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Editorial office address:
123995, GSP-5, Moscow, Leningradskiy prospekt, 53, room 5.6
Tel.: +7(499) 553-10-74 (internal 10-88).
E-mail: julia.an@maul.ru;
wne.fa.ru

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Reduction and Substitution of Markets

Yu.P. Voronov
Institute of Economy and Industrial Engineering, Russian Academy of Sciences, Novosibirsk, Russia
https://orcid.org/0000-0002-7835-5827

ABSTRACT

The article discusses the problem of reducing and replacing markets in the past, present and future. The author assumes that the market collapses when a new market takes its place or is another already existing one is being expanded. Two reasons for the replacement of markets are identified — technical innovations and the deterioration of business conditions in the established markets. In the first case, the replacement of the market comes from the supply side, in the second — from the demand side. When the conditions of activity worsen in one market, buyers' demand flows from the collapsing market to another, which increases due to this. The author also divides market substitution processes into spontaneous and organized ones. It is noted that the coronavirus epidemic puts on the agenda the problems of curtailing three markets that make up a significant part of consumption in the modern economy: mass gatherings (entertainment events), public transport, and restaurants. It is indicated that economic science in these conditions should reorient its research from the problems of economic growth to the problems of changing the structure and composition of markets to achieve balanced development, taking into account current and future restrictions on activities in the areas mentioned above.

Keywords: commodity market; private cars; public transport; medicine market; chemical fertilizers; herbicides and pesticides

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INTRODUCTION

World economic science was not prepared for the impact the coronavirus pandemic had on the economy. In times of crisis, there is always a growing interest in challenges that are overshadowed during periods of economic growth.

In 2012, Nobel Memorial Prize in Economic Sciences Alvin Roth introduced the term "unraveling markets".[1] This term can now be considered accepted in the conceptual structure of economic science.[2]

Such a successful term as "to unravel", unfortunately, is not available in Russian. It means simultaneously "dismantle", and "fall apart". There was a tangle of business connections and then it was unraveled — that's why it fell apart.

The first question to be answered is: how do markets actually wind up? The first, quite obvious, is that the old market is leaving only with the creation of a new, more attractive and more efficient.[3] Thus, the research objective of closing markets should include a description of the markets that will replace them.

Market creation can occur in two ways, the best known of which is technological innovation. Recall markets that have been closed and replaced. For example, the market for video recorders and videotapes had disappeared because a market for disk drives and CDs had emerged, which in turn had also "died" because it had been replaced by a market for solid-state media. And this market is likely to be closed by cloud technology.

In 1998, Kodak had 170 thous. employees and sold 85% of the world's photographic paper. Within the next few years, the company went bankrupt. Digital cameras were invented in 1975, the first of which had a resolution of only 10 thous. pixels, and Kodak did not expect much from such a competition. Nevertheless, the progress of digital photography was inexorable. Similar developments can and do occur in many industries, agriculture, transport and communications.

Smaller ones are replacing some markets, as a result, of technological advances (for example, cheaper solid-state data drives have been created instead of videotapes). Others are being replaced by larger markets (the road map market has disappeared and a larger navigation market has emerged).

There is no other way to create new markets and replace old ones with technological innovations: if conditions in a certain market become complex, consumer money flows to others.

Consider six markets as examples: tourism, restaurants, entertainment, medicines, private cars and dangerous means of increasing crop yields (chemical fertilizers, herbicides and pesticides). They now appear to be stable and even key to the modern economy, although their phasing-down has actually begun before the pandemic. The pandemic has imposed market closures not only on the health sector, it has led to changes in many aspects of lifestyle, and markets are being curtailed by restrictions. Research in this direction is in dissonance with the traditional focus of economic research on economic growth. Replacing some markets with others is a more general objective than the growth of existing markets or the creation of new ones. Any new market, however, will in one way or another tighten on the already entrenched economy.

There is clearly a moral element in reducing markets that increase the likelihood of infection and limit their development. [4]

ACTUAL UNRAVELING AND SUBSTITUTION OF IMPORTANT MARKETS (TOURISM, RESTAURANTS, MASS EVENTS)

It is now becoming clear that the concentration of large numbers of people in one place will contribute to the rapid development of the pandemic and increase the incidence of disease and death. If there is an outbreak of disease, there will certainly be

a prohibitive measure. The main component will be administrative decisions, leading to the closure of this market, not its replacement by others. This will significantly undermine the development of the world economy, and some economies (such as Italy or Brazil) will collapse economically.

The main problem to be addressed by the economy in anticipation of future possible (possibly continuous) epidemics — necessary reduction in contacts.

The decline in international and domestic tourism caused by the restrictive measures against the pandemic is considered by many to be an "unprecedented" situation. But, despite the "unprecedented" nature, measures are proposed that have clearly set precedents: tax cuts in tourism, exemptions and incentives, visa simplification, cheaper visas, new border control technologies.[5]

Against this background, there is a spontaneous substitution of the tourism market. Limited travel opportunities are people starting to build the place where they live: repair an apartment, build a cottage house, and change a TV, refrigerator or computer.

Substitution — is spontaneous, in the sense that these markets were not prepared for a surge in demand and responded, as in the market economy — to price increases. In value terms, these markets have grown significantly and in physical terms — slightly, since production capacity was not designed to accommodate this increase in demand. If government structures did not follow a well-established path to redress grievances, but commissioned studies on the diversion of household money, different support measures could be adopted.

Instead of giving subsidies and concessions to producers of building materials, appliances and electronics, low-rise construction, they were directed to industries that are prevented by the same State through restrictions and prohibitions. Substitution markets should have been raised, not tried at any cost to preserve the old ones. Once the epidemic was over, it would be possible to return to the old markets, where people spent a large part of their income.

It is obvious that the most severe damage caused by the coronavirus pandemic was to the restaurant business. The experience of 2020 has shown that financial assistance to this market does not have the desired effect. The reason is that, in addition to financial assistance, restrictions are imposed on the number of visitors, making this type of business unprofitable and non-prospective.

The main line of closure of this market is delivery of prepared meals to the house. Replacing restaurant attendance with food delivery is certainly not an option,— it will take decades to change habits and traditions. In order to understand how they will change, it's useful to refer to the story of how they appeared. The habit is historically relatively recent, it can be considered that the mass spread of it began in the first decades of XIX century. The word "restaurant" came before. In 1765 a store was opened in France where "soup, regain your strength" was sold. Then, for almost half a century, Europeans became accustomed to eating well outside their homes. Special catering line — Southern European taverns, where you could have both a snack and a drink. To the north of Europe, they probably reached through America, where they began to open in 1656, and then in some states the presence of taverns became mandatory.

But there is another line that belongs to the UK. The first place where people cooked their own food opened in London in 1200. Only after 200 years did restaurants have tables, dinning cutlery and portions not for carrying out, but for use on the ground. Even then, for a long time, food was served on a common dish for the company (https://pitportal.ru/pipressarchiv/11594.html). The tradition came, most likely, from Asia, where this custom has survived so far.

The Industrial Revolution gave a boost to the food supply, that created the need to create

canteens at plants and factories. At present, there is a trend towards the revival of the practice of preparing semi-processed goods as an independent branch of the food industry. Combined with a booming delivery service, it's likely to form a new market to replace what used to be the old one.

Should the State support the shrinking market, or should it be supportive of the substituting market? With regard to recent developments — is the choice between supporting a restaurant business or a delivery service, a fitness center or a home gym salesperson. In addition, there should be moral considerations, responsibility for a possible increase in mortality.

In the context of reducing global communication, it is useful to look at the history of the 2020 Olympic Games in Tokyo. They were rescheduled to July-August 2021 with planned limitations: all athletes must pass a coronavirus test both on arrival and on departure, no contact allowed between athletes outside the competition and no foreign fans.

The experience of the 2021 Olympics in Japan shows that if the market for large-scale sporting and spectacular events is not even closed, it will change significantly. As in Tokyo in subsequent games, there may be empty stands, foreign fans are not allowed, and contacts between athletes outside the competition are limited.

The next Olympic Games, to be held in Paris in 2024, are in doubt. The French budget deficit in 2021 was 152 billion euros (https://www.budget.gouv.fr/budget-etat), and government revenues are declining. It is unlikely that it will be possible to increase the budget expenditure by another 20–30 billion euros.

The games are most likely to be held in Los Angeles instead of Paris, where they are planned for 2028. But beyond that, the economic prospects for the Olympic Games are very uncertain.

The Olympic Movement is the "top" of mass sports events of the world, both socially and economically. Its dismantling could trigger a more global process — the dismantling of the non-supporting mass sports market.

Modern television broadcasts of matches without spectators are not a substitute for sports and other events, therefore holographic and 3D-technologies are developed, which can create presence effects, including emotional contact with other fans.

The possible substitution of the market for mass sports events may be the development of cybersports, the intensive distribution of video games. The first competition was held at Stanford University in 1972 and in 2020, "… game platforms have noted record numbers of daily activity among players due to quarantine and a large amount of free time, which had to take home". [6] International competitions are already being organized. Although they are two orders of magnitude smaller than the market for mass sporting events, the intensive development of cybersports in South Korea, China and other Asian countries makes it possible to predict the rapid development of this market in the world, which will partly replace the market for mass sports events.

The hint of possible ways to replace spectacular events other than sports gives TikTok — Internet-service for creating and viewing short (up to 1 minute) videos. Chinese company ByteDance established it in the summer of 2018, then TikTok and its parent company sold 35 billion dollars in turnover in 2020 and 7 billion dollars in profits, and the number of users increased to 850 million. This unique phenomenon requires in-depth research.

RESTRUCTURING OF THE HEALTH-CARE MARKET

There are currently two major world markets: food and medicine. They outperform energy markets, automobiles, etc. It seems to many that paying for medicine as much as for food — nonsense. It may look like a pyramid scheme, but it's real. If for the private car market a

"waste" scheme is gradually emerging, then for the drug market this outcome is not quite clear. However, some hints of this already have.

The dismantling of the market begins with the targeted delivery of drugs to the patient organ, reducing the need for the active substance. The directed delivery makes it possible to reduce the dosage of the drug and to minimize its side effects on other cells. The need for medicines is thus reduced.

At the end of the 19th century, prominent German bacteriologist Paul Ehrlich first pointed out the possibility of targeted delivery of medicines. The term "magic bullet" he proposed implied a drug, which selectively finds and kills tumor cells and does not affect healthy tissues. [7] The dosage can be reduced many times over. Either magnetic or ultrasound delivery is used. Latest — is for the introduction of drugs into tissues (phonophoresis).

The pandemic has brought to the fore the market for medical diagnosis. In the Russian Federation only 330.6 million tests were carried out in 2020, an annual increase of 18.2%. [8] Before it increased annually by percentages. The developed offer of the diagnostic market in the coming years will be a driving force for the development of this type of medical service.

Worldwide, tele-health surveillance is available 24 hours a day. For example, in Germany and in a number of other countries, it has become common for all those suffering from coronary heart disease to wear a cardiograph on a permanent basis and to transmit information via the Internet. For Russia, it's exotic for now, but prospects for this market are very good. Remote monitoring of health makes it possible to detect problems prior to the onset of a disease or the aggravation of a chronic disease. It also facilitates early warning of infections and epidemics.

Large transnational companies have entered the market: General Electric, Siemens, Aloka, Philips. The world biomonitoring market is expected to reach 35.7 billion dollars by 2025, with average annual growth 9,7%. [9] The high demand for health monitoring systems is due to the ability to analyses the state of the organism and make decisions online, without waiting for a person to feel unwell and reach the clinic or call "ambulance".

If the health of a particular individual is monitored continuously, the drug mix and dosage will also become individual. Moreover, these drugs will not cure, but prevent disease at the first symptoms. The market for continuous monitoring will grow in response to the pandemic.

Current treatment — mainly medication with less frequent physiotherapy and surgical interventions. The drugs have already markedly lost dietary supplements (DS), which are fundamentally different from drugs: they don't immediately improve well-being, they can be taken long enough without side effects. And, although on the packaging sold by DS is obligatory inscription "isn't a drug", their popularity has increased in recent years. The market is expanding accordingly.

DS appeared in Russia in 1994,— it was then that these products were not registered as medicines but were placed in a separate group. Since 1998, DS have been actively promoting in the Russian market.

Every drug has a clear chemical formula and contains only what is described in the manual. DS doesn't have a defined formula, but what makes it possible for the input components to interact and activate the right component at the right time. Drugs are alien to the body, and the DS simply restore the lack of what should be normal in the body. Each drug acts on a specific symptom or syndrome. The use of DS results in deep alterations in the body leading to the normalization of organ functions and exchange processes. In a drug, the effects are selective, in DS — complex, they are not directly related to specific diseases.

One of the major reasons for the growth of the DS market is that, due to fewer physical

pressures, food consumption in modern humans is lower than before. As calorie intake decreases, so does intake of essential (essential) elements in food, i.e. those that the body cannot itself synthesize. Drugs cannot compensate the shortage of essential substances, only biologically active additives can reduce it.

But if the DS has so many virtues, why does the drug market flourish? There are two reasons for this. First, from drug use, the result is quick and visible, and in DS it comes after long use. Second, the effects of drugs stop when they stop being used. If DS consumption stops, the positive effects continue.

DS market in Russia is growing faster than world average. [10] The reasons for this appear to be a combination of the low purchasing power of the population and the artificial overpricing of imported drugs.

Within the drug market DS is promoted. New developments have shifted towards biological substances. That is, essentially, it's already DS, but with effects like in drugs. Such drugs are more likely to focus on prevention rather than treatment, and are also similar to DS in use. In addition, this trend intensifies: the message on the label "isn't a drug" is perceived in a very different way than half a century ago.

Today 85% of the world's DS is produced in just three countries: 35% — in USA, 32% — in European Union (mainly in Germany and France), 18% — in Japan. Russia is still lagging behind, but the rapid growth of this market gives rise to hope for equalizing the positions. [11] So far, it is unrealistic to expect that the DS market will significantly push back the huge pharmaceutical market.

Pharmaceutical market is close to new developments in the field of medical technology and the development of its domestic sector, i.e. production of home devices and appliances.

The market for drugs is also significantly tightened with physiotherapy. Health benefits of bathhouses are widely known, inhalation or local infrared heating. Economically speaking, all of this means that the drug market is closing.

Whereas previously the main part of the range of "Home Medical Appliances" stores was made up of objects intended for the disabled, now their range has expanded considerably. In developed countries, household medical equipment accounts for 40% of total medical products. And over the years, that share has been rising quite rapidly.

Previously, crutches and wheelchairs were the core of this market segment, and now — high-technology diagnostics and therapies. In the medical equipment market, Russian manufacturers account for only 1% and 40% of it belongs to the USA. Relatively low representation of China. But for now, current retail sales of domestic medical equipment in China have already reached 64.5 billion RMB (9,7 billion dollars) per year.[1] [12] And it is becoming a significant element in the expansion of the domestic consumer market, which for China is considered an essential element of the economic strategy.

The pandemic has significantly accelerated the restructuring of the medical home appliance market owing to the fact that contact with other people has become dangerous.

The discussion on scaling down large-scale markets is particularly relevant for our country. Most developed countries are taking steps at the national level to contain treatment costs: an international concept for the evaluation of medical technologies has been developed — Health Technology Assessment (HTA), evaluation of economic and clinical effectiveness. In our country, the problem has not spread, on the grounds that health care is seen as a necessary cost to reduce, which is apolitical, it's not acceptable to speak of their ineffectiveness. There is little economic research in this area.

But there is the Strategy for the

[1] Report on Analysis of Demand and Investment in the Medical Equipment Market in China. Beijing; 2016.

Development of the Pharmaceutical Industry of the Russian Federation up to 2020, which also has no economic calculations. The so-called "Pharmaceutical innovation model" is considered for the future in strategy, that our pharmacists will start producing original drugs instead of generic drugs.

An essential element of the post-pandemic global economy will be the previously marginalized category "right to health". It has traditionally been interpreted as a set of obligations of the State towards its citizens: a set of free medicines, an ambulance service, etc. In the new interpretation, the right to health would be an obligation not only of the State but also of citizens.

