to implementation, the boundaries of identifying and prioritizing risks across project programmes and technology areas are significantly expanded (elements of the technological contours implementing a promising business model). Each project programme receives its own risk register with response and mitigation plans. Part of the risks in such private registries are cascaded from the overall corporate level.

The next step in actively managing the risks of digital transformation is continuous monitoring and controlling. The most convenient way to do this is to synchronize the management of current risks across project programmes while simultaneously managing the most fundamental risks of digitization. This approach maintains a balance between centralized management of reserves and distributed scenarios of response (mitigation) and contingency plans for groups and even individual risks.

Such risk management in a digital transformation is conveniently constructed on the basis of a hierarchical model of linked lists of different levels of operational relevance. The general features of this model are presented in *fig. 3*.

The most damaging and topical risks for transformation iteration are in mixed management: the implementation of mitigation plans and emergency plans lies in a joint area of responsibility for the digital transformation management team and individual project (project's program) managers. The allocation of financial reserves to such risks is centralized. Current risks with lower priority are managed separately: overall corporate risks are handled by a dedicated unit responsible at the corporate level for digital transformation, while private project risks are handled by the respective project managers.

The iterative nature of the digital transformation allows a more gradual and balanced consideration of the impact of risks, combined with the analysis of intermediate results [14]. The identified and significant risk pressure on the resulting economic results is a significant factor both in the re–focus of digitization in the next iteration, and adjusting the strategic goals of the organization, the forward–looking business model and the composition of the technological contours. Regular reassessment of financial reserves within risk management [9, 15], implying a "flexible" allocation of reserves in current areas of digitization, is also a good practice. Practical experience of digital transformation, determined by the characteristics of the corporate culture of each industrial enterprise and the set of technology stacks in the contour, over time, optimizes both the financial reservation model and the rate at which cash is injected/withdrawn from operations into reserves [16].

CONCLUSION

According to some researchers, the digital transformation of an enterprise — is almost a forced step, a kind of response to the competitive challenge of the external environment [17, 18]. For Russian industry,

digitization is already catching up, despite the Russian market's achievement of a sufficient level of maturity [10, 14, 19]. As shown in this article, a combination of general and specific risks accompanies the entire long–term process of digital transformation. Managing such risks should be part of the corporate risk management model and enable: identify threats and potential costs, prepare for negative consequences during realization of risks, and "flexibly" react to competitive challenges and objective complexities of implementation of large–scale changes.

The article proposes a set of current risk management models aimed at managing risks at all stages of a typical digital business transformation road map: from business planning to the introduction of elements of the technological contours of the prospective business model through application project programs. It is clear that such risk management should also cover all typical risk groups: from targeting to significant internal organizational resistance that rapidly devalues investments already made [20]. The proposed two–tier hierarchical model of risk monitoring allows to flexibly manage the efforts of teams implementing changes and financial reserves.

Moreover, financial reserves, as a method of operational response, remain relevant to all phases of risk management: from business planning and transformation budgeting to the end of implementation and embedding in practice large–scale changes in technological and business processes.

Regular identification, monitoring and controlling of risks certainly save money for the enterprise and increase transparency in complex digital transformation processes.

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The World of Work in the Context of the COVID-19 Pandemic: Analysis, Assessments and ILO Recommendations

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ABSTRACT

The crisis caused by the COVID-19 pandemic, unprecedented in scale, speed, and depth, has imbalanced and destabilised national labour markets. This article highlights the work of the International Labour Organization (ILO), which since the start of the pandemic has made a significant contribution to analysing the situation in the crisis and developing practical recommendations for the restoration of labour markets. The author of the article examines the key challenges facing national governments in this challenging and responsible period, including those identified by ILO Director-General Guy Ryder. Particular attention is paid to the analysis of the consequences of introducing strict restrictive measures, primarily the closure of jobs. Data on lost working time in various regions and subregions of the world are provided. Based on international labour standards, ILO experts have formulated the main directions for combating the crisis caused by COVID-19, the implementation of which will contribute to faster recovery and stabilisation in national labour markets.

Keywords: crisis; pandemic COVID-19; destabilisation of labour markets; the closure of jobs; loss of working time; forecasting the situation; the policy of overcoming the crisis

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INTRODUCTION

In early 2020, the world faced a crisis of sui generis. At first, it was global in scope. At second, it was unprecedented in both scale and scope. At third, it evolved at a very high rate. That is why researchers and experts have noted that, by overlapping all three characteristics of the crisis, it is very, very hard to make any predictions for the future[1].

The crisis has hit the workforce hard. By mid-2020, due to the coronavirus, the world's labor force had lost 400 million jobs [1], which is ten times more than what happened during the 2008 crisis[2].

That is why, from the very beginning of the COVID-19 crisis, the ILO has intensified its activities as much as possible to inform national Governments about the labour situation. This work was carried out in three main areas [2].

First pillar. Regular publication of ILO analyses of the impact of the pandemic on labour in different countries. These were the result of analytical monitoring based on

[1] It is not the purpose of this article to study all aspects of the socio–economic crisis in the world of work. However, the author of the article agrees with the opinion of the majority of authoritative experts that the effects of the current labour crisis will be felt for a long time.

[2] According to ILO, 23 million jobs were lost worldwide during the 2008–2010 crisis.

Organization for Economic Co–operation and Development (OECD) data, published in the review "OECD Economic Outlook", and research center Economist Intelligence Unit, and national statistical offices also. ILO also made its own projections using economic and mathematical tools.

Second pillar. Regular online seminars of various levels and formats to exchange information and evaluation of the measures, that taken by national Governments, to minimize the crisis for both workers and employers [3].

The seminars laid the groundwork for a global discussion on the impact of the pandemic on the world of work. Such a global debate was held in July 2020 with the participation of national government leaders.

The first part of the discussion was held on 1 and 2 July in the format of regional events on Africa, the Americas, Arab States, Asia and the Pacific, Europe and Central Asia. Representatives of Governments, employer's and worker's associations and regional organizations discussed the impact of the pandemic on the economy, society and national labour markets, as well as responses from different countries

Discussions at regional events fed into the global summit held from 7 to 9 July 2020. It was attended by Heads of State and Government and prominent global leaders. The Summit was the largest–ever online gathering of workers, employers and government representatives with the participation of heads of international organizations such as UN, WHO, ILO, IMF, WTO и OECD.

The Director–General of ILO Guy Ryder, speaking at the summit, stressed that: "We all want to bring the world of work back to normal, and to that end we have several very important tools at our disposal. Some — such as social dialogue and international labour standards — are well known to us. Others have emerged relatively recently, I refer to the "ILO Centenary Declaration on the Future of Work". We see now how important it is as a plan of action through which we can understand how to move forward" [1].

The summit discussed strategies to address the challenges identified by the pandemic. These included how to meet the needs of those working without social protection and under informal conditions, how to promote full and productive employment and the development of viable enterprises, how to ensure that poverty reduction a fundamental element of economic recovery.

On the last day of the Global Summit, named "ILO Tripartite Participants Day", the Ministers and Heads of Worker's and Employer's Organizations from the 187 Member States of this organization shared their vision of how the "ILO Centenary Declaration on the Future of Work" can provide guidance for recovery from the pandemic and for building a more supportive work environment

Third pillar. Development of policies and practical tools to enable national Governments to respond rapidly to the challenges of the labour crisis and to promote the recovery and stabilization of national labour markets.

KEY CHALLENGES IN SITUATIONS OF PANDEMIC

The Director–General of ILO Guy Ryder outlined the key challenges facing national Governments, employer's associations and worker's associations to address the (COVID-19) labour crisis:

Task No. 1.

"...globally, and the expected loss of the equivalent of 305 million jobs worldwide by mid–year, the stakes have never been higher. Governments continue to "follow the science" in the search for the best solutions while foregoing the obvious benefits of much

greater international cooperation in building the needed global response to the global challenge".

Task No. 2.

"But with the war against COVID-19 still to be won, it has become commonplace that what awaits us after victory is a "new normal" in the way society is organized and the way we will work.

Because nobody seems to know what the new normal will be. Because the message is that, it will be dictated by the constraints imposed by the pandemic rather than our choices and preferences. During the crisis of 2008–2009 we were constantly told… that once the vaccine to the virus of financial excess had been developed and applied, the global economy would be safer, fairer, more sustainable. But that didn't happen. Not only has the world recovered, but the old reality, not the new reality, has taken root".

Task No. 3.

"The pandemic has brought to the fore all the precariousness and injustice of our world of work. In the informal economy, where 6 out of every 10 workers are employed, livelihoods are disappearing massively.

It is the gaping holes in the social protection systems of even the richest countries, which have left millions in situations of deprivation. It is the failure to guarantee workplace safety that condemns nearly 3 million to die each year because of the work they do. And it is the unchecked dynamic of growing inequality which means that if, in medical terms, the virus does not discriminate between its victims in its social and economic impact, it discriminates brutally against the poorest and the powerless".

Task No. 4.

"Decent work was in short supply before the pandemic. It has taken the calamity of COVID-19 to aggregate them into the collective social cataclysm the world faces today. But we always knew: we simply chose not to care. By and large, policy choices by commission or omission accentuated rather than alleviated the problem".

Task No. 5.

"The safety and health of our entire workforce is paramount today. In the face of an infectious disease outbreak, how we protect our workers now clearly dictates how safe our communities are, and how resilient our businesses will be, as this pandemic evolves. It is only by implementing occupational safety and health measures that we can protect the lives of workers, their families and the larger communities, ensure work continuity and economic survival".

Task No. 6.

"As the pandemic and the jobs crisis evolve, the need to protect the most vulnerable becomes even more urgent,— for millions of workers, no income means no food, no security and no future. Millions of businesses around the world are barely breathing. They have no savings or access to credit. These are the real faces of the world of work. If we don't help them now, these enterprises will simply perish".

Task No. 7.

"The virus has highlighted today the crucial, and sometimes heroic, role of those who work in a pandemic. The role of people we usually overlook, people we ignore, people we underestimate and even ignore,— medical, nursing, cleaning, supermarket cashiers, transport workers. Among them are many "working poor" and people without adequate protection".

Task No. 8.

"We will continue to face the challenge of building a future of work free from the injustices of the pandemic. But we will have before us the task of building a future of work which tackles the injustices that the pandemic has highlighted, together with the permanent and no longer postponable challenges of climate, digital and demographic transition".

Task No. 9.

"Measures for economic reactivation should follow a job–rich approach, backed by stronger employment policies and institutions, better–resourced and comprehensive social protection systems. International co–ordination on stimulus packages and debt relief measures — will also be critical to making recovery effective and sustainable. International labour standards can provide a framework".

Task No. 10.

"The decisions we adopt now will echo in the years to come and beyond 2030. Although countries are at different stages of the pandemic and a lot has been done, we need to redouble our efforts if we want to come out of this crisis in a better shape than when it started" [2].

DESTABILIZATION OF THE LABOUR MARKET

Job place closure

The imposition of severe restrictive measures by national Governments has dealt a serious blow to the world of work. According to ILO data, as of 15 June 2020, almost a third of the world's workers (32 per cent) lived in countries where job closures were mandatory for all but workers in vital industries. 42% lived in countries where job closures were mandatory for a number of sectors or categories of workers, and another 19% — in countries with recommended closure[3]. ILO monitoring indicates that the vast majority of workers in the world (93%) live in countries where some form of workplace closure is still in place. For example, the proportion of workers living in countries with the most severe closures peaked (around 70%) at the end of March and subsequently fell to 32% in mid–June 2020[4] (https://www.ilo.org/moscow/information–resources/ publications/WCMS_749644/lang––ru/index.htm).

The pattern of job closures varies considerably from region to region. The North and South America were the most affected by restrictions on workers and jobs in mid–June. At the same time, no Arab States or States in Europe and Central Asia continued to impose closures in all but vital sectors. In Africa, only 2% of workers lived in countries with severe restrictions.

ILO monitoring data indicate that even in those countries and regions where compulsory job closures are not currently widespread, many enterprises are still unable to fully return to work. According to ILO, as at 15 June 2020, all Arab States had some form of closure of jobs for certain sectors or categories of workers. Overall, 81% of workers in Europe and Central Asia, 69% — in Africa and 51% — in the North and South America live in countries with closure requirements for certain sectors and categories of workers[5].

The introduction of new restrictive measures or the continuation of existing stringent measures in the coming months, according to ILO experts, will lead to a further decline in economic activity and destabilization of labour markets, which could jeopardize the recovery of employment.

Losses of working time

In Q1 of 2020, according to ILO, global working time declined by about 5.4% compared to the Q4 of 2019 (which exceeds initial estimates of 4.8%), and equivalent of 155 million full–time workers (*see table. 1*). As the virus started earlier in China (where severe restrictive measures were already in

[3] ILO Newsletter: Covid-19 and the World of Work. Vol. 4. URL: http://www.ilo.int/wcmsp5 /groups/public/–––europe/–––ro–geneva/–––sro–moscow/documents/briefingnote/wcms_746704.pdf.

[4] ILO Newsletter: Covid-19 and the World of Work. Vol. 5. URL: https://www.ilo.org/moscow/ information–resources/publications/WCMS_749644/lang––ru/index.htm.

[5] See ibid.

place at the end of January 2020) and other Asia–Pacific countries, the region accounted for about 80% of the reduction in global working time in Q1 of 2020. The decline in working hours in the East Asian subregion in Q1 was 11.6%, equivalent to 95 million full–time workers.

Other regions also experienced significant working–time losses due to the spread of the pandemic. For example, in Q1 of 2020, the reduction in working time in Europe and Central Asia was 3.4% (11 million jobs), in doing so Southern Europe (5.3%) and Western Europe (4%) had the highest losses. Some 11 million jobs were lost in the Americas in Q1 of the year. In South America, the reduction in working hours was 4.8% compared to the Q4 quarter of 2019. In Africa, the loss of working time in Q1 2020 is estimated at 2.4%, equivalent to 9 million jobs[6].

In Q2 of 2020, the regional situation is as follows. In the North and South America, working time fell by 18.3% (70 million jobs in FTE). This is the largest loss of working time among the major geographical regions. South America has the highest estimated loss of working time in the Q2–20.6% — both within its region and among all regions and subregions of the world. Central and North American losses are estimated at 19.2 and 15.3%, respectively.

In Europe and Central Asia, the number of hours worked is estimated to have declined by 13.9%, equivalent to 45 million jobs in the Q2 and above the estimate (12.9%) previously given. Southern Europe (18%), Northern Europe (15.3%), Western Europe (14.3%), Central and Western Asia (13.6%) and Eastern Europe (11.6%) suffered the most.

In the Asia–Pacific region, total losses in the Q2 of 2020 are estimated at 13.5%, or 235 million jobs in FTE, compared to an earlier estimate of 10%. Among the subregions, has the largest loss of working time — South Asia (17.9%), followed by South–East Asia and the Pacific (12.6%) and East Asia (10.4%).

In the Arab States, working time in the Q2 of 2020 is estimated to have declined by 13.2%, or 8 million jobs in the FTE, which is 2.9% higher than the previous estimate.

In Africa, the cumulative loss of working time in the second quarter of this year is estimated at 12.1%, or 45 million jobs in FTE, and is higher than the previous estimate (9.5%). For the subregions, estimates of time lost in the Q2 of 2020 indicate the sharpest decline in North Africa (15.5%), followed by South Africa (12.2%), Central Africa (11.9%), West Africa (11.6%) and East Africa (10.9%)[7].

In the first half of 2020, job closures and other restrictive measures, combined with a rapid deterioration of the economic situation, resulted in a significant loss of work time. So, according to ILO estimates, global working time has declined significantly more than previously estimated. This reflects the deterioration of the situation in many countries of the world in the last weeks of the first half of the year. In particular, workers in developing countries, especially informal workers, have suffered more severely than in previous crises. Distance work is more limited in these countries. Increased vulnerability of informal workers to restrictive measures exacerbates the effects of the current recession and creates new labour market problems.

It should be noted that recent ILO estimates of global working time losses have been substantially revised upwards from previous estimates. For example, the latest estimates of the "ILO Newsletter" indicate a 14% reduction in global working time in the second quarter of 2020 compared to the previous estimate

[6] ILO Global Summit on COVID-19 and the World of Work — Building a better future of work.URL: https://www.ilo.org/global/topics/coronavirus/WCMS_748151/lang--ru/index.htm.

[7] As jobs crisis deepens, ILO warns of uncertain and incomplete labour market recovery. URL: https://www.ilo.org/moscow/news/WCMS_749584/lang--ru/index.htm.

Table 1

Lost working time (worldwide, regions, and sub-regions)

Redion	Q1 2020			Q2 2020		
	Full-time equivalent (FTE) (40 hours per week) million	Full-time equivalent (48 hours per week) million	Losses of working time	Full-time equivalent (FTE) (40 hours per week) million	Full-time equivalent (48 hours per week) million	Losses of working time
All world	185	155	5.4%	480	400	14.0%
Africa	11	9	2.4%	55	45	12.1%
North Africa	2	2	2.5%	11	9	15.5%
Sub-Saharan Africa	9	7	2.4%	43	35	11.4%
Central Africa	1	1	2.3%	7	6	11.9%
East Africa	4	3	2.4%	18	15	10.9%
South Africa	0	0	1.6%	3	4	12.2%
West Africa	3	3	2.5%	15	13	11.6%
North and South America	13	11	3.0%	80	70	18.3%
Latin America and Caribbean	10	9	3.6%	55	47	20.0%
Central America	1	1	1.1%	16	13	19.2%
South America	9	7	4.8%	38	32	20.6%
North America	3	2	1.8%	25	21	15.3%
Arab State	2	2	3.1%	10	8	13.2%
Asia-Pacific region	150	125	7.1%	280	235	13.5%
East Asia	115	95	11.6%	100	85	10.4%
South-East Asia and the Pacific	7	6	2.1%	44	37	12.6%
South-East Asia	7	6	2.1%	42	35	12.7%
Europe and Central Asia	13	11	3.4%	55	45	13.9%
Northern, Southern and Western Europe	8	6	4.2%	29	24	15.7%
Northern Europe	1	1	3.1%	7	6	15.3%
Southern Europe	3	3	5.3%	10	9	18.0%
Western Europe	3	3	4.0%	12	10	14.3%
Eastern Europe	3	3	2.6%	15	12	11.6%
Central and West Asia	2	2	2.7%	10	8	13.6%

Source: ILO Newsletter: Covid-19 and the World of Work. 5th issue. 30 June 2020, pp. 7–8.

of 10.7%, equivalent to 400 million full–time workers[8].

IMPACT ASSESSMENT OF THE PANDEMIC ON THE LABOUR MARKET

Working hours are an important indicator for assessing the impact of the pandemic on the labour market. An analysis of the determinants of labour market performance in specific countries during the pandemic leads to practical conclusions relevant to the recovery process.

ILO considers that, in order to identify the main mechanisms for the impact of the crisis on the labour market, the loss of working time can be divided into four components:

1. Reduced working hours: lower average number of hours worked per week compared to the pre–crisis situation.

2. Employment without work: workers retain existing jobs but do not do any work. They are employed but not at work or temporarily absent (for example, employees on unpaid leave or sick leave).

3. Unemployment: readiness for work and job search.

4. Unemployment: withdrawal from the labour force[9].

The ILO monitoring shows that there are significant differences in the composition of time lost in the COVID-19 crisis worldwide due to labour market institutions and policy decisions. For example, in the Republic of Korea and the United Kingdom, the main reason for the loss of working time is a reduction in working hours and a lack of work. These two forms of work organization maintain the worker's link to the current workplace, thereby reducing the risk of destabilization of further working life in the medium term. In these two countries, the contribution of unemployment to reduced working hours was very small, although the level of inactivity in the Republic of Korea increased significantly.

In the case of Peru and Mexico, where strict restrictive measures have been introduced, changes in unemployment rates have also been modest. In Mexico, reduced working hours and employment without work resulted in approximately half of the time lost, while the remaining losses were due to inaction; the contribution of unemployment was low. In Peru, about 90% of the reductions in working time were due to job losses leading to inaction, with unemployment not playing a role.

In Canada, there has been a significant loss of jobs, which has increased both unemployment and inaction. Finally, in the United States, job losses caused about 2/3 reductions in working hours, with unemployment accounting for almost half of the decline.

ILO experts conclude as follows: analysis of working time losses across countries has shown that focusing only on unemployment does not fully capture the actual impact of COVID-19 on the labour market. Moreover, the line between inaction and unemployment has become blurred by the crisis, because the criteria for finding a job and being ready for a new job, which are necessary for obtaining the status of an unemployed person, are often impossible due to restrictive measures, so that many "unemployed" are considered as "inactive".

FORECASTS FOR 2020

The pandemic led to job instability and large–scale job and income losses in the first half of 2020. It is difficult to predict labour market outcomes in the second half of the

[8] Building back better: Equality at the centre. URL: https://www.ilo.org/moscow/ news/WCMS _751923/lang––ru/index.htm.

[9] The difference between unemployment and inactivity as defined in this analysis is based on individual responses to a labour force survey or similar household survey (based on the criteria of readiness for work and job search necessary for the granting of the status of unemployed person). It is important to note that this status does not reflect eligibility for unemployment insurance, COVID-19 support or other social protection schemes.

Table 2

Forecasts of loss of working time in the second half of the year (IV quarter) of 2020, by region (% and full-time equivalent)

Region	Q2 2020		Base scenario		Pessimistic scenario		Optimistic scenario	
	Losses of working time, %	FTE (48 hours per week) million	Losses of working time, %	FTE (48 hours per week) million	Losses of working time, %	FTE (48 hours per week) million	Losses of working time, %	FTE (48 hours per week) million
All world	14.0	400	4.9	140	11.9	340	1.2	34
Africa	12.1	45	3.5	13	10.8	40	–0.1	0
The North and South America	18.3	70	7.8	29	15.6	60	2.5	9
Arab States	13.2	8	3.9	2	11.9	7	–0.1	0
Asia–Pacific region	13.5	235	4.5	80	11.5	200	1.2	21
Europe and Central Asia	13.9	45	5.4	18	10.6	35	1.2	4

Source: ILO Newsletter: Covid-19 and the World of Work. 5th issue. 30 June 2020, pp. 15–16.

year because of the lack of data on the pace of labour market recovery from a similar crisis in the past. Nevertheless, it is important to consider different options for recovery. ILO has therefore developed a model for calculating hours worked in the second half of 2020, based on a short–term forecast of hours worked in the first half of the year.

ILO has traditionally considered three scenarios: base; optimistic; pessimistic.

The base scenario is based on the latest GDP growth projections in the OECD June collection "OECD Economic Outlook", and a research centre Economist Intelligence Unit. They predict a certain recovery in economic activity in the second half of the year, which, however, will not prevent a significant decline in productivity in 2020 compared to the pre–crisis period. The OECD forecast is that workplace restrictions will be lifted and consumption and investment largely restored.

Pessimistic scenario: the pandemic will continue or lead to a second wave of large–scale job places closures. The increase in GDP is in line with the second wave scenario set out in the OECD June economic forecast (2020), which assumes a lower GDP growth rate in the last quarter of the year.

Optimistic scenario: indicator of hours worked are more responsive to the output gap than to the long–term trend (i.e. the upper 5% of the estimated distribution is used instead of the average distribution used in the base scenario).

According to the baseline scenario, global working time (compared to the last pre–crisis quarter, i.e. Q4 of 2019) would be reduced by 4.9% in the Q4, equivalent to 140 million full–time workers, once it peaked in the Q2 (48 hours a week to work). This means that by the end of 2020, labour markets are likely to be far from fully recovered.

In a pessimistic scenario, the situation in the second half of 2020 will remain almost as complex as in Q2. Even if more targeted policies are adopted, based on the experience

of the first half of the year, global working time will decline by 11.9% by the end of 2020, equivalent to 340 million jobs in FTE, compared to Q4 of 2019.

In an optimistic scenario, the level of time lost in Q4 of 2020 will be reduced to 34 million jobs, and the gap from Q4 of 2019 will be only 1.2%.

ILO projections for the second half of 2020 show wide regional disparities (*see table 2*). Recovery in working hours will be most rapid in Africa, a region with historically high employment rates due to high participation in the informal economy.

The slowest relative recovery is expected in the Americas, where expected working time losses range from 3 to 16% by the end of Q4 2020.

PRACTICAL ACTIONS TO EMERGE FROM CRISIS

An unprecedented labour market crisis requires timely and large–scale support for enterprises and workers worldwide. ILO policy to address the COVID-19 crisis has four main lines of action.

It is particularly important, according to ILO experts, that, in the current situation, resources be mobilized and effectively allocated to address the far–reaching economic and social consequences of the pandemic and to promote job recovery while protecting workers in the workplace.

Many countries have implemented a wide range of policy measures relatively quickly, focusing on measures to stimulate the economy and employment, support enterprises, jobs and incomes.

ILO experts note that most countries have made significant efforts through fiscal and monetary policy instruments to allocate resources as quickly as possible, to prevent economic collapse and to support incomes and jobs. This required innovation and some flexibility.

In many countries, due to the COVID-19 crisis, fiscal regulations and legal restrictions on policies to increase fiscal space were lifted, and central banks around the world have gone beyond their usual roles, using their funds to intervene directly in the economy and buy large amounts of government and corporate bonds.

ILO estimates that by the end of May 2020, more than 90 countries had introduced or prepared fiscal measures totaling more than 10 trillion dollars. Interest rates have also been reduced in a comparable number of countries since the onset of the crisis.

Fiscal measures adopted in developed countries (an average of about 5% of a country's GDP in each case) account for 88% of the world stimulus programme. The range of measures adopted varied from country to country, but typically included the deferral and elimination of taxes, social security contributions and other payments, as well as providing grants, credit guarantees and wage subsidies to enterprises, including small and medium–sized enterprises (SME), in some cases only on condition of job retention.

Most of the discretionary spending in the most developed countries went to expand existing social protection schemes for workers and vulnerable households (including unemployment benefits, sickness benefits and social assistance). Significant conventional and unconventional monetary policy measures were also quickly adopted to avert a liquidity crisis.

Developing countries and economies in transition responded equally quickly, but their fiscal measures were more modest. In developing and emerging economies, financial assistance averaged 2.3% of GDP, reflecting their less favourable position. Overall, the measures taken represent only 2.5% of global fiscal measures. Their rather limited resources were used mainly to support vulnerable enterprises, defer payments and provide

emergency assistance to the most vulnerable through direct cash transfer (mainly special allowances and grants).

Despite these efforts, the limited coverage of unemployment benefits and other social protection schemes has created many difficulties in preventing harm in developing and transition economies, especially for workers and households employed in the informal economy.

In many low–income countries, the situation is even more difficult, as the fiscal space is extremely limited. This limited fiscal space has been further eroded by a sharp decline in commodity prices, as well as a decline in export earnings, remittances and foreign investment. Without large–scale international support, stimulating the economy and employment through fiscal measures will not be affordable for many of these countries.

With reference to monetary policy, many developing and transition economies have the potential to further reduce interest rates. Further efforts are therefore needed to find sustainable and effective ways to mobilize resources, given the limitations of the transmission mechanism of monetary policy in these countries.

In addition, the broad character and urgency of interventions has created many policy implementation problems in countries in all regions and income groups.

In general, the application of the measures proceeded smoothly where strong institutional structures already existed: developed and resourced social protection systems, an efficient tax system, a well–capitalized banking sector and strong public investment banks. Some countries have adapted these already existing institutions to introduce innovations such as new work–sharing schemes, increased support for the self–employed, criteria for payment and guarantees.

Many countries were able to respond quickly by mobilizing, expanding and adapting existing social protection mechanisms. As at 16 June 2020, 1 166 social protection measures had been announced in 200 countries and territories in various areas, including health and income protection, unemployment protection and job protection.

Innovative approaches have also made the response timely and effective in both developed and developing countries. For example, digital technologies and mobile phones were widely used in many countries, including for registration and payment of benefits in social protection programmes. Some developing countries (e.g., Ghana and Nigeria) have established special mechanisms to channel international humanitarian funds and remittances to the most vulnerable. Delaying and exempting tax payments helped to quickly provide resources for households and businesses.

In addition, some countries and cities sent remittances to households in the form of digital certificates of consumption to prevent the use of these funds for savings or debt repayment, and also offered tourist vouchers for use in local restaurants (for example, in Japan and the Republic of Korea).

FUTURE TASKS

ILO experts note that, despite the extraordinary and unprecedented measures taken worldwide, the damage caused by the COVID-19 pandemic in the labour markets is enormous and poses the greatest challenges to labour policy makers. The real outcome of the labour market in the second half of 2020 and beyond will depend on the choices they make and the future scenario of the pandemic. Moreover, decisions taken in the short term could have long–term effects on the world of work.

All countries will face different challenges. The seriousness of the challenges, the

instruments and the resources, which they can use, will differ significantly. But most countries will have to address a number of key challenges.

First, finding the right balance and sequencing of health, economic and social policies to achieve optimal and sustainable outcomes in the labour market. From the outset of the pandemic, priority had to be given to containing the virus and halting its spread, although the result was not always successful.

This has entailed significant economic and social costs, but otherwise sustainable recovery is not possible. Today, national governments are increasingly called upon to make complex decisions to open jobs, implement health–care measures and continue or withdraw support for those enterprises and workers that cannot resume normal activities.

Such decisions are increasingly difficult to make because of public and private sector spending on prolonging restrictions and fears that premature action may trigger a new wave of the pandemic.

Second, implementing and sustaining policy measures on the scale required, while resources are becoming increasingly limited. The realization of the need to do "whatever it takes" to sustain economic activity, jobs, enterprises and revenues during the course of the pandemic led governments to cancel previously set fiscal and monetary targets. Even if the pandemic recedes in the coming months, many countries will confront with high debt levels and very limited monetary policy space.