Prior to the pandemic, Russia had adopted a long-term health-care development programmer, which envisaged that from 2024 the main funding of public health institutions would not be directed to treatment, but to disease prevention, so-called four "**P**" program: identify any **P**redation to certain illnesses, **P**revention a disease, **P**ersonalization approach to the treatment, **P**articipation of the patient. It's an English tracing paper on Russian: predation, prevention, personalization and participation. The intention was to focus the existing system against aggravation and complications on prevention, towards prevention, early detection of diseases, control of risks of disease, genetic tracing.

In 2019, the Health Bill was passed through the Health Standing Committee of the National People's Congress. In addition to defining "basic health services" as a State obligation, it asserts that public health is the highest priority for all levels of government. Disease prevention and control is the first of all measures. The draft law emphasizes the early warning of infectious diseases, which is the responsibility not only of the State but also of all individual and legal persons. Compulsory vaccination is also introduced, which is understood not only as a right but also as an obligation.[12]

HOW CAN MARKETS FOR CHEMICAL FERTILIZERS, HERBICIDES AND PESTICIDES BE CLOSED

Is it possible to increase yields with traditional technologies? This path is deadlocked and will require a sharp increase in investment in fertilizers and pesticides, which are not actually paid for now, even without taking into account the value of the resource. It destroys soil — the main source of food and other agricultural products.

There are glaring examples. The proportion of organic matter in the soils of the North-East of China has decreased from 10% in the 1950s to 1–5% today. 30% of China's land is on the verge of infertility. Russia's other problem is not the loss of organics, but the intensive contamination of the soil with poisonous chemicals and the increase of resistance of pathogens to them. As a result, soil fertility can only be restored in half a century, if it becomes a major part of the budget.

The downsizing of the market now consists of the introduction of genetically modified organism (GMO). The coverage of GMO by individual crops is impressive. It accounts for 70% of the sown area, 49% — for cotton, 26% — for corn and 21% — for rape. GM crops occupy only 9% of the sown area so far. Leaders here are the US, Brazil, Argentina, India, Canada and China. Gene modification consists of relatively simple procedures for the introduction of a resistance gene for pathogens or a toxin-producing toxin for pests. It's projected that new GM-technologies will be developed after 2020 to provide combinations of desirable qualities such as tolerance to drought. By 2050, there will be more radical options that will shut down the fertilizer and poison market. The new market is initially monopolized, with only six company's worldwide controlling GM-seed production.

At the end of 2015, President of the Russian Federation V.V. Putin announced that the Russia would become "a leading exporter of "non-GM-products" in the world". 194 State scientific

institutions and 166 institutions The Federal Agency for Scientific Organizations (FASO) in Russia are working on innovation in the Russian agribusiness complex with a total employment 25.4 thous. people. In 2014, the federal budget allocated 378.4 million roubles for this purpose (822 thous. roubles per organization in year or 1 240 roubles per employee per month). That is, there is little meaningful financing for good agricultural practices. That just means that we run the risk of being stuck in the fertilizer and chemical markets.

But the world goes beyond GMO products. In 1980, Japanese professor Teruo Higa (University of Agriculture, Okinawa) developed the so-called EM-technology or efficient microorganism's technology. T. Higa tested a group of 80 microorganisms from five families. It showed that the kit contributes to soil improvement, the suppression of pathogens, the building of resistance to disease and pests. A set of effective microorganisms is cultivated (multiplied) in bioreactors and introduced into the soil.

Argentina offers another way out of the established market for fertilizers and pesticides. This country was a major GMO-experiment site with large investments from the USA. There is now a kickback in the other direction. This kickback is something like our "jump" from one extreme to, from centrally planned economy — into the most unregulated market. Principle of the new direction that has become part of Argentine public policy,— no future use of imported fertilizers and chemicals. After harvesting, a set of useful micro-organisms should be extracted from the soil sample of a specific field and reproduced in a laboratory, and then introduce them during sowing or spring pre-sowing in the same field. This forms an autonomous metabolic system that perfectly preserves soil fertility without interference from foreign fertilizers and pesticides.

It is possible to come back to the discourse on the phasing out of the drug market. The fact is that EM-technology now concerns not only plants but also farm animals. The young bull is taken from a complex of effective microorganisms that live in it and on it at a time when it is absolutely healthy. These microorganisms are stored in a state of hibernation, and when treatment becomes necessary, they reproduce and return the bull through food or shower. It turns out that he's in a favorable environment that's better than drugs, that helps his health. This is already the Japanese experience.

The active application of EM technologies in animal husbandry was bound to lead to their use in high performance sport. And already in some countries of the world, athletes are taking sets of micro-organism complexes from their best sporting times, keeping them in special conditions, and when the time comes for important competitions, the athlete is injected in ways that are no different from normal nutrition or water procedures. The drug produced by the body itself cannot be identified or condemned. This places the high-performance sport market in a very different area, where human microbiology will play a major role.

RADICAL CHANGES IN THE PUBLIC TRANSPORT MARKET AND PROSPECTS FOR THE REPLACEMENT OF THE PRIVATE CAR MARKET

The world economy is now trapped in an institutional trap — a continually expanding private car market. It is clear that this area of scientific and technological development is deadlocked on several criteria. First, there will never be money to build roads where private cars can drive. China already has 50-lane motorways, but they're full of cars. The alignment of the road network with the number of vehicles is not possible in all countries of the world, either for financial or urban reasons. Second, this transport resource is inefficient, never fully used. One passenger usually drives by a driver and, with

a probability of 50%, each private car with a capacity of 4 to 5. In addition, there are problems not directly related to transport. You can't even park a car anymore. Area of one parking space with access an average of 25 square meters (this is more than the standard floor space per person), at work — the same. Besides work, there are shops, polyclinics and other public institutions.

Therefore, it is now clear that the market is winding down. Vehicles will first be replaced by unmanned moving vehicles, then remote control will be implemented, after which the ownership of a private car will be revoked. So the tracks are going really well in Finland, where there's a 70-kilometre stretch of highway dedicated specifically to autopilot cars. Cars on this highway will be driven through cables laid under the canvas and "communicate" with each other in analogy to how drivers communicate with each other. Since 2016, the Federal Road Agency of the Russian Federation, together with the Finnish Transport Agency, has been preparing Russian roads for unmanned transport: tracks fitted with electronic devices in contact with autopilots. A similar experiment was started earlier in California, where autopilot control is carried by satellite. Many programmers from our country participated in the development. This experience is replicated in many countries under the Aurora brand. Japan and Norway are participating in the project. Investment in research and development on this topic will amount to 70 billion euros by 2030, and 44 million unmanned vehicles will travel on the world's roads.

There are many institutional barriers to the gradual replacement of private cars by drones, triggered as necessary. It is necessary to define the right of limited ownership of the vehicle, which will grant you on order distribute insurance risks, optimize waiting time, etc.

The coronavirus epidemic showed how weak the automobile market is. As a result, world car sales fell from 88.9 million in 2019 to 76.5 million in 2020, i.e. by 14% (https://auto.vercity.ru/statistics/sales/2020/).

Triple pressure on this market from rental (carsharing), delivery systems and drones will reduce it quite quickly.

This means that the automotive industry, as it stands, will not be maintained and will need to be transformed into a new format focused on the improvement of autopilots, sensors and on-board computing systems. Economists are now using data on the dynamics of the automobile market extensively (it may be said) in their economic growth forecasts, but will have to turn to other information. The number of accidents will also be drastically reduced, from one accident per 100 thous. km of track to 10 million km of accident-free running.

The process of substitution will also involve public land transport, which will forgo stable routes, and will be on call, assembling hitchhikers in vehicles with a small number of passengers in each of them. This will be possible as the economy enters the digital age, building many routes according to the requests of passengers. The boundary between public and private transport will be blurred, with many passenger options. Related to this process will be the redefinition of the ownership of the private car, followed by relevant legislation.

FROM SPONTANEOUS TO ORGANIZED MARKET SUBSTITUTION

In previous private substitutions of markets, one can see both unmanageable processes and restructuring with some government regulation. There are many options for such restructuring at the country level.

We will consider options at the supranational level. In 2015, UN experts proposed a concept for sustainable development consisting of 17 goals (Sustainable Development Goals, SDG).[2] Is it legitimate to look for any substitute markets

[2] Resolution adopted by the General Assembly on 25 September 2015. UN. 2015. 21 October.

in the global sustainable development goals adopted at the global level?

In author's opinion, there are at least three goals out of 17 (specifically 6, 12 and 14) that can serve as a basis for the development and promotion of new substitute markets at the global level.

One of the most pressing problems facing the world economy is addressed by SDG 6 — access to clean water. Currently, 2.2 billion people are excluded. The substituting market can be formed by increasing water quality requirements and the spread of general payment practices for drinking and technical water. The clean water market in particular may replace part of the market for medicines for the treatment of infectious and gastrointestinal diseases.

There is now a market for bottled mineral and drinking water. In our country, there are prospects for the growth of this market. With the introduction of mandatory labeling of bottled water from 01 September 2021 (which will guarantee quality), it will partly replace the market of medicines. To increase this market, it is necessary to promote clean water with constant indications that diseases are imminent when using dirty water.

Goal SDG 12 — sustainable consumption and production patterns (halve per capita world food waste at the retail and consumer levels and reduce food losses in production and supply chains, including post-harvest losses, etc.). This target directly targets the restaurant business, which is the world's leading supplier of food waste. In fact, the goal is to create a food waste processing industry with a corresponding demand for food processing products.

Food waste is now being processed into several useful products: animal feed, organic fertilizer (particularly using effective micro-organisms and earthworms) and biogas. A total ban on the disposal of food waste in garbage cans would help to create this market. The development of these markets will facilitate the substitution of markets for food and chemical fertilizers.

Goal SDG 14 — conserve and sustainably use oceans, seas and marine resources for sustainable development. New markets can be formed in a number of ways: underwater tourism, less exposed to the impact of the pandemic, construction of underwater settlements, increased requirements and penalties for pollution of the oceans and seas, establishment of international volunteer units for the environmental health of the seas and oceans. The market is created as a commercial accompaniment of these measures and should partly replace international tourism.

As illustrated by the examples, the formation of these three replacement markets needs to be organized in two directions — forced creation of demand and incentives for participants to enter these new markets.

CONCLUSION

Thus, economic theory and government regulatory practice are now faced with choices: treat events as transient or perceive them as an opportunity to open up new avenues for research and action. Meanwhile, the decline in tourism and restaurants has led to higher prices for building materials, household appliances and electronics, and it's surprising to professionals and politicians.

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ABOUT THE AUTHOR

Yuri P. Voronov — Cand. Sci. (Econ.), Leading Researcher, Institute of Economy and Industrial Engineering of the Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia
corpus-cons@ngs.ru

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"Smart Government": prospects for introduction of digital technologies in public administration in Russia*

D.R. Mukhametov[a], K.V. Simonov[b]
Financial University, Moscow, Russia
[a] https://orcid.org/0000-0001-7256-3281; [b] https://orcid.org/0000-0001-8693-3132

ABSTRACT

The article discusses the prospects for introducing government technologies (GovTech) in Russia and the possibility of using digital technologies to improve public administration. GovTech projects are related to forming a "smart state" that uses new approaches to economic regulation, planning, and communication with citizens and businesses. In this regard, GovTech is a set of tools that allow adaptation of the models of public administration to social reality and increase the effectiveness of planning. GovTech is defined as the operationalization of space and resources of management through the creation of digital identities: GovTech tools allow to determine the object's position in real-time and assess the consequences of economic decisions. The author discusses trends in different directions of GovTech development in Russia: 1) open data, 2) public services and digital profiles, 3) integrated platforms and monitoring systems in "smart cities" and regions. Three scenarios of the results of the implementation of GovTech are formulated: 1) digital democracy; 2) machine of targeted control; 3) resource of technocracy.

Keywords: government technologies; GovTech; open data; public services; digital profile; "smart city"; information systems; "smart state"; public administration; digital society; client-oriented government

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PROBLEM STATEMENT

The current political environment is characterized by increasing systemic risks. The negative effects are related to the coronavirus pandemic, increasing inequality and social differentiation, the crisis of existing socio-economic development models, including globalization, sustainable development, post-industrial and information societies. In this context, expectations of active government intervention are increasing, which is largely due to the role of the State as the central regulator, which sets and controls the "rules of the game", and is also able to support the vulnerable by increasing budget deficits. In this context, pilot projects for basic unconditional income payments in a number of countries are most illustrative [1], equally important are examples of public support programmes for people and businesses that are being implemented by national Governments in the face of declining business and income in the face of the constraints of the pandemic. [2].

Improving public administration and planning systems are mainstreamed in this context, government technology models are the most sought after — GovTech. GovTech is seen as a platform for the creation of the "smart government" and involves the use of

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resources aimed at improving mechanisms of coordination and communication between the state, citizens and business. However, the term GovTech is much broader and, in addition to e-government, includes technologies from "smart cities", digital regions and e-government, digital profiles and identities, open data, integrated information systems. For these reasons, it is advisable not to limit GovTech to public services, but also to include other listed technologies in the analysis.

Digital expansion has been uneven: new solutions have been initiated by fintech and telecom, and the digital wave has spread to education (EdTech), medicine (BioTech). In the context of this logic, GovTech can be seen as involving public institutions in the digital agenda. Nevertheless, it is important to bear in mind that the Government is a complex configuration of interests and relationships that determine the outcomes, often non-linear, of the implementation of digital technologies. This nonlinearity updates the consideration of problems and prospects of the introduction of GovTech in Russia.

GOVTECH AS OPERATION OF CONTROL SPACE THROUGH CREATION OF DIGITAL IDENTITIES

First, GovTech covers a wide range of digital technologies to optimize public administration and planning processes: public service delivery platforms, digital monitoring and decision-making systems, electronic public security services, transport, environment and energy, e-document workflow platform. GovTech aims to improve the quality and reliability of public services, creating a digital environment of communication between the authorities, citizens and business, personalizing and adapting public services to the needs and expectations of citizens. Moreover, GovTech is closely linked to the provision of services and solutions by the private sector to public entities, which stimulates the production of innovation. For example, in 2019, the global market of GovTech was 400 billion USD, while 48% belonged to the USA and Canada, 27% — to the European Union, 12% — to Asia.[1] At the moment, the leading companies of GovTech can already be identified, and the location of their headquarters in the USA and Canada largely explains the quoted GovTech market volumes in different regions (https://www.govtech.com /100/2020/).

GovTech functions, however, aren't limited to creating new technology markets and government-business cooperation. At the same time, the normative definitions linking GovTech to improved communication between the state and citizens (Government-to-Citizen, G2C), are also insufficient.

GovTech aims to bring new benefits to public administration, so it is possible to define **GovTech as the operationalisation of management space and resources through the creation of digital identities**. The operationalization of the control space involves the building of links between the control elements and the establishment of principles for the measurement of these connections. Previous approaches to public administration and planning used bureaucratic methods and statistics to operationalization. However, GovTech allows us to create a new approach: platforms and integrated government information systems become the basic element, which aggregate and combine information from different sources to form a complex digital identity or digital duplicate of the object of control — citizens, organizations, physical facilities and cities. Operationalization through GovTech solutions is aimed at establishing in real time the position of the object of control in different dimensions of state planning, as well as numerical evaluation of the consequences of economic and management decisions.

[1] Accenture. GovTech. Europe's next opportunity; 2018.

The integration of public information systems and platforms results in the creation of digital identities. Identity is understood as a digital data corpus from which it is possible to identify a person or organization in a digital system. [3] For example, the integrated digital identity of a citizen is shaped by the integration of personal data from different services: health, welfare, security and public services; there is also a history of employment. However, digital identities are not limited to citizen databases; they may also include virtual maps, digital duplicates of cities and businesses that have become common due to advances in simulation and simulation modelling.

Digital identities and twins express the basic idea of digital transformation — integration of a holistic management environment rather than individual processes. On this bases, it may be concluded, that the operationalization of governance space through the creation of digital identities based on integrated information systems addresses the mismatch between governance models and social reality, using data analysis and artificial intelligence technologies, governments are given the resources to comprehensively assess decisions and forecast the state of the system.

GovTech thus has the advantage of being able to assess and predict the state of multiple control objects through digital identity, doppelganger and media technologies. These advantages enhance the capacity of public administration in the areas of financial planning, targeted social support, forecasting and obtaining operational information on crises, and communication with citizens and business. Today, these objectives are particularly important in view of the growing social differentiation, the rigidity of bureaucratic structures, the persistence of low economic growth and the general uncertainty of the future. To solve these problems, GovTech involves not only operationalization through digital doubles, but also reducing transaction costs, increasing the availability of information, and involving citizens in decision-making.

It's worth mentioning that examples of large-scale implementation of GovTech at the national level already exist today. It's worth noting in particular the "Transformational Government" [2] program of the Government of "New Labour" in Great Britain, which was to integrate the databases of the various public authorities in order to optimize the fiscal burden of public administration in the context of increasing social differentiation. [4] The integration of databases allowed the identification of individual support measures for individual citizens or social groups through a comprehensive machine analysis of their social situation. A new organizational policy is being developed to implement national GovTech-projects in different countries: in the UK has a decentralized system for the development and implementation of digital innovation in public administration, in Singapore established Government Technologies Agency (https://www.tech.gov.sg/), responsible for digitizing public administration. In addition, given that GovTech covers areas such as e-government, health and education systems, local government, GovTech development is also the responsibility of national ministries of digitization and communications.

GovTech as the operationalization of the control space is closely related to the **infrastructure authority of the state**, which is defined as the capacity of the Government to implement its policies and to enforce its decisions throughout its territory. Infrastructure power is expressed in the creation by the State of conditions in which access to public goods and resources is

[2] Cabinet Office. Transformational Government: Enabled by Technology. London: The Stationery Office; 2005.

possible only through recourse to Government structures and authorities. [5, 6] Therefore, the conduits of infrastructure authority are the centralized system of public services, national systems of measures and weights, transport and communications systems. In this regard, GovTech — is a tool for implementing infrastructure power in a digital reality, which allow the Government to retain its role as a regulator of social relations in an online environment in which the division of labor is being eroded and social life is becoming increasingly chaotic.

Thus, GovTech as an operationalization of the governance space is not just about improving government planning, but also to create advantages for the state in the sphere of communication with citizens and control of implementation of decisions. For these reasons, GovTech's outlook analysis should take into account how the introduction of digital technologies is changing the way in which the social system integrates and communicates.

PROSPECTS FOR GOVTECH IMPLEMENTATION IN RUSSIA

At the moment, the GovTech market in Russia is only emerging as the informatization of state administration is given priority in government activities. However, it is difficult to estimate GovTech prospects in Russia based on market indicators. Therefore, it is possible to consider the existing achievements and challenges in the different directions of GovTech, based on which it is possible to predict which solutions will receive attention from the state structures. GovTech's main development directions are: 1) open data; 2) e-government services and digital profiling; 3) "smart government" and digital regions. Within each area, it is necessary to consider which technologies are used to operationalize the management space; how the technologies used structure the relationship between the Government and citizens; what projects and solutions are being implemented in Russia (achievements and challenges).

It is important to note that the priority is not the detailed analysis of existing GovTech institutions and projects in Russia, but the analysis of trends in different directions from the point of view of operationalization of the management space and change the relationship between the Government and citizens. Based on this, it will be possible to form a summary table and draw conclusions about prospects and scenarios of the implementation of GovTech in Russia.

OPEN DATA

Open data — is information on the directions and results of the activities of public authorities and local governments, which is available on the Internet in the form of data sets. Government structures publish huge amounts of data and information through open data portals, statistical reports and infographics. By providing their data sets, governments are operationalizing the management resources they have, making them more transparent and accountable to citizens.

Open data is characterized by reuse and free dissemination, so it is seen as an effective tool for stimulating business and creating innovative, citizen-oriented services. [7] Open data enable citizens, first, to assess the adaptability and acceptability of policies and, second, to create expectations about public policies in specific areas. In the context of structuring public relations, open data operationalizes the space of governance not so much for Government structures as for business and citizens, enabling them to monitor data on financial flows, efficiency of infrastructure projects, and scope of regulation of economic sectors. On this basis, open data can be considered as a resource for social self-organization, as the hosted

datasets become the signals on which citizens and businesses assess and make decisions.

In Russia, Federal Act "Amendments to the Federal Act "On information, information technology and the protection of information" and Federal Act "Access to information on the activities public authorities and local government" (https://base.garant.ru/70393024/) regulates the publication of public State data. In addition, the obligation of the federal executive authorities to publish public data is established in the Decree of the President of the Russian Federation "On guidelines of the improvement of public administration" (https://base.garant.ru/70170942/). Detailed information on which public data should be published by the authorities is available to the Government of the Russian Federation "Approval of a list of publicly available information on the activities of the Federal Public Administration, the government authorities of constituent entities of the Russian Federation and local government, which is posted on the "Internet" information and telecommunications network in the form of public data" (https://www.garant.ru/products/ ipo/prime/doc/70313602/). Information on the names of authorities and subordinate organizations and a plan for the conduct of inspections of legal entities and individual entrepreneurs for the next year should be published in the form of public data, and results of scheduled and unannounced inspections, vacancy announcements, activity-specific license registers. There are common regional portals, relevant sections on the websites of ministries and departments, and a federal open data portal for the publication of public data — data.gov.ru.

Open datapPolicy as direction of introduction of GovTech in Russia faces certain problems. In the context of open data, the operationalization of government space is reflected in the average openness of federal and regional governments, which is currently insufficient. For example, in 2019, the average informational openness of the websites of federal ministries and agencies was 67%, with the results of the different departments being highly variable: show a high degree of openness Ministry of Finance of the Russian Federation, Federal Service for Intellectual Property and Ministry of Transport of the Russian Federation, however, some agencies generally do not have open data sets (https://read.infometer.org/foiv2019). At the regional level, the average open access of open data sections and portals was 54 per cent, with the average open availability of mandatory sets estimated at 43% (https://read.infometer.org/region2019/od/rating#!/tab/122830689–3).

Taken together, these indicators indicate a lack of operationalization of the control space through ongoing monitoring of the release of open data.

Despite the generally low level of open data policy, further development of GovTech in Russia in this direction remains possible. In particular, the Chairman of the Accounts Chamber of the Russian Federation A. Kudrin noted the problem of inefficient work of federal agencies in publishing open data at the V Open Data Day, where he noted the need to develop open government data portals at all levels of government. In addition, in March 2020, information became available on the Government of the Russian Federation work to re-establish links with OECD, which could also stimulate the evolution of open data policy, as the OECD is a main agent in promoting the concepts of open and digital government.

In this regard, it should be noted that the improvement of open government data policy as a component of GovTech requires the following solutions. First, there is a need to identify which online resources are the key to hosting open data sets, because uncertainty also affects low levels of openness. For example, the average rate of data openness on single regional portals is 63.8%, on websites

of different authority's 43.7% and on the federal open data portal — data.gov.ru — 49.5%. Second, there is a need for mandatory public disclosure of municipal quality of life data (education, health and environment). Although individual departments and regional governments publish this information, the practice has not become common. Third, as diversity and data sets become more diverse, it remains important to demonstrate that open data can be used to develop innovative projects, related to traffic regulation, emergency response, urban planning — currently, the need for open government data is not fully understood by citizens and businesses, but its use may be appropriate for civil and commercial initiatives. These changes will increase the potential of open data as an element of GovTech, focused on the growth of self-organization of citizens. Open data — is not the only way to improve government performance [8], but they are a necessary component for building trust in authority and citizen engagement.

E-GOVERNMENT SERVICES, DIGITAL PROFILES

The development of electronic public services and digital profiles is a separate area within the framework of the digitization of public administration and planning. In the context of GovTech development, a new approach to the provision of public services is emerging. Priority is being given to the creation of integrated public service platforms and portals, not simply to the electronic delivery of public services, but to the establishment of legal acts and communications with public authorities and services. An additional aspect of integrated public service platforms and portals is the digital profile — set of government digital records of natural and legal persons that are made available through the technology infrastructure. The digital profile — is the result of the integration of different public services into a single platform. This integration makes it possible to create a complex digital identity of a citizen and to introduce a system of "single window" for providing all services.

Unlike open data, which involves self-organization of citizens and rational decision-making, integrated public service platforms structure the relationship between the citizen and the Government in a different way. In fact, the goal of integrated platforms — is to accumulate as much information as possible about control objects and to exclude other channels of communication and access to public resources. Thus, through integrated public service platforms, targeted regulation of access to public services based on individual digital profiling is possible. This improves the quality and convenience of public service delivery, however, in the absence of proper legal regulation of the provision, access and dissemination of data through platforms, a soft form of control can be implemented, introduction of personal restrictions and regulation of behavior through the collection of data on digital identity.

In Russia, e-government services have become widespread, and the country is now among the leaders in this area. In particular, 63.5 million citizens used the Internet to obtain state and municipal services in 2019, that 77.6% of those applying for public services. In addition, Russia ranked third in the world in the rate of growth in the use of digital public services and reached the top-10 in the intensity of their use — 92% of respondents to the survey noted that the quality of the Russian Federation's electronic public services had improved over the past two years (https://www.rbc.ru/society/13/03/2019/5c87d2ae9a794743baad4ef6). In addition to the priority given to e-government in the context of the digitization of public administration is indicated by the inclusion of the public service portal application in

Minfigure's ranking of programs to preinstall on smartphones.

It should be noted that in Russia's public services are developing along the path of super-service integration, and this trajectory is distinguished as working with the existing Unified Public Services Portal, and plans to establish the platform GovTech. At present, it is possible to envisage transforming the public services portal into a digital ecosystem or platform, which will make it possible to use the portal site to interact with other organizations providing public and municipal services. In particular, this is indicated by the plans of Rosreestr to create of the Unified State Register of Real Estate data showcase in 2021, in which real estate certificates and registration will be available to users of the public services portal. A related development is the development of a digital profile that makes it possible to automatically use user data on the public services portal for authorization and for obtaining banking and other services.

Other development of integrated e-government services — creation of GovTech platform, which will unite different state information systems, creating a common online environment of interaction of citizens, business and state structures. The project is currently in its infancy phase, so content is limited to normative goals to improve quality and reduce the cost of public services. Nevertheless, the platform structure updates the above aspects of the operationalization of management space through the collection of data from users of public services and their use for differentiated social support.

In the context of further development of integrated portals/platforms for public services and digital profiling, the following risks become relevant. First, the importance of information security and information literacy training in preventing data leakage and/or transmission to third parties is increasing. At the moment, there are regular cases of leaking of personal data of users of regional public service portals, even the "nameless" data that does not indicate the user's full name is dangerous,— despite the absence of a reference, other numerical identifiers can be found from this data (number of individual personal account of the insured person in the statutory pension insurance, driving license) and build the final profile of the citizen. [9]

Second, there is a need to introduce tools to enable citizens to track the data they have agreed to handle and to be able to withdraw their data. In the digital profiling system, this's done through the digital consent service, but it is important to extend these tools to all projects and initiatives, related to the interaction of the state and citizens in the online environment to prevent the growth of mistrust of state institutions. The situation of the pandemic has enabled the Government to increase the legal capacity for online control of citizens [10, 11], however, the continuing imbalance and lack of mutual control by citizens of data aggregated and used by the Government, can increase tendencies to go into the "grey zone" and provoke negative reactions to targeted forms of control and regulation.

"SMART GOVERNMENT" AND DIGITAL REGIONS

"Smart government" and digital regions — it's concentrated in the online space networks of exchange, control and regulation, in which the relationships «man-machine» and «machine-machine» are integrated. [12] In this respect, GovTech projects include these networks in integrated city platforms and digital doubles. However, in terms of technologies and ontologies, there is no difference between the "smart city" and the digital region, since the main differentiation is related to territorial scales and their inherent characteristics.

"Smart cities" and digital regions can be considered both as an additional direction of

GovTech and as a platform for testing other GovTech-solutions. For example, "smart cities" and digital regions require active development and dissemination of e-services and development of open data portals to create local innovations, but in a broader perspective city and regional GovTech-projects have their own features.

Operationalization of governance spaces in "smart cities" and digital regions involves two aspects. On the one hand, technologies such as integrated urban monitoring and management platforms and digital city doubles [13] allow to unite the analyst of the "smart house" into a single system, public transport management, security services, environmental monitoring, emergency forecasting and biometrics analysis (this integration facilitates the integration of all parts of the urban system into a single administration). In this case, operationalization involves the creation of a virtual city reality, based on which changes are modelled and the consequences of decisions are predicted. On the other hand, "smart city" and digital region technologies also include citizen engagement platforms and civic engagement services, which enable citizens to obtain information about infrastructure projects and to assess their need for or quality of implementation. This is the second side of operationalization where citizens are given the opportunity to model the future of the city/region. [7, 14] Based on this, it is difficult to define unambiguously peculiarities of the use of technologies of "smart city" and digital region for structuring social relations.

In Russia, the digitization of regional and municipal administration is realized in the framework of the national project "Digital Economy", which includes departmental federal projects "Digital Region" and "Smart City". Due to the reallocation of budgetary funds to fight coronavirus and its consequences, the project "Digital Region" was frozen until 2021. Moreover, its approval has been delayed until the autumn, but the second project — "Smart City" — continues, with 209 cities now participating.

The directions of development of "smart city" and digital regions include the digitization of education, health care, introduction of new channels of communication between services and citizens, but success in realization of these projects depends on the resource base of a given city. Modern trends in the development of GovTech-initiatives in Russian "smart city" are related to the heterogeneity and uneven distribution of the Russian market of "smart city" technologies. Despite the growth (in 2017 it amounted to 75.02 billion rub., in 2018–81.2 billion rub.), 93% of the market is in Moscow, 2% — in Saint-Petersburg, 5% — in other region (http://survey.iksconsulting.ru/page5160775.html). In this context, the role of State programs in financing IT-projects is being strengthened to overcome the financial constraints of regional budgets.

At the federal level, the highest priority is given to State programmes and projects related to the control and monitoring of public safety. In particular, a new system called "Safe City", a project of the Ministry of Emergency Situations, is being developed to integrate disparate IT-security systems in municipalities. The possibility of integrating urban the intellectual video surveillance systems is due to the increase in the number of cameras in Russia: 13.5 million (93.2 cameras per thous. person),— third place in the world after China and the USA (https://tdaily.ru/news/2020/12/25/telecomdaily-rossiyskiy-rynok-ovn-budet-rasti-na-23-ezhegodno). Legislative enforcement of the programs by all regions and obligations of owners of commercial video surveillance systems (58.7% cameras in the country) input of data into the State information system is aimed at creating a coherent system of analysis and response to emergencies and incidents.

Table

Prospects for the introduction of GovTech in Russia

Task	Open data	E-government services and digital profiles	"Smart cities" and digital regions
Technology of the operationalization space management	Online publication of mandatory and additional open data sets	Integrated citizen-centered public service platforms/ portals	Integrated monitoring systems and digital city/region doubles
Purpose in structuring social relations	Increased transparency of the public sector and self-organization of citizens in decision-making	Information accumulation and diversity of functions for targeted social support and regulation of access to public resources	Create a virtual city/region reality to simulate the effects of decisions and gain local knowledge of the territory
The situation in Russia	Institutional regulation, lack of effective results	Increase in the number of e-government services provided, integration of the public service portal with other information systems for growth of digital functionality	Institutional regulation remains in place, while policies for the digitization of municipal and regional governance remain fragmented

Source: compiled by the authors.

In addition, in large Russian cities (Kazan, Yekaterinburg), integrated platforms connecting dispatch services, "smart" transportation and public safety control systems have spread. Based on the platform, urban monitoring tools are being introduced, covering both target areas (mobility, safety) and complementary areas (urban activity, planning). There are also initiatives to introduce citizen engagement platforms, but their scope is limited, so the benefits of operationalizing government space remain insufficient for citizens.

PROSPECT COMPARISON

Thus, analysis of different directions of GovTech in Russia allows drawing the following conclusions. Digital transformation relies on integrated public service platforms and urban/ regional monitoring systems as opposed to open data. Taking into account trends in Russian GovTech, based on the ways of operationalizing the management space and structuring social relations, it's possible to form a *table*.

Because of this table, it can be stated that at present the development of GovTech as the operationalization of the space of government is more conducive to structuring social relations in favor of the state. Technology allows public databases and information systems, creating new infrastructure for integrated digital identity of the citizen/organization and access management strategies. In the face of diluted government and planning capacities, GovTech benefits allow the state to contain the chaotic nature of social and economic life, while preserving the "rules of the game", the introduction of GovTech tools without a prior assessment of social needs and expectations can offset these benefits.