The long–term damage to labour markets and the prevailing difficult global economic environment in the near future indicate that even in these unprecedented circumstances, support measures will have to be maintained for a sustained recovery. Premature fiscal consolidation, such as that which followed the 2008–2009 financial crisis, could destabilize already weak labour markets.

Third, support for vulnerable and severely affected populations and more equitable outcomes in the labour market. The pandemic has brought inequality and other labour problems to the fore. Even before the advent of COVID-19, women, youth and informal workers were in a very difficult situation, and now they are among those who have experienced the full impact of the crisis.

The society has also changed its attitude towards the hard and undervalued work of health care workers, welfare workers, cleaners, domestic workers, whose work is very important in overcoming the pandemic. If the most vulnerable and vulnerable are not given due attention, recovery processes may run the risk of exacerbating existing inequalities.

Fourthly, international solidarity and support, especially for countries with developing and transition economies. Whatever the achievements of individual countries, the overall response to the global COVID-19 crisis has been characterized by a notable lack of international cooperation.

The analysis shows that the enormous amount of resources allocated by high–income countries to fight the pandemic is simply unavailable to other countries. This has a significant impact on the ability of developing countries and countries with economies in transition to protect their citizens and contain the pandemic, which in turn worsens the prospects of all other countries.

The need for a global response to the global crisis caused by the COVID-19 pandemic must be translated into concrete measures to assist countries with limited financial capacity, in particular through multilateral action on concessional financing and debt relief.

Fifth, strengthening social dialogue and respect for labour rights. In many cases, social dialogue, bringing together governments, employers and workers, has proved valuable

in shaping effective, balanced and acceptable policy responses to COVID-19 at the sectoral and national levels. Social dialogue can also contribute to shaping sustainable paths of recovery in the period ahead. During the pandemic, people in most countries were subjected to severe restrictions on personal freedoms, which were generally considered necessary and justified. However, the permissibility of such measures depends on their proportionality, appropriateness and time constraints.

The COVID-19 pandemic does not give rise to any restrictions on the basic labour rights enshrined in international labour standards and their unconditional observance is a prerequisite for effective social dialogue.

CONCLUSION

Prior to the pandemic, the international community committed itself to realizing far–reaching transformative changes in global development and the world of work, adopted the "Sustainable Development Agenda 2030" and the "ILO Centenary Declaration on the Future of Work".

The world will emerge from a pandemic with higher levels of unemployment, inequality, poverty, debt and political disillusionment. It is therefore very important that national governments make recovery plans central not just to a return to pre–crisis situations, but to recovery on the principle of "better than it was".

The "ILO Centenary Declaration on the Future of Work" sets out a people–centred agenda for the future of the world of work, including investment in human capabilities, labour market institutions and sustainable jobs in the future, which provides important benchmarks for addressing the key challenges we face.

The pandemic has shown that decent jobs, a sound health system, universal social protection — are the infrastructure of human life that must be the focus of attention.

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National Interests, Strategic Goals and Long-Term Security of the Russian Federation*

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ABSTRACT

The state and the nation have their interests. They call them "the national interests". Even though the study of national interests began many centuries ago, there is still no single methodology to determine national interests, let alone quantifying them. National interests largely determine the goals that society sets for itself. Thus, from the national interest "preservation and survival of society" arises the strategic goal of human society, the state, and the nation — to increase the population and ensure its security. The preservation of territorial integrity is one of the national interests, so each state has the goal to preserve its territorial integrity and maintain the territory of its habitat in a life-friendly condition. If a goal is set, there should be indicators of its achievement. For example, for the strategic goal "ensuring socio-economic well-being and growth of well-being" indicators are the volume and dynamics of income of members of the society, the unemployment rate, the coefficients of differentiation of incomes of the population and some other indexes. The author of this paper has identified seven strategic goals of a society that correspond to six universally recognized national interests. To quantify the measure of their achievement, the author selected 23 indicators. The author based his choice on the capabilities of Russian statistics. It turned out that this indicator had a downward trend in 2000–2018, and its fluctuations were damped.

Keywords: national interests; strategic goals; national security; Russian Federation

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MAIN OBJECTIVES

The national interests of the Russian Federation — objectively relevant needs of the country, satisfying which ensures realization of strategic national priorities of the Russian Federation.[1]

Although the doctrine of the interests of individual states was developed in the 14th and 15th centuries by Machiavelli (1469–1527), developed in the 16th and 17th centuries by Giovanni Botero (1544–1617) and Jean Boden (1530–1596), there is still no unified method for defining national interests [1]. One of the reasons for this seems to be the breadth and complexity of the concept of "interest". In a vast array of scientific works on national interests and security, national interests and politics (primarily English–speaking authors[2]) the most prominent national interests are: 1) preservation and survival of the nation; 2) territorial integrity; 3) political and economic independence, self–governance; 4) socio–economic well–being and welfare (material and spiritual); 5) protection from hostile attacks; 6) an honourable place in the world community; 7) environmental safety.

National interests, joint activities, relations, and interaction among members of society, a system for regulating their conduct, relations and activities, and a common area of residence form the basis for the formation of strategic goals of society. The goal — is the image that people create.[3] Society's strategic goal — is the long–term goal of society. In fact, it represents some of the ideals that this society aspires to [2].

All life is genetically engineered to preserve and continue life — its own and its own species. Preservation and reproduction of human society (hereinafter simply — "society") is, above all, an increase in the number and life expectancy of people. Therefore, **the first strategic goal of society and the State is to increase the population and ensure its security.**

"The fate of Russia, its historical perspective,— is said in the message of Russian President Vladimir Putin to the Federal Assembly of the Russian Federation in 2020,— depends on how many of us will be (I want to start with demographics), depends on how many children will be born in Russian families in a year, in five, ten years, what they will grow up to be, what they will do for the development of the country and what values they will support in life." (http://www.kremlin.ru/events/president/news/62582). The Decree of the President of the Russian Federation from 21 July 2020 No. 474 "On the national development goals of the Russian Federation for the period up to 2030" says softly: the national goal is "preservation of the population, health and well–being of people" (http://publication.pravo.gov.ru/Document/View/0001202007210012). Conservation is simply reproduction. It is not enough.

Since, in spatial and geographical terms, national interests are not limited to the territory of the State, it is in the interests of the Russian Federation — to increase the number of its citizens beyond the borders of the Russian Federation.

To maintain and to continue life, society needs development resources. Their society draws from nature, creates and reproduces. The labour force creates and reproduces resources for development (L1). Other things being equal, the number of workers directly and positively depends on the size of the population: L1 = f(L), where f — rising function; L — a number of people.

[1] National Security Strategy of the Russian Federation. Approved by Decree of the President of the Russian Federation of 31 December 2015 No. 683.

[2] In English–language literature, the national interest has two meanings: a) "the federal government interest"; b) interest of a particular nation (ethnic group).

[3] "Goal — ideal, mental anticipation of result of activity". Great encyclopedic dictionary. URL: http://www.onlinedics.ru/slovar/bes/c/tsel.html.

Formally, the direct linear relationship of the amount of development resources (products) produced by a society to the size of the working population is as follows: $X(t) = L1(t) \cdot p(t)$, where t — time index; $p(t)$ — labour productivity.

Labour productivity, in turn, depends directly on the worker's level of skill and training and the means of production used — subject of labour, machinery and technology. The relationship between labour productivity and the quantity and quality of capital goods is recorded as a ratio: $p(t) = k(t) \cdot b(t)$. Here $k(t)$ denotes the fixed capital per worker, and $b(t)$ — denotes the fixed assets turnover ratio.

FIXED CAPITAL PER WORKER AND FIXED ASSETS TURNOVER RATIO, CHARACTERISTICS OF MEANS OF PRODUCTION USED BY SOCIETY

The productivity and effectiveness of the latter depends on the educational, cultural, scientific and knowledge levels achieved in the country. All these factors ultimately are determined by the number of highly educated people, the nature and quality of all levels of government in a country — human and institutional capacity.

Hence the conclusion: **the strategic goal of the Russian Federation — is to increase the number of capable, highly educated, professionally trained citizens of Russia.** The availability of such human resources — is one of the main components of the country's scientific and technological security.

Human and institutional capacities depend on the level of development and the state of society. An increase in the number of the country's able–bodied, highly educated and professionally trained population is impossible without a successful socio–economic, cultural, educational, scientific and technological, information system, ideological, organizational and political development.

Therefore, **the strategic goal is to ensure, as far as possible, the sustainable development of society and all spheres of human activity** (socio–economic, cultural, educational, scientific and technological, information, ideological, organizational and managerial, political, defence, etc. within the country and within established borders outside the country). The realization of this objective will, among them, enhance the country's economic security.

The needs of modern society are: equality before the law, opportunity to participate in public life (including in the preparation and adoption of decisions), improve their well–being, and the traditional quest for justice. It is therefore in the interest of individuals, social groups and authorities to maintain the social and economic balance in society and to prevent excessive differentiation in society.

All this sets a strategic goal for the society and the state: **to prevent dangerous levels of social, economic, regional differentiation; class, religious, ethnic and other types of unwanted confrontation in society**. This is an important component of social security.

People live in a certain space, in a known area. It is therefore **the strategic objective of any State to ensure its territorial integrity and to maintain that territory in a life-friendly condition.** This requires ensuring the territorial and ecological security of society.

As long as there is a struggle on Earth for spheres of influence (economic, political, scientific and technological, cultural, information, military and technical, etc.) and for territory and natural resources (including human) **the national interest and strategic goal of society and the State is to safeguard the sovereignty of the country and protect it from all types of external threats, as well as the protection of people, property and assets from all types of natural disasters, technological disasters, new dangerous organisms and other emergencies.**

Realization of national interests, achievement of strategic goals and ensuring the security of society and its socio–political institutions enhance the ability of society to successfully overcome unfavourable living conditions, resistance to stressors, the ability not only to exist but also to develop, i.e. the resilience of society, the individual, the State. Synonymous with resilience are concepts "viable" ("the ability to live in all its manifestations, not only to exist, to adapt to living conditions, but also to develop") [3] and "survivability" ("the ability of a machine, structure, means or system to perform its basic functions despite the damage caused" (https://dic.academic.ru/dic.nsf/ruwiki/36975).

RESILIENCE FACTOR

National interests, strategic objectives, safety levels are usually expressed in measurable (quantitative and/or qualitative) indicators. By a change in the values of such indicators they judge about the success and failure in the implementation of national interests, fulfilment of the goals set, achievement of necessary safety levels.

In 2007, the staff of the Governance and Problem Analysis Center (Moscow) proposed a vitality rate for assessing the viability of the country, taking into account the five factors that characterize the size and dynamics of the population of the country:

$$B(t) = H(t)*[P(t) - C(t) + \\ + \Delta LEB(t)/LEB(t)] + M(t), \quad (1)$$

Here t — time interval index; B — vitality coefficient; H — the numder of population; P — the number of births per 1 000 population; C — the number of deaths per 1 000 population; LEB — life expectancy at birth; ΔLEB — increase in life expectancy at birth; M — migratory net balance (person per year) [4].

It is known that most of the indicators, used to characterize an object, are only suitable for a strictly defined set (type, class) of objects. Calculation of indicator B(t) by formula (1) as any additive value is only possible for the same physical units of measure for all components.[4] It is also desirable that the value of an indicator should indicate its proximity or distance to a known boundary (target or critical value). For indicator B(t), this may be a proximity or distance from a simple reproduction of the population.

Let us consider another possible indicator of the resilience of a society in which such requirements are met. In order to obtain it, we will divide the many factors that a society is able to manage in its development into two groups.

In the first (group G) we will include those factors increase in value of which has a positive effect on the target indicators, such as national interests, strategic goals, the development of society and the strengthening of its viability, the security of the country, etc. The factors of this group contribute to the activity, maintenance and reproduction of life. These include, for example, population size and life expectancy.

To the second (group Q) we will attribute negative influencing factors. The increase in their values runs counter to national interests, hinders the achievement of strategic objectives, hinders development, weakens viability, reduces safety, etc. Factors in this group impede activities, make it difficult and have a detrimental effect on life (e.g., air pollution, exhaustion and lack of development resources).[5]

Since increasing the values of G factors improves resilience and Q — decreases it, the

[4] In terms of (1) this requirement is violated. The units of measurement of the indicators are different: persons on a fixed date (static indicator) and persons per year (dynamic indicator).

[5] "Resources — are the set of currently known means and sources of their obtaining, which are possible and available for use in solving certain and unforeseen tasks under normal, optimal and extreme conditions regardless of the time of use" [5].

following indicator (coefficient) of change in resilience in a certain period of time V(t) is proposed [6]:

$$V(t) = \frac{\sqrt[n]{\prod_i^n G(i,t)}}{\sqrt[m]{\prod_j^m Q(j,t)}}. \quad (2)$$

Here:

$t = 1, 2, \ldots, T$ — time index;

$i = 1, 2, \ldots, n$ — index of group G factors;

$j = 1, 2, \ldots, m$ — index of group Q factors;

$G(i, t) = g(i, t) / g(i, t - 1)$ — the rate of change of factor i from group G the time interval t;

$Q(j, t) = q(j, t) / q(j, t - 1)$ — the rate of change of factor j from group Q the time interval t;

$g(i, t) > 0$ — value of factor i from group G the time interval t;

$q(j, t) > 0$ — value of factor j from group Q the time interval t.

The ingredients of the ratio (1) are the growth rates, therefore each of the variables in the calculation $g(i, t)$ и $q(j, t)$ must be different from zero and not infinitely close to it, do not change the sign during the time period considered. The scope of application of the proposed coefficient $V(t)$ is specifically limited to socio–economic indicators meeting such conditions.

The proposed resilience indicator is expressed in fractions of one, it is greater than zero. The value of $V(t)$ indicates neither a high nor a low resilience of the subject(s), i.e. its absolute level. It shows the direction of the change in resilience — growth or decline — and gives an estimate of the rate of change in resilience.

The equality of the index of change of resilience to unit [$V(t) = 1$] means that in time t resilience has remained at the level it was in the previous period $t - 1$. In real economics, this corresponds to simple reproduction.

The value of a factor greater than one [$V(t) > 1$], indicates that the level of resilience has increased (extended reproduction) and smaller than a unit [$V(t) < 1$] — that resilience has decreased (reduced reproduction).

It is clear that both the set and the number of factors in the expression (2) used to assess the dynamics of the process being studied (in our case of resilience) can be changed.

Mention should also be made of the use of certain factors to increase the resilience of a society that it is able to create, reproduce, modify and use, may require a total or partial waiver for some time or permanently from one or more of the other factors. This is usually the case when comparing immediate and future, short–term and long–term costs and benefits, as well as in deciding which means and sources of development with limited resources (human, temporary, logistical, information, etc.) to expand, create and reproduce in a fixed period of time and which are not. "In order to build the future — Doctor of Philosophical Sciences A.I. Selivanov notices — special efforts are necessary, which often go to the detriment of the present, and this has to be made consciously, sacrificing the present for the future" [7].

APPROACH TO ASSESSING THE DYNAMICS OF NATIONAL INTERESTS

Let us apply the expression (2) to assess the progress of the Russian Federation in the implementation of the seven national interests mentioned at the beginning of the article in 2001–2018. The indicators chosen to characterize them are shown in the *table*. The availability of statistics has also been taken into account in the indicators presented.

Among the parameters presented in the *table* for calculation by formula (2) are those included in the lists of economic security indicators contained in the Economic Security Strategy of the Russian Federation for the period up to 2030 (approved by Decree of the President of the Russian Federation of

Table

Baseline indicators selected for assessing the implementation of national interests

Indicator designation	Baseline indicator
National interest: **Preservation and survival of the nation**	
G1	Population
G2	Life expectancy at birth
Q1	General population morbidity, newly diagnosed patients
National interest: **Territorial integrity of the country**	
G3	Length of railway tracks
G4	Length of paved public roads
Q2	Inequality of the constituent entities of the Russian Federation in terms of GRP *
Q3	Inequality of the constituent entities of the Russian Federation in the level of real disposable cash income *
National interest: **Political and economic independence**	
G5	Domestic R&D costs adjusted for GDP deflator
G6	Industrial output (at comparable prices)
G7	Agricultural output (at comparable prices)
Q4	Share of chemical industry, rubber, machinery, equipment and vehicles in Russian imports
National interest: **Socio–economic well–being and welfare gains**	
G8	Real disposable money income of the population
G9	Annual average number of employed in the economy
Q5	Decile coefficient of funds
National interest: **Protection from hostile attacks**	
G10	National defence spending adjusted for GDP deflator
G11	Population at working age
G12	Ratio of revenues of the consolidated budget of the Russian Federation to its expenditures
Q6	Level of depreciation of fixed assets
National interest: **A worthy place in the world community**	
G13	The share of GDP of the Russian Federation in the GDP of the world
G14	Share of Russian exports in world exports
National interest: **Environmental security**	
G15	Fixed capital investments for environmental protection and rational use of natural resources adjusted for GDP deflator
Q7	Volume of pollutants emitted into atmosphere
Q8	Volume of discharge of polluted sewage

* – the value of the inequality is calculated as the ratio of the maximum value of the indicator in the Russian Federation to the minimum value of the indicator.
Source: compiled by the author.

13 May 2017 № 208) and in the Decree of the President of the Russian Federation of 21 July 2020 № 474 "On the national development goals of the Russian Federation for the period up to 2030" (signed 21 July 2020). Some of them were taken unchanged, some were modified. The former include, for example, the share of Russian gross domestic product in world gross domestic product, the degree of depreciation of fixed assets, and the decile coefficient of funds. The second — is the ratio of the consolidated budget revenues to its expenditures. The list of national security indicators includes a deficit in the federal budget and a deficit in the consolidated budget of the constituent entities of the Russian Federation. The value of the budget deficit can change from positive to negative and negative to positive at times and be equal to zero. This makes it impossible to calculate its growth rate. Therefore, the ratio of the budget's income to its expenditure is used to calculate according to formula (2). The same can be done in cases with other indicators, in the dynamic series of which there are both positive and negative values, and which are the sum of two other values with the same signs (plus or minus).

In addition to the above–mentioned criterion for the selection of the starting points for the calculation of the formula (2) — the possibility of calculating their growth rate — another principle of their selection is used in this work: the indicators should not be expressed through each other. For example, in the Russian Federation's Economic Security Strategy 2030 two indicators do not satisfy this principle. First, index of volume of gross domestic product, second, share of fixed investment in gross domestic product. The same parameter, gross domestic product, is used in their calculation. Let us see how it will look if one include them in formula (2).

Denote gross domestic product through $X(t)$ in time t, $I(t)$ — amount of fixed investment. If both of these indicators are in group G, which is logical, then their product will be:

$$X(t)/X(t-1) \cdot I(t)/X(t) = I(t)/X(t-1).$$

This is a different measure — the share of fixed investment in GDP in the previous period.

Assume that the volume index of gross domestic product is in groups G (inclusion in group Q is illogical), and the share of fixed investment in gross domestic product — is in group Q. Then their ratio in terms of (2) would be: $X^2(t) / [X(t-1) \cdot I(t)]$.

The meaning of the ratio is unclear.

In order to avoid such cases, the principle of not including indicators expressed through each other was adopted. In general, the application of this principle does not exclude all indicators that directly or indirectly (through other indicators) affect each other's values. For example, it is natural to assume that, all other things being equal, the dynamics of the volume of industrial output directly influences the share of gross domestic product in world GDP and the share of Russian exports in the exports of all countries of the world.

Statistical verification showed a significant linear correlation of the growth indices of these indicators (linear correlation coefficients are 0.777 and 0.738 respectively) in the study period (2001–2018) with the bilateral confidence level $\alpha = 0{,}01$. A significant linear correlation ($R^2 = 0.9787$) has also been found for indices of changes in the share of the gross domestic product of the Russian Federation in world GDP and the share of Russian exports in world exports. This means that excluding one of these shares from the calculation of the index will not have a noticeable impact on the trajectory of the coefficient $V(t)$, but will only change its value (if the index of change in the share of exports of the Russian Federation in world exports is excluded, the value of $V(t)$

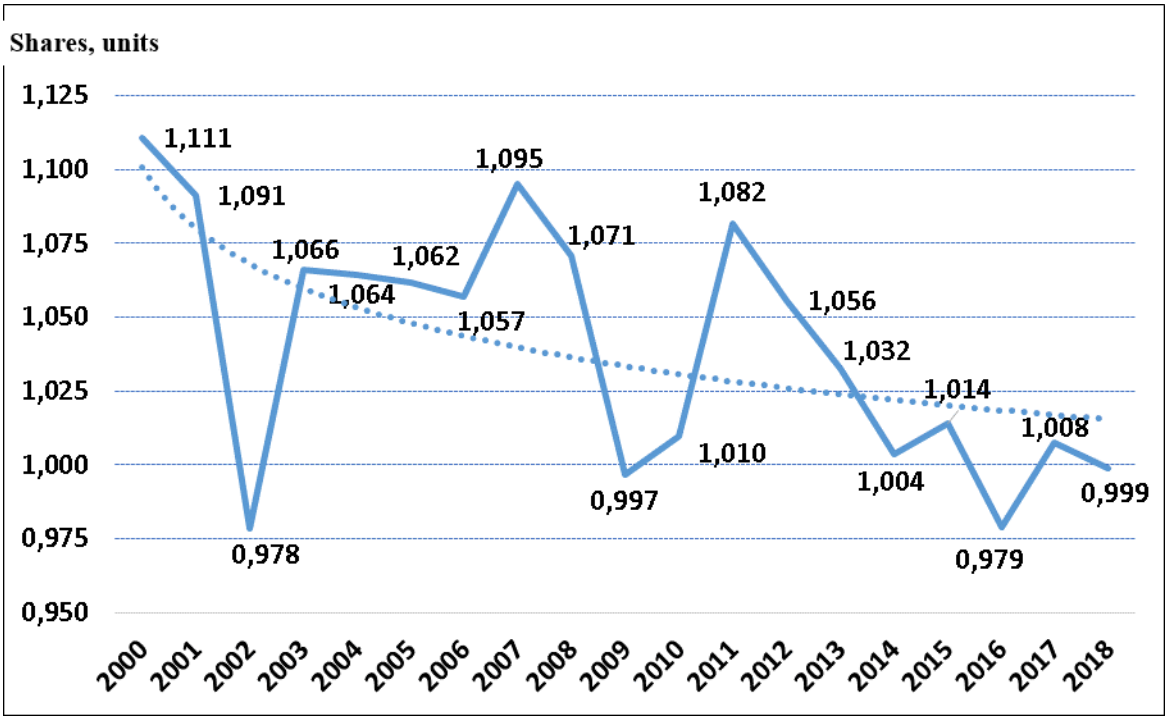

Fig. 1. **Dynamics of the coefficient *V*(*t*) in 2001–2018, shares of unit**

Note: Dashed indicates the power line of the trend ($y = 1.1009x^{0,027}$, $R^2 = 0.311$).

Source: the author's calculation based on data from Rosstat and the World Bank.

will change from –2.4 to +1.7 per cent of its reference value).

It is important to note that the indices in question are chosen as indicators of the dynamics of the national interests under discussion, rather than as factors for achieving the latter.

EVALUATION OF THE DYNAMICS OF THE REALIZATION OF RUSSIA'S NATIONAL INTERESTS

The assessment of the dynamics of realization of the seven national interests under our consideration with the help of the baseline indicators (see the table above) and expression (2) was made on the basis of the official data of the Federal State Statistics Service of the Russian Federation (Rosstat) and the, the World Bank's Word Development Indicators. The indices of change of values of these indicators (in unit shares) are calculated for 2001–2018. They are different from zero and are not infinitely close to it. The resulting evolution of the coefficient *V*(*t*) is shown in *fig. 1*.

The high level of dependence of the Russian Federation's economy on world commodity and financial markets has led to a consequentially low level of its resilience in the years of the greatest influence of economic crises and sanctions imposed on the Russia. In 2002, the economy of the Russian Federation experienced the effects of the dot–com crisis[6] (2000–2001); 2009 was the year of the strongest impact on European economies and the Russian Federation of the global financial and economic crisis 2008–2010[8]. In 2012, the U.S. Real Estate and Financial

[6] "Dot–com is a term used to refer to companies whose business model is based entirely on work within the Internet. The term comes from English "dot–com" — top–level domain. com, which has mainly registered sites of commercial organizations". URL: dic.academic.ru/dic.nsf/ruwiki/9131.

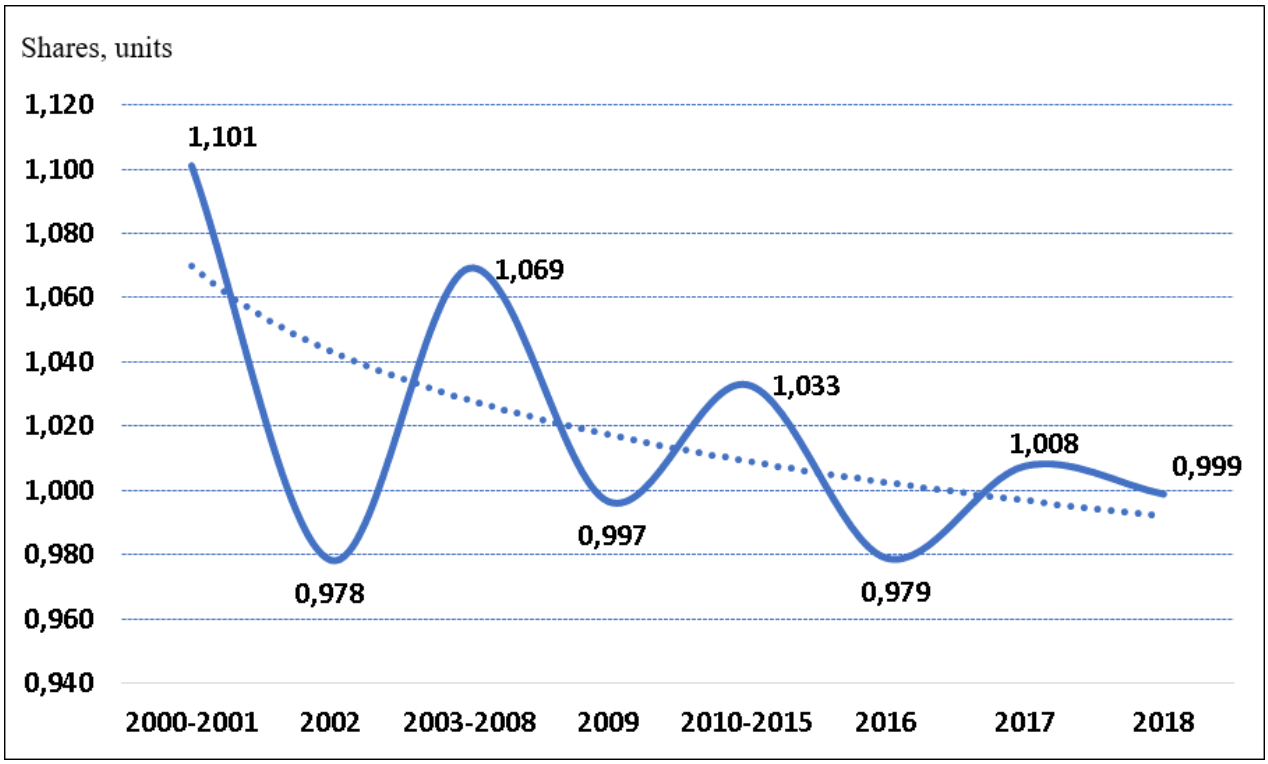

Fig. 2. **Average annual *V*(*t*) changes during periods of its growth and decline, fractions of a unit**

Note: Dashed indicates the power trend line ($y = 1.07x^{-0,036}$, $R^2 = 0.3591$).

Source: the author's calculation.

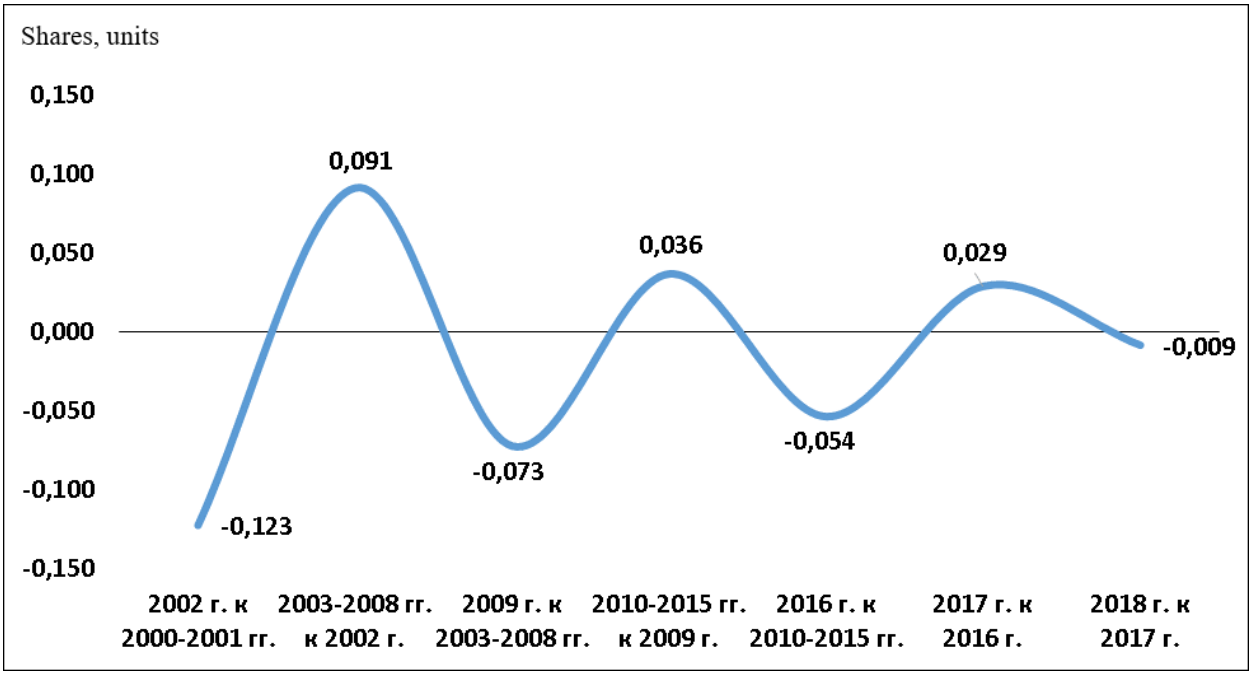

Fig. 3. **The damping of the ratio *V*(*t*) fluctuations in 2001–2018, fractions of a unit**

Source: the author's calculation.

Credit System Crisis, aggravated by the consequences of hurricane "Sandy", spread throughout the world. In the same year "the second wave" of the global financial and economic crisis 2008–2010 took place in the eurozone states.[7] Since 2014, the economy of the Russian Federation has been under pressure from anti–Russian sanctions implemented by 42 States.

In general, the values of the indicator of the dynamics of the realization of the national interests of Russia $V(t)$ in 2001–2018 showed a downward trend, which in *fig. 1* is represented by the trend line. In this case, the oscillation amplitude of this indicator fades in time (*fig. 2*) and its dynamics show a trend towards simple reproduction[8] (*fig. 3*), which corresponds to $V(t) = 1$.

It appears that the evolution of the rate of change in the resilience of the Russian economy, as shown in *fig. 2* and *3*, is a matter of concern. After overcoming the consequences of the COVID-19 pandemic, such a trend should be resolutely overcome!

[7] European Economic Forecast. Autumn 2012. European Economy 7/2012. Fiscal Sustainability Report. European Economy 8/2012.

[8] The calculations showed that excluding one or more of the indicators in the table from formula (2) did not fundamentally change the trajectory of the indicator $V(t)$.

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Strict Rules of Free Competition (about The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2020)

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ABSTRACT

Studying the research results by Nobel prize-winning economists is a fundamentally important task for determining the most promising areas of development of Russian economic science. The author traces the connections between all these works and their predecessors' work, many of whom were also awarded the Nobel prize in economics. Three lines of development of the predecessors' achievements are identified: information asymmetry, limited rationality, the design of market mechanism and new institutionalism. The article does not address the problems of auction theory related to its formal justification, which is part of mathematical economics and game theory. However, it is noted that this is an essential part of the laureates' achievements. The article's main conclusions are that the prize received for "improving the theory of auctions" fits into the broader economic research context. The winners solved the problems of maintaining free competition and reducing the market's likelihood of monopolization. The author pays special attention to the results of the empirical analysis of actually implemented auctions. This analysis is divided into three parts, corresponding to the three stages of each auction: starting problems (distrust, the reputation of participants, etc.), the course of the auction (behaviour of participants and results, in particular, the "winner's curse".

Keywords: Nobel prize on economics; auctions, asymmetry of information; restricted rationality; market mechanism design; game theory; mathematical economics; "predatory pricing"; market monopolization; free competition; the reputation of auction participants; collusion

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INTRODUCTION

Political economy XIX century was a science fundamentally different from modern economic theory. Then it was enough to show or even mention that the market is prone to monopolization. Now the meticulous people are beginning to ask how the competitive market can do this. This is in connection with the following event.

In 2020, two professors from Stanford University (USA) — Paul Milgrom and Robert Wilson — won the Nobel Prize in Economic Research. The Nobel Committee's formulation: "for improving auction theory and developing new auction formats".

The biographies of the new Nobel Prize winners are not abrupt. Paul Milgrom received a bachelor's degree from the University of Michigan, a master's degree in statistics and a doctor's degree in "business" from Stanford.

R. Wilson got all three of these degrees from Harvard University. He had a scientific adviser was Howard Raiff, an eminent decision — making theorist.

Both winners now teach at Stanford University and work in neighbouring departments.

As R. Wilson joked: "Both at work and at home the distance between us is not more than 40 meters".

The fact that the winners are from the United States has become common. Americans are twice as likely to win the Nobel Prize in economics as citizens of the rest of the world.

The theme of the laureates is also not new to the Nobel Committee. In the justifications of the achievements of the previous winners, the term "auction" was not met, but, in fact, the winners of the 1995 (R. Lucas), 1996. (W. Vickrey and J. Mirrlees) and 2007 (L. Hurwicz, E. Maskin and R. Myerson) actively worked with the topic of auctions.

A more specific formulation of the achievements of the winners in 2020, linking them to auctions, may give the impression that their research is a private issue, one of the relatively exotic market procedures applied in a few specific situations. But it's not. The recipients themselves put their work into a much broader context and the development of new market mechanisms.

More recently, the actual introduction of economic research results into business practice has become the practical criterion for the selection of new Nobel laureates as economists. But that does not preclude the fact that the next Nobel laureates in economics are an integral part of a constantly evolving world of economic science. As we know, there is no science without a theory.

THE FIRST LINE — INFORMATION ASYMMETRY

P. Milgrom and R. Wilson won the award primarily because they were practically implementing auction theory. But the wording of the award highlights the laureates' achievements in developing auction theory. Part of the reason for this decision is that auctions are becoming increasingly prominent in the system of market — based mechanisms. But the most important reason is that auctions are linked to several lines of modern economic theory. One of them — the concept of asymmetric information developed by 2001 Nobel Prize winners in economics George Akerlof, Michael Spence and Joseph Stiglitz. Forerunner laureates — also Nobel Laureate in Economics in 2001 year "for analysis of markets with asymmetric information" Michael Spence.[1] He analysed in detail the results of the bidding where the bidders had different information, in particular the results of the auction.

In fact, the two winners' journey to the 2020 award began with a paper by Robert Wilson, written precisely in line with the concept of asymmetric information [1]. He had worked out a specific situation where information was unevenly distributed among bidders at the start of the bidding and that anomaly was rectified as the case progressed. Then R. Wilson tried to go into formalization beyond auctions and other types of market transactions, but also long — term partnerships [2], and the auction trade subsequently became his main focus. Contributing to this return, no doubt, was Paul Milgrom's development of his ideas.

THE SECOND LINE — LIMITED RATIONALITY

This line of research began with Nobel Laureate in Economics Simon Herbert,[2] who noted that a person within an organization objectively has limitations on his or her rational behavior.

Initially economists introduced into the term "rational" a completely different meaning, far from what ordinary people mean by it. Rational behavior considered by economic theory is quite "dull" and consists only in the attempt to use the resources available to a person with the best benefit for himself. At the same time, as noted by Paul Milgrom, it is implicitly accepted that (according to the theory) a rational person has one unlimited resource– his intelligence and his ability to anticipate future events.

[1] **Michael Spence** (born 1943) is a professor at the University of California (Berkeley).

[2] **Simon Herbert Alexander** (1916–2001) — Professor at Carnegie Mellon University, Nobel Laureate in Economics in 1978.

This weakness was pointed out by Herbert Simon, who proposed a concept of bounded reality based on the following assumptions. Market actors have limited ability to clearly define objectives and foresee the consequences of their decisions. The rationality of the market participant is limited because it cannot be the "perfect calculator".

But it is not just a matter of a person's limited ability to foresee the future [3]. The behavior of many market participants is often guided by the principle of satisfaction rather than profit maximization. I think many readers have had to meet people who, having reached a certain level of affluence, stop caring about his further improvement.

One very special forerunner of Paul Milgrom and Robert Wilson, including Nobel laureates, is Reinhard Selten [4], who received prize in 1994.[3] The concept of R. Selten can be seen as a further development of the ideas of the bounded rationality of H. Simon.

THE THIRD LINE– NEW AUCTION FORMATS AS PART OF THE DESIGN OF MARKET MECHANISMS

The 2007 Nobel Laureates were Eric Maskin[4] and Roger Myerson,[5] who have contributed greatly to the theory of auctions as part of a more general problem of developing (design) market mechanisms. By then, Paul Milgrom and Robert Wilson were not only researchers, but also recognized developers of new auction formats.

In economic theory, the problems of the most intricate market mechanisms, far removed from the normal trade transaction, are much discussed. It is noteworthy that the forerunners of P. Milgrom and R. Wilson have moved from treating the market mechanism as a result of the natural course of events to be understood as a planning goal.

Market planning theory has shown why an auction is usually the most efficient way of allocating private (not public) goods to a given pool of buyers. This theory demonstrates, in particular, that the auction mechanism produces the highest expected return on the seller. In the domestic literature, the criterion of the income of the seller (in many cases — the State) is supposed to be the determining criterion. But other criteria are used in the work of the winners, in particular maximum efficiency of the sold right (license).

In the future, the use of artificial intelligence is considered when developing new auction formats [5].

THE FOURTH LINE– NEW INSTITUTIONALISTS

Most researchers consider P. Milgrom and R. Wilson as continuing a relatively new direction in economic science — neo — institutionalism. Nobel Laureates in economics Ronald Coase[6] and Douglass North[7] are considered to have created this line.

The term "neo — institutionalism" introduced Oliver Williamson.[8] It is submitted that that he has finalized this direction of economic thought into a whole teaching. The main work in this area — is Douglass North's monograph "Institutions, Institutional Change and Economic Performance" [6]. But the beginning of the neo — institutional direction of economic thought

[3] **R. Selten** (1930–2016) — the only German economist to win a Nobel Prize in economics. His achievements were overshadowed by John Nash, with whom he received the award.

[4] **Eric Maskin** (born 1950 r) — Professor at Princeton University, Nobel Laureate in Economics in 2007.

[5] **Myerson Roger** (born 1951) — Professor at the University of Chicago, Nobel Laureate in Economics in 2007.

[6] **Ronald Harry Coase** (1910–2013) — an English economist, a professor at the University of Chicago, a Nobel Laureate in Economics in 1991 "for the discovery and clarification of the precise meaning of transaction costs and property rights in the institutional structure and functioning of the economy".

[7] **Douglass Cecil North** (1920–2015) — American Economist, Professor at the University of Washington, Nobel Laureate in Economics in 1993. Won it with Robert Vogel "For the revival of research in the field of economic history, thanks to the application to them of economic theory and quantitative methods allowing to explain economic and institutional changes".

[8] **Oliver Eaton Williamson** (1932–2020) — Professor at the University of California, Nobel Laureate in Economics in 2009.

was the work of R. Coase "The Nature of the Firm" [7]. In it was the search for an answer to the unexpected question: "Why exist firms?". R. Coase replied so: "Because inside of them is below transaction costs". The question to which R. Coase responded was, over time, overshadowed by the focus on the theory of transaction costs, of which R. Coase is rightfully considered the author.

However, the more important element of the neo– institutional concept, which develops one of Hegel's theses, is ignored: "All existing market institutions are appropriate, and it is necessary to explain the reasons for their existence".

While arguing for the need to analyze and explain what exists, neo — institutionalism is relatively new (and the century has not gone by) the direction of economic thought is based on several postulates. First — economic agents are able to decide their actions individually. Second — market institutions are influenced by the behaviour and interests of specific market actors who seek to avoid chaos. The information used by economic agents is always asymmetrical. One side of the transaction is bigger, the other side — is smaller. This characteristic of economic information provides the basis for unscrupulous (opportunistic) behaviour, which, according to the concept of neo — institutionalism, should be equally taken into account by theory as by rational behaviour.

Much of the attention of neo — institutionalists has been devoted to the analysis of changes in the structure of economic agents: households, private companies and States, which were perceived as a given by neo — classicists and not studied separately.

While recognizing the limitations that neoclassical theory has taken into account (i.e., physical, resulting from scarcity of resources, and technological, reflecting the level of development of knowledge and skills of economic agents), neo — institutionalists have introduced another type of constraint related to the institutional structure of society. They argue that, with the adoption of a new type of restriction, it will be possible to better understand and explain the real world in which economic agents operate in a situation of uncertainty and risk, high transaction costs, unclear property rights, unreliable contracts.

Motivation in neo — institutionalism is more diverse than in other currents of economic thought. In classics and neo — classics, the main, and often the only, motive for behavior– is the maximization of benefits, and in neo — institutionalism, the mechanism (progress) of decision — making, its conditions and prerequisites are analysed. Motive becomes just one of the prerequisites that are volatile.

Traditional neoclassical theory, according to O. Williamson [8], characterized by the technological paradigm. Neo — institutionalism relies more on the notion of the economy as a system of mutually beneficial relationships between people and companies. Such relations could not be realized otherwise than through an institutional environment.

Representatives of neo– institutionalism are accused more than others of "economic imperialism", i.e. of seeing economic phenomena and processes in all aspects of social life. You can argue with such critics. If economists see friendliness as an opportunity to get interest — free credit, it does not prevent psychologists from exploring friendships by other methods and other conceptual devices.

I consider, that this "flaw" is obligatory for economist. Let psychologists and sociologists reclaim territory taken by us.

WHAT IS AUCTION THEORY?

Before answering this question, I will give you some relevant facts. In their papers, Paul Milgrom and Robert Wilson, in the part noted as the basis for their Nobel Prize in Economics, developed the research of William Vickrey, who became a Nobel Laureate in 1996 — year.[9] They were his

[9] **William Vickrey** (1914–1996) — American Economist, Professor at the Columbia University, Nobel Laureate in Economics in 1996.

followers so that when W. Vickrey died (a few days after he received the Nobel Prize), Paul Milgrom gave the Nobel lecture for him.

William Vickrey's initial premise was that auctions — are part of a system of market mechanisms that keep economies from monopolization and speculative bubbles.

You can give a lot of examples of modern auctions, one more surprising than the other, each of which — has a lot of procedural subtleties.

Auction theory is largely formal and expressed by many mathematical equations [9]. The formalised part of auction theory is significant, and is organically part of the mathematical economics that works with models of some conditional economies. But the most interesting thing is that it involves data processing and analysis of actual auctions [10].

In addition to a series of formal justifications, auction theory includes a system for analysing the effectiveness of different types of auctions. It considers three stages of the auction: the starting positions of the bidders, their behaviour during the auction and their evaluation of the results at the end of the auction [11].

START PROBLEM — MISTRUST

In any trade transaction, the buyer doubts to some extent the characteristics of the good or service it purchases. Thanks to the formalization of the tendering procedure in the auction trade, the level of these doubts can be assessed in the course and outcome of the auction. One element of auction theory — is the assessment of the buyer's initial distrust.

Many empirical studies have been carried out by the 2020 award winners to demonstrate that in designing the format of the auction, it is imperative to avoid as much as possible the suspicion of buyers that some information is deliberately hidden from them [12]. Suspicions increase participants' caution and deter them from high demand prices. The level of initial mistrust can be identified by special studies and surveys.

The root of the distrust among participants, not only in the auction but also in any market transaction, is that any information may contain elements of persuasion. Therefore, the concept of asymmetric information clearly needs to be complemented by a provision that any market information may be toxic, i.e., capable of forcing a market participant to make the wrong decision.

Like many economists, Paul Milgrom proceeds from the general proposition that if something exists and seems to us to have no direct relationship with the market, it's– a research gap and needs to be found that connection [13].

In the framework of research on the motives of decision– making (both at auctions and in the market economy in general), the winners have focused on the motivation of maintaining the company's reputation as a worthy market participation.[10] By setting a price or defining the parameters of price policy, a firm that cares about its reputation is oriented not so much on current profits as on the future behaviour of partners and competitors.

However, the development of such a theory is useful for practical applications even if it is not practicable. In Russia, the reputation of market participants can be considered catastrophic. But reputation is a major part of so– called intangible assets that have a monetary value.

In the 1990s, the share of intangible assets of Russian companies was 5%. In 30 years it rose to 12%. But this is far from the world average (63%).[11] World practice of reputation evaluation has spread in the Russian Federation. Any manager or owner of a firm may apply to the system[12] and obtain a value for the reputation of his organization. But there's no particular demand.

Paul Milgrom and Robert Wilson associated a reputational evaluation problem with the format of the auction. It's one thing to have companies

[10] The founders of reputation theory and its role in the market are Nobel Laureates in Economics in 2004, Finn Kydland and Edward Prescott.

[11] URL: http://emco-eqs.webflow.io/

[12] URL: https://www.rep-in.ru/

with impeccable reputations participate in an auction, and it's another to do so if some of them cause mistrust of other participants in the auction itself and its possible outcome.

PROBLEMS DURING THE AUCTION — POSSIBLE COLLUSION

The second element of auction theory is based on an analysis of the behaviour of bidders during the auction. If in one case buyers define their proposals as a simple additional fixed sum, and in another case, they have interest rates in mind, the auction rules for both should be different. The rules of the auction restrict the actions of bidders, making it easier to formalize their behaviour. Formalizing participants of the auction participants is a powerful means of limiting the opportunities of large players, equalizing their rights with those of other auction participants. Using simple auction formats does not always achieve this goal.

I'll start with negative examples, namely — the 1995 auctions of collateral, which deprived our State of a substantial part of its property. The subject is, unfortunately, overly politicized. It seems that this is a case of privatization in general, and this is not. Bail auctions began after the Decree of the President of the Russian Federation B.N. Yeltsin in August 1995.[13] There were only 12 before the end of the year and only a few large State — owned companies were affected. The increase in the sales price relative to the starting price was minimal: the majority share of "Sidanko" was sold with an increase of 4%, "Yukos" — 2.6%, "Norilsk Nickel" — 0.6%.[14]

The main evidence of collusion is that the small increments are such that there is no competition during the auction. No competition– hence, the market is totally or partially monopolized. Collusion– is a way of mutually supporting those who replace free competition with monopoly or oligopoly.

So it makes sense that the development of auction formats that reduce the likelihood of collusion among bidders requires an interested party and an order for such development. But due to the absence of a normal scientific analysis in Russia so far, even the 1995 bail auctions, one can guess that the state order for the development of auction formats with a low probability of collusion in our country is not yet ripe.

Collusion and mistrust — two issues that increase the likelihood of monopolization. Therefore, measures aimed at reducing this probability create obstacles to the activities of future and established monopolists and contribute to the maintenance of free competition.

SUMMING UP, "WINNER'S CURSE"

Third element of auction theory (in its empirical part) — summing up of auction results. Losers are notoriously unhappy with the auction, but it turns out that often the winner of the auction is dissatisfied. Such situation was designated by the winners as the "curse of the winner" and analyzed in detail. It can be understood by interviewing many auction winners who often worry that they overpaid.

There are many such complaints in some auction formats, for others — substantially less. Victory can be considered both bad news and good news. The better the auction format the less regret the winner. This pattern was first noted by Robert Wilson [14]. The winner's estimate of his future income was the most optimistic. When he wins, he gets a lot of negative information when he learns that everyone else has given less credit than he has. On the basis of this information, he adjusts his earlier estimate of his future gain and becomes pessimistic.

Paul Milgrom "Winner's curse" does not treat simply as a phenomenon, a symptom of the efficiency (or ineffectiveness) of the chosen auction format. He explains it using

[13] Decree of the President of the Russian Federation dated 31.08.1995 No. 889 "On the procedure of deposit of shares in federal property".

[14] Calculated from data: URL: http://nationalization.ru/privatizaciya-v-90/kriminal-zalogovyh-aukcionov/.

two categories — persuasion and openness of information [15]. It is interesting that this approach of the laureate overlaps in many ways with the ideas expressed exactly a century ago by the Russian academician V. M. Bekhterev [16]. The latter drew a line between suggestion and conviction, believing that the belief was to explain to a person what the actual situation was and to counter the compulsion, which was an instrument for influencing not only the mind but also the subconscious.

Paul Milgrom draws a similar line between persuasion and openness of information based on another criterion. Persuasion — there is a purposeful influence on the consciousness of market participants, in the openness of information there is no such purpose, at least obviously. "Winner's curse" is the result of persuasion (and possibly compulsion), even if the seller did not intend to induce or convince the buyer of the merits of the goods, services or rights he purchases.

BROADCAST TRADE

The modern market economy is characterised by the fact that the bulk of intra — market transactions consist of trading rights for certain activities. Those who try to link the modern economy to commodity flows condemn themselves to failure. They are replaced by intangible assets. One such asset — is the right to use radio airplay.

Bidders at auctions to sell licenses to use a given radio frequency spectrum in a given territory are divided into several groups. Radio station owners, cellular service providers are interested in licences. Many nations around the world are using the work of P. Milgrom and R. Wilson to auction licenses for radio frequency bands.

In the United States, radio frequency auctions have been held since 1994. The first was the debut of P. Milgrom and R. Wilson as developers of auction procedures. Since then, 87 auctions have been held, i.e. 10 every three years. About 60 billion dollars was earned at these auctions. The last large — scale auction took place in 2008 for 700 MHz. The first 3G-frequency auction was held in India in 2010, with a revenue of 14 billion dollars. In 2015, it held an auction for frequencies ranging from 0.8 to 2.1 GHz, lasting 19 days. Government revenue — 17 billion dollars. That is, everywhere such auctions generate revenue for the state.

In Russia such auctions are not popular — neither in the radio frequency market, nor for cellular communications. Thus, in 2015, a seven — day auction was held to sell licences for the right to use radio frequencies for the fourth generation (4G) communication networks. For the next bids — in 2016 and 2018 — no bids were submitted (https://digital.gov.ru/ ru/events/38690/). In 2020, strips of millimeter range for creation of pilot zones of networks 5G were provided without any competition to the joint enterprise Megafon and Rostelecom created especially for their reception.

Thus, auctions on the sale of radio frequencies for cellular communications of new generations in Russia have ended and the collusion has gone unnoticed. People don't really care who gets the radio frequencies. But the exit of competition from this field was supposed to be a very important event for domestic economic science. Unfortunately, this has not happened.

PREDATORS ON THE MARKET

If prices go down in the market, it's good for buyers. In the case of consumer goods, statisticians report that inflation is low. But in fact, a big "predator" company came to this market, and it knocked down prices to drive out competitors who couldn't handle sales at such low prices. Sometimes retail prices are lower than not only wholesale prices, but also production costs. A large company can compensate for its losses by selling other goods or trading in other markets, and weaker competitors will realize that they will not keep up and leave. A large monopolist can then

quietly raise prices without having to worry that its interests will be affected.

The term "predatory pricing" is usually translated into Russian as "predatory pricing". This translation hides two tricks. First, "pricing" — is not so much "price formation" (in the sense of shaping prices on the market) as "assigning price to an individual seller". With the word "predatory" is even more complicated: with full decryption we are talking about "predator", which guards its territory or has hidden and waits for the victim. Personally, I consider the translation of this term as "treacherous", behind which there are goals other than trade. But the term is already well established as "predatory", so it will have to be used even after these clarifications. Such price fixing increases the probability of monopolization of the market or maintenance of monopoly of one market participant — "predator". In most countries, it is considered a violation of competition law and is subject to legal prosecution.

Special case of "predatory" price — so called "deterred price". The price is set by the "predator", who has already eliminated the competitors and protects the seized market. It is appointed in such a way that a novice (perhaps even larger "predator") is not interested in entering this market.

These studies have a powerful potential client — the antimonopoly service. However, the vast majority of countries in the world do not have a direct link between science and the work of this service. Recognition of a company as a "predator" requires a legal form that is outside the scope of scientific theories and their empirical confirmation. Lawyers can deny the very link between price war and unfair competition. Moreover, in practice, it is not pure monopoly, but oligopoly, where several "predators" either seize the market or block the entry of new players into it [17].

The problem arises — how to separate "predation" from competitive pricing? For that you have to know, it's necessary to know whether the firm has the assets that are necessary to "sit — down" the competitor and whether it agrees to take long — term losses.

Another way of separating "predation" from normal competition is connected with the proposed laureates' division of "predatory pricing" into three classes, which correspond to three types of models.

The first corresponds to the reputation model [18]. When an already working market participant, meeting with a stream of willing to come to this market, opens a price war, it acquires a reputation of "big — time", which prevents the arrival of new competitors.

Signalling models correspond to the second class. The newcomer does not know whether the incumbent is weak or not, i.e. high or non — existent costs. And when he makes the decision to enter the market, he analyzes its price. Here P. Milgrom identified two possible equilibrium states: separate and joint. In the first, the participant maintains low price and damages. In the second, both parties bear damages.

The signal model may, for example:

1. The incumbent selects the price.

2. Low earnings for a beginner if the costs are low.

3. Market grab game.

In such a model, the low price suggests that a market participant has low costs. Relying on low profits, the newcomer begins to sell at a lower price.

The third class corresponds to the model "large pocket "predator" [19]. In the model of "predation", "large pocket" there are two companies, a novice and a participant. They incur the same costs during the standoff and differ only in the amount of liquid assets. Whoever has the most assets wins.

There are many disadvantages to such models: extensive information is required, price wars are absent in equilibrium markets, it is doubtful that a newcomer is unable to attract more assets. But most importantly — they can

only be used to explain what is happening, and to my mind, they are useless as a working tool. Creative techniques of entrepreneurs sometimes contain so much fiction that no theory can capture them.

Researchers (and winners among them) argue that the existing theory is a reliable basis for decision — making in the field of antimonopoly legislation, that theoretical constructions can separate "predation" from honest price competition [17].

In the scheme of the "predator" that captures the market, prices are lowered to then establish a monopoly. And this intent can only be determined by subsequent events when prices rise after elimination of competitors. But even then, a new player can come to the market, who will reduce prices for the same purpose.

In addition, post — takeover price increases cannot be long — lasting, otherwise they will attract new players who may be more financially strong [20].

Characteristically, models of "predatory pricing" are not particularly complex. They are built to give an overall qualitative assessment of the mere fact of "predation". Simplification conscious and explained. If you bring models closer to reality, you have to enter an excessively large number of parameters that represent that reality.

Such models are interesting also because behind the private problem of "predatory" pricing is the already mentioned large — scale problem of economic theory, namely — the tendency of the market economy to monopolize certain markets and, in this sense, to deny the possibility of the long — term existence of free competition. "Predators" will take a monopoly position in all markets, and the time of free competition will end.

The Nobel laureate's forerunner, R. Selten, divides three types of strategies for human behavior in the marketplace, and not only:

1. *Routine,* when he does what he normally does.
2. *Imagination,* when a man comes up with something original that he has never seen before.
3. *Reasoning,* when it comes to a decision on the basis of the logical constructs it has constructed.

Game theory, as well as classical and neo — classical approaches, are based on the latter approach. And in life, all three strategies are used as needed. Is it possible that theory can anticipate all creative findings of market participants? It's unlikely.

CONCLUSIONS

So, while Paul Milgrom and Robert Wilson have won the Nobel Prize in Economics for the development of auction theory, their research spans a much wider area [21].

The economists who applied for the Nobel Prize in 2020 are not so much interested in themselves as in the subjects of their research, but the Nobel Committee considered them less important than auction theory. For example, Stephen Berry and James Levinsohn (Yale University) and Ariel Pakes (Harvard University) have developed a widely used BLP (by the first letter of their names) logistics model for assessing demand. David Dickey (University of North Carolina) and Wayne Fuller (University of Iowa) developed the Dickey– Fuller test, which evaluates time series for the likelihood of growth. Ironically that in 2003 won the award Robert Fry Engle and Clive Granger, who conducted their research using this test. Now Paul Milgrom and Robert Wilson have won the award, which also include time series testing for stationarity.

Clearly, in a year when the world economy was undergoing unprecedented changes, the Nobel Committee had assumed that there would be little benefit from trend studies.

Harvard University Professor Claudia Goldin was projected as laureates also. She is deals with gender — based economic inequality, but the relevance of the topic has faded in the background of developments in 2020.

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Potentials and Limitations of "Input-Output" Analysis (To the 60th Anniversary of Statistical Work in the Field of Intersectoral Research in the CIS Countries)

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ABSTRACT

The article reveals the possibilities of using the Russian system of input-output tables and intersectoral models for analytical and forecasting purposes and substantiate managerial decisions in the field of economic policy. It is shown how the input-output method's capabilities were implemented at three stages of the development of intersectoral research in Russia, taking into account the specifics of the problems being solved and the development of the statistical base. The primary attention authors paid to the current stage of developing the method and its use directions. A characteristic is given of the constraints objectively inherent in this method and the input-output tables' information system (IOT). The authors' position regarding their significance is expressed. A new direction in using data from the IOT system is considered — the analysis of the final product's cost as accumulated value-added, which implies a full use of the analytical potential of modern input-output tables. Proposals are given for improving the intersectoral toolkit based on taking into account the links between production, the need for investment and the state of the production and technical base.

Keywords: input-output table system; IOT; input-output method; cross-sectoral research; cross-sectoral tools; modeling; IOT constraints; IOT-based analysis; final products; added value

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THREE STAGES IN THE DEVELOPMENT OF INTERSECTORAL RESEARCH IN RUSSIA

In 2021, two related anniversaries for national statistics were celebrated: 60 years since the **first inter–sectoral balance** of the economy of the USSR was released in monetary and physical terms (the latter was a unique development in international practice) and 95 years since the first material product system (MPS) of the USSR. The work of the Central Statistical Office of the USSR on MPS was the first worldwide statistical implementation of the balance sheet method to reflect the production proportions of the economy in the form of a balance sheet system.

The approach applied to the compilation of the USSR MPS gave impetus to the world–renowned research of V.V. Leontief in the field of the theory of the tables "input–output" (IOT) in the concept of the System of National Accounts (SNA) and the practice of cross–industry modelling, which have become the basis for statisticians and analysts in many countries of the world, including Russia [1]. Presentation of the complex history of balance sheet development in the USSR and Russia and related discussions is devoted to a number of interesting materials prepared by Russian statisticians and scientists [2–6].