RESULTS AND SCENARIOS OF GOVTECH IMPLEMENTATION IN RUSSIA

Continuation of the above trends in GovTech development may lead to the implementation of several scenarios: 1) GovTech as a path to digital democracy; 2) target control machine; 3) effective management resource.

Digital democracy scenarios and targeting machines are linked. In the first case, the focus is on open data policy, public sector transparency, citizen engagement in decision-making, second — lack of transparency and lack of support for increased oversight practices through data

collection and analysis. The implementation of a scenario in Russia will depend on the institutional support of new State information systems, related to the collection of biometrics of citizens, monitoring of social networks, digital identifiers. At present, there are no institutional mechanisms for peer review between the State and citizens, which makes a targeted control scenario more likely.

The most dangerous **scenario is the implementation of GovTech as an effective management resource**, use-oriented technocratic strategies to optimize budget spending and social support. It's very much related to the stated mechanisms of targeted control, but it does not focus on control, but on reassessing the social guarantees of the State. This scenario becomes possible through the development of an integrated digital profile of the citizen, the modelling of his needs and the introduction of differentiated minimum support measures. Need to take into account, that in mind that modern governance strategies are based on fiscal consolidation, the introduction of quasi-markets and the elimination of excessive governance [15, 16], which increases systemic risks, since institutional redundancy — is a major barrier to containing cascade effects.[17]

In a context of growing social inequality, the use of GovTech to optimize the social spending of the state can lead to increased social conflicts and contradictions, reducing the initial perceived benefits of communication and regulation that public technologies should provide.

The scenarios presented are ideal-type projections, so consideration should be given to their possible combinations, the implementation of certain scenarios in some areas and their absence in others. However, the implementation of GovTech is not needed as a management complexity and optimization tool to create the most favorable scenarios, as a set of applications for identifying and interacting with social complexity. GovTech implementation should not result simply in the formation of a customer-centered state or a "state without bureaucracy", and a complex network of feedback, communication and peer review to maintain the complexity of the management system.

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ABOUT THE AUTHORS

Daniyar R. Mukhametov — Research Assistant at the Center for the Study of the Transformation of Social and Political Relations, Department of Political Science, Financial University, Moscow, Russia
mukhametovdaniyar@gmail.com

Konstantin V. Simonov — Cand. Sci. (Political Sciences), Professor, Director of the Department of Political Science, Financial University, Moscow, Russia
KVSimonov@fa.ru

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Assessment of the Stability of the Russian Banking Sector in the Context of Macroeconomic Volatility*

I.I. Belyaev[a], S.N. Silvestrov[b], T.S. Gaibov[c]
Financial University, Moscow, Russia
[a] https://orcid.org/0000-0003-2843-9683; [b] https://orcid.org/0000-0002-7678-1283;
[c] https://orcid.org/0000-0002-5489-835X

ABSTRACT

In recent years, one of the main features of the development of the world and, in particular, the Russian economy has become macroeconomic volatility and instability, which requires flexible approaches from the state and financial institutions to regulate and promptly respond to crisis phenomena. The new normalcy and the resulting new challenges for the Russian economy create the need for banks to maintain a high level of asset quality and an acceptable level of capital adequacy. The analysis made it possible to conclude that the introduction of the BCBS standards and IFRS 9 by the banking system led to the expected reduction in the capital base of Russian banks. At the same time, the Russian banking sector also demonstrates heterogeneous growth rates of total assets and stable growth of equity capital. Despite the impact of COVID-19 on the global and Russian economies, the authors' assessment of the stability of the Russian banking sector showed that at the end of 2020, the financial position of the Russian banking sector could be characterized as stable.

Keywords: banking sector; stability; macroeconomic volatility; capital adequacy; absorption of losses; corporate loan portfolio; retail loan portfolio

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During the last two decades, the domestic economy has experienced many stressful and crisis events. Thus, 2008 was marked by the global financial crisis, which affected the 6% drop in the GDP of the Russian Federation and the first bank bailouts.[1] In 2013, with the change of management of the Bank of Russia, a large-scale revocation of banking licences began. By May 2021, this had reduced the number of active credit organizations by more than twice. In 2014, the European Union and the USA imposed sector-specific sanctions on major banks, particularly state-owned banks, significantly reducing the ability of the banking sector to attract foreign funding. Moreover, the subsequent devaluation of the rouble also weakened the position of the Russian economy on the world capital market. In the past 2020, the COVID-19 pandemic has been affected by restrictions on the movement of citizens and the functioning of businesses. In order to mitigate the impact of the virus on the economy, the Government of the Russian Federation and the Bank of Russia adopted concessional lending programmers and relaxation of banks' recognition and restructuring of problematic loans. [1–4]

It should be noted that the Russian banking sector has historically exhibited uneven growth rates in aggregate assets (*fig. 1*). When the movement of assets is linked to the movement of the rouble against the United States dollar, the sector experienced the most stable period of growth from 2010 to 2013when the sector grew at a rate of 18.3–18.8% per year.

The recovery of the banking sector has been very slow since the 2008 crisis, with total assets growing at or below 1.6% in 2009. In 2014, following the imposition of sanctions,[2] devaluation of the ruble followed (the dollar appreciated almost 1.7 times) and the growth of the banking sector became more limited (4.8–6.1% per year).

Developments in the 2008 crisis highlighted the need to revise the then existing Basel I and Basel II standards, as a result, Basel III claims were submitted to the Basel Committee on Banking Supervision (hereinafter BCBS) in September 2010.[3] [5] A feature of the introduction of BCBS standards into Russian practice was the instantaneous implementation of all standards (Basel I, Basel II and Basel III), while European banks had been implementing standards for 10 years. [3, 6]

Implementation of Basel I and Basel II standards for capital adequacy approaches started in 2012: total (equity) capital of banks updated,[4] introduction of new requirements for the calculation of market[5] and credit risks[,6].[7] In addition to a standardized approach to calculating credit risk (based on fixed risk weights for each asset group), the Bank of Russia has started the process of preparing for the IRB-approach, allowing

[1] In September 2008 "Commercial Bank "Globax" and "Svyaz-Bank" faced problems against the backdrop of the outflow of funds and the collapse of the stock market due to which "Vnesheconombank" had to start the procedure of their financial recovery.

[2] Citizens of EU countries and European companies were prohibited from trading in securities of Sberbank, VTB, GPB, VEB, Rosselhozbank and their subsidiaries for more than 30 days. Residents of the USA have been barred from extending credit to previously designated banks and related entities beyond 90 days.

[3] Basel Committee on Banking Supervision. Basel III transitional arrangements, 2017–2028. URL: https://www.bis.org/bcbs/basel3/b3_trans_arr_1728.pdf.

[4] On the basis of the Regulation of the Bank of Russia from 28 December 2012 No.395-P "On the method of determining the amount and assessing the sufficiency of own funds (capital) of credit organizations ("Basel III"")». The document is no longer in force.

[5] On the basis of the Regulation of the Bank of Russia from 28 September 2021 No. 387-P "On the procedure of calculation by credit organizations of the value of market risk".

[6] On the basis of the Directive of the Bank of Russia from 03 December 2012 No.139-I "On mandatory regulations of banks".

[7] Basel Committee on Banking Supervision. Basel II: International Convergence of Capital Measurement and Capital Standards. URL: http://www.bis.org/publ/bcBS 128.PDF.

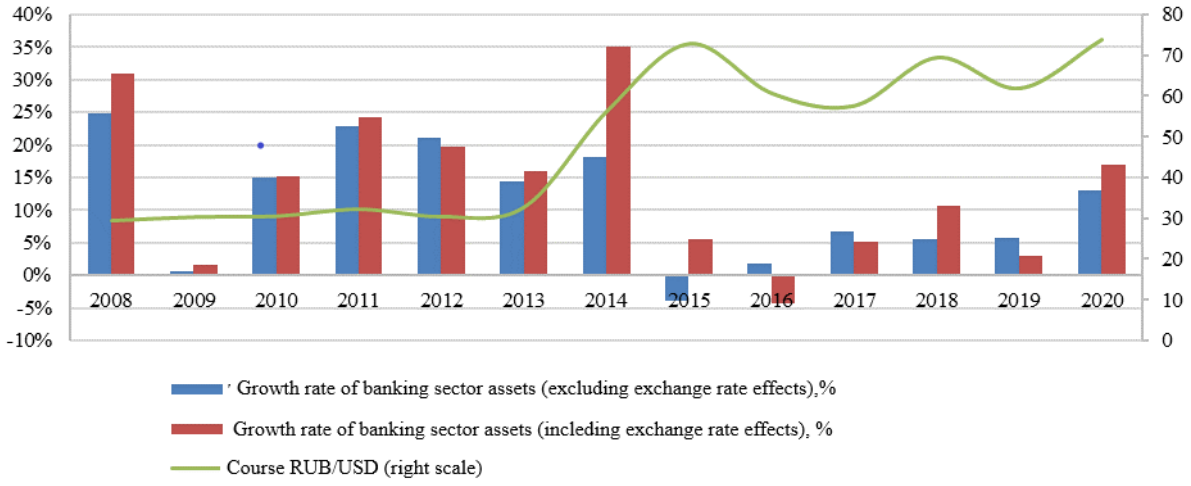

Fig. 1. **Growth rates of the banking sector in the Russian Federation and dynamics of the ruble/US dollar exchange rate for the period from 2008 to 2020**

Source: Data of the Bank of Russia, compiled by the authors.

banks to independently determine, based on statistically sound models, the level of risk of borrowers to calculate capital adequacy standards. Capital adequacy requirements were more stringent than those defined by BCBS requirements. It was proposed that the capital adequacy ratio of base capital should be 5% instead of 4.5% and the capital adequacy ratio of total capital should be 10% instead of 8% (since January 1, 2016, Bank of Russia has changed requirements and synchronized them with BCBS standards). Basel III requirements for the calculation of leverage, short-term liquidity, net stable funding, and the application of additions to capital adequacy standards (counter-cyclical buffer and capital conservation buffer) have been fully implemented in regulatory practice since early 2019.

However, since 2014, despite the general downward trend in inflation and interest rates, the ratio of total assets of the banking sector to GDP has exceeded 80% for the first time and reached a record 97% in 2020 (*fig. 2*).

Interest rate trends in the economy changed in 2021. Inflation and inflationary expectations increased in the context of the post-pandemic recovery. Thus, due to high inflation expectations (annual inflation exceeded 6% in July 2021), the Bank of Russia consistently raised the key rate from 4.25% at the beginning of the year to 5.5% on 11 June 2021, and on 23 July decided to increase it to 6.5%.

Since 2015, when, for the first time since the end of the 2008 financial crisis, a 0.2% reduction in the loan portfolio has been recorded, the banking sector has shown strong growth in the loan portfolio (*fig. 3*). The growth of the total credit portfolio (12.1% in 2020) has been and continues to be driven by the growth of the retail rather than corporate credit portfolio (13.6% in 2020), which is also confirmed by the ratings agency's findings ACRA.[8] Retail lending is driven by three factors:

1. Decline in real disposable cash income.
2. The decline in the cost of loans following the decline in the key rate.
3. Low base effect, as retail lending in the Russian Federation is 1.7 times lower than corporate loans.

Increased demand in the retail-lending segment drives banks to increase their

[8] Российский банковский сектор: прогноз до 2020 года. Слабый спрос на кредиты стимулирует аппетит российских банков к риску. URL: https://www.acra-ratings.ru/upload/iblock/850/61eqni56jhoomg03tpjv4l7gqrv2uqvf.pdf.

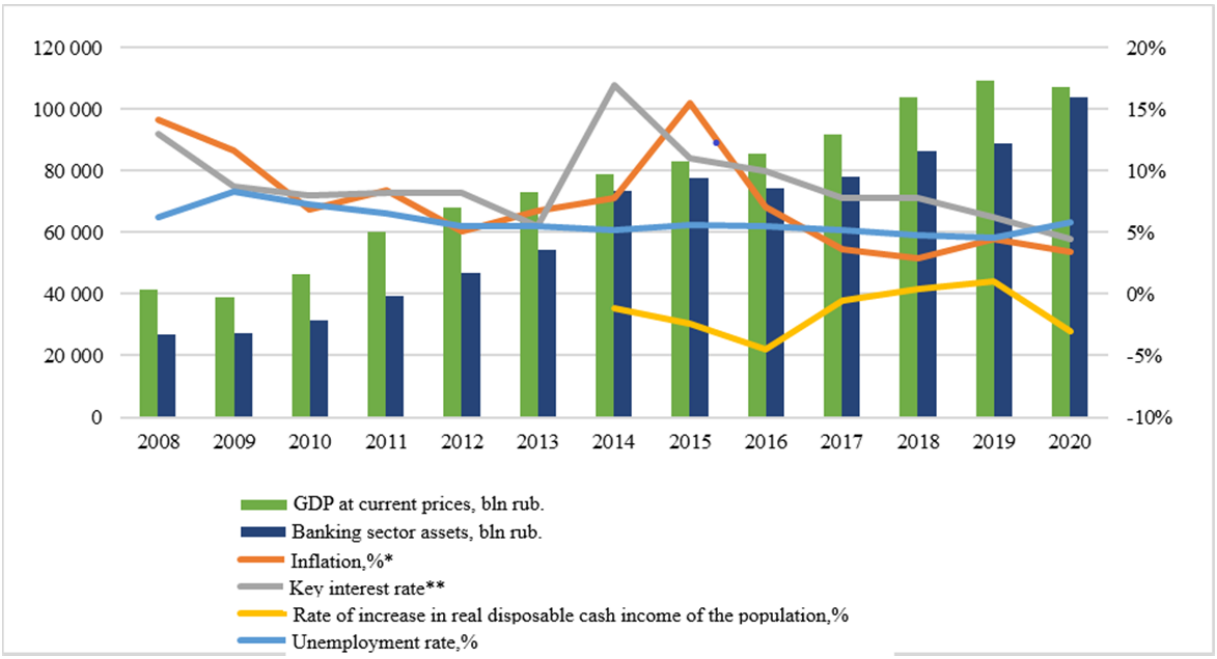

Fig 2. **Overall dynamics of banking sector assets and macro indicators for the period from 2008 to 2020**

Source: Data of the Bank of Russia, compiled by the authors.

Note: * — according to the World Bank; ** — up to 2012 inclusive, the refinancing rate is given.

risk appetite, as evidenced by the constant increase in the cost of risk,[9] which in 2020, it was 2.2%. According to 2021 results, rating agencies expect a risk cost increase of 1.5–1.7% (NCR) or 2.8% (ACRA). [7, 8]

Given the gradual phasing out of the COVID-19 easing in 2020, the ACRA forecast of 2.8% seems realistic.

One of the crisis factors in the development of retail credit other than mortgages is unsecured consumer credit. Thus, according to the Bank of Russia, the volume of unsecured consumer credit in 2020 exceeded 9 trillion rub., which accounts for almost 47% of the retail portfolio.

In order to maintain the quality of the loan portfolio as well as to cool the market, the Bank of Russia gradually increases the retail credit risk premium, and from 1 October 2019, introduced a borrower debt burden indicator to limit lending to highly indebted borrowers and hence to high credit risk.[10]

In terms of the quality of the loan portfolio, there has been a slight decline in the proportion of non-performing loans after 2015 (the proportion of delinquent loans, combined with the appreciation of the dollar and the imposition of sanctions, rose to 7.4 per cent of the total loan portfolio) up to 6.5 per cent in subsequent years. The 6.4% level of arrears in 2020 is due to the introduction of business and citizen support measures in the context of the COVID-19 pandemic. At the same time, the Bank of Russia, analysts, rating agencies expect in 2021 an increase in reserve growth and arrears on loans for which banks took advantage of the preferences in 2020.

In general, despite all the external shocks that occurred during the period under review, the change in approach to calculating capital and the introduction of IFRS 9, the banking sector has shown a steady increase in equity

[9] Показатель Cost of Risk (CoR) рассчитывается как отношение созданных резервов по отчету о прибылях и убытках к среднему за период кредитному портфелю до вычета резервов.

[10] Банк России. Показатель долговой нагрузки. URL: http://www.cbr.ru/finstab/instruments/pti/.