Then, in the 50–60s. 20th century, the basis of further productive work by Soviet economists in the field of intersectoral research was laid down. Important milestones in the development of the balance sheet method, intersectoral research and intersectoral Soviet–era modelling are related to names P.I. Popov, L.I. Litoshenko, V.S. Nemchinov, A.I. Efimov, M.R. Adelman, L.Y. Berry, F.N. Klotsvog, E.B. Ershov, E.F. Baranov, V.V. Kossov, L.E. Mintz, S.S. Shatalin, A.G. Granberg, Y.V. Yaremenko, and A.G. Aganbegyan, Y.M. Urinson, V.D. Belkin, R.A. Belousov, A.A. Konyus and some economists.

It should be noted that the translation and publication in the Soviet Union in 1958 of the fundamental work of V. Leontief and his collaborators on the study of the U.S. economy helped to popularize the ideas of intersectoral balance [7], and later, in the early 1960s. has been translated into Russian on the problems of intersectoral research by Hollis Chenery and Paul Clark, Isamu Jamada and Richard Stone.

In the USSR, cost, monetary and physical and interregional inter–industry models were created and solutions for their dynamic and optimization statements have been developed. The focus was on the optimal allocation of resources, pricing, improving economic efficiency through the implementation of STP (scientific and technological progress) achievements.[1]

Experts have tried to reflect the impact of scientific and technological progress in the direct input factors of the cross–industry balance sheets. Numerous sectoral institutions were involved in their development in the planned perspective. These studies were complemented by the Y.V. Yaremenko group's work on structural models, on accounting for the qualitative heterogeneity of resources and on priorities in their allocation.

The innovative ideas of Y.V. Yaremenko, while remaining highly relevant, define important directions of work in the field of analysis and cross–industry modelling today [8]. Many of the results of other scientists (related to the dynamization of the IOB–model, taking into account price and income, labour and fixed capital, resource substitution, etc.) have become a source of ideas for a number of modern applications of economic modelling.

Unfortunately, in the 1990s the accumulated knowledge potential in the field

[1] Economic and Mathematical Research / World History of Economic Thought. Domestic Economic Science. V. 6. B. 1, section YI, ch. 27. M.: Thought; 1997. URL: https://www.booksite.ru/fulltext/oie/mys/ly/index.htm.

of intersectoral research wasn't adequately utilized in the management system, which was noted at the international scientific–practical conference "Input–Output balance — history and perspectives", organized in honor of the 50th anniversary of the development of the first USSR input–output balance (IOB).[2] Despite the obvious need and the possibility [9] of using cross–sectoral tools during the transition period to improve the quality of public administration, research in this area has slowed markedly.

This was due in large part to objective difficulties in reforming the statistical system and drastically reducing the budget for statistical work. Both the underestimation of statistical data requirements in the context of deviation from the planning and administration system and the perception of the high–cost statistical development of IOB tables and cross–industry models as being mainly suitable for administrative planning.

The first set of Russian "input–output" tables in the 1995 SNA concept was published by Goskomstat only in 2000 on the basis of the results of the large–scale business survey, i.e., thirteen years after the last fundamental input–output balance data production (1987). At the same time, the need for economic projections of a country in the 1990s (for annual and then three–year budget planning) also determined the need for instruments to balance and harmonize macroeconomic and sectoral projections.

During these years, gaps in statistical estimates of the input–output balance were regularly filled by the IOT pilot estimates performed at the Institute of Macroeconomic Research (Russian Foreign Trade Academy).[3] Cross–sectoral research work was also supported in a number of academic institutions (Institute of Economic Forecasting, Russian Academy of Sciences and etc.). By providing a basis for model calculations, they have played a positive role in preserving the culture of intersectoral research in research teams, and have contributed to the development of approaches to modeling the country's economy in market conditions.

Since the beginning of the 2000s in Russia there has been a renewed interest in the subject of intersectoral modelling, which has increased markedly in recent years. Both this is related to the significant improvement in national reporting on the input–output table system and the recovery processes in the Russian economy, and with increased demand for model tools in government organizations in economic decision–making and transition to strategic planning. The activity of Russian scientists was stimulated by trends in world economic science and the emergence of new foreign publications [10–14].

The globalization of world linkages and cross–country integration have given impetus to new directions in the use of IOT tools, as well as the need to study its mixed effects on national economies and the world community as a whole, and new theoretical concepts aimed at explaining observed patterns (including the concept of trade in value added). Based on the world's IOT international databases (in some of them — WIOD, OECD ICIO, EORA, GTAP–MRIO — included Russia) are being used to develop cross–country cross–sectoral models and provide in–depth analysis

[2] International Science and Practice Conference Intersectoral Balance — History and Perspectives 15 April 2010. M.: GA IMR; 2011. 228 p.

[3] One of the areas of specialization of GA IMR (formerly SIER under the State Plan of the USSR, and now, after joining the RFTA Ministry of Economic Development of the Russian Federation, — IMR RFTA) — development of operational (expert) evaluations of the IOT system on the basis of the reports of Rosstat, FCS, Cebtral Bank of Russia, etc. sources. Estimates have been produced annually since 1993 to provide timely information on the cross-sectoral IMR model and the model apparatus of the Ministry of Economic Development of the Russian Federation for the last year preceding the forecast period.

of the world economy and to assess global development scenarios.

Modern statistical work on the IOT system is conceptually aligned with the SNA– 2008 methodological recommendations, other UN and Eurostat publications.[4] The Russian classifiers of types of economic activity and products are harmonized with international ones, which, given the complexity of the tasks to be performed in the course of constructing the IOT, is considered to be a great merit of statisticians. However, there is a lack of detailed methodological explanations by Rosstat on the construction of the IOT system with references to statistical observation forms among professional users of IOT, supporting assumptions, interpretations of a number of SNA indicators in the annex to Russian features. The latest detailed material on this subject published by Rosstat more than 20 years ago.[5]

With regard to the continuity of knowledge, it is important to note that 2019 was a milestone in the educational process — production, after a long break, of a national specialized textbook devoted entirely to the topic of "input–output",[6] where the fundamentals of the IOT system and its potential application in macroeconomic modelling are clearly described.

STATISTICAL RELEVANCE AND ANALYTICAL CAPACITY OF IOT

The "input–output" table system (IOT system) is an important part of a country's SNA, revealing the positions of its consolidated accounts (goods and services, production and generation of income) at the level of types of products and groups of industries, and also the impact of transport margins, trade margins, net taxes on products, on the increase in the price of products in basic prices to the value in buyers' prices for different groups of consumers.

Regular development of IOT,[7] compilation of food balance sheets that are consistent with the records of enterprises, departments and population surveys, significantly increases the reliability of estimates of macroeconomic aggregates (GDP and its components). With the extensive use of the sample survey method and the need for estimates of the non–observed economy, it is difficult to overestimate the importance of IOT for statistical purposes as a balancing tool.

The composition of the IOT tables published by Rosstat contains virtually all the relevant tables for analysts to describe the structure of production and end–use of goods. The basic tables are quite representative of the composition of the branches and types of products allocated. For example, in the published core tables for 2016, the OKVED 1.1./OKPD 1.1 classifiers identify 206 product types and 98 industries, the dimension of the symmetrical IOT (commodity by commodity tables) was 95×95.

The dimension of the summary tables in the intermediate years between the output of the basic tables is significantly lower. With the transition to the new OKVED 2/OKPD 2 classifiers, the dimension of the summary tables for 2016–2017 improved slightly: from (59×59) to (61×61), and unfortunately,

[4] The System of National Accounts 2008. In 2 vol. Transl. European Commission, IMF, OECD, UN, World Bank. New York; 2012. 764 p.; Eurostat Manual of Supply Use and Input-Output Tables). Eurostat; 2008.; Handbook on Supply, Use and Input-Output Tables with Extensions and Applications. United Nations, New York; 2018.

[5] Methodological provisions on statistics. Issue. 2. M.: Goskomstat of Russia; 1998.

[6] Sayapova A. R., Shirov A. A. Fundamentals of input-output method. Book. M.: Ltd Maks Press; 2019. 336 p.

[7] The system of "input-output" tables with data for years of their estimation is presented on the website of Rosstat (https://rosstat.gov.ru/). Includes 8 core tables (of goods and services; use of goods and services at buyers' and basic prices; use of domestic products, imports, transport and trade margins and net taxes on products) and a symmetrical IOT. Symmetric tables are published for base years. Base years — when large-scale statistical surveys of organizations are carried out. "Input-output" tables for base years are called "base" tables.

however, the representativity of the data in the section "Extraction of mineral resources" was significantly reduced, which became reflected in one row and one column (previously the dimension was 5×5). This decline in data for one of the most important sectors of the economy is quite surprising. But on the whole IOT system — is a rich source of information for structural and comparative (cross–country, temporary) analysis of the Russian economy, identification of "bottlenecks".

There are three ways in which IOT data can be used in a given year's economic situation:

• direct analysis that relies directly on the data in the tables, for example, the estimation of the element structure of costs, the share of imports in costs, the distribution of domestic and imported inputs by direction of use, the tax component's share in the value of used products, the share of knowledge–intensive and high–tech industries in exports, etc.;

• more in–depth analysis based on transformed data, using matrices with full–cost ratios, which makes it possible to assess the relationship between final demand in a given direction and the formation of output, imports and value added in different domestic industries, dissect the value structure of the final product, etc.;

• extended in–depth analysis with complementary data, in particular on labour, capital stock, investment, energy balances and environmental performance. Within this line, the full costs of the relevant types of inputs and the characteristics of the full "ecological burden on the economy" associated with the production of different types of final domestic production can be estimated.

The results of the analysis using IOTs in the identified areas, especially in the temporal dimension, are not only of scientific interest. They are of practical importance to government: they are used to provide predictive and scenario analysis, to develop hypotheses, to select solutions. IOT information (both reporting and forward–looking) can be useful for business entities working in a particular area of the economy. Of particular interest in that context can represent information in rows "Table of use of goods", description of demand for domestic and imported products in selected segments of the domestic market.

Many publications contain some of the results of the IOT analysis, some of them using an innovative calculation methodology.

In our view, it would be useful to synthesize the accumulated experience into a single material, where the methodological basis of the analysis of the economy on the basis of the IOT is organically supplemented by a description of the methods of implementation of non–trivial aspects of the analysis taking into account the peculiarities of Russian statistics, and with a clear explanation of the practical significance of the result for managers.

INFORMATION AND METHODOLOGICAL LIMITATIONS OF THE IOT SYSTEM

In the economic environment, with a generally weighted approach to assessing IOT limitations, there have always been, and there are, strong critics and even opponents of the "input–output" method [15, 16]. In some cases, a strong criticism of the IOT method is related to the absolute limitations of the IOT information system. In some instances, there is opposition to the theory and methodology of the SNA as a whole, for example, by moving away from business practices to abstract categories or for other reasons. Often, criticisms are simply rewritten from other sources, sometimes seemingly without understanding their methodological validity.

By the limitations of the IOT information system we understand its peculiarities that limit the possibilities of economic analysis and modelling on the basis of it, as well as some imputations in the estimates that may

be associated with some imputation on the IOT basis that are objectively conditioned by the IOT methodology.

In the first group of restrictions may include:

1. Lack of a sufficiently representative time series of IOT system tables compiled in a single methodology. Over the last 25 years, analysts have methodologically comparable data on the IOT by brief system for 1995–2003; then, after an eight–year break, for 2011–2016 (but already in updated classifiers and refinements in methodology); then a radical change of the classifiers takes place again, and analysts receive IOT data for 2016 and 2017 in modern classifiers and methodology (SNA-2008, OKVED 2, OKPD 2). With the understanding that Russian IOTs should fit into the international system of methodological requirements, the associated limitations of analysis and forecasting on the basis of the "input–output" method cannot be denied.

2. Lack of statistical practice in compiling the IOT system in constant prices. It should be noted that this does not contradict the requirements of international organizations to national IOT. Nonetheless, it should be noted that the SNA-2008 (chapter 14, 15) notes the importance of compiling the "Table of use of goods and services" in constant prices and gives recommendations on this issue.

Such developments are important for improving the reliability of IOT statistics and their consistency with price statistics. For IOT users, the absence of such developments limits the ability to identify the time–to–time relationship between utilization indicators through volume indices and cost deflators, factor analysis, including direct cost factors.

Second group of restrictions — conditional in IOT estimates

1. Certain convenience of indicators I and III quadrants of the Symmetric table "input–output" (SIOT), which in Russian statistics is formed in the format "commodity by commodity". Its main purpose — is to reflect the non–statistically observed structure of output costs by product type (the so–called "net" evaluation principle). This makes it possible to estimate a matrix of direct cost factors SIOT, the use of which in the calculation of full cost factors gives them economic value.

Moving from "Table of use of goods and services" to Quadrant I and III estimates, based on the reporting of institutional units in the format of "product to industry", to the I and III quadrants of SIOT, mathematical methods based on certain assumptions are used,[8] which defines some arbitrariness of cost estimates and coefficients of direct and full costs in the SIOT. Reason for this convenience is objective: the availability of secondary products in industry outputs and the need to aggregate data in the production of IOTs. The level of deviation of the estimates in SIOT from the unknown real values depends on the aggregation of the data: the higher the detail, the smaller the deviation.

2. Other imputations related to aggregation. To a certain extent there will always be some conditionality in the compilation of deflators for resource flows by the cells of "Table of use". This is due to differences in internal product flow patterns of the species *i*, used by different consumer groups. Almost any species aggregation (*i*) combines many specific products (total — several tens of thousands). Because it is not feasible to separate them by use and uncertainties of the measure of

[8] Known mathematical solutions for the SIOT format "commodity by commodity": the method of industry technologies, the method of product technologies, their hybrid versions. The industry technology approach assumes that a single technology is applied for all products processed in the industry j, but in the method of product technology — that a single technology is used in different industries of the same type of product i. Each of the methods has its pros and cons, as described in the UN guidance materials, and none, due to the unavoidable aggregation of products into species groups, is able to estimate the cost structure of net releases with 100% accuracy.

structural heterogeneity of thread flows is considered acceptable to the indicators of the row "Tables of use of domestic products in basic prices" apply a single "line" deflator for all directions of domestic use (in addition, of course, to exports). The same approach is applied to the construction of deflators by cells "Table of use of imported goods".

The accuracy of indicator deflators in row cells depends on the aggregation of data (it increases with more detail). This has an impact on the estimation of volume indices of the use–oriented grouping of the product *i* and macroeconomic aggregates, including expenditures on intermediate consumption and gross value added (GVA) of sectors of the economy.

3. Convenience associated with the acceptance of the SIOT–based matrix of direct cost factors as the "technological matrix" of the economy. Currently, as noted in the SNA-2008, the definition of this matrix as "technological" is becoming increasingly conditional. In particular, this relates to the development of goods processing services (domestic, imported) without transfer of ownership and the adoption of the IOT treatment of these transactions. The value of the processed goods is not included in the value of the processor's intermediate consumption, but only the value of the processing services is included in the output. This estimation approach *"changes the nature of input–output factors. They no longer describe the technological structure of the production process but the economic process"* (SNA-2008, chapter 14). This limits the study of technological changes in production to a matrix of direct cost factors.

Thus, the IOT data system (as with any macro–level statistical information) has a number of limitations for quite objective reasons. Among the most disturbing are the gaps in information, which are being addressed in a number of scientific communities [17–19]. IOT limitations related to methodological reasons do not seem to be critical (taking into account the principle of acceptable tolerance), but they need to be "kept in mind".

It should be noted that we do not include in the IOT information limitation list the so–called "problem the four quadrant" — the implicit shift from primary income from productive activities to final consumption and savings expenditures, mediated by the redistribution of financial resources between institutional sectors. This shift is reflected in other SNA accounts with which IOT has aligned for the reporting years.

At the same time, while we fully agree on the importance of taking this connection into account in forecasting, we stress that it is a general problem of modeling the economy using any method, including the "input–output" method.

Cross–sectoral model based on the IOT of the reporting year — is a statistical model based on the "input–output" method (IO method) and linked to the structure of the reporting year. The mechanism of operation of the model is based on the laws of linear algebra (matrix operations). The model needs a large amount of initial (exogenous) information to be applied in scenario predictions. But this is not a reason for disappointment with the IO method, given its unique balancing properties and high analytical potential. It merely took that successful macroeconomic forecasting requires combining balance sheet methods, including the IO method, with other methods and aspects of forecasting.

This is realized in a modern cross–industry toolkit by means of extended (multi–block, factor–based) cross–industry model productions, creating model systems that integrate the development models of economic segments and the cross–sectoral model.

USE OF CROSS–INDUSTRY TOOLS IN SCENARIO CALCULATIONS

The use of cross–sectoral tools in public administration makes it possible to meet the challenges of balancing forecasting in the light of production constraints and assessing the reaction of the economic system to changes in business conditions.

In terms of the scope of the study and its structure, three major classes of cross–industry models can be identified for scenario analysis and prediction: a) national economy; b) Russian regions and economies in regional level; c) Union State, EAEU — by EAEU member States.

The development of model tools for the solution of the last two groups of tasks is to a large extent constrained by the difficulty of developing regional IOTs for Russia and inter–country IOTs in the EAEU area. Nevertheless, a number of important results have been achieved in the scientific community. First of all, the work of specialists of Institute of Economics and Industrial Engineering, Siberian Branch of the Russian Academy of Sciences and Institute of Economic Forecasting, Russian Academy of Sciences on Russian interregional modelling [20–24].

Support for research in this area and its use in the practice of State administration will help to solve current problems in the area of territorial development in Russia.

Also noteworthy is the pioneering work of the Institute of Macroeconomic Research (Russian Foreign Trade Academy)[9] on the compilation of intercountry IOT (SIOT) for EAEU countries. This allows an assessment of the macroeconomic effects in the EAEU area related to the economic policies of EAEU governments, business structures and external influences. Taking into account such effects is important for the formulation of agreed decisions by countries in order to realize the Union's integration potential more fully and thus improve the competitiveness of economies and the living standards of the population.

The most widely used model systems in Russian public administration are currently focused on the first group of tasks. A similar model system, in which the cross–sectoral model is allocated to the corresponding unit of calculation, where information from other units of the system is received, is used in the Ministry of Economic Development of the Russian Federation. This model is used mainly for balancing tasks and is markedly less used for other analytical purposes.

As a balancing tool, the cross–sectoral model is required in predictive calculations. According to the forecasting technology at the federal level, the balancing properties of the model are used both at the stage of development of the scenario conditions and in the process of mutual agreement on sectoral designs that are formed in the sectoral departments according to the scenario conditions. As a tool for analysis, different versions of the cross–sectoral model have been used to assess the macroeconomic effects of individual financing decisions from fiscal sources, import substitution programmes, tax and price policies, etc.

For example, the cross–industry model helped in the mid-2000s to assess the inflationary impact of planned tariff changes for natural monopolies and contributed to the decision to set lower–than–planned tariff ceilings for these services. It, along with other tools, was used in the evaluation of the effects of the realization of the infrastructure project "Eastern Polygon". Assessment of macroeconomic effects — is one of the most

[9] The work on the topic "Development of the methodology for the construction of the cross-country table "input-output" of the Eurasian Economic Union, experimental calculation and evaluation of the integration potential of the Union on the basis of it", was carried out within the framework of the Treaty of IMR Ministry of Economic Development of the Russian Federation with the International Organization Eurasian Economic Commission of 27 July 2018 No. N-07/225.

interesting and complex areas in the use of high–speed cross–sectoral tools [25–27].

Most of the production versions of the cross–industry model are based on the classic "Leontief" scheme. The practical use of this scheme requires a weighted approach and opens up new possibilities for analysis with a fairly complete set of tables in the IOT system.

Availability of Tables of use of domestic products enables the full cost matrix to be evaluated on the basis of this matrix (not based on the table of use of goods in fixed prices). This is theoretically correct in estimating the need for domestic production, as import costs should not be factored into the multiplication of direct cost factors to arrive at full (see infinitely decreasing geometric progression limit formula[10]).

Otherwise, full input ratios and output estimates will be overestimated/underestimated with changes (increases/decreases) in final domestic output. The availability of import use tables allows for a more accurate estimation of the need for intermediate imports[11] based on the estimation of import direct cost factors.

According to the concept of cross–industry and inter–temporal transfer of values in the annual production process, the valuation of final domestic production in basic prices can be considered as the result of the accumulation of value added in the economy, i.e. a summary of GVA, intermediate imports (foreign value added) and net product taxes (NNP — net national product) included in intermediate costs.

Consequently, it is possible to analyse the internal structure of the values of domestic final output as carriers of value added.[12] The essence of the analysis is the decomposition of the value of the final product of the species *i* by source of education and the assessment of the role of each source.

The implementation of such structural analysis is ensured by the up–to–date composition of the IOT tables and opened up the possibility:

- assessment of the impact of point measures on final demand and on the formation of GVA as an impulse for different groups of producers;
- obtain additional information on the internal market of final products of *i* from imports, as the full measure of participation of all imports in the value of this final domestic product is *clearly identified*;
- assessing the evolution of the need for intermediate imports with shifts in the composition of final demand and anticipating possible negative effects in the light of development objectives;
- assessment of *the effects of tax policies and other pricing factors,* which are reflected in the structure of the value of final domestic production in basic prices in the change of NNP share parameters, as well as tax and other indicators of the internal composition

[10] $\Delta X = \Delta Y + A\Delta Y + A(A\Delta Y) + A(A(A\Delta Y)) + \ldots A\left(A^n \Delta Y\right) + \ldots = \frac{\Delta Y}{(E-A)} = (E-A)^{-1}\Delta Y,$ where ΔX — change in output vector due to change in final demand for domestic products ΔY; A — a matrix of direct cost factors, $(E-A)^{-1}$ — full cost factor matrix.

[11] Need for intermediate import of $IMpp^t$ estimated as a function of the vector of final domestic production KI^t_{OT} and the coefficients of the full import cost matrix per unit of final domestic production B^t_{IM} or, the same as the function of the calculation vector of Xt output and the coefficients of the matrix of direct import inputs per unit of output A^t_{IM}: $IMpp^t = A^t_{IM} \cdot X^t = B^t_{IM} \cdot KI^t_{OT}$, where $B^t_{IM} = A^t_{IM} \cdot B^t_{OT} = A^t_{IM} \cdot \left(E - A^t_{OT}\right)^{-1}$.

[12] A typical calculation formula can be used to estimate (decomposition into components) the composition of the value of the final domestic output of type j, used by direction *k* (KI_{OTjk}): $IC_{domjk} = \sum_i d_{GVAi} \cdot b_{domij} \cdot IC_{domjk} + \sum_i d_{NPPi} \cdot b_{domij} \cdot IC_{domjk} + \sum_i b_{IMij} \cdot IC_{domjk}$ where: d_{GVAii} and d_{NPPii} — elements of diagonal matrices with shares of GVA and NNP respectively in output; b_{OTij} and b_{IMij} — The full cost factors, respectively, of the domestic and imported products of type *i*, per unit of final domestic production of type *j*.
The components of the first two sums in the formula show the value added of domestic production *i* that was directly and indirectly involved in the creation of domestic output of type *j* for final use in the k direction included in the value of that output. The components of the third sum show the contribution of imported value added (imports of type *i*) to the value of these products.

Table

The role of end-user sectors in the formation of GDP and the ratio of the elemental composition of the value of products in end-use to GDP in 2018 (% of GDP, experimental estimates)

GDP 2018 = 104 630 billion rub.	Economy	Sector 1 "FC"		Sector 2 "GCF"		Sector 3 "Export"				
		subsector G	subsector S	subsector G	subsector D	set subsector G	Of which subsector			subsector S
							Gen	Gee	Got	
1. GDP (1.1+1.2)	**100.0**	**15.4**	**41.6**	**3.6**	**11.8**	**22.2**	**14.4**	**1.2**	**6.6**	**5.3**
1.1. GVA (2.3.1+2.3.2)	*89.7*	*10.1*	*40.3*	*3.3*	*11.6*	*19.2*	*11.5*	*1.2*	*6.5*	*5.3*
1.2. NNP (2.2+2.3.4)	*10.3*	*5.4*	*1.3*	*0.4*	*0.2*	*3.0*	*2.9*	*0.0*	*0.1*	*0.0*
2. EUP to *z* buyers*	**120.6**	**22.3**	**46.5**	**8.3**	**13.6**	**24.1**	**14.9**	**1.6**	**7.6**	**5.7**
2.1 Import to IC	11.5	4.9	2.4	3.9	0.4	0.0	0.0	0.0	0.0	0.0
2.2. NNP in EU	8.8	5.2	0.4	0.3	0.0	2.9	2.9	0.0	0.0	0.0
2.3. EUPdom in basic prices	**100.3**	**12.3**	**43.8**	**4.2**	**13.2**	**21.2**	**12.0**	**1.6**	**7.6**	**5.7**
2.3.1. GVA direct producers	52.8	3.6	28.2	1.3	6.4	10.4	7.1	0.5	2.8	3.0
2.3.2. GVA co–owners, including:	36.9	6.5	12.1	2.0	5.2	8.8	4.4	0.7	3.7	2.2
in the production of goods	15.5	3.8	3.0	1.1	2.0	5.1	2.7	0.4	2.0	0.6
in the production of services	21.4	2.8	9.1	1.0	3.1	3.8	1.8	0.3	1.7	1.7
2.3.3. Import to IC (sector full cost)	9.1	2.0	2.5	0.8	1.5	1.9	0.4	0.4	1.1	0.4
2.3.4. NNP in IC	1.5	0.2	0.9	0.1	0.2	0.1	0.0	0.0	0.1	0.0
Import of all (2.1+2.3.2)	20.6	6.8	4.9	4.7	1.9	1.9	0.4	0.4	1.1	0.4
Full import intensity of domestic products in EU (2.3.3./2.3.*100)	9.1	16.1	5.8	19.5	11.1	**8.8**	3.6	23.7	13.9	**7.3**

Product's end–user (end–use) sector designations: FC — final consumption; GCF — gross capital formation; G — "goods" in the sector (OKPD 2 codes: 01–39); S — "services" in the sector (OKPD 2 codes: 41–98); Geng — energy exports (coal, oil, gas, oil products); Gee — engineering export; Got — other export goods.
Indicator symbols: GVA — gross value added; NNP — net taxes on products of everything; EUP — the volume of products in end–use; EUPdom — the volume of domestic end–use products; Import to EU — imports received for end–use; Import to IC — imports received for intermediate consumption; NNP in EU–NNP added in end–use; NNP in IC — NNP included in intermediate consumption.
* transport and trade margins in the cost of goods at buyers' prices by sector CI are accounted for in the service subsector.

Source: calculation by the authors according to the experimental input-output tables developed at IMEI VAVT for 2018 based on the current statistics of Rosstat.

of GVA, which can also be explicitly included in such an analysis. Note that the content of tax policy analysis can be enhanced by the decomposition of the NNP matrix.[13] In general, the implementation of the stated approach to the analysis of the value of final domestic production not only confirms that any tax on the producer is ultimately paid by the consumer, but also that excessive tax increases can harm producers (of the components of GVA as the *i* final product);

- estimates of the value added of imports and the domestic economy in terms of exports and exports of each product, which meets the analytical challenges of international trade in value added.

Some of the results of the experimental calculation for 2018 using the described method of decomposition of the value of products, received to end–use (EU), are presented in *the table* where data are shown as% of GDP. The sub–sectors "goods" and "services" of the three UU sectors were considered — final consumption (FC), gross capital formation (GCF) and exports. The data explicitly reflect the structure of the value of the final product, the value of the domestic product for each area of demand; "participation" of demand for selected subsectors in the GDP of the economy; capacity of each demand line to initiate GVA in related production, full need for intermediate imports and tax revenues.

For example, the highest relative capacity to initiate GVA in related activities was in demand for final consumption goods, the lowest — demand for services for final consumption and energy exports.

The consolidated estimates of the full need for intermediate imports for designated UU sectors had a significant impact, in addition to the volumes and supply structure of final domestic production, are specific values of full import intensity coefficients. According to 2018 estimates, at the highest level these values are kept for machine building (0.2–0.4), rubber and plastic (0.32), textile and footwear (0.27), pharmaceutical (0.24) products; the lowest (0.03) — for oil, gas, education and real estate.

Imports accounted for 17% of total economic expenditure on final products. Imports accounted for 31%, 56% and 23%, respectively, of expenditure on consumer goods, goods for gross savings and machine–building exports.

AREAS FOR IMPROVEMENT OF CROSS–SECTORAL TOOLS

Model systems are constantly evolving and improving. For example, one of the activities of the Institute of Macroeconomic Research (Russian Foreign Trade Academy) — strengthening the dynamics of the cross–industry model through the development of the investment and equity cluster and to make explicit the linkages between sectoral demand for investment, the state of the production and technology base of sectoral industries, financial conditions and developing demand for sectoral products. In assessing the prospects of the economy, it is important to link sectoral investment and production projections and to assess changes in the volume, structure and quality of the sectoral production base.

The complexity of the development of the investment and stock bloc is determined by the known volatility of the annual rate of return on capital and fixed investment, the absence of time series that are methodologically compatible with investment and the estimation of the principal of the economy.