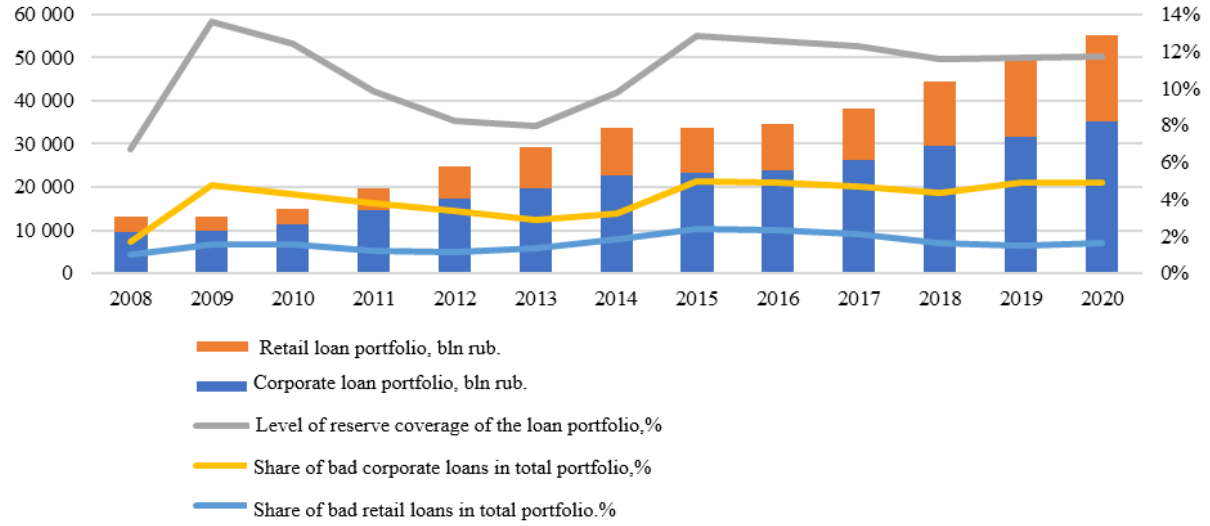

Fig. 3. **Loan portfolio structure and share of overdue loans for the period from 2008 to 2020**

Source: Data of the Bank of Russia, compiled by the authors.

(*fig. 4*).

Since 2018, banks have started to adopt IFRS 9 "Financial Instruments" accounting standard, which has changed the approach to assessing the impairment of loan indebtedness. Two aspects are specific to the IFRS 9 standard. The first involves three asset categories:

- assets measured at fair value through profit or loss;
- assets measured at fair value through other total income;
- assets measured at amortized cost.

The second introduces a model for the valuation of impairment of financial assets based on expected credit losses instead of the previous model for credit losses incurred. The adoption of new standards will generally contribute to the stability of the banking sector by pre-emptive recognition of potential losses, but even in the opinion of the Bank of Russia, IFRS 9 defines the basic criteria for asset classification and estimation of expected losses, where the determination of the specific parameters of the model remains entirely at the discretion of the particular bank. [9] The first full results of the implementation of this standard were reflected in the 2018 IFRS reports of banks. Thus, the introduction mainly led to a decrease in the capital of banks (e.g., VTB — 124 billion rub., or — 8% capital, Rosselhozbank — 83.2 billion rub., or 55% capital, Sberbank — 69,5 billion rub., or — 2% capital, GPB — 26,1 billion rub., or — 4% capital), although there were banks that, on the contrary, were able to release additional capital (for example, the Alpha Bank released some 37.5 billion rub.).

However, the impact on capital from the introduction of IFRS 9 was felt by banks, which are predominantly in the retail-lending segment, given the traditionally high level of defaults among borrowers in this segment. For example, Tinkoff Bank had the greatest impact on capital (9,8 billion rub., or –15% capital), Pochta Bank (–6,3 billion rub., or –20% capital), East bank (–5,4 billion rub., or –23% capital), Bank Russian Standard (–2,8 billion rub., or –13% capital) and MTS Bank (–2,5 billion rub., or –3% capital).

Since the beginning of 2019, IFRS 9 standards have been implemented in Russian accounting standards (RAS), as a result of the results of 2019 and 2020, the banking

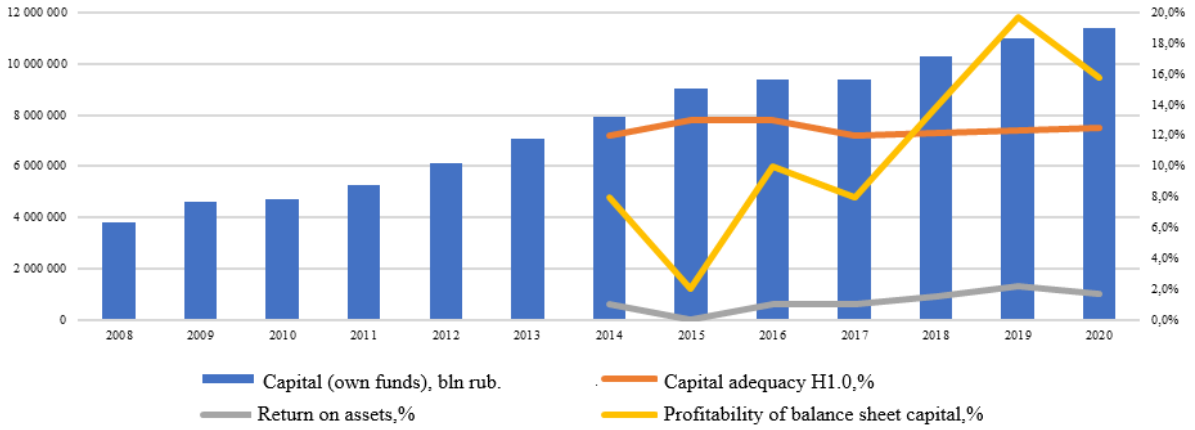

Fig. 4. **Dynamics of the total capital of the banking sector, profitability and total capital adequacy**

Source: Data of the Bank of Russia, compiled by the authors.

sector created an additional 486 billion rub. (8.6% total reserves on loan portfolio) and 395 billion rub. (6.1% total reserves on loan portfolio) reserves, respectively. In general, the downward trend in banks' capital when switching to a model of reflecting expected losses is indicative of increased credit risks in Russia, as well as the existence of significant potentially problematic assets on banks' balance sheets.

Despite an average annual growth rate of 10% in equity (H1.0), capital adequacy remains stable at 12%, owing to the recovery of capital due to asset growth combined with increased risk weights on specific asset groups (e.g., retail lending) (*fig. 4*). Theoretically, the ability of the banking sector to absorb potential losses should be reduced or at best unchanged. However, the synchronization of the Bank of Russia's regulatory requirements with those of BCBS in the area of capital adequacy standards has increased the buffer for the absorption of potential losses in the banking sector by a factor of 1.5–2 times (*table 1*).

At the same time, a 2% reduction in minimum capital adequacy requirements made it possible to double the ability of the banking sector to absorb losses on the loan portfolio.

Historically, rating agencies have assessed the liquidity and funding of the Russian banking sector with some restraint. In its annual Banking Industry Country Risk Assessment (BICRA), international rating agency Standard & Poor's Global Ratings has expressed a clear opinion that "banking sector financing carries with it high risks" (to 2019 "very high risk"), referring to the "large volume of domestic deposits (which account for about 70% of total funding)". It was stated that "deposits are a reliable and stable source of funding for Russian banks".[11] These observations are quite valid, as customer funds have traditionally been the basis of bank sector financing, averaging at least 65% of total liabilities.

In turn, domestic credit rating agencies rarely assess current or forecast positions on liquidity as well as banking sector financing structure, limiting themselves to brief remarks or comments.

The liquidity of the banking sector across the full horizon can be described as satisfactory in view of the maintenance of an optimal level of highly liquid assets to cover

[11] S&P still classifies the FM banking sector as Group 8 by level BICRA. URL: http://www.finmarket.ru/news/5088453.

Table 1

Assessment of the absorption buffer for potential losses of the banking sector

Indicator	2014	2015	2016	2017	2018	2019	2020
Capital (own funds), billion rub.	7928	9009	9387	9397	10269	10981	11413
Minimum H1.0 at date, %	10.0%	10.0%	8.0%	8.0%	8.0%	8.0%	8.0%
Capital required to meet minimum standards	6607	6930	5777	6265	6734	7124	7324
Capital buffer, billion rub.	1321	2079	3610	3132	3535	3857	4090
Capital stock in relation to total portfolio before reserve	3.9%	6.2%	10.4%	8.2%	8.0%	7.8%	7.4%

Source: Data of the Bank of Russia, compiled by the authors.

wholesale funding (despite slight volatility, average coverage is 106% (*table 2*).

It should be noted, however, that the share of highly liquid assets has been declining steadily, with increasing concentration on the funds of clients who are the most stable sources of funding. This is a low-level risk factor for the banking sector, combined with a general decline in interest rates (*fig. 2*). Thus, in 2020, while the key rate was constantly falling, and hence the yield of bank deposits was reduced, transfers from individual deposit accounts to current accounts were recorded (according to the results of 2020 the inflow to the current accounts amounted to 4.1 trillion rubles against outflow from the deposit accounts in the amount of 1.7 trillion rubles.), which substantially adjusted the internal structure of funds of individuals (*table 2*).

It's to be expected, that in 2021, because of the rise in the key rate, banks would adjust the yield of deposits upwards, which in turn would increase the term deposit base. [7] Unfortunately, statistics as at the end of April 2021 show a continued upward trend in current accounts (for 4 months of 2021, the funds in the accounts of natural persons increased by 7%, or 840 billion rub.) and reduction of the deposit base (in the first four months of 2021, fixed-term deposits of individuals decreased by 3%, or 732 billion rub.).

One of the features of the sector's funding in 2020 was a final return to a sustained liquidity deficit, with the economy growing from surplus in 2017. At the same time, the banking sector's projections up to 2020 assumed that it would maintain a surplus in liquidity and remain a net creditor of the Bank of Russia in subsequent periods.[12]

In addition, we would like to mention an absolutely unique situation for the Russian banking sector in terms of currency liquidity. From November 2020 to April 2021 (i.e. 6 months), the banking sector experienced a currency liquidity deficit in terms of the ratio of foreign exchange assets to liabilities. However, the situation deteriorates from month to month (in November 2020, the deficit was 98 billion rub., in April, it was 1 119 billion rub., or 9.8% of the banking sector's capital stock).

Thus, a number of factors that, in 2021, could lead to a deterioration in the financial

[12] Russia's banking sector: forecast to 2020. Weak demand for credit boosts Russian banks' appetite for risk. URL: https://www.acra-ratings.ru/upload/iblock/850/61eqni56jhoomg03tpjv4l7gqrv2uqvf.pdf .

Table 2

Aggregate indicators of liquidity and funding of the Russian banking sector for the period from 2008 to 2020

Indicator	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Ratio of HLA* to assets	28.4%	22.8%	22.6%	27.9%	22.0%	17.6%	16.4%	13.8%	13.0%	14.0%	13.8%	13.8%	13.1%
Coverage of wholesale funding ** HLA	113.9%	134.6%	115.5%	136.6%	116.3%	108.5%	90.9%	102.5%	92.1%	88.8%	90.8%	106.9%	92.5%
Currency gap between assets and liabilities, billion rub.	1077	692	454	733	66	518	789	1183	993	421	288	-32	-622
Funds in the Bank of Russia, billion rub.	297	687	821	770	887	1021	1739	923	1267	2845	2476	1645	1934
Loans from the Bank of Russia, billion rub.	3370	1423	326	1212	2691	4439	9287	5363	2726	2016	2607	2451	3598
Net position to attract regulatory funding, billion rub.	–3073	–737	495	–442	–1804	–3418	–7549	–4440	–1459	828	–132	–807	–1664
Liability diversification (HHI)***	0.20	0.23	0.25	0.25	0.23	0.23	0.21	0.25	0.25	0.26	0.27	0.27	0.26
Share of current accounts of legal persons	41.8%	41.6%	44.8%	39.1%	37.4%	37.7%	30.6%	32.1%	34.9%	33.7%	31.1%	31.8%	35.9%
Share of legal persons deposits	58.2%	58.4%	55.2%	60.9%	62.6%	62.3%	69.4%	67.9%	65.1%	66.3%	68.9%	68.2%	64.1%
Current account share of individuals	14.3%	14.3%	15.5%	17.2%	17.2%	17.2%	15.9%	15.3%	16.9%	19.6%	22.3%	24.8%	35.4%
Share of individuals deposits	85.7%	85.7%	84.5%	82.8%	82.8%	82.8%	84.1%	84.7%	83.1%	80.4%	77.7%	75.2%	64.6%

Source: Data of the Bank of Russia, compiled by the authors.

Notes: * — highly liquid assets are defined as the amount under the items "Cash and cash equivalents", "Funds with the Bank of Russia", "Loans to banks" and "Securities"; ** — wholesale funding is defined as the amount under "Due to banks" and "Debt securities issued"; *** — the Herfindahl-Hirschman Index is calculated for the following grouping of liabilities: "Loans from the Bank of Russia", "Due to banks", "Funds of legal entities", "Funds of individuals", "Other customer funds", "Escrow accounts under Participation ", " Debt securities issued ", " Liabilities on derivative financial instruments for which economic benefits are expected to decrease ", " Other liabilities "and" Balance sheet capital ".

position of banks and the soundness of the banking system should be highlighted:

- non-performing loans gradually mature against a backdrop of declining credit growth. Thus, in 2020 and the first half of 2021, the growth rate of non-performing loans coincided or even exceeded the growth rate of the loan portfolio;
- against the backdrop of another increase in interest rates and a decline in income, credit portfolio growth will be supported only by government programmers;
- currency asset and liability imbalances are on the rise, reaching 9.8% of the banking system's equity by the end of Q1 in 2021, which could result in losses due to negative currency revaluation;
- despite the expectations of the growth of the deposit base as the key rate increases, there is an increase in the current accounts of individuals, which increases the risk of "investors' raiding" on banks under economic stress.

Despite macroeconomic volatility (in particular the events of 2020–2021), the banking sector shows mixed and sometimes contradictory indicators, but, at the end of 2020, the financial situation of the Russian banking sector can be described as stable.

The banking sector had a good stock of equity at the beginning of 2021 to absorb a full depreciation of up to 4 trillion rub., or 4.6% assets. The quality of assets is reasonable, the share of delinquent loans in the loan portfolio is 6.5%, the position on financing and liquidity is adequate.

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ABOUT THE AUTHORS

Ivan I. Belyaev — Dr. Sci. (Technical Sciences), Professor, Head of the Scientific Research Laboratory of Institute of Economic Policy and Economic Security Problems, Financial University, Moscow, Russia
IVIBelyaev@fa.ru

Sergey N Silvestrov — Dr. Sci. (Econ.), Professor, Head of Institute for Economic Policy and Economic Security Problems, Financial University, Moscow, Russia
silvestrsn@gmail.com

Tural S. Gaibov — Cand. Sci. (Econ.), Senior Researcher of Scientific Research Laboratory of Institute of Economic Policy and Economic Security Problems, Financial University, Moscow, Russia
tural-5@mail.ru

Authors' declared contributions:
Belyaev I.I.— development of the general concept of the article.
Silvestrov S.N.— general guidance on writing an article, formulation of conclusions.
Gaibov T.S.— collection of analytical material and definition of the logic of research; assessing the stability of the banking sector based on the consolidated financial statements of IFRS banks; analysis of regulation and implementation of BCBS standards in Russian banking practice; analysis and generalization of the results obtained.

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Self-Employed Finance in the New Russian Economy

T.V. Zhukova[a], **Ya.M. Mirkin**[b]
Primakov National Research Institute of World Economy and International Relations (IMEMO), Russian Academy of Sciences, Moscow, Russia
[a] https://orcid.org/0000-0002-5568-4089; [b] https://orcid.org/0000-0003-2507-9811

ABSTRACT

We based our study on statistical, actuarial, and predictive methods, including the method of moving ages. We assessed qualitatively and quantitatively Russian self-employed. Their potential for participation in pension insurance is assessed using foreign experience. We proposed promising instruments for pensions of self-employed. We concretized the concept of self-employed for the Russian pension system based on international approaches. Their number, gender, age and professional composition and income level are estimated, including international comparison. Further, we predicted the demographic number of self-employed as potential recipients of social pensions. Their income potential for pension insurance is assessed. Finally, we developed recommendations for using the best foreign experience to expand the coverage of self-employed with pension insurance.

Keywords: self-employed finance; self-employed without employees; dependent self-employed; retirement benefits; retirement savings; contributions; income; social pension; pension insurance coverage

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INTRODUCTION

Self-employed finance — a broad category that includes: self-employed income, savings, taxes and benefits, credits, investments, pension accumulations and pension rights. This article focuses on three critical components of finance for the self-employed that determine their place in the new economy. These are the boundaries and structure of the self-employed (including the professional, taking into account the degree of use of new knowledge, information technologies), the income of the self-employed and their pension schemes.

Income generation for the self-employed is characterized by variable size and less dependence and affiliation on occupational groups. The transition to self-employment, even for a short period, reduces the level of future pension coverage. Poverty of older persons is linked to inadequate coverage of self-employed pension insurance.

Self-employment is an important factor guiding the transformation of public finances [1, 2]. OECD (Organisation for Economic Co-operation and Development) classified self-employment as predominantly non-standard forms of employment in 2019 (16.7% of OECD employees in 2019). Including temporary workers (13%) and part-time workers (15%), non-standard forms of employment account for a third of total employment.[1] New classifications of self-employed have emerged:

- *self-employed traditional* (farmers, craftsmen, traders) and *liberal professions* (lawyers, notaries, engineers, architects, doctors, painters, artists, musicians, etc.) [3];
- *self-employed with employees and self-employed without employees* [4, 5]. The growth of the latter increases the innovation of the economy [6, 7], but reduces future pensions, extends the scope of "old" poverty [8]. These self-employed earn less than employed [9]. The following groups are distinguished:
- dependent self-employed — "self-employed without employees who in the last 12 months worked for a single client or had a dominant client and this client determined the number of hours of work for the self-employed".[2] [10];
- *freelancers,* which are *characterized* by professionalism, apply information technologies and manage risks. They are linked to qualitative changes in the labor market [11, 12]. More narrowly defined are *"independent professionals" (I-pros)*, offering only their own labour in the service sector [13];
- *involuntary self-emloyed* excluded from the labour market (displacement factors are often considered in relation to business cycles [14]).

For the categories listed above: separate pension schemes for the self-employed (Luxembourg, Greece, Italy, Japan, Korea, Poland, Turkey); special conditions within occupational schemes for employees (France); compulsory participation for part of the self-employed (Germany); obligation to pay contributions obligation of self-employed large clients to pay contributions for self-employed (Spain, Italy, Portugal, Germany) [1].

In Russia, self-employment research focuses on legalizing [15, 16]. The experts draw conclusions about the insignificant number of self-employed in the economy [17]. It's noted that the concepts of "self-employed" and " independent wokers", "informal employed", "registered self-employed" are often confused [18]. However, for the Russian pension system, the category of self-employed persons without employees of working age with voluntary participation in pension insurance is relevant [16, 18].

[1] OECD (2019), Pensions at a Glance 2019: OECD and G20 Indicators, OECD Publishing, Paris, chapter 2. URL: https://doi.org/10.1787/b6d3dcfc-en.

[2] The main results from the 2017 Labour Force Survey (LFS) ad-hoc module on «Self-employment». Eurostat. Self-employment statistics, 2018. URL: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Self-employment_statistics.

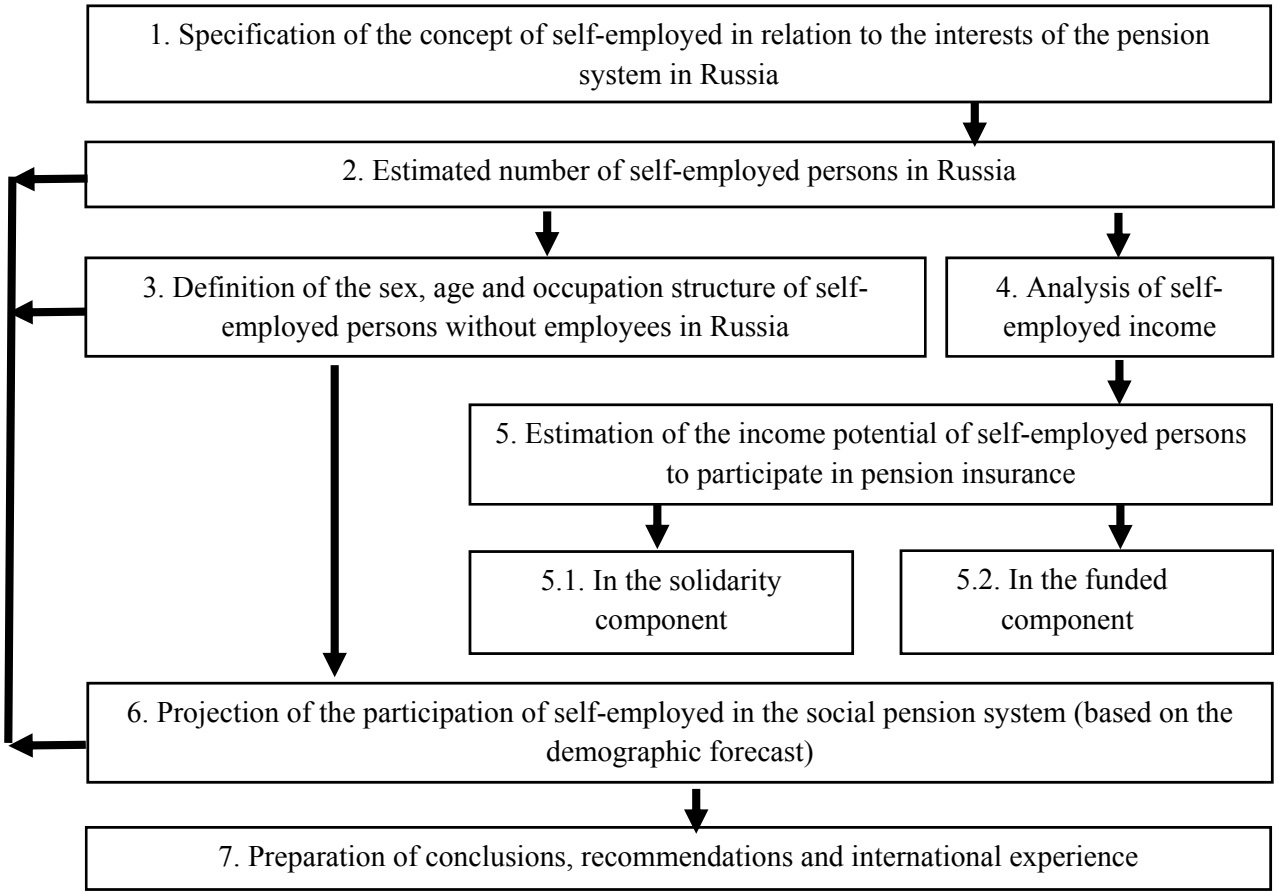

Fig. 1. **Общий алгоритм исследования / General research strategy**

Source: compiled by the authors.

This determines the wide range of estimates of the number of self-employed in Russia: from **16–17 million** (2019[3]) to **2 million people** (professional income tax payers as at 23 March 2021[4]). According to OECD, Russia had one of the lowest rates of self-employment (independent workers) — 6.7% of the employed population in 2019 (OECD average — 14.1%[5]).

The Russian authors note that it is impossible to resolve questions relating to self employed pensions without a comprehensive reform of the pension system and the harmonization of pension rights and State obligations [18, 19]. Otherwise, extending the coverage of the self-employed through the State Compulsory Pension System (CPS) will reduce the average amount of the insurance pension [19].

There is another position — it's important to extend pension insurance coverage to as many self-employed persons as possible, in order to reduce the burden on the State budget in the form of social pension payments to self-employed categories, whose number will only increase.

The problem of self-employed finance — low incomes [1], making their participation in both solidarity and funded pension schemes futile. Taking into account

[3] RANEPA Social Survey: in Russia about 17 million self-employed — a quarter of the working population. URL: https://social.ranepa.ru/novosti/item/socopros-ranhigs-v-rossii-okolo-17-mln-samozanyatyh-chetvert-ot-rabotayushhego-naseleniya.

[4] Information from the Federal Tax Service dated 23.03.2021. "Two million self-employed persons registered in Russia". URL: https://www.nalog.ru/rn77/news/activities_fts/10747467/.

[5] OECD (2020), Self-employment rate (indicator). DOI: 10.1787/fb58715e-en

international experience, it can be concluded that for Russia there may be alternative ways of organizing pension insurance for self-employed within the framework of quasi-mandatory models with partial coverage of certain categories [1]. However, the specification of their application in prospective mechanisms is based on knowledge of the number and structure of the self-employed, their income potential.

The slow adaptation to the new tasks of the statistical apparatus explains the lack of macroeconomic research on the finance of the self-employed. This article defines the objectives of a comprehensive qualitative and quantitative analysis of the self-employed for the benefit of the pension system, estimation of their income potential, preparation of recommendations for the organization of pensions for the self-employed, taking into account international practice.

MATERIALS AND TECHNIQUES

To solve the problems the complex method is applied in the composition of: specification of the concept of "self-employed"; statistical estimates of the number, structure and income of self-employed; actuarial valuation of their participation in pension insurance; demographic projection of the number of self-employed persons to estimate future social pension payments (*fig. 1*).

(1) Specification of the concept of "self-employed": recommendations of the International Labor Organization (ILO)[6]; approaches in OECD and Eurostat statistics; mechanisms for legalizing self-employment in Russia: providing services for personal, household and (or) related needs[7]; professional income tax payers; private practitioners.[8]

(2) Estimated number of self-employed persons in Russia: Quantitative analysis with combined use: sample microdata from the Rosstat labor force survey (LFS Rosstat)[9]; microdata from the Russia Longitudinal Monitoring Survey (RLMS).[10] The estimation algorithm is shown in *fig. 2*.

(3) Determination of the sex, age and professional structure of the selected group of self-employed persons, motivation for self-employment:

- for the sex, age and professional structure: Rosstat microdata, sample of self-employed according to the working definition (*Table 3*), their distribution among 39 sub-groups by OKZ 2014[11] as part of:

freelancers: intellectuals with a wide range of clients, skills and knowledge (including information and knowledge-intensive technologies);

technology specialist: intellectuals with intermediate specialized qualifications with professional knowledge (including technology, processes);

operational specialist: workers trained in the use of professional appliances, machines, tools and equipment;

manual workers, unskilled manual labour.

- to assess the motivation of the self-employed: microdata of RLMS (*fig. 3*).

[6] Resolution on statistics of employment in the informal sector adopted by the 15th International Conference of Labor Statisticians (Geneva, 1993). Recommendations on the statistical definition of informal employment of the Seventeenth International Conference of Labor Market Statisticians (Geneva, 2003).

[7] art. 23 Civil Code of the Russian Federation, p. 7.3 art. 87, p. 70 art. 217 Fiscal Code of the Russian Federation.

[8] art. 227 p. 1, subp. 2; art. 227.1, p. 1, subp. 2; art. 346.12, p. 3, subp. 10; art. 419, p. 1, subp. 2; art. 422, p. 1, subp. 2; art. 430 p. 4, subp. 2; art. 432, p. 5.

[9] Rosstat microdatabase. URL: https://www.gks.ru/labour_force.

[10] The survey is carried out by the Research Centre "Demoscope" together with the Institute of Sociology RAS, Institute of Nutrition of the Russian Academy of Medical Sciences (to 2006), HSE University and University of North Carolina at Chapel Hill (USAOngoing funding for the project is provided by HSE University. Project description. URL: https://www.hse.ru/rlms/project.

[11] OKZ — All-Russian Classification of Occupations.

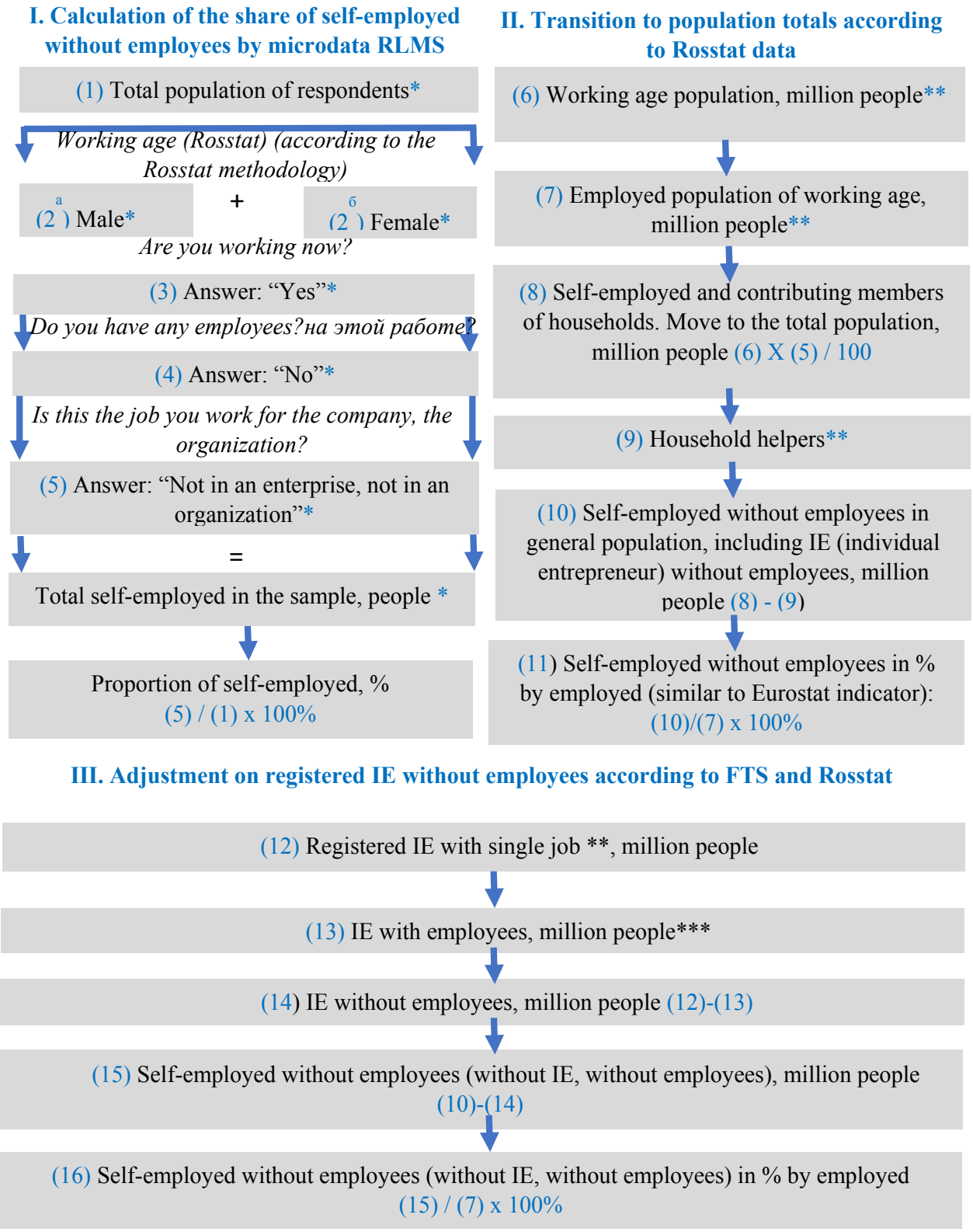

Fig. 2. **Quantitative estimation algorithm**

Note: * – microdata RLMS; ** – OCR – microdata of Rosstat; *** – FTS data: the number of individual entrepreneurs working with cash registers is assumed to equal the number of entrepreneurs with employees [individual entrepreneurs without employees received a deferral to install such devices until 06/01/2021 (129-ФЗ dated 06/06/2019)].

Source: compiled by the authors.