To date, proposals have been developed to explain the dynamics of fixed investment, based on the method of investment decomposition. In particular, a formula has

[13] The NNP table is compiled as the sum of the tables of each tax category (excise, VAT, customs duty) and the table of subsidies on products. But this data is not published by Rosstat.

been proposed (1), which takes into account the three factors of investment demand in industry *i* per year *t* (Inv_i^t):

а) "lag" of the capacity–building process as measured by the link (α_i) to investments of the previous year (Inv_i^{t-1});

б) the necessity of maintaining a production base, as measured by the link (β_i) with the industry's stock of fixed capital (Sfc_i^{t-1});

в) Investments related to the expansion of demand and other factors (including changes in the level of utilization of available capacity, etc.) in the context of the growing demand for sectoral products, as measured by the linkage parameter (φ_i^t) ith growth in output of industrial production ($\Delta Prod_i^t$).

The first two relationship parameters can be interpreted as the share characteristics of the respective regressions and the last — as the incremental investment intensity of output in year *t* (excluding the investments associated with the first two factors).

The overall dependency of investments on determinants is expressed by the equation: (1)

$$Inv_i^t = \alpha_i \times Inv_i^{t-1} + \beta_i \times Sfc_i^{t-1} + \varphi_i^t \times \Delta Prod_i^t .$$

The evaluation of function parameters (by OKVED 2) was carried out for the period 2015–2019. In each year the indicators were calculated at the prices of the previous year in order to eliminate the effect of price fluctuations.

The parameters α_i and β_i were determined simultaneously with the average incremental investment intensity φ_i n this period, based on minimizing the sum of squares of residues in equation (1) with residues. For example, for the economy as a whole, α was determined at the level of 0.33; β — 0,056; φ — 3,6. The resulting parameter values α_i, β_i and φ_i are the expected values of these variables in the range 2015–2019 calculated in comparable prices. After evaluating these parameters, the current φ_i^t values can be refined according to formula (1) for zero residues.

It should be noted that such a division is relatively conditional, but that it addresses in some way one of the problems of dynamic cross–industry modelling — the issue of investment sustainability in future investment demand modelling.

CONCLUSION

The development and application of cross–sectoral models in economic analysis and forecasting, initiated 60 years ago, has gone through several significant stages, with varying degrees of demand for IOB models, frequency and intensity of statistical development, tasks to be undertaken in planning, forecasting and managing economic processes, level of development of the models themselves and their specification.

At present, the main range of tasks to be solved with the use of intersectoral tools is not only restored, but also expanded. These include balancing scenario conditions and medium–term projections, assessing the impact of tariffs and tax conditions on the economy, and taking into account the full cost of imports in the creation of final products, Assessing the macroeconomic effects of financing major investment projects and economic sectors, etc. The IOT toolkit has practical application in government and can be a useful source of information for business (in some cases it is already used in this capacity).

The modern IOT system of Rosstat contains almost all the necessary tables for a deep analysis of the economy. However, there are a number of information restrictions for the study of regularities using Russian IOTs. In addition, the IOT methodology determines some unavoidable assumptions in the estimates, which does not prevent the productive use of IOT for modelling and predictive analysis.

The development of statistical work and tools based on IOTs opens up new possibilities for analysis and scenario construction. One such area — is the analysis of the value of the final product as a carrier of value added.

The development of cross–sectoral tools is linked to the reflection of the dynamics of the reproduction processes as well as their relationship to the financial environment of the economy, including through the development of an investment pool in the structure of cross–industry models.

According to the authors, there is a need to update and expand statistical publications with methodological materials for the production of the "input–output" reporting tables, as well as to address at the statistical development level some issues related to the limitations of the IOT information system (in particular the development of IOT at constant prices).

In our opinion, it is also advisable to develop a detailed methodology for the analysis of the economy with the application of IOT (possibly as a collective monograph of key IOT users). On this basis, it is possible to move to a new level of cross–sectoral balance in the management environment in the selection and justification of decisions.

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Problems and Trends in Promoting Japanese Automotive Products on World Markets

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ABSTRACT

This paper presents a study of the international car market; analysis of the development of automotive markets in Europe and Russia's national car market; a review of the global car market; and international trading activity in the car market. Japan's automotive industry is significantly developed with Toyota as one of the world's leaders. Also, in addition to cars, Japanese companies are among the leaders in the production of motorcycles and engines for cars participating in sports races. Japanese legislation encourages the production and sale of cars with high environmental friendliness, hybrid and electric cars. This step allows companies to focus their production on a new class of cars, which helps Japanese companies outstrip European and American cars of the future. However, cars' air pollution is relevant for Japan since the state subsidizes automakers and consumers, reducing taxes and supporting companies that switch to hybrid vehicles.

Keywords: Automotive industry of Japan; international car market; regulation of car market

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Japan is one of the biggest players in the automotive market. The largest corporations — Toyota, Nissan, Mitsubishi, Honda and many less well–known companies that manufacture cars mostly for domestic use (Suzuki, Daihatsu). Note that almost all major Japanese automobile companies have a subsidiary brand, produce luxury cars for sale abroad and were created for the US market. Competitors — USA and Germany.

Japanese companies currently operate in two markets: local and external. In the local market, the range of vehicles varies considerably from other markets — in Japan, a large number of low–wage people are buying small cars because of the large difference in payments to the State for the ownership of this mode of transport. Also, if it is assumed that this model of the car will not be able to enter the foreign market, the company will sell it on the territory of Japan, where competition is much lower. One examples is Toyota Crown — the trademark, which was introduced in Japan more than 30 years ago, has never been placed on the world market.

Production costs for all the world's automobile companies are approximately 20% of the sale price. Another 20% of the sale price is the transport and R&D costs of the company, the remaining 60% — is the margin per brand. In the domestic market, Japanese companies try to maintain lower prices by encouraging buyers to switch cars frequently to new models, using the efficient Trade–in mechanism. For the external market, Japanese companies produce models such as Toyota Tundra or Mitsubishi L200. These cars are extremely convenient for the American market, which is famous for its affection of pickups. In Japan, by contrast, a pickup — is very rare, as these cars consume large amounts of fuel, which in Japan is expensive because of what is purchased in the Arab region [1].

Cars with engine capacity less than 1.4 litres are very common in Japan because they consume significantly less petrol [2].

Japanese cars are popular in China and the best selling is Nissan Bluebird. Japan sells many more cars to countries without own automobile production. This is due to the fact that Japanese companies most often offer high–quality cars with the most essential systems in the cabin. This allows consumers to use the car for a long time and at low cost, compared to European electronics–filled cars, which significantly increases the cost of the car. For example, the price of one–class cars in the maximum range: Nissan — 140 thous. yuan, *или* 1 million 500 thous. rub., a BMW — 346,9 thous. yuan, or 3 million 500 thous. rub. (https://www.bmw.com.cn/zh/all–models/3–series/sedan/2019 /specshee).

That is, the cost of BMW in identical configuration is more expensive, which is associated with the cost of the brand, possibly delivering components, given that Japan is much closer to China.

Automobile production in Japan was an economic miracle — in 10 years, the country's economy has become one of the most advanced in technology. It is important to note that Japan — is an island State with virtually no mineral resources. Because of this factor, the production of machinery has begun, which, 50 years later, remains one of the most sought after in the world.

The truck market in Japan is represented by several companies in several modes. Mitsubishi company's is one of the most successful in the freight transport sector, its cars can be seen in almost any country of the world. In addition, Japan is manufactured large–scale truck tractors by company Hino, and is also sold worldwide and compete with Europe's specialized companies such as Iveco and Scania (*see fig. 1*).

For other transport modes, Yokohama, Suzuki and Honda motorcycles are in demand

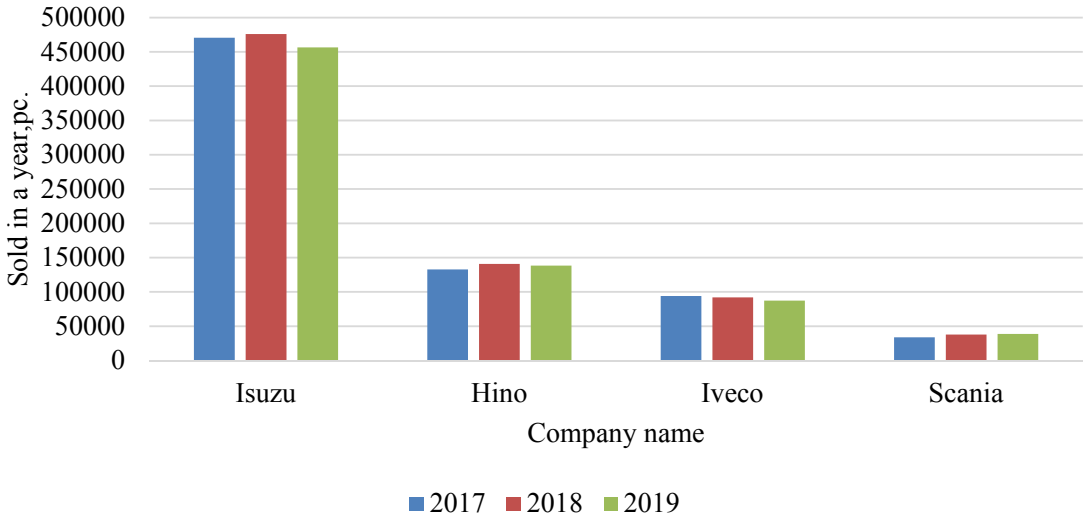

Fig. 1. **Sale of trucks in the world**

Source: URL: https://auto.vercity.ru/statistics/sales/.

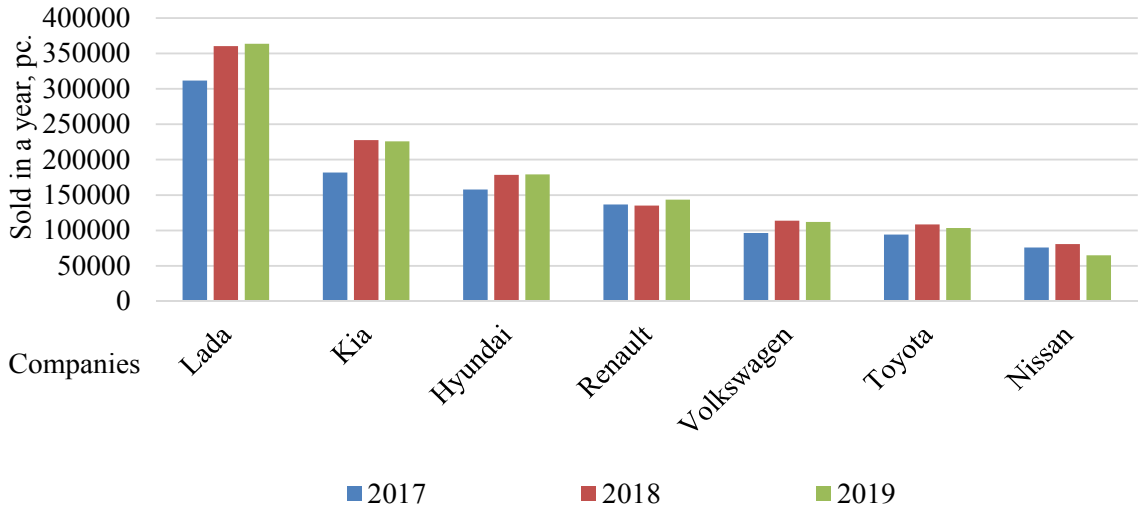

Fig. 2. **Car market in Russia**

Source: URL: https://auto.vercity.ru/statistics/sales/.

on the world market. The Japanese company sells an average of 2,400 bikes a year. As in the automotive sector, Japanese companies sell motorcycles at a more loyal price than American or European competitors. Japanese motorcycles are quite practical in terms of engine and handling.

A new Honda motorcycle with 218 horsepower engine in Russia will cost the buyer 1.75 million rub., about the same motorcycle as Ducati company's — for 250 thous. rub. more expensive. Japanese engines are used in most sports races: Honda supplies engines and motorcycles to Formula 1 teams Red Bull Racing and Alpha Tauri Racing, which also shows that Japanese technology is in the leading positions in the world.

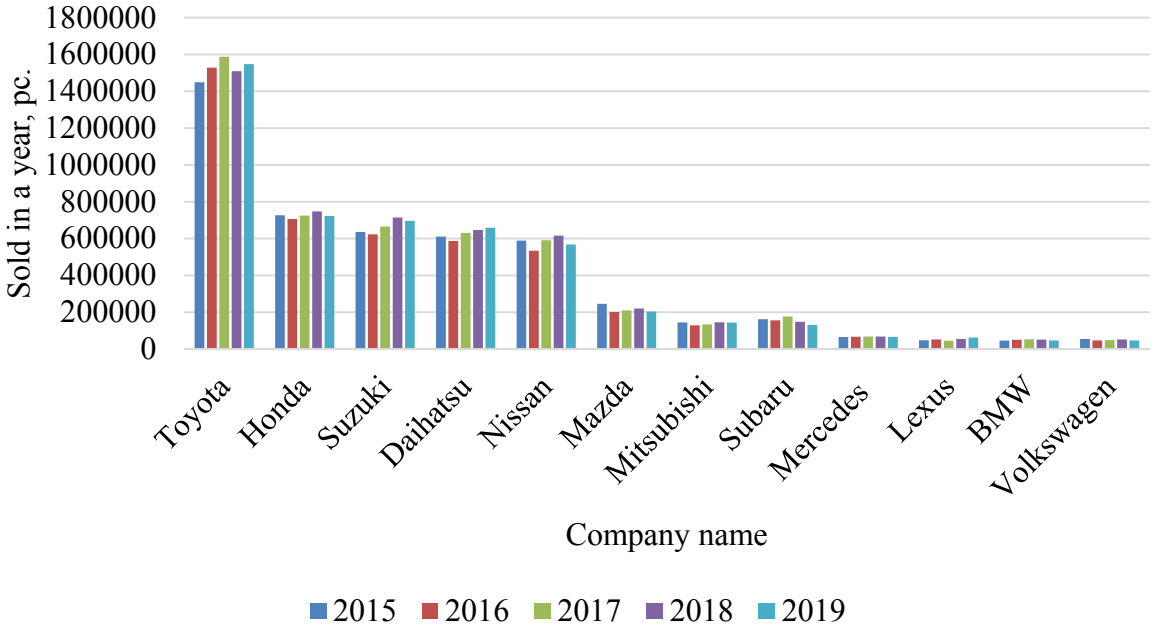

Fig. 3. **Car sales in Japan**

Source: URL: https://auto.vercity.ru/statistics/sales/.

Consider Japanese car sales in some countries and worldwide. In terms of the Russian Federation (*see fig. 2*), the number of Japanese cars sold is above the budget (including South Korea). For example, in 2019, Toyota cars were ranked 6th after Lada, Hyundai and Kia.

This situation is due to the fact that the majority of the Russian population does not have the money to buy Japanese cars, as they are only represented in in the business car segment and SUVs, while South Korean manufacturers supply us car as economy class, which allows citizens to buy them for relatively little money.

Japanese cars are more competitive than European cars on price criteria. For example, Nissan Teana or Toyota Camry can be compares with BMW 3 series, and the amount per car will vary from half a million to one million if you consider different complete sets. Consider the cost of complete set "Comfort" Nissan Teana or BMW 3 series. At the most standard level Nissan Teana will cost the buyer 1 million 300 thous. rub., BMW, in turn, is worth 1 million rub. more. In addition, BMW's component costs are 2–3 times higher than Nissan's.

In Russia, European manufacturers raise prices through brand and modern electronics (https://www.bmw.com.cn/zh/all–models/3–series/sedan/2019/specshee).

Japanese buyers try to buy cars from the domestic manufacturer, American cars are almost non–existent, European cars — are expensive both on purchase and in service (*see fig. 3*). Chinese and South Korean cars are not allowed on the market, as Japanese companies will suffer losses due to lower prices.

In Japan, compact and hybrid cars are the most popular. The first "hybrid" in Japan is Toyota Prius, which is also popular in Europe and USA, but due to climatic conditions did not take place in Russia. At present, Japanese companies present electric car concepts as the most promising in many international car shows. Currently, Nissan Company occupies a large share of the electric car market (Nissan Leaf). This brand, like Prius, is popular in Europe, as it has few competitors (mostly

Table

Toyota car sales by continent

Continent/Year	2016	2017	2018	2019
North America	2 764 475	2 831 235	2 773 791	2 696 447
Europe	924 660	981 038	1 002 249	1 045 367
Asia	2 583 214	2 639 100	2 891 929	2 822 350
Japan	1 636 495	1 597 471	1 569 566	1 587 297
South America	395 766	431 839	427 851	391 908
Oceania	259 381	273 619	264 379	255 928
Africa	183 397	183 246	196 202	200 559

Source: compiled by the authors based on URL: https://global.toyota/en/company/profile/production-sales-figures/.

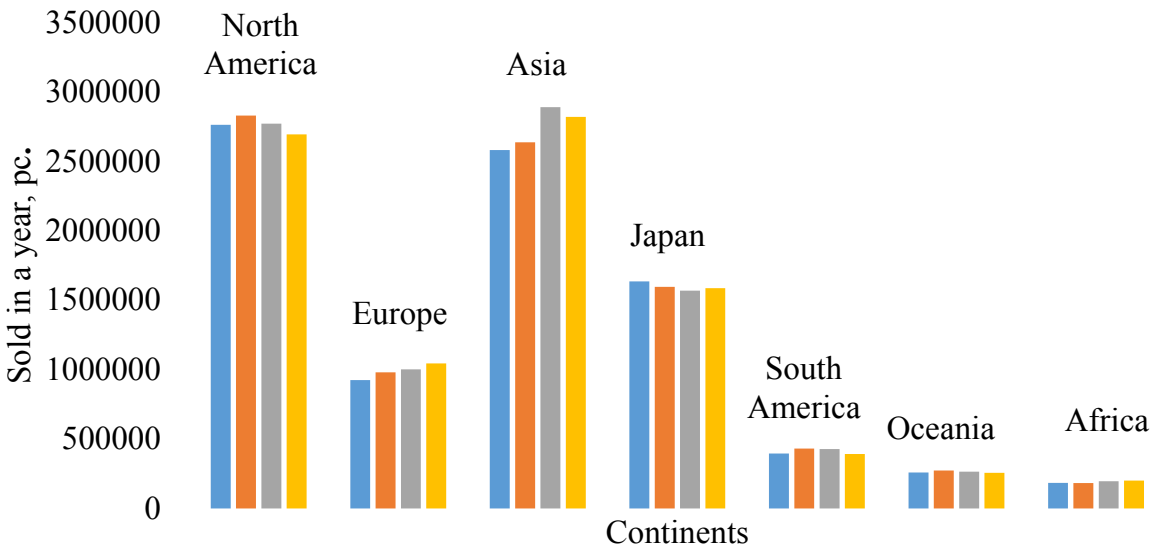

Fig. 4. **Toyota car sales worldwide**

Source: compiled by the authors based on URL: https://auto.vercity.ru/statistics/sales.

luxury European companies or Tesla, but its value is much higher).

Toyota car sales in different regions are shown in the *table*. If Japanese car sales in the European market are considered, they are significantly lower than in Russia, North America and Asia (*see fig. 4*).

The most developed is the Asian market — 2 million 822 thous. 350 pieces sold in 2019, of which in Japan — 1 million 587 thous. 297 pieces. The North American market is slightly inferior — 2 million 696 thous. 447 pieces in the same year 2019. In all Europe sold less than in Japan — 1 million 45 thous. 367 pieces.

In Europe are known such companies, as Czech Skoda, German: Volkswagen, BMW and Mercedes, Italian: FIAT and Alfa Romeo, French: Reno and Peugeot. A number of Japanese companies have established

subsidiaries in the European and American car markets. The European Union imports about a quarter of Japanese automakers' cars, while it exports only 6% of all exports to Japan. This indicator brings us back to the fact that the Japanese car market is dominated by domestic manufacturers.

The situation in the US market is similar to that in Europe, where home–made cars are mostly used, such as Ford, Chrysler and Chevrolet. But because America has fewer companies than Europe, and the number of cars — 2 per family, there are more Japanese cars. For the US market, the Japanese make models of cars that are not even sold in Japan. As mentioned earlier, these cars are Toyota Tundra and other pickups. Despite the support of their own manufacturer, Americans believe that Japanese cars are significantly better in terms of durability. It is due to durability that Japanese motors are called "millionaires", while European motors on average "run" distance in the area of 250–300 thous. km. Also, the attraction of Japanese cars to the US is that the largest Japanese companies have factories there and do not need to spend extra money on transportation and parts for these cars.

In Asia and the Pacific, Japanese car sales are the most popular in almost all countries except in South Korea, where the automobile market is highly developed. China's top–selling — Japanese brand cars, despite the successful development of its own automobile production over the past 10 years, most of which are exported to low–tech, low–income countries [3].

As a result of the promotional policies implemented since 2009, the demand for hybrid vehicles has been growing — amounting to 60% of all cars sold in Japan.

Another regulatory measure is vehicle recycling. Recycled cars are used in the manufacture of new machines, which reduces environmental problems in the country and reduces the purchase of components from abroad. Disposal in Japan by a dedicated vehicle recycling centre.

As Japan began to switch to electric vehicles more than 10 years ago, almost every city parking lot and toll roads have chargers for them. The next step in the development of Japan's auto industry is to switch to self–propelled cars.

The prospect of integrated firms is predictable, much more difficult to understand what is expected of automobile manufacturers, who find it very difficult to survive and compete in the global international automobile market. Today, a large number of firms exist in alliances with automotive manufacturers of TNCs from different States [4].

In summary, the main challenge for Japanese companies remains to increase sales in Europe, to enter new developed markets, to create new models of electric vehicles for sale in South America and emerging markets in South–East Asia [5].

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Food Sovereignty and Agricultural Policy of Egypt

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ABSTRACT

The material conditions for countries and peoples' existence are now changing significantly and sharply and put forward new requirements for the quality of reproductive mechanisms. To a large extent, this process is related to the village, which seeks to increase agricultural productivity, but cannot yet become on a par with industrial potential. The gap between these two parts of a single economic organism is large and is especially noticeable in developing countries and, in particular, in Egypt. This country is extremely poor in agricultural resources; it has been trying for decades to overcome the threat of hunger, sometimes achieving moderate success in some areas. But on the whole, it can only follow events in a catch-up mode. Now Egypt is entering a new phase of the struggle for food sovereignty and an unclear final result. However, the state's current policy is focused on making food security solvable.

Keywords: Egypt; food and food security; agrarian reform; crops; agrosphere; water resources; natural environment; peasant household and farming; agribusiness

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EGYPTIANS — BREAD NATION

Egypt's current food strategy is based on a combination of extensive and intensive agriculture. Related activities include the expansion of land for cereal crops using modern irrigation infrastructure and more vigorous adoption of innovative technologies and agro — biology, in parallel with the introduction of optimized management Production and implementation of a clearer social policy in the village. In this way, Egypt is creating a more progressive model of agrarian growth in accordance with its natural conditions, which in some cases are not devoid of individuality.

This country has, at all times and with great labour costs, literally struggled to survive in a harsh environment. The focus efforts in that direction is still high, even more so than before, when demographic and resource factors were less acute. The only exception nowadays is the experience of the Arabian monarchies, who, with oil revenues even in the heated desert, have successfully conducted agribusiness on local sites and have been so successful as to supply part of the production for export. But most Arab countries, with investment hunger and scarcity of land and water, are unlikely to become the agrarian powers of the Arab East even in the foreseeable future.

Among them, the leader of the Arab world — Egypt — stands out in terms of territorial and demographic indicators. The productive forces of the Egyptian village are chronically under stress. Their constituents constantly seek to compress under pressure not only the hazards of natural origin, including the deterioration of the climate, but also the operational and purely production circumstances.

Nevertheless, the food security situation in the country is more or less tolerable in some

respects. In particular, access to food and its energy value. This is a significant indicator, but it is not the only one and certainly not the only one that determines the food supply of the population.

Already, wheat harvesting in Egypt, while still one of the highest in the world, has reached a level beyond which it is unlikely to increase land productivity by ordinary means without massive application of a variety of technologies. Especially with increasing demand due to projected population increase by 2025 to 111 million peoples and wheat imports growing as more affordable and in demand.[1] Such circumstances make them a major challenge to the food sector of national agriculture.

Meanwhile, Egyptians have long been known as the bread nation, in surplus oriented to flour products, in particular wheat cakes, which are unusually popular in the poorest layers because of their subsidized cheapness, that in per capita measurement requires maximum quantity of wheat. The country is forced to import grain and supplies are growing. For example, 9 million tons were imported in 2011 and in the 2018–2019 season — more than 12 million tons of wheat from a government agency and private companies [1]. The subsidized bread programme provides 150 pies per month to the needy, each costing the consumer 0.1 market value, or 0.03 dollars.[2] But such an operation forces the State to spend more than 2 billion dollars annually from the budget on bread reimbursement.

The persistent poverty of at least a quarter of Egypt's population only exacerbates the social and food situation, which does not fall into crisis at the expense of public assistance alone. The maintenance of a constantly balancing but inefficient economic institution is a major national problem. It has been seriously aggravated since the beginning of the January 2011 revolution by events that, on the one hand — have exacerbated the seriousness of the food situation in Egypt and, on the other, have made the authorities active in that direction.

MANOEUVRING AROUND WHEAT

Egypt is hard–pressed but still self–sufficient in its products (except for strategic products such as wheat, oil and sugar). And rice production, for example, surpasses world leaders like China, India, or Indonesia, but only through the use of new, non–fuel crops. However, this fact alone has not saved him from necessity since the mid-1990s remain among the top three cereal importers since the financial crisis of 2007–2008. Egypt has had to establish itself firmly in this group, responding painfully to the shocks of the volatile world market. On average, food accounted for 17% of imports during this period, as compared with, for example, 3% and 4% of India and Brazil — as neighbours.

Food security is determined both by the presence of food in circulation at the national level and by its availability in households. In the macroeconomic perspective, balance is achievable by fully exploiting the domestic potential of food production or by adequately accumulating sufficient free currency to pay for imports in the right quantities. The microeconomic approach convinces that if they rely on local rural producers they must be able to grow their own food or have the resources to produce through the market [2]. All this creates a system of interdependencies that form the backbone of relations over the grain component of food and affect its durability in any country.

In principle, the observation captures a fairly standard picture of what is happening on the food front, not only in Egypt, but in most other countries as well. Under pressure, they have little choice. And, as a matter of fact, while this model works, there is as yet no reliable way to improve it.

In addition, Egypt has a complex relationship with European practice, where breeders of patented seed have exclusive rights over them and their harvests. The recorded extension

[1] URL: https://countrymeters.info/ru/Egypt#population_forecast.

[2] URL: https://www.apk–inform.com/ru/exclusive/file/1106824.

of plant breeder's rights may not only restrict the rights of beneficiary farmers to deal with seed stocks, but may also negatively affect the livelihoods of smallholders by denying them access to seed stocks, i.e. seeds and plants. Meanwhile, it is estimated that up to 62% of Egyptian producers relied on seeds (from outside funds) stored on their farms to meet agricultural and food needs [3]. This situation arises because previous demands allowed peasants to act in this way without the permission of breeders. By doing so, farmers made their lives easier.

However, Egypt's Intellectual Property Law of 2014 recognized private property rights over genetic resources. And the implementation of new international obligations in the context of the prevailing Egyptian realities requires complex procedures to overcome the legal and political obstacles that, in the circumstances, are detrimental to economic agents. In addition, the market will have to adapt painfully to the new situation.

In general, the legal, social and economic environment in the village has become increasingly complex due to the need to link initiatives with other imperatives dictated by the need to conserve biological wealth, prevent habitat degradation (of which plant life), finally, to counteract the increase in environmental pollution and tension in other dimensions of the deterioration of the material and environmental conditions of the population.

EARTH AND WATER — IS THE STAFF OF LIFE

Such goals are increasingly difficult to achieve, given the factors that combine not only to affect nature but also to undermine food self–sufficiency. The growing climate threat, with its many other challenges, plays a leading role. These include increased salinization in the Nile Delta due to the rising waters of the Mediterranean Sea and urbanization, which penetrates the area of traditional riverine farms and destroys traditional crop production. Reducing Nile run–off is important because of Ethiopia's heavy hydraulic construction and the large number of young people leaving the village for the cities in search of more gainful employment, as well as — the ageing infrastructure of social and other services.

The enormous water scarcity is indeed critical for the entire Arab East, but Egypt is particularly severe when it comes to the availability of moisture in relation to the scale of land and water resources. There are two kinds of extremes. One is that Egypt, unlike a number of other Arab countries, has virtually no rain–fed agriculture that produces basic grains, which for Egypt might be way out.

Another characteristic stems from the fact that it is only through technological maneuvers of various kinds that a delicate balance is achieved between water and agricultural land that is a great achievement when the process is clearly on the limit of what is possible in a situation of exhausting scarcity of both resources.

It is in view of this multifaceted negative impact on the establishment of the National Food Fund and the intention to at least counteract the food imbalance, if not prevent it, The Egyptian Constitution of 2014 enshrined the right of the people to adequate and healthy food, and made the State responsible for the implementation of the Proclamation. The seriousness of intent was also reflected in the reformulation of food security into food sovereignty [3].

The impact of such an act on the lives of fellahs (farmer) and farmers could hardly be instantaneous, but a number of measures had been taken in that direction in favour of agriculture and the food sector, and thus of the entire population.

Such goals are increasingly difficult to achieve, given the factors that combine to affect not only nature but also food security. Against this background, land hunger is becoming more pronounced, with 97% of Egypt occupied by deserts and an equal number of people living in

the delta and the Nile Valley on the remaining lands.

Negative examples are best illustrated in this part of the Egyptian agro–sphere. Here, for example, between 1992 and 2015, an average of 3.1 thous. hectares of old land were withdrawn from agricultural production, resulting in the expropriation of nearly 75 thous. hectares of working land for urban development, and the loss of which was compensated by the introduction of 206 thos. hectares of new land through the development of wasteland. By 2030, another 87 thous. hectares are projected to be lost, which, by definition, will undermine the stability of the food sector [4]. The situation of culturally suitable land remains tense in other agricultural activities within the food sector. According to available data, the total area of irrigated land (and only such land can be efficiently used) in the traditional areas of agricultural production is close to 3.45 million hectares, or 3.4% of the country's territory, with a production rate of 146%, which means that more than one crop per year is harvested. The cultivated area is 5 million hectares, and in fact 85% of this category is located in the Nile Valley and Delta [5].

Against this background, Egypt has two extremes. One, as already mentioned, is the lack of rain–fed agriculture as an alternative to expensive irrigation. Another is that with the Nile, access to water is constantly on the verge of being possible.

In this regard, it is safe to say that bread and water in Egypt are dual and cannot be considered as functionally different categories.

The water deficit reaches 30 billion cubic meters and it takes at least 90 billion cubic meters per year to meet the needs of the country. Meanwhile, the Nile supplies only 55 billion cubic meters of moisture and about 5 billion are drawn from non–renewable underground resources in deserts. Agriculture alone consumes 84% of resources, which poses a problem of water rationing. The topic is so acute that there is a need to reduce the area under rice cultivation from 1.7 to 0.7 million feddans (1 fed. = 0.42 hectare), to save 3 billion cubes meter of water. In addition, 53 types of strategic water–saving crops have been identified that could at least offset the use of available sources.[3]

The ratio of careful water is dictated by its increasing scarcity per capita from approximately 900 cubic meters in 2000 to 700 cubic meters in 2012 and 590 cubic meters in 2017, which is well below the 1,000 cubic meters limit determined by the World Bank.[4] Meanwhile, Egypt already uses 127% of its water resources, of which 27% are virtual water contained in imported agricultural products and foodstuffs. According to some estimates, in 2020, the rate could rise to 47%.[5]

THE PATH TO CEREAL ABUNDANCE?

Despite the relative balance between demand and supply in a number of cultures, there are few indications that Egypt is close to addressing the food problem in all its dimensions and in a manner consistent with the notion of food sovereignty as such. Agriculture is part of the country's current economic trend and is an important element of the national reproductive system. As of 2018, its share of GDP exceeded 11%, it creates 28% of jobs and provides 55% of employment in desert Upper Egypt. In general, however, small farms along the Nile are predominant. They follow a traditional practice that lags behind the growing demands of the State. The high labour input, based on conventional technology, does not work well, affecting the quantity and quality of harvests, soil conditions and the competitiveness of products.

Nowadays, the Nile segment of agriculture is implementing a single crop rotation system, expanding the range of varietal seeds, modern mechanization tools and related services, the

[3] Facts about water resources and rationing in Egypt. URL: www.egypttoday.com.

[4] URL: www.worldometers.info.

[5] What Does the Future Hold for water in Egypt? URL: water.fanack.com.

distribution of which is regulated and controlled.

These measures also have a strong social connotation. The whole block is correlated with the 1.5 million feddans or 630 thous. hectares project initiated in 2014 in the Western Desert and a number of other areas of the country due to their inundation. The opening of the topic was not the first of its kind. It dates back to the 1930s in the last century, when the State first determined its intentions in this matter. It was only 30 years later, when the economy was shifted to five–year development plans, that it went into action, and by 2015, 2.6 million feddans of cultivated land had been developed, which nearly doubled their area.[6] It may have been more successful if the process had not been accompanied by periods of long attenuation and a rare increase in activity at the targeted sites. In particular, as early as H. Mubarak, on the eve of the new century, a programme was announced for the reclamation of 1 million feddans of particularly arid territories, and already in 2017. The Western Desert was supposed to be a direct resemblance of Delta. However, all plans were broken and the project was not implemented on most of the indicators.

In 2009, the same Egyptian leader renewed the campaign to reclaim 3 million feddans by 2030. However, due to the January 2011 shocks, only parts of the project were implemented. As a result, a number of scattered, inefficient farms were created that could not be consolidated into arrays capable of shaping the future of advanced Egyptian agriculture.

The modernization of this huge economic institution continued to be an open subject. Growing problems with the population continue to overstretch the resource base of the food sector, while functioning economies are stretched to the limit and require significant efforts, to avoid over–regulation land exploitation and to maintain the viability of the Egyptian food sector.

[6] USDA Foreign Agricultural Service. GAIN Report. URL: http://apps. fas.usda.gov/newgoinapi/api/report/downloadreport by file name?file name=Egyptian%20 Land%20Reclamation.

Since the launch of the Project to develop 1.5 million feddans, the State has focused considerable efforts on improving the functioning of the agricultural organism. The key to success is seen in solutions that guarantee higher yields of grain farms, introduction of progressive methods of project management in close cooperation of different forms of ownership represented by public, private and cooperative institutions.

IN SEARCH OF A NEW MODEL

Over the past half–century, Egypt has gone through a long road of intensive reforms, most fully implementing the IMF's policy of liberalizing the economic space, developing market relations and making production more private. Reforms have also affected the agrarian sector, adjusting landownership and land use and giving greater latitude to the village's business sectors. Naturally, this was also linked to the changing nature of relations between commercial, peasant and farmers' groups and the State. In general, the whole process can be interpreted as a kind of completion of the market transformation of the country, because "reforms in agriculture and water resources were seen as part of a broader agenda that is now being implemented across the region in various ways and catalyzes the growth of agricultural capitalism [6]. The expansion of the cropping zone is being pursued in two ways: by increasing production in the Nile Delta, as noted, by wetting uncultivated land on the side of the riverbed and by connecting desert areas upstream, with an emphasis on groundwater extraction. This shows a desire to balance the location of the productive forces of the village, to draw in the deserted areas and to expand employment by creating new jobs. At the same time, power proves the ability to act to solve the food problem and convinces the population that it is ready to respond to the public demand with a strong agrarian policy.

Having abandoned the idea of a decision–making economic method, the State retains

regulatory and distributional functions, relating to the financing, management, mobilization of land and water resources and a number of other responsibilities related to the organization and maintenance of projects. The Contract Farming Act is at the centre of the chain of activities. Its provisions paved the way for guaranteed production and marketing of products, limiting the role of speculative capital, preventing rural depopulation due to adverse economic and non–economic factors, which are expressed, for example, in the difficult marketing of crops even at lower prices, in the cost of means of production, logistics, processing of perishable products, etc.

The number of peasant farms in the country reaches 4 million units. Including them in a more productive contract economy offers a chance to bring more stability to agricultural production and beyond. Getting the controls in order, the financing and organization of this mass activity during the process–testing process should lead to an improvement in the quality of all aspects of production and ensure that only the right crops are put on the market at any given time. Streamlining their range is a prerequisite for the sustainable accumulation of strategic food stocks.

The Act also focuses on the consolidation of the country's agricultural sector through the introduction of cooperative farming principles as a tool, working for the benefit of village producers, who thus gain a fairly secure protection from the negative effects of the market and the actions of unscrupulous economic agents.

It is estimated that, as a result of the combined application of the measures envisaged, the incomes of rural workers may increase by a third compared with the previous practice, The State did not pay due attention to the balance between domestic production and consumption and did not regulate crops.

In the hope of the effectiveness of the measures to transform the traditional Nile part of the agricultural sector and the expected high performance of large–scale desert projects of the commercial plan, the State hopes to level the overall development of the village, Combining the potential of dual reproductive systems to achieve Egypt's food security.

To this end, more stringent rules have been established in the planning of specific projects and the timing of the incorporation of land plots, in order to cut off informal links in land operations, land development and contract farming.

A legislative framework has been developed to regulate land and water management systems, regulating the flow of water under the supervision of the Office of the President, following the example of the High Dam and other major national infrastructure projects. It provides financial incentives for small farmers to save water, to follow established crop rotation and to use economic, logistical and other schemes to accelerate the supply of agricultural produce to food markets. In addition, small–scale contractors are being set up to develop services in villages and to assist small–scale producers.

Within the framework of the post–revolutionary sentiments, a joint–stock company has been set up, consisting of Egyptian governing bodies, administrative bodies of agrarian projects and banks, on the one hand, and farmers,— on the other, as a means of counteracting abuses in investment and financial reporting on specific projects. In this way, the State markedly transforms farm practices, encouraging them to optimize social and labour relations within projects and introducing elements of democratization into the general atmosphere of local institutions.

IN THE DEVELOPMENT OF THE TOPIC

Against the backdrop of high–profile attempts to give impetus to the emerging desert economies, which had previously been highly resource–poor and embodiment of the inertia of reproduction and the stagnation of the village, there is hope for the consolidation of a sustainable discourse,

laying the foundation for a new quality of Egypt's agrarian system.

However, there are circumstances that could delay this process. In the rural hinterland, which is now more actively involved in modern agrarian activities under the 2014 programme, there is still a centuries–old mistrust of the Government and of power in general. The resulting inertia and uncertainty in the future, multiplied by poverty, do not necessarily lead the periphery of the village to believe in the success of any endeavors from above and to be willing to follow orders from above.

In addition, the desert part of the generally–Egyptian project covers territories whose legal status is not visible because the unequal plots are included in the state domain, are privately owned or used by different persons without proof of title. Breaking established ties and relationships against this background can also be seen as a constraint to growth. Moreover, with low productivity and low investment, farms are not sustainable and their ownership status does not allow regular access to finance, technology and mechanization, allowing them, at best, to enter the local market.

The State has proposed a modified system which, to some extent, takes into account the experience of the Al Jazeera cotton project of Anglo–Egyptian Sudan. The work in this case is directed by the Egyptian Village Development Company, which interacts with major Arab and foreign investors, for whom the land–ownership ceiling is set at 100 thous. feddans. The land is divided into blocks of 1,000 feddans and leased to private farmers, who attract small farmers as simple producers of goods. Revenues are regularly distributed among the parties on the basis of negotiated agreements.

This is — a weakness of the projects, as profit–sharing tends to be controversial. The latter is particularly true of people from the lowest strata of the village and urban unemployed, who are socially integrated into the projects and account for up to 20% of those employed and have no experience or habit of regular farming. The resulting conflicts of any etiology are resolved in the conciliation councils — important organizational structures of projects intended to resolve conflicts between workers and land lords who may encroach on the interests of small producers.

This type of action is urgently needed, as, in the face of continuing demographic pressure and a chronic shortage of cultivated land, desert development remains the only alternative to the threat of land hunger and cannot be discredited. Especially as land–use operations on the desert south–western fringe of Egypt are expected to house 4–6 million Egyptians and to create up to half a million jobs within 10 years by 2020, 80% more efficient use of irrigation, to expand the use of mechanized means to increase productivity and increase wheat and cereal yields by 20%. The same standard is set for the growth of the incomes of peasants with plots of less than 3 feddans, which make up 85% of the total [7].

Today, such a goal is perceived as elusive. Indeed, the situation is constantly close to the boiling point, and the authorities have no choice but to reverse long–standing trends and open up new opportunities. Only the creation of a more stable basis of the village's reproductive system can be a real counterweight to the multi–location that generates conditions for dispersed farm forms with varying degrees of stage maturity. Their consolidation into consolidated agrarian enterprises with a more modern production and technological base will create conditions for the formation of a more homogeneous social and economic mass of rural owners ready to carry out national tasks.

AGRIBUSINESS — AGRIBUSINESS FRAMEWORK

It is no coincidence that the current President of Egypt has set the goal of accelerating the construction to produce tangible material results two years after the project's launch. The appeal shows how interested the State is in the

transformation of the village, although objective difficulties are palpable. It is not just a question of mobilizing financial resources, which in principle can be sufficient. It is more difficult to reformat mass consciousness and to integrate the peasant households and farming masses into the changing forms and norms of labour participation in projects. The difficulty is that it will take time for projects to establish themselves as incubators for a generation of self–sufficient farmers and well–targeted workers.

The experience of the development of the agrarian machinery in Egypt shows that the alleviation of the food situation must not only be the result of the organizational and technical reorganization of large segments of the agrarian sphere itself, but also as a consequence of the introduction of world science and practice, of which agribusiness is an important channel. Supporting it as a developing institution is also a matter of special concern to the authorities.

This business is seen as a platform for building productive linkages in domestic and export–oriented horticultural production, as a "sandbox for high–end crop production, rational wetting, storage and post–harvest processing. It is agribusiness that gives rise to the hope that it will be easier for agribusiness to become self–sufficient in the much–needed types of crops, while at the same time ensuring the necessary competitiveness of Egyptian products in the external market.

Indeed, agribusiness seems to have such potential for the future. So far, he's just preparing to be the growing nucleus of Egypt's rural economy, but if we succeed, we can expect to multiply progressive practices, which are concentrated not only in the "near–nuclear space, but also introduced under its influence into the productive fabric of the food sector. These actions are matched by a more ambitious desire to turn agribusiness into a powerful framework for national agriculture, which will be built as the interest of the village's active economic agents in high–productivity work in the countryside grows.

If the agrarian policy successively promotes a move towards further change in the social and economic structure of the Egyptian village, it will significantly accelerate the transition to intensive forms of food sector development. There will be no need to change the established model of the existence of the village in a two–fold — river and desert — environment–dependent format, which, in general, may remain valid in the present circumstances, especially since there is no alternative to it.

It is obvious that the imperatives of the looming food crisis are pushing the State to take rather decisive measures to overcome the rubble that is preventing the national grain market from being properly filled. In principle, the current situation can be seen as evidence of a fuller transition of Egyptian agriculture to a new quality, in which elements of the agro–industrial complex are formed. Beyond that, the process encompasses other aspects related to the country's food empowerment. The production of artificial foods, in particular meat products, which, over time, could alleviate the nutritional problems of the population, is now being discussed.

This requires the management of natural, financial and labour resources, which is carried out by the competent authorities in accordance with current needs. Meanwhile, the status and quality of decisions related to the transformation of Egypt's agrarian complex, the reduced tone of administrative structures, bureaucracy and lack of coordination between departments and institutions of different hierarchies are still far from being a strength of the State, while some progress has been made, shortcomings are gradually being overcome.

Still, given the general practice of Egyptian life, it is more reasonable to expect that agriculture will be difficult to develop, recording past achievements in a number of high–commodity agricultural activities, but still lagging behind in the grain segment. It is possible that in the future this moment could become a kind of "grain

curse for Egypt, analogous to oil for Arabian monarchies. The difference is that for Arab oil exporters it is a figure of speech, and for Egypt — it's a hard reality.

However, this is a huge sector that is entering a period of deep modernization of the material base of agricultural production and transformation of the village's internal structure, as well as technical re–equipment of labour in agriculture and grain production. It also creates an environment that seems to have a more subtle attenuation of public consciousness and greater social responsibility of the rural population for the results of work. This brings to the fore aspects designed to revitalize the State's agrarian policy and to ensure the accumulation of basic prerequisites for strategic gains on the food front.

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Crisis Phenomena in the European Union Economy at the Present Stage of its Development

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ABSTRACT

The article reveals the main problems related to the EU economy's state and the prospects for its further development. This topic is extremely important for Russia since the European Union is its leading foreign trade partner. The article states that the EU is the largest integration grouping globally in terms of its economic potential. Simultaneously, the lack of significant reserves of natural resources and dependence on their external supplies does not allow the EU to realize its economic opportunities fully. At the same time, the export-oriented model of the economies of its leading member countries makes them sensitive to fluctuations in the conjuncture of foreign markets, and the growing public debt contributes to the development of disintegration processes. Besides, the growth of migration flows, the increase in socio-economic tensions, especially during the coronavirus period, also do not allow the EU to solve the accumulated problems. Simultaneously, excessive dependence on the United States in geopolitical and geo-economic relations hinders the development of mutually beneficial economic ties with Russia and other countries. The article presents various opinions about the future of the EU and notes that many authoritative political figures and experts consider that due to these reasons, it cannot be preserved as a whole.

Keywords: EU; USA; economic development; energy resources; social sphere; disintegration processes

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FEATURES OF THE CURRENT STAGE OF EU ECONOMIC DEVELOPMENT

The European Union's economic potential is characterized by the fact that many of its countries have virtually no significant natural resource endowments. This is one of the reasons why the EU does not fully claim to be the global center of power in world politics and economics.

For example, Europe's energy resources constitute a small part (no more than 12%) of the world's energy potential. For hydrocarbons, central European countries — Germany, Poland, and Czech Republic — have sufficient coal reserves, but together they do not exceed 20% of the world's known reserves. This is why the EU has to import a large amount of energy — up to 90% oil and up to 70% natural gas (https://ria.ru/20181205/15435 40738.html). Russia supplies 34 per cent of the EU — 33% of Middle East and African countries, and Norway — 20% of all energy imports.

As a consequence, the new EU energy policy focuses on the development of renewable energy (RE). This in turn implies a sharp reduction in Europe's dependence on primary energy imports. The European Union Energy Strategy 2018 states that oil and gas imports together account for more than 55% of energy consumption, with the target to be reduced to 20% by 2050.[1]

In some EU member — countries, this dependence is particularly pronounced, with Russia accounting for 51.6% of natural gas imports in Germany in 2019 and 72% of external energy requirements in total [1]. Therefore, all energy programs, in particular the "European Green Deal"[2] strategy developed in 2019, are aiming to achieve "climate neutrality" by 2050. This will require a phased reduction of hydrocarbons and an increase in the share of RE in EU energy consumption. But, since the development of the "green" energy is largely determined by the presence of non–ferrous and rare earth metals, their small number in the EU countries calls into question the feasibility of these programmes. For example, of the 25 species, lead alone provides 80 per cent of the energy demand, with imports of the remaining metals (aluminium, cobalt, silver, zinc, etc.) ranging from 30 to 100%.[3] US Secretary of State M. Albright's remarks (1997–2001): "Russia has too much natural wealth. That's not fair" [2] was to some extent a signal not only to the US, but also to the EU. This implies the need to ensure unhindered access to Russian resources on the basis of the best possible conditions for Western countries.

In general, the EU imports uranium concentrates, manganese and iron ore, nickel, tin, copper, molybdenum, tungsten, bauxite, oil and other inputs. This allows it to produce high–value–added products based on state–of–the–art industrial technologies. In this context, the import and export orientation of the national economies of many EU countries, especially Germany, makes them vulnerable to fluctuations in external markets, especially during the coronavirus pandemic. The European Union is now the principal trading partner for 80 countries. In comparison, the US is such a partner for just over 20 countries.[4]

The economic situation in this integration grouping has a direct impact on Russia as it is its main economic partner. The share of the EU in the foreign trade turnover of our country, according to the data of FCS of the Russian Federation, was approximately 50% in

[1] A Clean Planet for all — A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy. URL: https://ec.europa.eu/clima/policies/strategies/2050_en.

[2] A European Green Deal. Striving to be the first climate-neutral continent. URL: https://ec.europa.eu/info/strategy/priorities-2019–2024/european-green-deal_en.

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Table

External trade turnover of the EU with the main partner countries (billion euros, in brackets, share in % of total)

Country/Year	USA	China	Switzerland	Russia
2018	674 (17.1)	605 (15.4)	265 (6.7)	254 (6.4)
2019	744 (18.4)	645 (15.9)	292 (7.2)	248 (6.1)

Source: Trade. URL: https://madb.europa.eu/madb/statistical_form.htm (accessed on 22.04.2020).

the 2000s, and from 2008 to 2019 it decreased from 52.1 to 41.7%. But according to Eurostat data, Russia's share in EU foreign trade in 2019 was 6.1% (https://madb.europa.eu/madb/statistical_form.htm), which is a lot less than his other partners.

As can be seen from the *table*, the US is the main external trading partner of the EU so far, allowing it to influence its development in a beneficial direction.

THE US IMPACT ON THE EU ECONOMY

These factors, in particular heavy reliance on external suppliers and consumers, ensure US influence over the EU. This situation has historically existed, but the creation of a united Europe was primarily aimed at concrete geopolitical goals, namely — to confront the Soviet Union and then Russia. Therefore, US undisguised pressure on the EU is linked (and must be emphasized) primarily to that country's geopolitical interests. But it should also be noted that the post–World War II relationship between the United States and Western European countries is determined not only by a common ideology, common values and the existence of a NATO military–political bloc, but also by close economic ties. Thus, the EU's external trade surplus with the US in 2019 was 177.9 billion dollars, i.e. the US is the largest market for European goods.

Among EU member — states, US pressure on Germany is particularly strong, especially in the context of its cooperation with Russia. Therefore in the appeal of the German political party "Alternative for Germany" to the Federal Government in November 2019 (that is, immediately after the United States imposed sanctions on the "Nord Stream — 2") it is stated that the US attempt to impose its liquefied natural gas instead of the Russian "constitutes an unacceptable act of aggression" [3]. The German business, which has already lost due to anti — Russian sanctions, is estimated to have lost up to 100 billion euros, does not intend to incur further financial losses as a result of this US stance. This view is shared by many members of the German political elite as well as the EU leadership.

The European Union's desire to move away from a one — sided focus on the United States was reflected in the conclusion, at the end of 2020, of negotiations on an investment agreement between the European Union and China, which had been under way since 2013. It is clear that such EU policies have provoked a barrage of criticism from the United Kingdom and the United States. In those countries, it's seen as a blow to transatlantic cooperation. As highlighted in The Times, the EU — China agreement demonstrates the existing gap between the EU's declared foreign policy goals and reality. The European Commission (EC) claims to be "geopolitical". In 2019, it referred to China as a "strategic rival". However, the mercantilist influence of big business, especially in Germany, weighs on root any concern about "morality and security". Further, among other reasons for this decision, the EC in the newspaper is

called "French vanity", because in the UK traditionally consider France a supporter of European "strategic autonomy" to the detriment of the alliance with the US [4].

But even the author of this article, E. Lucas, must admit that the EU is largely right: "As Europeans note, their deal with the Chinese is basically similar to "Phase One" of the reciprocal market access agreement between the Trump administration and China last January. Why should European companies suffer, and American companies are legally protected?" [4]. That's a legitimate question, which we believe is on the surface. But, as E. Macron noted, France's desire to be independent is not so much about politics as about innovation: "Europe needs to build its own solutions and not depend on American and Chinese technology".[5]

EU SOCIO–ECONOMIC DEVELOPMENT CHALLENGES

Lack of necessary natural resources, strong export orientation of national economies and dependence on imports partly contributed to the EU's re –industrialization processes, i.e. emphasis on the development of a predominantly tertiary service sector (70.9% of GDP in 2017).[6] Many European corporations have found it more profitable to relocate production to China and other Asian or Latin American countries, where they can make higher profits. Moreover, the European Union's energy strategy for RE development, because of their higher cost, makes industrial production less profitable. This has resulted in many enterprises being forced to shut down or relocate to other countries. In parallel, the European Union is closing down extractive industries. In December 2018, the country's last coal mine was closed in the Ruhr district. The Government of Germany plans to phase out coal–fired power plants entirely by 2038, until which time coal will be purchased from abroad.[7]

Thus, in 2018, German hard coal mining was completely stopped, and brown coal mining has also fallen markedly in recent years. At the same time, domestic oil and gas production declined owing to depletion. "The development of RE has not been able to compensate for the shortage of other energy sources. It was therefore uncertain how the country would address the problem" [1].

All these activities were carried out under the pretext of environmental protection and the need to combat climate warming. In line with this global framework, the European Investment Bank has decided that it will cease lending to the oil and coal industries as of the end of 2021. This also applies to gas projects without carbon capture technologies (http://www.finmarket.ru/news/5118094). In 2018, the Danish Pension Fund terminated its cooperation with 35 major oil and gas companies, of which three were Russian. The reason for this decision was named their "inability to meet the objectives of the Paris Climate Agreement" [5].

Rising public debt poses a major challenge to the EU economy. The consequences of the 2010 debt crisis, which first affected peripheral EU countries (Greece, Ireland) and then the entire euro area, have not yet been eliminated. The EU public debt, according to Eurostat data, was 77.8% of total GDP in 2019, and even higher in the euro area — at 84.1%, well above the value established in the Maastricht Treaty (60%).

With these factors in mind, the EU is betting on an accelerated transition to a new technological order, particularly the digitization of the economy. But, as UNCTAD

[5] La doctrine Macron: une conversation avec le Président français. URL: https://legrandcontinent.eu/fr/2020/11/16/macron/.

[6] THE WORLD FACTBOOK. URL: https://www.cia.gov/the-world-factbook/countries/ european-union/.

[7] Mehr als nur Kohle. URL: https://www.sueddeutsche.de/wirtschaft/ruhrgebiet-kohle-ausstieg- 1.4253414.

experts point out, the digital revolution can create "both huge opportunities and enormous challenges" (https://unctad.org/en/PublicationsLibrary/der2019_overview_ru.pdf.). The European Union is not a leader in ICT — technology, and the US is a leader. For example, the capitalization of the largest American FAMGA corporations (Facebook, Apple, Microsoft, Google, Amazon) amounts to more than 4 trillion dollars.[8] In total, according to UNCTAD, these five super platforms, as well as two Chinese companies — Alibaba и Tencent — account for two thirds of the total capitalization of the global ICT — market. Therefore, as UNCTAD experts rightly point out, in the global value chain, many countries may find themselves in a position of dependence because of "that value creation and data are largely controlled by only a few of these global "superplatforms".[9]

Such a monopoly is highly disadvantageous to the EU. So, according to the European Commission (EC), Google pays less than 1% of its revenue in the EU. The USA resisted attempts to introduce a "digital" tax, but since January 2020 it has been introduced in France, Austria, Hungary, Italy and Turkey, and 9 European countries are preparing to introduce it [6]. In such circumstances, some Western experts are considering the option of integrating Europe into Chinese technological standards (5G), which would exclude the US and deprive the West of a technological advantage [7]. In order to prevent such a turn of events, the EC adopted the EU Digital Strategy in February 2020, whose main objective, as stated in the document, is to achieve world leadership in the field of artificial intelligence (AI).[10] How it will be implemented is difficult to determine, as economic difficulties in the EU are only increasing.

Its growth slowed as early as 2019 — real GDP grew by 1.5%, 0.6% less than in 2018. The decline in the economic performance of EU — Member States resulted in a 0.9% increase in the State budget deficit and a 1% decrease in industrial production.[11] The economic situation as a result of the coronavirus pandemic deteriorated significantly in 2020, EC predicted that eurozone GDP would shrink by 8.7% in 2020 and grow by 6.1% in 2021, and the EU economy will shrink by 8.3% in 2020 and grow by 5.8% in 2021. The European Commissioner for Economics, P. Gentiloni, noted in July 2020 that in every European country there would be a decline in GDP, but that growth is expected in 2021[8].

The economic and social situation is also steadily deteriorating. The EU Social Model, operated by EU rule of law and subsidiarity provided by supranational structures, is in crisis. The benefits previously enjoyed by EU citizens through the common market, the absence of borders and the protection of rights throughout its territory are now largely offset. Yet in the US and the UK consider, that social spending in the EU, which accounts for about 50% of global spending, is unacceptably high and causes national economies to lose competitiveness [9]. In addition, transition to a "green" economy, which is actively pursued in the EU, has little regard for social aspects.

L. Triangle, Secretary–General of the European Branch of the International Federation of Trade Unions IndustriAll, rightly states that up to 11 million jobs will be lost in the coming years in the extractive and energy — intensive sectors, as well as in the automobile industry of the European Union. Moreover, Triangle has expressed

[8] Welcome To The World Of FAMGA. URL: https://www.signs.com/blog/famga/.

[9] UNCTAD. Digital Economy Report. 2019. Value creation and benefits: implications for developing countries. URL: https://unctad.org/en/PublicationsLibrary/der2019_overview_ru.pdf.

[10] The European Digital Strategy. URL: https://ec.europa.eu/digital-single- market/en/ content/ european-digital-strategy.

[11] Eurasian Economic Integration 2020. P. 29. URL: https://docviewer.yandex.ru/view/ 0/?pageru.

the view, that the partition within the EU is so significant, that if the "green" transition continues to neglect the social dimension, that is, there is "a serious risk of seeing the EU break–up before it is decarbonized" [10].

Indeed, the European media makes little reference to the increasing social and economic differentiation within the EU and the decline in the standard of living of the poor as a result of such policies. At the same time, undue attention is paid to environmental protection issues. According to Swiss expert L. Scholz, "this is a terrible injustice that the environmental movement has never really been interested in" [11].

Increasing flows of migrants to the EU are a major social challenge. The migration crisis in the EU is believed to have peaked in 2015, after which its leadership has taken a number of measures to improve controls at external borders and reduce migration flows. As officially announced, as a result of these actions, the number of illegal entries into the EU has decreased by more than 90% (https://eeas.europa.eu/headquarters/headquarters–homepage_ru/54681/). But it is important to note that statistics on the counting of migrants in the EU are largely unreliable and do not reflect actual reality.

DISINTEGRATION PROCESSES IN THE EUROPEAN UNION AND ITS POSSIBLE CONSEQUENCES

Due to the above–mentioned crises, disintegration processes in the EU are gaining momentum, as exemplified by the withdrawal of the United Kingdom (Brexit) in the 2016 referendum. But it was not until the end of 2020 that the country and the EU negotiated a compromise agreement on trade and economic cooperation. It provides for free trade, unrestricted access to each other's territory, but also for the discontinuation of coordination of defence, external and sanctions policies.

Another catalyst for disintegration in the EU in 2020 was the coronavirus pandemic and its related economic crisis. The abandonment of the free operation of the Schengen area, the discussions on the EU budget, as well as on the financial support of individual national economies, are evidence of the growing controversy within this integration grouping. They were particularly sharp in the relations between the "old" and "new" members, in particular between France, Germany, Austria — on the one hand, and the countries of the Visegrad group — on the other hand [12]. Some EU Member States complain about the leadership's policy of "crisis solidarity". For example, in Germany it is perplexing that "Poland has been allocated more funds than the whole of Europe combined in the Marshall Plan". From 2004 to 2014, it received 101.3 billion euros from the EU through various specialized programmes and plans to continue to receive 11–18 billion dollars annually [13].