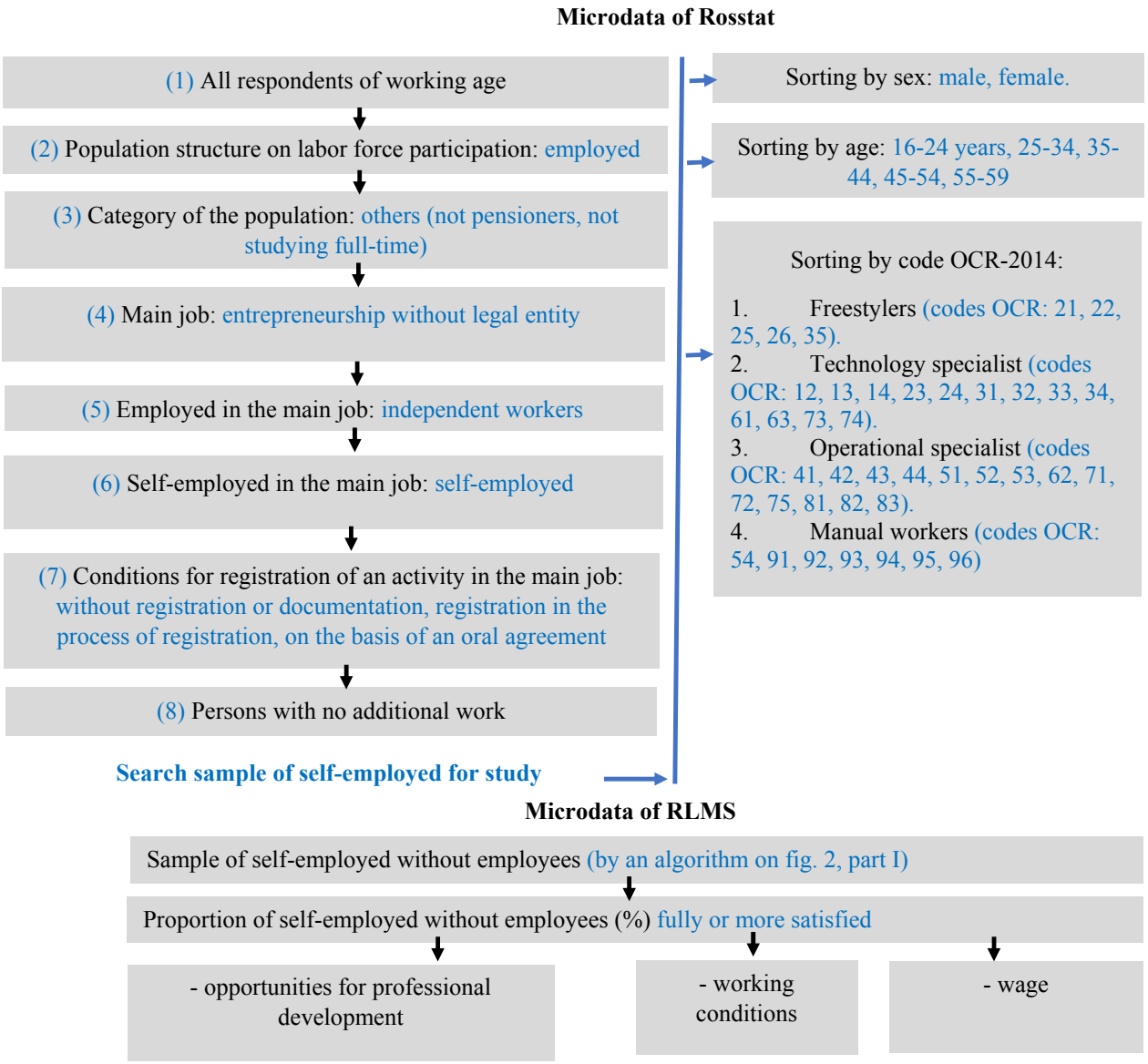

Fig. 3. **Structural analysis algorithm**

Source: compiled by the authors.

(4) Analysis of self-employed income: direct method of estimation from microdata of RLMS. Sample of self-employed — by these criteria (*fig. 2*). Distribution (%) — monthly income reported by respondents.

(5) Estimation of income potential of the self-employed

(5.1) In the solidarity component: the calculation of an insurance pension for a self-employed person who voluntarily entered into a legal relationship under compulsory pension insurance is modelled (CPI) under the following conditions: continuous payment of a fixed minimum amount of contributions,[12] minimum contribution period (from 2025–15 years) and sum of individual factors (from 2025 г.— 30 years) (*fig. 4*).

(5.2) In the cumulative component: the developed **actuarial model** determines

[12] If the amount paid is less than the minimum length of service, a smaller period is counted (proportional to the contributions paid).

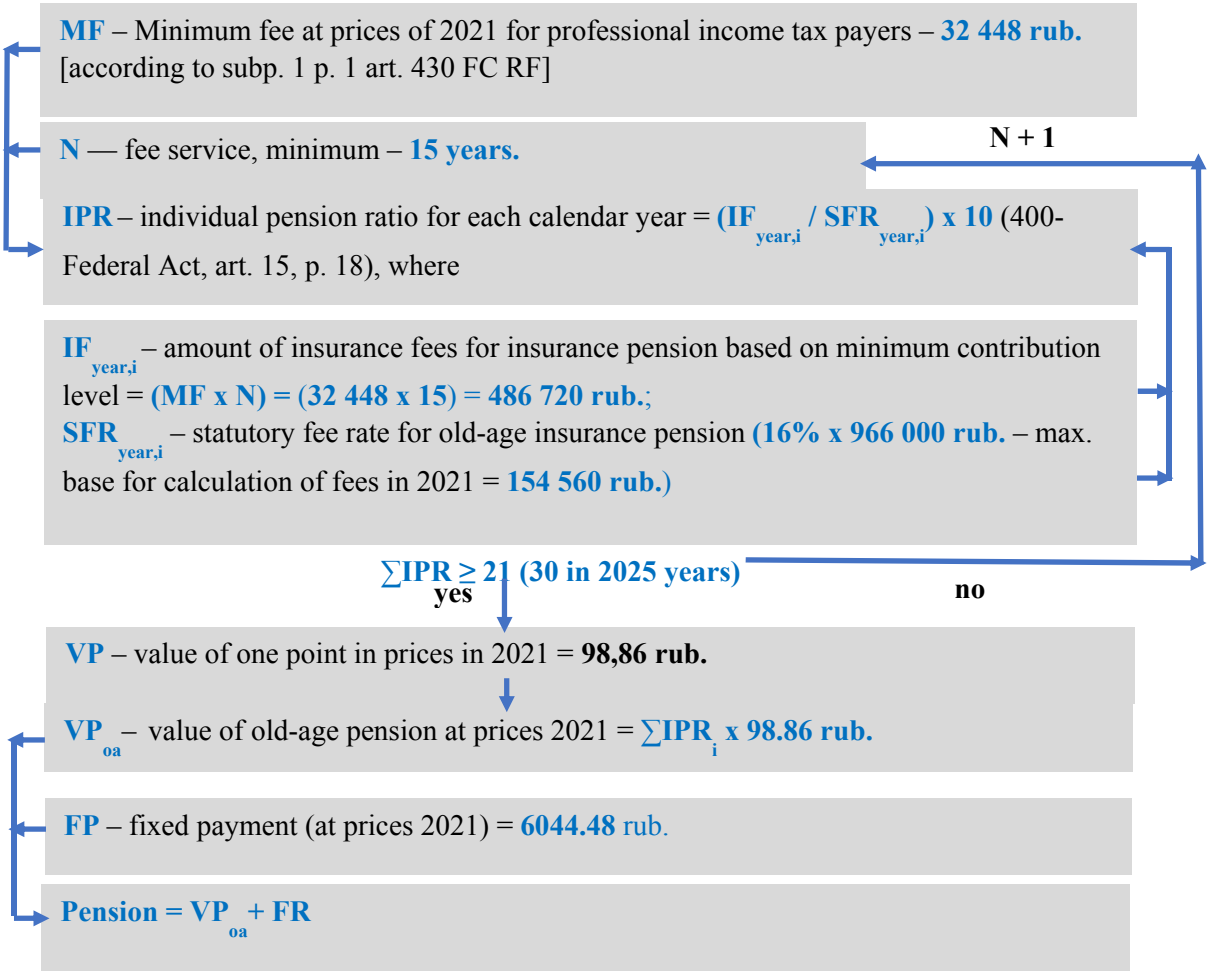

Fig. 4. **Calculating algorithm for the self-employed old-age insurance pension**

Source: compiled by the authors.

the amount of the cumulative pension, which would be determined by the self-employed person of the relevant age, income, size of contributions, period of regular payment up to 55 years (female), 60 years (male).

Model assumptions:

1. Simulated for early 2020 and projection period 2021–2061, excluding structural changes in self-employment.

2. The retirement age is 55 for women and 60 for men (similar to the current contributory system).

3. The amount of pension accrual depends on the amount of contributions for each individual with direct accrual of investment income in the individual account.

4. Assumes stability and continuity of contributions for the self-employed up to retirement age. Income is indexed to the projected rate of inflation and real income growth. Model parameters are presented in *table 1*.

The calculated amount of the old-age insurance pension (5.1) and the cumulative pension (5.2) is compared with the projected value of the social pension, [indexation to the inflation forecast, discounting on the investment rate of pension savings for 5 years (for insurance pension) and 10 years (for cumulative pension) (*table 1*), on reaching the age of retirement (70 years — for male and 65 years — female)].

(6) Forecast of the participation of self-employed persons in the system of

Table 1

Actuarial model parameters

Model variation parameters:	Constant model parameters:
– Investment strategy volatility; – Investment returns for actuarial calculations; – Average monthly income in rub. per month (with annual increase by projected growth rates of real wages and inflation); – Contribution rate (as a% of income); – Co-financing of the State, as a% of the fee; – Projected average social pension 2022–2061 (indexation of pension to forecast inflation (Ministry of Economic Development forecast followed by extrapolation to 2036), discounted for 10 years at risk-free rate	– official MED projections of inflation and real income growth according to the long-term socio-economic development baseline scenario of the MED of the Russian Federation to 2036r, extrapolated to 2063; – sex and age structure of the self-employed at the beginning of 2019, assumed to be unchanged; – Number of years remaining before retirement, i.e. the difference between the self-employed at the beginning of 2019 and the retirement age of the contributory pension (55 for female and 60 for male); – expected period of contributory pension – in art. 3, 424-Federal Act.

Source: compiled by the authors.

social pensions: based on the demographic projection, the annual number of self-employed persons is projected by the movement of ages method, hence of the age structure established in 2019, to the age of receipt of a social pension.

(7) Preparation of conclusions and recommendations: Analysis of the possibilities of applying foreign experience in pension provision to Russian self-employed, selection of advanced instruments and mechanisms.

RESULTS AND DISCUSSIONS

(1) According to the International Labour Organization (ILO), self-employed are independent workers who working in the informal sector on an individual basis without a permanent employer or permanent employees.[13] Self-employed are classified as belonging to informal sector and informal employment (non-registered, non-contributory).[14] Households are included into them.

For Eurostat, self-employed are "owners of unincorporated enterprises that do not combine this activity with that of an employee. They include: helping family members in their own business belonging to one of the relatives, engaged in production for own consumption, both individually and jointly".[15]

The concept of "self-employed" in Russia is shaped by the legalization of their activities as a group of persons not in informal employment with voluntary participation in pension insurance.

The result is a **working definition of self-employed for the Russian pension system:** self-employed individuals of working age in the labour force, those who work for remuneration in their main and only jobs for themselves (with or without civil contracts) in the business sphere, without employees outside the corporate sector. They do not include: persons who combine self-employment with other forms of employment; IE (pay taxes, insurance contributions); households.

[13] Resolution on statistics of employment in the informal sector adopted by the 15th International Conference of Labour Statisticians (Geneva, 1993).

[14] Recommendations for a statistical definition of informal employment 17 of the International Conference of Labour Market Statisticians (Geneva, 2003).

[15] Eurostat Glossary: Self-Employed. URL: (https://ec.europa.eu/eurostat/statistics-explained/index. php/Glossary: Self-employed#:~: text=A%20self%2Demployed%20person%20is, are%20considered%20to%20be%20employees).

Table 2

The number of the self-employed combined calculation method

	I. Calculation of the share of self-employed without employees by microdata RLMS	
1	Working-age (man + woman), %	100.0
2	Proportion of self-employed persons in the working-age population, %	5.1
	II. Transition to population totals according to Rosstat data	
3	Working-age population, million people	82.9
4	Self-employed without employees and contributing members of households with a transition to the total population, million people	4.2
5	Contributing members of households, million people	0.3
6	Total self-employed without employees, including IE, million people	3.9
7	Employed population of working age, million people	64.9
8	Self-employed without employees in % from the employed (Eurostat)	6.0
	III. Adjustment for inclusion of registered IE without employees	
9	Registered IE with main single job**, million people among them	2.0
10	IE with employees, million people***	1.0
11	IE without employees, million people	1.0
12	Self-employed without employees (without IE), million people	2.9
13	Self-employed without employees (without IE) in % from the employed	4.5

Note: * – microdata RLMS; ** – OCR microdata of Rosstat; *** – FTS data: the number of individual entrepreneurs working with cash registers are assumed to equal the number of entrepreneurs with employees workers [individual entrepreneurs without employees received a deferral to install such devices until 06/01/2021 (129-ФЗ dated 06/06/2019)].
Source: Quantification Algorithm (see *fig. 2*).

Table 3

Distribution of working-age self-employed without employees by age and sex groups

Age, years	Man, %	Women, %	Man+Women, %
16–24	7.2	10.7	7.9
25–34	31.8	41	34.2
35–44	30.7	28.1	29.8
45–54	22.5	20.4	21.8
55–59	8.2	-	5.9
Total	100	100	100
All	72	28	100

Source: Rosstat LFS microdata, 2019.

Table 4

Working-age self-employed professional groups

№ professional sub-group on OCR-2014. Types of self-employed professions	%
1 — Freelancers	
26. Legal consultants, writers, journalists and linguists, etc..	2.3
25. Software, web and multimedia applications developers, database designers, etc.	1.2
21. Physicists, chemists, mathematicians (including actuaries), electrical engineers, architects, planners, designers, etc.	0.9
35. Technicians in ICT operations, ICT user support, computer networks and systems, etc.	0.5
22. Specialists in medical care, veterinary doctors, etc.	0.2
Total for group 1	5.1
2 — Technology specialist	
13, 14. Managers of business, personal subsidiary, etc.	4.4
61. Gardeners, landscape designers, zoo technicians, etc.	3.3
31. Electrical, electronic, mechanical, etc.	1.9
34. Sports workers, personal coaches, etc.	1.4
73. Tuners and restorers of musical instruments, jewelers, engaged in art crafts, etc.	1.3
23. Tutor teachers	1.2
33. Accountants, credit and insurance agents, brokers, etc.	1.1
74. Electronic equipment installers and repairers, etc.	1.1
12. Consultants in finance and accounting	1.1
63. Professional assistants in personal support farms	0.7
24. Financial analysts, appraisers, marketers, etc.	0.7
32. Family planning consultants, nutritionists, etc.	0.4
Total for group 2	18.6
3 — Operational specialist	
71. Builders, masons, carpenters and joiners, etc.	22.3
83. Private owners of automobiles, buses, working trucks and loading car, hinged power equipment, etc.	17.7
52. Traders, not registered as EI	9.0
51. Cooks, hairdressers, cosmetologists, domestic helpers and etc.	8.6
72. Welders, plumbers, fixers, mechanics, etc.	5.4
75. Seamstresses, shoemakers, woodworkers, etc.	3.7
81. Operators of machines for production of photographic, textile, fur and leather products, for processing of food products etc.	0.6
62. Hunters, fishermen	0.6
53. Child care workers, home care workers	0.5
82. Machinists — assemblers of machines, equipment etc.	0.3
41. Keyboard operators, text typers, etc.	0.2
43. Assistants in materials and transport inventory, etc.	0.04
42. Call-centre type employees	0.03
44. Hawkers and mail sorters, proofreaders etc.	0.02
Total for group 3	69.0
4 — Manual workers	
93. Collectors, recyclers and sorters of garbage, cleaners, etc.	3.0
92,96. Ancillary workers in construction, agriculture	4.0
91. Cleaners and servants in houses, apartment cleaners, house cleaners	0.2
54. Watchmen, guards for individuals, small businesses	0.07
94. Kitchen assistants, food manufacturers	0.05
95. Salesmen, car washers, valets, etc.	0.04
Total for group 4	7.2

Source: Microdata from the LFS of Rosstat at the beginning of 2019, classifier OKZ-2014.