But there is another, opposing view. In the opinion of the Russian scientist N.K. Arbatova, the EU is currently focused on solidarity among member countries, recovery from the crisis and the elaboration of a post–crisis strategy. "The initial shock of the pandemic prompted member states to close their borders, which in turn triggered a series of apocalyptic scenarios about the future of the European Union. In fact, there is nothing new in predicting the EU's imminent collapse". Further, she quotes a EC Chairman U. von der Leyen, who said that "there can be no half measures to overcome this crisis until we bring our economy out of the crisis depression. To do that, we will need huge investments in the form of a Marshall Plan for Europe. This should be based on a strong new EU budget". Arbatova concludes: "whether the European Union will be able to deliver on what has been set, the time will come". But, in her opinion, "it is already obvious that the European Union's economic response

to COVID-19 was the strongest in the world" [14]. It's a very controversial point of view, but it has many supporters in both Russia and the EU itself.

The Ambassador of Germany to Russia, G. A. von Geir, dedicated his article to criticizing the concepts in which the idea of the EU's dissolution takes hold. He pointed out that in many media publications, the European Union appears to "have lost its moral compass and/or led its foreign policy solely at the behest of American". He goes on to say that "Brexit" is presented as proof that the idea of Eurointegration has no appeal, and "migration will destroy European identity". Yet, according to von Geir, "the credibility of the EU partnership remains today, as expressed in a large number of countries willing to cooperate with the EU or even aspiring to membership... And since then — this is my impression — these twenty–seven countries have come together even more closely than before "Brexit" [15].

This view is not shared by all politicians and statesmen in Germany itself. For example, former Chancellor G. Schroeder has taken a very pessimistic view of the future of the EU: "Europe is at a crossroads. America's political self–destruct, its once–key partner, confusion with Russia and China, the economic problems associated with the coronavirus, and the lack of real coordination in the pandemic — all caused a deep crisis in the European Union" (https://www.handelsblatt.com/meinung/gastbeitraege/).

Director of Crisis Research Institute by Oxford University M. Almond takes an even sharper view: "The European project in deep crisis, it is — bankrupt, both economically and morally. Its governance model is outdated and does not meet the challenges of 21th century" [9].

And such allegations are well founded. Since 2016, euro–skepticism is gaining momentum: according to some reports, one in three voters now supports parties that are critical of or directly hostile to the integration entity. So the collapse of the EU, according to the famous financier J. Soros, is inevitable (https://www.9111.ru/questions//). With the prediction that the coronavirus is a harbinger of the break–up of the European Union according to the scenario of the former Soviet Union, the famous leader of the French party "National Association" Marin Le Pen spoke.

The former President of the European Council, D. Tusk, also does not exclude the possible disintegration of Europe due to the coronavirus pandemic crisis. In an interview with Der Spiegel, he called for a "blitzkrieg" in the EU economy to reduce the impact of the epidemic. At the same time, he believes that the financial burden in times of crisis should be borne by the richest EU countries: "Those with more must give more. That is the principle of true solidarity. Germany is financially strong and can protect its industry and its companies. Other EU countries do not have this option" (https://www.gazeta.ru/politics/2020/04/24_a_13061731.shtml//). The President of France, E. Macron, holds a similar view. In his view, without the assistance of Germany and the Netherlands to the countries of southern Europe, the whole association could be threatened. In doing so, according to some French experts, Germany should also help France "by replenishing its post–coronavirus treasury. French debt is twice as high as German (140% of GDP versus 70%) and banks may face bankruptcy ... Germany will have no other solution if it wants to survive a crisis that could turn into a systemic one" [16]. Certainly, in Germany itself such approach does not find understanding, and nostalgia for the "good, old mark" there feels clearly.

The future of the EU depends largely on US policy. New administration of President USA J. Biden is likely to have to change her attitude, given the rise of anti–American sentiment in Europe. For example, a sociological survey commissioned by the

EC showed that the US actions against coronavirus negatively affected their image. 71% of Danes, 68% of French, 65% of Germans, and 38% of Poles have said that their attitudes towards the US have worsened since the COVID-19 pandemic [17]. In the leading English newspaper The Times, an article by E. Lucas (January 2021) states "Brussels is tired of years of hasty and unilateral American decisions" [4].

In connection with this, EC Chairman U. von der Leyen, congratulating J. Biden on winning the election, announced a "renewed partnership" between the two sides. J. Biden himself campaigned as a friend of NATO and a staunch supporter of preserving and strengthening transatlantic ties. In his opinion, "the most effective way to solve this problem — is to create a united front of US allies and partners to counter China's brutal behavior and human rights violations". Meanwhile, J. Biden stressed that in many areas of interaction he was willing to negotiate with China. But the main danger to so–called Euro–Atlantic solidarity he called the "Russian threat": "We must place real responsibility on Russia for its violation of international norms and stand on the side of Russian civil society, which time and again bravely opposes kleptocratic authoritarian system of President Vladimir Putin" [18].

To oppose Russia, according to his statement, "The United States is ready to provide economic support to European countries and to strengthen common values" [19].

However, many transnational businesses are interested in the disintegration of the EU, as it's believed to have fulfilled its historic role. In particular, K. Schwab and T. Mulleret, referring to the famous American scientist N. Ferguson, declare the US, China, and the EU "extremely disadvantaged", as the coronavirus pandemic has exposed their bankruptcy, "emphasizing the success of small states" [20].

Thus, in the face of growing global instability, the future of the EU is in doubt. Whether it will exist in its present form or disintegrate — is difficult to predict. But one thing is certain — the EU's leading — member states will continue to hold important positions in world politics and economics.

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Coronavirus as a Catalyst for Digitalisation and Public-Private Partnership in Medicine

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ABSTRACT

The article focuses on the impact of the COVID-19 pandemic on digitalization and public-private partnerships (PPPs) in medicine. The epidemic of this disease has intensively affected Russia, and the viral economic crisis has highlighted the need for structural reforms in many sectors of the economy, including medicine. The Russian Federation's budget regularly lacks funds to solve much pressing health care and science problems. In this regard, PPP is of particular interest, promoting better management and higher medical services quality. Therefore, the purpose of the work is to consider the forms of interaction of advanced medical institutions with entrepreneurship, scientific organizations, regional administrations, civil society and the possibility of increasing the potential of such cooperation. A methodological basis of our research was a synergistic approach to scientific knowledge, institutional, cluster, general scientific analysis of sources, which made it possible to establish key aspects of the interaction of agents, and the SWOT analysis method made it possible to show, with some examples, the impact of PPP not only on the development of medical institutions but also on efficiency activities of the company.

Keywords: pandemic; coronavirus; public-private partnership in medicine; digitalisation; high-tech medicine; viral and economic crisis; a new paradigm of healthcare management; precision medicine; telemedicine

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INTRODUCTION AND PROBLEM STATEMENT

The digitization of the economy is gradually leading to an inevitable change in the social and economic paradigm of the development of society and of certain areas of its activity, including medicine. The risk of technological lag is one of the major challenges facing the Russian economy. After all, the share of the digital economy in the total GDP of the Russian Federation is now only 3.9% compared to 11% in the United States [1, p. 42]. The digital economy must become a pivotal factor affecting not only economic growth but also the well–being and health of the population.

In this connection, the digitization of medicine is of particular importance, and it contributes to the reduction of costs and the improvement of the quality of both free and paid services, better diagnostics and the extension of life and working capacity of the population. The digitization of medicine, which began 10 years ago with the universal computerization of health facilities, now poses the challenge of using artificial intelligence (AI). Information technology assumes accelerated development of bioengineering, which will contribute to the development of completely new drugs and the prevention of potential infections. Central to this is a more in–depth study of genome editing technology, which will help to cure the majority of known diseases [2, p. 100]. Modern medicine will be equipped with cellular–level disease control technologies involving the accurate delivery of drugs [3]. The topicality of this problem is increasing due to the "viral–economic" crisis, epidemiological and political situation in the country and the world, which require technological breakthrough in medicine and the introduction of modern innovations in everyday life.

Digitization — is not only the use of artificial intelligence and other digital technologies, but also a persistent struggle for advanced systems and/or management models in medicine, including the nurturing and attraction of talent, their ability to work as a team with big data systems. At present, the qualifications of many senior and middle managers in medicine do not allow for such tasks. This resulted in a number of systemic errors, such as the mismanagement of material and human resources and high–tech equipment (and sometimes his simple), lack of permanent internal quality control, which was especially acute during the period of coronavirus pandemic and economic crisis, which the famous economist V. T. Ryazanov called "viral–economic" [2, p. 95].

It should be noted that a huge part of the damage caused by COVID-19 is due to the lack of preparation of managers at various levels for rapid mobilization. In Russia, this was complicated by failed reforms in the field of health care, when market concepts were introduced: "medical services" and "educational services". In this connection, it should be emphasized that health care — is a social institution for the maintenance and protection of public health. Medicine — is the treatment of disease with the best clinical results. Today, however, the challenge is not only to treat diseases, to diagnose them early, but also to prevent them. Systemic failures of medical power structures result in a high number of medical errors and inefficiencies throughout the country. In Russia, according to the information of the public organization Coalition for Patients' Rights, 50 thous. people die every year from medical errors [4, p. 226]. Thus, the digitization of the entire medical sector must begin with a sustained effort to reorganize the management system, while preserving the best medical traditions, schools and personnel.

The quality of medical care in the regions varies considerably — the best medical services are provided in Moscow and the

Republic of Tatarstan. The health–care system in Krasnodar Krai, Murmansk, Novosibirsk oblasts, Bashkortostan, Tyumen oblasts is not effective [5, p. 116]. Reforms in the medical sector have not eliminated regional disparities in the provision of resources and personnel to health institutions. In many villages, even paramedical centres have been dismantled, and the population has been left without medical assistance. The number of rural health organizations closed between 2005 and 2016 was 2,653 unit or 72% of the total [6, p. 70]. In small towns, even in Moscow Oblast, electronic registration to a doctor did not eliminate large queues, especially to "narrow" specialists. In most cities, the equipment of hospitals and clinics remained the same, and many even lack the Internet.

Health management requires a special approach in view of the fact that life and health are at stake. Society disagrees that the market has gone from being an economic mechanism to a self–defeating system that imposes its values [4, p. 62]. The economy therefore suffers immense losses from poor health and premature death. The mortality rate per 100 thous. people (for the working–age population) in Russia is three times higher than in developed countries, and for cardiovascular diseases — fourfold [1, p. 42].

The restructuring of the health care system should be carried out on the basis of the national project "Health Care" from 24.12.2018 No. 16, which provides for the reduction of mortality, control of cardiovascular diseases and cancer, completion of the establishment of a high–quality primary health–care network.[1] It covers the period 2019–2024 and requires not only huge medical efforts, but also significant financial outlays by the state, whereas today in Russia only about 5% of GDP is devoted to health care, compared to 10% in Europe and 17% in the USA. On health financing and its share of GDP, Russia ranks 140th out of 200 countries [1, p. 42].

PPPs are therefore of particular interest for the transition to high–tech medicine, which is particularly needed in problem regions where budgets are limited, investments are inefficient and most of them — have low management skills. The institutional framework for PPPs is being developed in the Russian Federation. Involvement of entrepreneurs in PPPs will allow for new financing mechanisms for health facilities and facilitate a faster and more complete transition to digital and high–technology medicine. Entrepreneurs, in cooperation with the State, are given the opportunity for stable business development.

Foreign experience in the introduction of public–private partnerships in health shows that there are great opportunities for such cooperation, which helps to solve a wide range of critical health and social problems. In Europe, private sector participation in financing, providing health infrastructure and delivering services through PPPs is most frequent because business is better at managing risks [7, p. 110]. L. Kostyak and his co–authors note that in low–income countries, private sector participation in financing medical innovation helps to ensure skilled care [8, p. 120].

The impact of income on health is highlighted by P. Braveman and his co–authors, who noted that better–off citizens are healthier than the poor, and PPPs help to reduce these disparities [9, p. 190]. K. B. Adan, after analysing the public–private partnership in health, concluded that it improves the management skills of health professionals and facilitates the provision of better–qualified health care [10, p. 316]. He noted that PPPs, for example in the United Kingdom, accounted for 12% of all sectoral projects.

[1] National Project "Health Care". URL: https://futurerussia.gov.ru/zdravoohranenie.

A. Lundström and L. Stevenson also point to improvements in the quality of health services through the interaction of business and the health sector [11].

A. Hira and K. Reilly highlight the need for entrepreneurship to work with civil society, including the medical community [12, p. 190]. R. Felix and J. Garcia –Vega, in considering the quality of life in Mexico, pay attention to health, noting its strengths and weaknesses [13, p. 237]. F.D. Castro stresses the innovative nature of Cuban medicine and its link to science, and he also talks about the use of nuclear radionuclides in the treatment of cancer [14, p. 13]. Such treatment is widely used in this free and affordable island State, which WHO describes as the best in the world. T.N. Yudina writes about the achievements of Cuban medicine and biopharmacy [15].

Excellent health system, considered by P. Downward and S. Rasciute, contributes to a better quality of life of the population, a more comfortable living environment and encourages people to participate in sports, especially with higher incomes [16, p. 213]. So, most foreign authors attribute PPPs to the possibility of a transition to modern medicine, better management, better health care and better living standards. In Russia, such interaction is just beginning, so that the issues of adaptation of medical institutions to the digital economy and the mechanisms of their cooperation with business are not sufficiently covered in the literature.

USING THE POTENTIAL OF THE NATIONAL PROJECT "HEALTH CARE" FOR A NEW PARADIGM OF HEALTH MANAGEMENT AND IMPLEMENTATION OF INSTITUTE FOR PUBLIC–PRIVATE PARTNERSHIP

In recent years, the health–care system in the Russian Federation has undergone a substantial reform, the results of which can be assessed in a mixed but largely negative manner. These include, first of all, a deterioration in the quality of medical care, a reduction in the number of medical staff and an increase in the workload of the remaining staff, and a reduction in the number of in–patient beds. 726 health organizations were dismantled under the optimization programme from 2015 to 2018, while the number of private health facilities increased (https://expert.ru/expert/2019/ 38/ minzdrav–rasteryal–vrachej/). From 2009 to 2017, the number of hospitals decreased by 30.8%, the number of hospital beds — by 23%, and the number of hospital beds by 10 thous. decreased by 25% [5, p. 110].

The gap between large and small cities and between urban and rural areas, as well as between rich and poor regions with lower levels of well–being, has widened in terms of access to health care. This reduces the quality of life of the population and threatens social and political stability and the unity of society. Citizens with limited financial resources are much more likely to have health problems and their health is more dependent on community efforts [17, p. 194].

The viral and economic crisis has led to a huge part of Russia's population becoming increasingly poor and small and medium–sized businesses going bankrupt. While large–scale capital actor had made 62 billion dollars in wealth from the onset of the pandemic to May (https://www.forbes.ru/ milliardery–photogallery/405643–kto–iz–rossiyskih–milliarderov–razbogatel–silnee–vseh–za–vremya?utm_medium=email&utm_source=Uni Sender&utm_campaign=237409834).

Reforms in health have highlighted the urgent need to shift to a new paradigm of innovative governance that is consistent with the genesis of the digital economy. The management of medical institutions should not only learn to manage the industry well, but also become an institution of citizenship

in interaction with business, scientific organizations, authorities and the population to discover the effectiveness of reforms. At the same time, a platform of precision medicine (personalized treatment of diseases based on genetics) should be formed in medical institutions, is needed early diagnosis of diseases through progressive screening methods, establishment of remote patient health monitoring services with wide application of telemedicine technologies.

Today, elements of precision medicine are used mainly for the treatment of oncological diseases. The national project "Health Care" aims to reduce the mortality of the working–age population from cancers that cause the most significant losses. In the country, the incidence of cancer has increased by 40% in 10 years, while the detection of malignant neoplasms is 20–30% lower than in Western Europe and the standardized mortality rate for malignant neoplasms is 10–15% higher [18, p. 168].

In this context, high–quality, up–to–date diagnostics are archived and PPPs have an important role to play. For example, GC MedInvestGrup is engaged in diagnosis and treatment of oncological diseases. Company built diagnostic centres in Balashikha and Podolsk and handed them over to the State, which, under a concession, granted them to companies for use with guarantee of patient flow. Every year, the Ministry of Health of the Moscow oblast sends more than 10 thous. persons for a positronic emission tomography. The company is partnering with regions and choosing forms of cooperation.[2] Partnership with the State has also had a positive impact on the company's performance,— over the last two years she has become a leader in the Russian oncological diagnosis market, has created the most modern network of nuclear medicine centers PET–Technologies, which are in 27 regions of the country and only in 2019 did more than 70 thous. research.[3]

Following the organization of nuclear medicine diagnostic centres "MedInvestGrup" launches a new project to install 100 linear accelerators in different regions of the country — radiotherapy equipment worth 37 billion rub.[4] Radiation therapy — is the most painless way to heal a patient without surgery. In the EU and USA, 70% of patients recover from radiation therapy. It is the most important project on the market of private investments in medicine of the Russian Federation.

Besides the nuclear medicine network, MedInvestGrup in 2019 acquired a share in the network of LabQuest laboratories. Today it has 65 retail outlets in Moscow and Moscow Oblast and 35 offices throughout Russia on a franchise basis.[5] The company plans to expand contacts with the medical industry, which positively influence the results of its activities. It also proposes radionuclide therapy — a treatment using pharmaceuticals that have a positive effect on tumors. It includes radionuclide therapy — it's a treatment with radiopharmaceuticals that have a positive effect on tumors. Today these technologies are used in small quantities in Obninsk, Omsk and Chelyabinsk.[6] However, there are significant obstacles to the company's ability to register drugs, train doctors, find partners.

Genetic research, including the diagnosis and development of modern genetic engineering vaccines, is now in high demand in all areas of medicine. Currently there are 15 independent medical genetic centers in Russia: Saint Petersburg, Republic of Bashkortostan, Krasnoyarsk Territory,

[2] URL: https://expert.ru/expert/2020/29/milliardyi–na–spasitelnyie–luchi/?mindbox–click–id=445011ce–ffde–4b28–aeb7–24b2c4f5da00&utm_source=mindbox&utm_medium=email&utm_campaign=14ePismoIyul20202Massovaya.

[3] See ibid.

[4] See ibid.

[5] See ibid.

[6] See ibid.

Sverdlovsk Oblast. It has been shown that the cost of treating cancer to society is being recovered by further reducing mortality losses and increasing the contribution to gross national product.

The national project Health Care attaches great importance to the treatment of cardiovascular diseases and diseases of the circulatory system (DCS) and the reduction of mortality from them. Combating these diseases and cooperation with innovative enterprises is one of the important areas of activity of the Samara State Medical University (SSMU). A digital project office has been set up in the region at the initiative of the Governor, who has become a communicator for attracting new investors to the most sought–after industries. The project office SSMU together with EMC of Concern Vega set up the production of neurosimulators, a new system for the rehabilitation of motor disabilities using virtual reality technology is being developed as a software and hardware system for the recovery of a stroke patient.[7]

Currently, SSMU has become the hub of the Regional Medical and Pharmaceutical Technology Cluster. It has brought together leading companies in the real economy in the fields of pharmacy, IT medicine, biotechnology, medical engineering. The Institute for Innovative Development at SSMU has established joint scientific laboratories with production enterprises, marketing researches are carried out, partners are searched and products are brought to the market according to the principle of "single window".

Infant mortality is a current problem facing modern medicine, requiring the latest inventions and partnerships with business. Although, according to Rosstat, in 2019 it decreased to 4.9 cases (from 5.1 in 2018),[8] but the problem remains a pressing one. Congenital hereditary anomalies dominate among the causes of infant mortality. A separate annex to the national project "Health Care" from 14.12.2018 No. 3 "Development of Children's Health Care, including the creation of a modern infrastructure for providing medical assistance to children" is dedicated to children's health.[9] The main goal is to reduce infant mortality by 2024 to 4.5 per thous. born. Therefore, the prevention of the occurrence of hereditary diseases, their early diagnosis becomes particularly important, and the innovative genetic service becomes indispensable. 85 regional programmes have been approved for implementation. Construction of 40 children's hospitals envisaged,[10] many of which will be built through PPPs.

To innovative medical and pharmaceutical companies on the ground, regional authorities, officials responsible for cooperation with business should create favorable conditions of activity, establish all kinds of concessions, actively engage with them and promote their involvement in industrial parks and clusters. The public authorities should help them find partners and encourage the creation of industrial parks. For example, in the Republic of Tatarstan, the leadership of the region keeps the problem under constant review, supporting the medical industrial park, which is an experimental industrial for residents of the medical industry [19, p. 349]. It expands competitive advantage through public–private partnerships with the Kazan Federal University, Kazan State Medical University, research organizations, SUE Tattekhmedpharm, group of companies Eidos. The strategic partner of the project is SEZ Innopolis.

[7] Analytical Journal of the Federation Council. 2019;8(722):24–27.

[8] Analytical Journal of the Federation Council. 2020;14(757):5–8.

[9] Child health development, including the establishment of modern child health infrastructure. URL: https://futurerussia.gov.ru/razvitie–detskogo–zdravoohranenia–vklucaa–sozdanie–sovremennoj–infrastruktury–okazania –medicinskoj.

[10] Analytical Journal of the Federation Council. 2020;(751):3–6.

One of the key measures in support of the high–technology sector are clusters that create synergies by creating new linkages and strengthening existing ones, they promote business cooperation with scientific organizations, officials, the medical profession and civil society. On the territory of Novosibirsk region with its high concentration of research, unified research platform and innovative business high–tech medical cluster allows to make the most modern discoveries and quickly introduce them into production. The region's good infrastructure has made it possible to host other innovative clusters such as biotechnology and pharmaceuticals. Because high technology — is the most advanced technology, including convergent (ICT, bio–, nano–, cognitive) technologies that differ from conventional technologies in that they are highly knowledge–intensive [20, p. 27].

The Novosibirsk region has a cluster model based on PPPs that won the Ministry of Economic Development competition for the project "Development of innovative clusters — leaders of investment attractiveness of world level". For this purpose the Scientific–Production Cluster Siberian Science was formed by adding a new direction — "high–tech medicine". He is one of the few clusters in Russia that has a bronze label and a quality assurance certificate of the cluster management to European standards of European Cluster Management Excellence.[11]

Clusters, as a trend in the new economy, enable the rapid development of modern pharmaceuticals, medicines and technologies, lead to reduced transaction costs, effective matchmaking and contracting. Thanks to this, almost all the companies of Koltovo and Akademgorodoka have emerged from the sphere of science and innovation, they actively cooperate with higher education institutions of Novosibirsk, medical organizations, and the administration of the region. It's It is LLC Bio–Vesta, JSC Katren, JSC RPC Bio–Biological Union, JSC Vector–BiAlgam.[12]

One of the largest public–private partnership projects in the field of health in Russia is the agreement on concession construction, financing and maintenance of 7 new polyclinics in Novosibirsk.[13] "Concession" means that the Government grants the right to organize an industrial enterprise to private individuals [21, p. 73]. This involves the construction of modern clinics, which the region urgently needs. Thanks to PPP in this Siberian city 3 vascular centers have been created, and in Yekaterinburg such interaction allows to reconstruct in a short time center "Microsurgery of eyes".

So one of the key measures to support modern high–tech medicine that promotes cooperation of business, scientific organizations, administrations of regions and populations is high–tech medical clusters. They contribute to different PPP options, although the main forms of implementation are concessions. There is also a partnership based on contracts for works, medicines and equipment for public health facilities, contracts for the construction and equipping of hospitals and clinics with public and private investment, etc.

In the health care of the Russian Federation PPPs are just beginning, which is explained both by the bureaucratization of the health care system and by the fact that many companies have just started to digitize and have not had time to change to new mechanisms of interaction. This cooperation is further complicated by the lack of business readiness to invest in long–term health and science. Impact of low investment and innovation attractiveness in the country,

[11] Analytical Journal of the Federation Council. 2019;27(741):15–20.

[12] Analytical Journal of the Federation Council. 2019;27(741):21–25.

[13] Analytical Journal of the Federation Council. 2019;27(741):15–20.

unpredictable institutional changes in the economy and medicine, and deteriorating economic performance of small and medium–sized businesses.

CORONAVIRUS PANDEMIC – PROMOTER OF THE TRANSITION TO HIGH–TECH MEDICINE

The COVID-19 pandemic exacerbated the economic crisis. For the Russian economy, this was particularly difficult, as the average GDP growth rate for the last 10 years was only 1% per year, and the pandemic exposed and exacerbated the difficult socio–economic situation. It clearly highlighted the need for structural reforms in many sectors of the economy and the need to move towards high–technology medicine. The first wave of the pandemic demonstrated the confusion of many officials who were unable to act quickly and effectively against the spread of COVID-19. The country lacked hospital beds, masks, disinfectants, and companies began a fierce battle for profits.

An example of the effective use of digital technology for the benefit of the country's residents, businesses, and the effective fight against coronavirus was provided by South Korea, where when entering buildings there are cameras measuring the temperature of the enters, which quickly track patients. The country has excellent economic and medical management, and feedback from citizens has been widely introduced, so it was able to respond quickly to the outbreak of the virus, and the disease has gone down. South Koreans nowhere allow congestion, effective disinfection, not formal disinfection, where testing is widely available, all of which prevented the spread of infection. Of course, the organization of the population has played a huge role: South Koreans adhere strictly to the rules prescribed by the authorities, trust them, don't consider the information about the coronavirus to be fake. All these measures have resulted in South Korea having the lowest mortality rate among COVID-19 patients, which is only 0.77%, while Italy has 6%, China 3–5%.[14]

The Russian Federation also strives to reduce morbidity from coronavirus, although the population is not highly organized. The National Research Center for Epidemiology and Microbiology named after Honorary Academician N.F. Gamaleya quickly created a vaccine, the development of which was invested by the high–tech company R–Farm and the Russian Direct Investment Fund, which invested 4 billion rub. in the project.[15]

Another company that has completed scientific development of vaccine against COVID-19 is the virology center Vector in Novosibirsk. This high–tech center produces the most advanced preparations for especially dangerous infections, poisonings, oncological diseases, detects molecular predisposition to a disease.

Speaking of the pandemic, during this difficult period, the digital economy and digital companies have helped to effectively combat the spread of coronavirus. Thus, in Moscow, the diagnostic system became operational based on X–ray imagery using AI, developed by the Institute of Computational Technologies SB RAS scientist.[16]

Many innovative companies have started to look for new applications of robots. Microbots are already able to biopsy, deliver medicine. Russian developer Promobot showed a robot capable of conducting

[14] The situation in South Korea today. URL: https://lubimuedoramy.com/situacija–s–koronavirusom–v–juzhnoj–koree–na–segodnjashnij–den/ (accessed on: 15.11.2020).

[15] RDIF and "R–Farm" invest at least RUB 4 billion in the production of vaccines and preparations for COVID-19. URL: https://yandex.ru/news/story/RFPI_i_R–Farm_vlozhat_ne_menee_4_mlrd_rublej_v_proizvodstvo_ vakciny _i_preparatov_ot_COVID-19––b66daa30e1afe91305d2c214f906fc79?fan =1&from=newswi zard&persisten t_id=100037406&wizar d=story.

[16] Russian scientists developed a way to diagnose coronavirus using X–rays. URL: https://xn––80aesfpebagmfblc0a.xn––p1ai/news/20200413–1013.html.

medical examination of patients, performing primary medical diagnostics and deciding whether a given person needs self–isolation.[17] Petrozavodsk company K–Sky has created a system that analyzes electronic medical cards (https://expert.ru/expert/2020/46/iskusstvennyij–intellekt–poka–ne–mozhet–lechit/).

The greatest number of developments (30) are related to social distance. So, Yandex launched an interactive map of the spread of the disease. The holding Schwabe, part of Rostec, has prepared for release a modification of "antique" thermal isors with functions of face recognition and independent decision making.[18]

During the viral and economic crisis, the role of e–health in medical institutions and telemedicine is growing. Thus, the holding Ruselectronics (part of the state corporation Rostec) together with the company Netrika introduced telemedicine consulting service in 8 regions of the country. Such technological solutions allow doctors to provide up to 400 consultations per day, embedding telemedicine support in the process of patient care.

By video link, the consultant diagnoses the disease and is able to modify its treatment. Such remote technologies are particularly important in the context of pandemics and epidemics, as the service is easily integrated into existing health information systems and improve the timeliness, quality and routing of health care. The patient receives treatment 2.5 times faster than when scheduled for a traditional consultation.[19] The system does not require expensive technology and long lead times. It also provides reliable protection of personal data.

Telemedicine services are increasingly available at various clinics in the country, mainly — in private clinics. So, in 2020 telemedicine service Doc+, which invested Yandex, funds VostokNewVentures and BaringVostok, agreed on a merger with the company Doctor ryadom.[20] Telemedicine service Doc+ — is an ecosystem of IT–solutions, which is a mobile application, where there are not only telemedicine services, electronic medical card, but also the possibility of calling a doctor to a home, purchasing medicines in pharmacies.

Another part of the service — is cloud workplaces for clinic staff, data sharing with health facilities. According to the version of Forbes, which has compiled the rating of private medical clinics in Russia, Doctor ryadom is the leader not only of the telemedicine market, but also of the top three private medical clinics.[21]

Gradually, both public hospitals and health clinics are moving towards the AI system, although at a much slower pace than private ones — bureaucratization, more formalized and insufficient funds. This process is being intensified in capitals. Thus, in Moscow polyclinics is introduced the system of AI, which helps to prevent doctors' mistakes in making a diagnosis. Moscow is moving increasingly to "smart medicine", which by 2030 will consist of a single digital platform where diagnostic and treatment patterns will

[17] The first concept of a medical robot Promobot. URL: http://promo–bot.ru/news/d0–bf–d0–b5–d1–80–d0–b2–d1–8b–d0–b9–d0–ba–d0–be–d0–bd–d1–86–d0–b5–d0–bf–d1–82–d0–bc–d0–b5–d0–b4–d0–b8–d1–86–d0–b8–d0–bd–d1–81–d0–ba–d0–be–d0–b3–d0–be–d1–80–d0–be–d0–b1–d0–be–d1–82–d0–b0–promobot/.

[18] "Anticovid" pass system will appear in the Russian Federation. URL: https://radiosputnik.ria.ru /20200823/1576191371.html.

[19] Telemedicine service "Ruselectronics" is implemented in eight regions of Russia. URL: https://iecp.ru/news/item/428620–telemeditsinskiy–servis–roselektroniki–vnedren–v–vosmi–regionakh–rossii.

[20] URL: https://www.forbes.ru/tehnologii/407835–doktor–v–plyuse–zachem–servis–s–investiciyami–yandeksa–obedinilsya–s–liderom–rynka?utm_medium=email&utm_source=UniSender&utm_campaign=239202832 (дата обращения: 10.11.2020).

[21] 20 largest private medical clinics in Russia, rating Forbes. URL: https://basetop.ru/20–krupneyshih–chastnyih–klinik–rossii–reyting–forbes/.

accommodate. The AI as a "second opinion" will monitor the implementation of these norms.

Speaking of the virtues of digitization and digital medicine, its great reserves in the fight against. "Coronavirus Economy" promotes total control over citizens, and human movements can be tracked by hackers who hacked into the service. The more humanity invents and implements, the more it faces challenges and threats to its existence [22, p. 9]. Breakthrough technologies would increase longevity, but that could further exacerbate environmental and social problems. Thus, new technologies are becoming a real threat to traditional human values and social stability.

CONCLUSION

On the basis of the study, it can be concluded that the coronavirus pandemic has highlighted not only the urgent need to transform the entire system and management model of the medical industry on the basis of a new paradigm, but also the need to move to high–tech medicine. PPPs of medical, scientific, advanced educational institutions, business, science, people and regional administrations can play an important role in this, and should help to ensure adequate conditions for companies that create innovative products for medicine. It can therefore be confirmed that in a low–income country PPPs contribute to the transition to high–tech medicine and a new governance paradigm. Such interaction was not only in the interest of the medical profession, the business community, but also of the leaders of the territories, who should guide and revitalize that relationship. After all, PPPs in health serve to improve the health of people in a region and are a tool for their dynamic socio–economic development. It improves the quality and quantity of public sector services through investment from extrabudgetary sources.

However, the view that PPPs improve people's well–being in the Russian Federation has not been confirmed. This may be due to the underdevelopment of the PPP institute in the medicine of the Russian Federation, its genesis, the lack of access of most residents to the best medical practices, the low level of expertise, the lack of digital literacy, the persistence of many companies seeking to maximize profits and even rent–seeking, 200% profit, lack of transparency, and, of course, pandemic.

The COVID-19 pandemic has found that it is necessary to rapidly develop new medical products that are needed to fight epidemics, and be able to instantly test them with patient feedback on the basis of new formats of interaction between doctors and patients. There is an urgent need for a model of innovative medicine, using a platform of precision medicine in health facilities, where high–tech innovations such as heart implants, cancer–killing lasers and viruses play a major role. The State must help launch an effective mechanism of innovation for the transition to high–tech medicine. The management of medical institutions is obliged to become an institution of citizenship in cooperation with business, scientific organizations, authorities and the population, where new forms of medical care (for example, telemedicine) are widely used, and the range of e–health technologies is constantly expanding and the best Russian medical traditions, schools and personnel are not forgotten. Managers need to work more effectively with businesses, health service providers and goods to deliver them quickly to patients. Further research may involve studying the interaction of business and environmental organizations to create a favourable institutional environment for healthy people.

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ORIGINAL PAPER

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Higher Education in Russia: The Rise of Economic Dominance

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ABSTRACT

Choosing a university is not an easy matter, and, as a rule, it is a task of multi-criteria optimization, and one of the weighty criteria is career prospects. At present, the children of those who themselves were applicants during the USSR collapse started to choose a university. At that time, it was believed that only elite universities (Moscow State University, MGIMO, etc.) would serve as a social lift to the most prestigious organizations of business, government, and science. In part, this can explain the almost total desire of modern school graduates to have a higher education, although often it is the desire of their parents. Using the example of the higher education market in Russia, the author examines the tendencies of universities' concentration, their stratification into three levels with different institutional conditions and the dominance of the upper levels (alpha universities) over the lower ones (beta and gamma universities). The article analyses Russian alpha universities' features against the background of a similar global hierarchy and identifies development trends for universities after the explosive introduction of distance learning technologies.

Keywords: theory of economic domination; institutional rent; higher education; distance learning technologies

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INTRODUCTION

Besides gaining a profession and independence from parents, realising ambitions, possibility to live abroad, boys enter the university in the hope of "disassociating from the army, and girls — find a successful husband. The traditional parental mantra: without education there will be no success/happiness still works, but already after a couple of generations the motivation to go to a university can change dramatically.

What is happening on the market of higher education in Russia? Let's try to work out with the theory of economic dominance (TED), proposed by A. Blokhin in [1], later elaborated by him together with I. Lomakin–Rumyantsev and S. Naumov [2] and developed by V. Vertogradov [3].

STRUCTURE OF THE HIGHER EDUCATION MARKET WITHIN THE TED

Fashion on higher education has led to that, at the moment of transition from universities of the USSR to universities of Russia sign university has ceased to correspond to such status even among elite educational establishments. Therefore, now the name very often little says to the applicant — people focus primarily on the history of the university [4]. Thus, the initial market of higher education has developed, organically divided into alpha–, beta– and gamma universities.

So far in higher education the following structure according to the TED. Alpha–university are the "natural alpha — oldest Russian universities with many scientific schools, infrastructure, developed branch and partner network. The state has created a number of new alpha — university: federal universities, which are intended to consolidate the region's applicants, have selected promising higher education institutions in "Project 5–100" (https://www.5top100.ru). Some of the nomenclature institutions of higher education, such as RANEPA, MGIMO and the Financial

University, have also been included in this category.

Regional universities with history and specialized sectoral institutes have formed a complex of beta–universities. For them, the main advantage is the proximity of contacts with the line ministry or enterprises of the main industry. At the same time, regional and technical universities often have their own scientific and engineering schools to train high–quality professionals. As a result, these institutions have received a large number of public places, which makes them attractive to students.

The last category of higher education institutions (gamma) formed numerous paid non–public higher education institutions, created on a wave of restructuring by teachers who do not agree with the concept of development of their "native higher education institution, or by teachers with entrepreneurial vein. Over time, some gamma universities ceased to exist, while others expanded, expanded and still exist, finding their clients.

RESTRICTIONS IN THE HIGHER EDUCATION MARKET

In order to understand the links in the market for higher education, it is necessary to understand some of its features. Now the market for higher education is characterized by a high degree of bureaucracy: the number of papers to be filled has increased in number, while the creative component of the author's programs is practically forbidden, everything is tied to competences. The implementation of the Bologna Process poses significant challenges to universities, both in organizational and substantive terms [5].

Employers and civil servants tend to place more and more work responsibilities in the baccalaureate education standard than they do in the case of master's and post–graduate studies, which are narrowing and becoming more formalized. The desire of business is understandable — everyone wants at the bachelor level to get a ready–made specialist who knows everything. At the same time, the entrepreneurs themselves do little to assist the university in the training of specialists, although there is a wide range of possibilities for them: internships, internships, participation in the R&D or participation in the academic activities of a student or university. As well as a working instrument such as the Endowment fund in Russia is used very rarely, and the size of the funds used in comparison with the amount of financing of universities is rather modest.

Since 2009, admission to higher education has been based on the results of the USE (unified state examination), which has made it easier for gifted applicants from the regions to have access to alpha — universities, and higher education institutions have thus helped to find such applicants more quickly. Another traditional source of talent search and selection for the university is the system of Olympics on school subjects — the winner/winner of All–Russian Olympics on a subject relevant for the university has the possibility to enter without an entrance test in a budget place. And the winner/winner of the Olympiad List (https://olimpiada.ru/article/942) can get benefits: from 100 points for the USE on the respective subject before enrolling without entrance tests. With the adjustment to bureaucracy, the education system has a lag between the request and the implementation of specialist training from 4 to 6 years, although with some limitations it can be tried in 2.5–4 years. The universities, which have changed to the system bachelor's and master's degree, have proved to be much more mobile in this sense — their lag size does not exceed two years. This creates a significant imbalance between the demand for and the training of professionals, such as in the professions related to artificial intelligence, cryptocurrencies and mobile technologies.

STRATEGIES FOR ALPHA – UNIVERSITIES

In the category of "alpha one can refer to about three tens of universities. They are not all large:

on *fig. 1* shows the relative size of alpha–higher education institutions by number of students and professor–teaching staff (PTS). As can be seen from the figure, there is a part of the giant universities: SPBU, MSU, HSE, SUSU, RANEPA, the Financial University, but most of the universities are divided into two clusters by the number of teachers (0.6–1.5 and 2–4 thousand people). А во разбро по численност студенто каждом кластере весьма большо: от 7 до 37 ты. че. The difference between the number of students in each cluster is very large: from 7 to 37 thous. people. According to a number of criteria, the Skolkovo Institute of Science and Technology (Skolteh) can also be classified as an alpha university, but on the scale of traditional universities it is microscopic, although it has a share of influence.

On *fig. 1* oldest Russian universities are marked with a circle, the federal universities are marked with a square (the KPFU, although it is a federal university, but it is noted as the oldest university in Russia), and the parishes are allocated universities from Project 5–100.

Alpha — universities derive major benefits in terms of institutional rents:

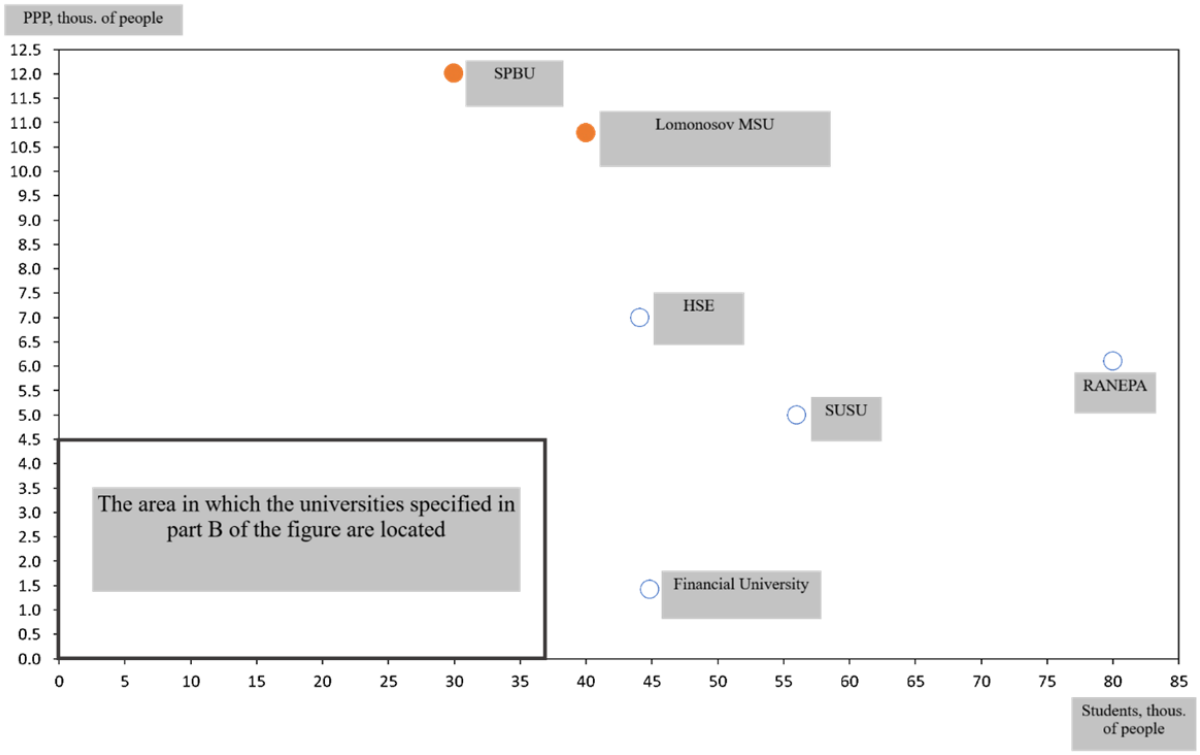
- Increased funding;
- Adoption of educational regulations and standards;
- Implementation of the State R&D;
- Work with alpha — companies (including R&D);
- publishing.

The scheme of financing of universities in Russia can be described as "money follows student. Therefore, if, from the point of view of budget, the student's education costs n rubles, then the student–contract should cost as much (in practice this is not always so, usually a little more). In other words, if you look at the amount of the tuition fee in a higher education institution, you can find out the approximate level of its financing from the budget per student. The cost of education in alpha–higher education is 2–3 times higher than in beta–higher education and 4–8 times higher than in gamma–higher education. Some alpha–higher education institutions have full academic autonomy and a separate budget line in the Russian Federation, which allows them to maintain a good technical base and attract the smartest and most solvent applicants.

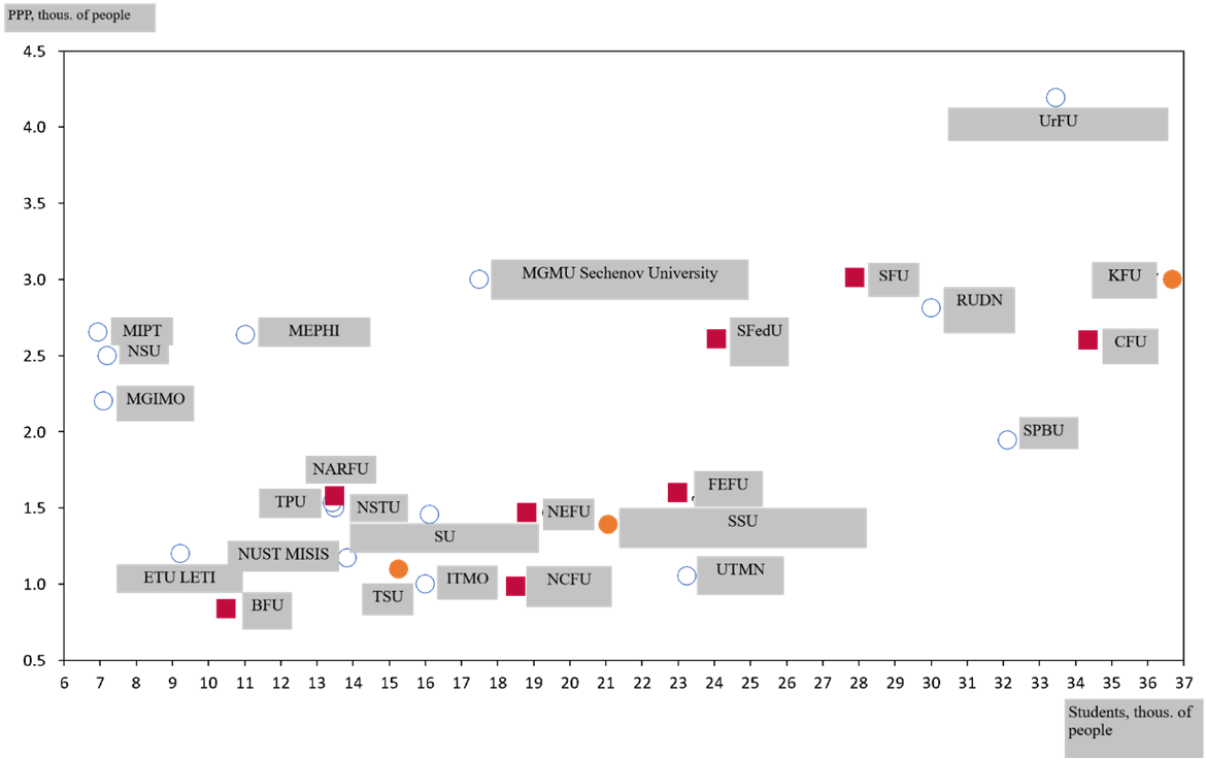
Another institutional advantage of alpha–higher education is the formation of rules and methods. As a rule, representatives of alpha–higher education institutions are listened to by officials when formulating the rules to be followed in all higher education institutions in the country. Alpha Universities are most likely to lead Federal Learning and Learning Coalitions (FLLC) in larger specialties, where the formulation of Competences and Regulations for Federal Public Education Standards (FPES) is being actively discussed. Of course, the Ministry is responsible for the final approval and implementation of FPES, but the most common FPES language, based on the results of the testing of new discipline modules, was proposed by alpha–universities. It cannot be argued that the course and pace of educational reform is governed by alpha–higher education, but that these processes are significantly influenced by alpha–higher education representatives,— no doubt.

The last three points of the sources of institutional rents for alpha — universities are sometimes very difficult to separate from each other, so let's try to describe them in an integrated way. This is no longer relevant for higher education as it is for secondary education, but the whole chain works. Alpha — universities always support the demand of their methods, textbooks, teachers through close cooperation with publishing houses of educational literature. Institutions of higher education write textbooks to lobby for competences and results, develop methods, and recommend them for use as basic materials in the subjects being developed.

Similar difficulties for "strangers are also supported when working with scientific articles, magazines and conferences. Almost all alpha



Part A



Part B

Fig. **Comparative sizes of alpha-universities in Russia**

Source: compiled by the author based on data from the official websites of universities.

universities are founders of HCC, Russian Science Citation Index, Web of Science, Scopus, etc. These are magazines with a good impact factor, in which publication significantly influences the scientific status of the author. Conferences organized by alpha — universities tend to have a higher status and participation, so that the presentation of the report gives more weight to the author. The system of review and free publication, together with the waiting time for graduate and postgraduate students, is the right mechanism. But assuming that reviewers can be specifically selected, the mechanism may not be quite right. Of course, anyone with good points has a chance to become a speaker, and with good research — to be published in a prestigious magazine, but still the system is designed to support their own: often high citation, speaking at prestigious conferences as evidence of a speaker's experience can be one of the criteria for winning R&D tenders, for receiving a grant, etc.

The largest customers of R&D and corporate learning are representatives of either government agencies or alpha companies in their industry. It is easier and more convenient for such customers to communicate with equal status and capabilities of alpha–universities, in fact it is a market α2α . It is almost unrealistic for beta– and gamma– universities to receive a large R&D from an alpha — company or a government agency unless specific specialists or a school are needed. On the State side, alpha — universities are the most frequently involved in the development and implementation of national strategies and federal targeted programmes.

It can be stated that alpha–universities cooperate with the highest State bodies, the largest Russian and international companies and the best scientific institutions, by receiving funding from them for contract work and providing their best students for their human resources services. Alpha graduates become business elite, occupy high positions in the state and work with their alma mater to lead the respective alpha structures.

The circle was closed definitively, drawing the contours of an ecosystem in which the transition to a higher level was almost impossible because of high costs or administrative barriers. Is the educational ecosystem described exclusively a Russian phenomenon? As noted by the authors of TED, concentration of business, its stratification by size and domination of the upper levels above the lower –norm for large developed economies [2], in other words — no, similar ecosystems are formed worldwide, gradually transforming into alpha — empires.

Thus, Russian alpha–higher education institutions are now engaged in meeting criteria that allow them to enter or rise within a variety of international rankings, while in the domestic market alpha–higher education is, on average, quite slow in terms of technology, since institutional rents allow resting on laurels instead of looking for growth points.

STRATEGIES FOR THE BEHAVIOUR OF BETA – UNIVERSITIES

Given the capabilities of alpha — universities, it would seem that beta universities simply have no chance of survival or survival. But this is far from being the case. In the struggle for a student, the beta — universities begin to develop qualities for which the alpha universities lack time. This applies in particular to the educational infrastructure and the creation of a comfortable learning environment for students. According to the observations of the author's colleagues working in financial literacy projects, regional universities acquire excellent equipment, create favorable operating modes of objects such as libraries, co–working zones, recreation areas, creative spaces.

The main source of money for beta — universities is the budget money, wherein they, all other things being equal, recruit among the best students of those who did not pass in alpha — universities, for example, on the budget, or who cannot "pull the cost of education in alpha– universities.

The second line of revenue is provided by the non–attractive Alpha — higher education R&D and the R&D provided by the line ministry or line companies. Yes, these R&D are often smaller and cheaper, but they are available and demand is growing — modern economies require new technologies and materials.

A recently launched tool to address the human resource hunger of enterprises and institutions — targeted training — has so far been perceived as a legitimate way to circumvent the competition. But, first, in the current version of the documents, the competition for target recruitment may be higher than general, and second, perhaps target recruitment and lowers the bar on entrance to the university, but no one plans to lower it in the course of study, i.e. a student enrolled on a target set, can be just as easily expelled for academic failure.

The target set is a possible growth point of the beta–universities, where the basic fundamental knowledge is given through the online–disciplines of the alpha — universities, and the "cut of the future specialist, including a large amount of practices at the client–enterprise, is carried out on the spot.

By analogy with remark V. Vertogradov the cost of beta business followers (according to economic dominance theory is gamma business) is always lower, and if these gamma companies have access to the capabilities of linked alpha — companies, they are also significantly more successful financially [3], it can be said that beta — universities can always replicate the work of alpha universities, reducing their costs and increasing their profitability. In addition, alpha — universities have long been absent from projects that consider themselves too small, outsourcing them to a limited number of satellite universities. Thus, given the stable demand for beta higher education services and the trend towards the revival of domestic production, there are no threats to the established beta — higher education community.

Russian beta–universities are now engaged in the development of their growth points without notice: creating a comfortable learning environment, increasing expertise in their subject areas, and the rehabilitation and development of scientific and engineering schools.

STRATEGIES FOR THE ACTION OF GAMMA UNIVERSITIES

Gamma — universities within the system provide training only in high–altitude professions, and their resource base is mainly for applicants not enrolled in alpha– and beta–higher education. Therefore, gamma — universities are notable for their pop advertising and sometimes create unique image projects: for example, Synergy University and its forum have already become the heroes of memes, which for a certain category of applicants may be attractive.

At the same time, it is not necessary to think that there are not many such institutions: on the information portal dedicated to education in Russia and abroad, at the request of "non–governmental universities in all specialities the answer is given: results of search of higher educational establishments of Russia (found 1005 educational establishments).*

Gamma — universities can be used by alpha– and beta– universities teachers as a platform for running programmes of new disciplines, teaching methods (which cannot be implemented in their home universities), teaching aids and forms of control. Sometimes it gets funny: like, an unknown university, and all the teachers are from alpha — universities, and if you want to go no–name universities, you can get an education as good as the top ones.

The main source of income for gamma — universities are treaty–based, as there are few or no government–funded places in such

* List of non-State institutions of higher education in Russia. Information portal on education in Russia and abroad. Academica.ru. URL: https://academica.ru/vysshee–obrazovanie/negosudarstvennyj–vuz/stranitsa_1/.

institutions. At the same time, the tuition fees for such higher education institutions sometimes amount to only 15–20% of the tuition fees for the respective specialty in alpha — university.

Another possible source of income may be R&D, but its cost and complexity cannot be compared to the R&D received by the alpha — universities. However, these institutions often do not have their own space — they rent premises and therefore do not offer training in specialities for which special equipment or experimental sites are required.

It is not necessary to think that non–state paid institutions of higher education always remain in the category of "gamma,— with proper management and good training such higher education may well find themselves in the category of "beta. The Russian Economic School (RES) is an example of an excellent beta–university, whose graduates find jobs in alpha–companies in Russia and abroad. However, such beta — universities have to occupy a very narrow niche, being educational boutiques rather than a mass product. The RES and HSE have a joint project in which all three parties (each university and student) benefit, and the success of the project shows that different types of cooperation are possible in the education market.

THE ROLE OF RUSSIAN UNIVERSITIES IN THE WORLD MARKET FOR HIGHER EDUCATION

The processes taking place in the Russian education market are fully replicated on a smaller scale the processes taking place in the world. Russian alpha — universities against the background of Western alpha — universities occupy at best a niche of beta — universities. The oldest Russian universities, the SPBU and the MSU, were founded in the 18th century, and most European universities were established in the 14th and 15th centuries, so we are clearly losing out on experience and tradition here. At the same time, Western universities have a much better culture of using alumni aid, more developed channels of assistance and business participation in the educational process, but most importantly, what we lose is ratings. The best place Russian University ranked The Higher Education (THE) — 187 from 1300, although Russian Higher School is represented by 39 universities [6]. The top rankings of higher education institutions are in the USA and the UK, and that hasn't changed for a very long time. And if the universities of Great Britain were founded in 11–12th centuries and they have a rich history and huge experience, then USA universities often buy talented scientists and researchers. So the top — universities make discoveries, get awards and grants, broadcast success stories, and, of course, young, talented students from all over the world.

One of the criteria for different university rankings — is the number of foreign students. All things being equal, paying foreigners will go to the USA and Europe for an education that will give them the right to remain there to work. Often the opinion of experts/businessmen (their honesty and truthfulness are never questioned) is the criterion for the ranking, and due to the prominence of the top — universities of higher education these respondents are more likely to name them. The set of criteria for rating can always be chosen in such a way that the top — universities will lead them.

Another popular criterion is the citation of authors. But the scientific literature industry has long turned into a multi — billion dollar (enough to study the accounting records of a typical Elsevier company) business: the honesty and impartiality of reviewers is not questioned, and the promotion of the principle of the cool teacher who publishes (publish or perish) forces teachers to write articles, replacing the scientific content with at least some econometric study. At the same time, the founders of journals for publication are either alpha — universities or independent associations that actively use the services of these same alpha — universities.

But all of the above does not mean that our universities cannot be included in these ratings.

When you're trying to get into the THE ratings, you have to be very clear that we're starting to play on someone else's field by someone else's rules. Without creating its own alternative rating system, without developing a wide range of studies within the country, without investing in education and creating attractive conditions for young scientists, and without involving researchers in the educational process, we will always be dependent on those who controls the rules of the game — western alpha — universities.

TRENDS AND PROSPECTS IN HIGHER EDUCATION

And what will happen to the market after the arrival of black swan — coronavirus pandemic? In Russia and in the world as a whole, the coronavirus has contributed to the explosive introduction of remote technologies, and the fastest it has touched upon education — it is already possible to speak of the total upgrading of qualifications of all teachers within the country and the world. And after the coronavirus, some of that technology will remain forever.

A situation of uncertainty could lead to a profound transformation of the education market if the alpha — universities want to take advantage of this opportunity. For example, they may suggest that alpha — universities teachers lecture on basic curriculum courses from a distance to the whole country (region). The introduction of online — courses in basic subjects of the curriculum from alpha — universities free of charge (or their use in lieu of lectures by their teachers) — is a major threat to beta — and gamma — universities.

Moreover, the learning process itself can change irreversibly: analysts The World Economic Forum (https://www.weforum.org/) — international public–private cooperation organization — wrote mistakenly: "new solutions for education can bring welcome innovations [7]. I'll try to be specific: as 5G technology becomes increasingly accessible, the whole environment can be made interactive — learning can become permanent and continuous (training anywhere at any time — "Education 3.0). Schools and universities will become unnecessary, much more effective will be learning in town: you put a pebble from the ground up against a smartphone camera — and it gives you all the information: its composition, a few videos — from how it formed to what you can do with it.

On the one hand, it's convenient, because all the available information will be at hand. But on the other hand, according to WEF experts, inequality in education may increase, because all have different financial opportunities to access data and information transfer technologies, including training.

The Wall Street Journal experts, in its recent article [8], finds it disappointing that as early as this year, due to the large amount of non–payment by students, up to 20% of humanities colleges could go bankrupt, but Ivy League schools slightly increased admission of students in autumn 2020 [9]. The total switch to distance learning raised a legitimate question for students and their parents: what are we paying for? Because similar digital content can be obtained for much less money or allow a wider choice of sites for the same fee. In general, this will necessitate a revision of the current model of fee–paying education, the calculation of tuition fees.

Interesting fact in The New York Times [10]: The rich don't live like that. The rich have become afraid of the screens. They want their kids to play with the dice, and the private schools without technology grow rapidly. People — are more expensive, and rich people are willing and able to pay for them. Communicating with people — a life without a phone during the day, leaving social networks and not responding to e–mail — became a status symbol. All this led to a new curious reality: human contact becomes a luxury.

Interestingly, a similar opinion in a parent chat in WhatsApp was voiced before New Year when the plans of a Russian alpha–university to translate the lectures into a remote format. So, there is a unique chance for alpha — universities

to assert their superiority: by introducing distance lectures for all, they give their students the same lively communication, and others the high quality of education, but from the screen. For beta –and gamma — universities — it's an opportunity to reduce costs and reallocate the burden of their teachers to the subtleties of their specialty. As can be seen, the use of the theory of economic dominance is justified for the analysis of the higher education market. This theory helps to understand the logic of the behavior of alpha–, beta– and gamma–universities in the current situation, allows to give some forecasts on the development of the industry, to suggest trends that may be realized in the near future. Although, as life has shown, everything is far more interesting and less predictable.

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