Table 5

Working-age self-employed without employees by income groups (after taxes and contributions)

Income range, rub. per month	Share,%	Average income rub. per month
Up to 10 thous. rub.	10.6	7844.1
From 11 to 20 thous. rub.	37.6	16741.3
From 21 to 30 thous. rub.	28.3	26889.0
From 31 to 40 thous. rub.	8.1	37307.7
From 41 to 50 thous. rub.	4.7	48533.3
From 51 to 60 thous. rub.	1.2	57750.0
From 61 to 70 thous. rub.	0.9	67000.0
From 71 to 90 thous. rub.	0.9	76666.7
From 91 to 100 thous. rub.	0.3	100000.0
More than 100 thous. rub.	1.2	142500.0
Non-response	6.2	-
Total	100	-
Weighted average	-	25623.4

Source: RLMS microdata base, 27th wave.

(2) The current number of **self-employed persons of working age in Russia** (as defined above) at the beginning of 2019 is estimated at **3 million people.** This represents 4.5% of all employed persons of working age (*table 2*).

The number of 3 million includes registered and unregistered self-employed persons of working age, non-IE. This is an unstable value. The composition and number of self-employed persons vary from period to period (including through the influx of employees registered by the IE), depending on the relative attractiveness of the tax benefits granted, the economic situation.

Using the (by comparison) approach of Eurostat, the number of self-employed in 2019 in Russia can be defined as 3.9 million people working age or **6.0%** employed population of working age. This is lower than in EU countries (in 2019–9.6%).[16]

(3) Sex, age and professional composition of the self-employed Russia and the EU are different. In Russia self-employment without employees — more "young" and with less participation of women. At the beginning of 2019, there were 75.4% of self-employed persons aged 25–49 and 62% in the EU.[17]

[16] Eurostat data. URL: https://ec.europa.eu/eurostat/databrowser/view/tqoe4a3/default/table?lang=en.

[17] The main results from the 2017 Labour Force Survey (LFS) ad-hoc module on «Self-employment». Eurostat. Self-employment statistics, 2018. URL: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Self-employment_statistics .

Table 6

Testing results of the actuarial model, man (selected information)

Monthly income	40 000 rub.		60 000 rub.		80 000 rub.	
Investment return, % annual / fee, %	% self-employed persons with a retirement pension > social	age, years	% self-employed persons with a retirement pension > social	age, years	% self-employed persons with a retirement pension > social	age, years
Without government co-financing						
5 / 3	0.0	0.0	3.4	16–22	14.5	16–27
5 / 6	14.5	16–27	41.7	16–35	58.4	16–40
10 / 3	0.0	0.0	3.4	16–23	14.5	16–27
With government co-financing (50% of fee)						
5 / 3	3.4	16–22	25.4	16–30	41.7	16–35
5 / 6	41.7	16–35	63.7	16–42	74.4	16–46
10 / 3	1.9	16–22	25.4	16–30	41.7	16–35

Source: compiled by the authors.

Proportion of self-employed women — 28% (*table 3*), in Europe in 2019–35%; in countries — 26–49%.[18] In Russia, in a group close to I-pros — 46%[19] women, as in the EU.[20]

In Russia, a low share of freelancers **— 5%** of self-employed persons without employees, in the EU — 47%.[21] Fewer technological specialist using professional knowledge of technology — 18.6%. $^{2}/_{3}$ **self-employed** — operational specialist (69%) *(table 4)*.

Core of Russian self-employment — construction workers (**22.3%** against **14%** in EU[22]), and drivers and sellers **(35.6%)** *(table 4)*. That is, the offer of standard works or services is distributed.

Less skilled manual workers account for 7.2% (*table 4*) with a lower share of self-employed workers in agriculture, forestry, fisheries — 5.6% (16.7% — in EU[23]).

Self-employment in Russia is **largely forced**. Satisfaction with conditions of work in 2019 was reported by 62% of the self-employed with no wage earners and by income level in total 35%. Slightly higher percentage of people with positive views on career opportunities — 41%. Eurostat estimated the rate of satisfaction of the self-employed in 82%.[24]

[18] Eurostat data (https://ec.europa.eu/eurostat/statistics-explained/images/1/16/Shares_of_men_and_women_among_self-employed_with_and_without_employees%2C_aged_15–74%2C 2019_%28%25_of_total_self-employed_ with_and_without_employees%29.png)/.

[19] Joint remote exchange research FL.ru and HSE University based on surveys of 2 410 working freelancers. HSE University. Research Project "Freelance Census: Monitoring the Russian Language Remote Work Market (2009–2019)". Noted that in 2009 there were twice as many men as women. URL: https://www.hse.ru/org/projects/275856215.

[20] The main results from the 2017 Labour Force Survey (LFS) ad-hoc module on «Self-employment». Eurostat. Self-employment statistics, 2018. URL: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Self-employment _statistics .

[21] Freelancing in Europe. 2018 Survey. EFIP. Malta, 2018. URL: https://news.malt.com/wp-content/uploads/ 2018/ 10/EFS-2018-Infographics.pdf .

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[23] The main results from the 2017 Labor Force Survey (LFS) ad-hoc module on «Self-employment». Eurostat. Self-employment statistics, 2018. URL: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Self-employment_statistics .

[24] See ibid.

(4) Income of self-employed persons in Russia is lower than in OECD countries. The average income of the self-employed without employees at the beginning of 2019 (after taxes and contributions) was 25 600 rub. per month (*table 5*). **64%** of the average wage of employees (in OECD countries in 2019–8**4%** [6]). 85% self-employed received a monthly income less than 40 000 rub., 1,5% — more 90 000 rub. (*table 5*).

Most profitable industries — information technology, finance (average wage — 59 thius. rub. per month) — presented 2.2% self-employed.[25]

The working conditions of the self-employed in Russia are different: irregular working hours (49% — 8 hours per day, 19% — 10 hours, 15% — 12 hours[26]), income inequality and volatility in prifessional groups [20].

(5) Russian self-employed persons are not motivated to participate in pension insurance.

(5.1) With a minimum contribution level for 15 years, the self-employed will receive 31.5 points, equivalent to 3 114.1 rubles. With a fixed amount — 9 158.6 rub. (*fig. 4*).[27] Average social pension in 2021 (from 1 April) — 10 200 rub. Thus, even with a social pension five years later, a self-employed person would have a comparable pension income without having to save for a future pension.

A. K. Solovyov presented similar conclusions on the insufficiency of the fixed payment for the insurance pension in the amount of one subsistence minimum of a pensioner (SMP). Self-employed person would need 121 years to complete 2.5 SMP.[28] [21]

(5.2) Funded schemes, even with regular contributions from 16 to 20 years of age at the rate (3 per cent) from 40 000 rub. to retirement age, will not provide a pension greater than the social pension, indexed and developed at the time of receipt of the funded pension (*table 1*) no potential participant (*table 6*). The increase in the contribution rate from 3% to 6% makes it interesting to create pension savings for 11.7% of the total number of self-employed persons aged 16–27 (man). Persons over 40 can only be covered by the cumulative insurance scheme if their income has doubled (*table 6*).

Co-financing by the State of 50% of the contribution makes it appropriate to participate in the funded pension insurance for all persons from 16 to 22 years of age with income 40 000 rub. per month. With regular contributions up to 59 years of age, they will receive a cumulative pension more social.

(6) 3 million self-employed persons without employees — is **4.5%** employee and **2.7%** individual personal accounts maintained by the PFR (Pension Fund of the Russia) (no pensioners).[29]

The number of self-employed persons reaching the age of social pension is projected to increase from 63 thous. in 2030 to 1.3 million by 2055. By 2040, the social pension

[25] Calculations based on microdata RLMS, 27th wave. Sample of self-employed without employees (*table 3*). Question from the questionnaire: "How much money have you received in the last 30 days at your main job after deduction? If you received all or part of the money in foreign currency, transfer everything to rubles and name the total amount".

[26] Calculations based on microdata RLMS, 27th wave. Sample of self-employed without employees (*table 3*). Question from the questionnaire: "How many hours and minutes on average do you continue your normal working day in this job?".

[27] If the amount of the insurance pension, taking into account other amounts of material security, is less than the amount of the pensioner's subsistence minimum established in the region or in Russia (detailed calculation is set 178-Federal Act, art. 12.1), social pension supplement is provided. In 2021, the subsistence minimum for a Russian pensioner was 10 022 rub.

[28] Calculated according to conditions 2019.

[29] At the beginning of 2019: 3 million — estimated number of self-employed without employees, 155.3 million — total number of individual personal accounts, 43.9 million — number of pensioners (Open data PFR. URL: http://www.pfrf.ru/opendata/).

Table 7

The number of the self-employed without employees at retirement age for a social pension forecast

Year	Man. 70 years and over, thous. people		Woman. 65 years and over, thous. people		Man + Woman, thous. people		Social pension, thous. rub. per month	Social pension payments, bln. rub.
	Without mx*	With mx*	Without mx*	With mx*	Without mx*	With mx*	F**	F**
1	2	3	4	5	6	7	9	11
2030	35.2	29.2	35.2	33.4	70.4	62.6	14.38	10.8
2035	220.4	137.2	220.4	188.1	440.8	325.3	17.50	68.3
2040	473.2	228.2	473.2	390.1	946.3	618.3	21.29	158.0
2045	753.2	279.6	753.2	596.9	1506.5	876.5	25.90	272.4
2050	1082.8	318.7	1082.8	792.1	2165.6	1 110.8	31.51	420.0
2055	1466.0	351.4	1466.0	932.5	2931.9	1 284.0	38.34	590.7

Note: mx — mortality rate; F-forecast.
Sources:
Columns 2, 4 — таb. 2.3.
Columns 3, 5 — the number of self-employed people corresponding to age, adjusted for the mortality rate by the age-shifting method (The Human Mortality Database, Russia, 2014. URL: https://www.mortality.org/cgi-bin/hmd/country.php?cntr=RUS&level= one).
Column 6: Column 2 + Column 4. Column 7: Column 3 + Column 5.
Column 8 — open data of the FIU.
Column 9 — forecast of social pension, base — 2021, 2022 and further — indexation to the inflation index projected by the Ministry of Economic Development with subsequent extrapolation (Forecast of socio-economic development until 2036).
Column 10 — (column 8 × column 7) / 1000 (in billion rubles).
Column 11 — (column 9 × column 7) / 1000 (in billion rubles).

for the self-employed will amount to an additional 50% for all social pensions in 2019.[30] (*table 7*).

CONCLUSIONS AND RECOMMENDATIONS

For the Russian pension system, self-employed persons without employees of working age are significant. When their quantitative estimates are similar to those of other countries, differences are found in structural characteristics: forced, low percentage of freelancers — 5% (in EU — 47%); less women, younger self-employed; low incomes [64% of average wage earners (in OECD — 84%)].

All this with the guarantee of a social pension (which is quite large) renders the participation of the self-employed in both the insurance and the funded pension system without prospects.

In international practice, 3 approaches to self-employed pension schemes have been identified [1]:

- compulsory participation of the self-employed in the public CPI system, together with and on equal terms with employees;
- the same, but on concessional terms;
- voluntary participation of self-employed persons in various pension schemes.

Russia has not yet implemented any of these approaches.

International experience has shown that the compulsory participation of the self-employed is effective at income levels beyond that of wage earners. Inclusion of low-income

[30] According data by PFR, in 2019, the number of recipients of social pensions amounted to 3.2 million people, the average amount of social pension — 9.3 thous. rub. per month, expenditure on social pensions — 357 bln. rub. a year.

self-employed persons in general distribution schemes reduces average pension [1].

The provision of benefits in general schemes (reduced tariffs, tax deductions, exemption from fees, etc.) does not significantly improve the coverage of self-employed persons. Nor it is confirmed (at low incomes) that the success of differentiating the architecture of pension systems at the expense of multiple private and occupational pension schemes has been achieved.

There has been a gradual phasing out of special pension schemes by occupation (farmers, artisans, traders, liberal professions); differentiation of insurance rates and contributions according to various criteria (income, age, length of service, etc.) [1].

Solution for Russia — **recognizing that there is no alternative to voluntary pension insurance for self-employed persons**; to create a **base for increasing payments** as welfare increases and the legalization of the self-employed. Because of the above analysis and taking into account established international practice, the following promising instruments and mechanisms for involving the self-employed in pension insurance can be identified:

1. **Careful application of mandatory elements and targeted inclusion of selected prospective categories**:

• obligation of a person in any employment status to participate in a pension insurance scheme of choice.[31] That all — free entry and exit, with the possibility of paying contributions either independently or by third parties; with the right to choose — under which pension scheme to retire, with the possibility of converting one pension scheme to another;

• orientation of the private funded pension scheme towards the interests of the younger generation, actively using information technologies and willing (according to numerous surveys) to form pension savings with relative freedom of disposal, with the use of mobile financial technologies for obtaining information and managing pension accounts (choice of trustee, pension fund, change of pension plan, choice of tariff, management of part of savings etc.).

2. **The principle of expanding the status of participants** in pension insurance is important. Should not be limited to a narrow group of registered self-employed.[32] Both self-employed and near-self-employed persons not covered by pension insurance are considered.[33]

3. In Russia, **more incentives are provided by forms of State support (savings schemes)**. That's:

• state guarantees to protect 100% of savings (possibly with a guarantee of 1–2% of investment returns) to make the savings scheme more attractive than guarantees on bank deposits within a bank for the duration of the contract;

• co-financing by the State of a part of the fee (possibly with a limit on the maximum amount).

The latter instrument is highly cost-effective, given the potential reduction in the cost of future social pensions. Actuarial model calculations for the group of men *(table 6)* shows, that, with co-financing from the State, 1.5 out of 3% of the contribution at income 40 000 rubles self-employed men, with the established gender and age structure of self-employment, will earn 5 rubles for co-financing costs savings on social pension payments (adjusted to present value).

[31] For example, employees, registered sole proprietors, private practices after changing status to self-employment will be obliged to make a choice: a CPS or a voluntary funded scheme.

[32] Current regularization schemes do not cover all self-employed occupations.

[33] Close to self-employed insured persons are persons employed in the household (homemakers), students, volunteers (if willing to pay fees by other family members), unsigned employees (informal workers), persons engaged in household production for sale, helping family members in their own business belonging to one of the relatives.

It is possible to grant the right to form a cumulative pension on the basis of full (conditionally "1.5% + 1.5%") or partial (conditionally "1% + 0.5%") schemes.

It is possible to establish State participation not from the first year but, for example, from the fifth year (for the full scheme) or from the tenth year (for the partial scheme). Another option is State participation for the first 5–10 years.

4. Each country involves the self-employed in pension systems by **designing specific products**. All countries create resources for citizens to understand the prospects of participating in the programme: information platforms, online calculators, visualization tools (infographics, brochures, multiplied videos, etc.). This enables the self-employed to understand all the nuances and risks of participation in pension schemes, without "going deep" in financial knowledge. Similar ideas in the part of creation of "calculator of pension rights" for the self-employed are contained in the works of A.K. Solovyev. [21]

5. The interaction of information systems, databases of Bank of Russia, PFR and pension funds, creation of central pension administrator, client big data, increase of operational ability (models, actuarial calculations, forecasts) is very important.

6. The following mechanisms are promising in pensions for self-employed persons (from international practice [1]):

- minimum income threshold below which there is no payment or compulsory participation (in case of employment) in at least one pension scheme (for example, at 1 MW);
- maximum income threshold after which no pension insurance payments are collected (for example, at 30 MW);
- exemption from tax and other payments within 2 years of registration with pension insurance;
- tax deduction (in whole or in part);
- joint accumulation of pension by spouses (family account);
- various types of bundles with other insurance payments (temporary disability, maternity, loss of provider, etc.); minimal linkage in terms of tariffs and the mechanism of recovery and payment;
- the right to early (early) withdrawal; the right to late withdrawal; the right to voluntary supplements for the purpose of increasing the pension, etc.;
- additional retirement benefits [lump-sum, holiday (e.g., Christmas) etc.];
- exemption from insurance payments during special periods of life (pregnancy and post-natal leave, etc.).

Thus, it is important for Russia to use the maximum of these approaches in order to create a beneficial regime for the self-employed, to provide incentives for them to "get out of the shadows", to prevent mass withdrawal from the pension system.

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ABOUT THE AUTHORS

Tatyana V. Zhukova — Candidate of Sciences (Econ.), Senior Researcher, Department of International Capital Markets, Primakov National Research Institute of World Economy and International Relations of the Russian Academy of Sciences (IMEMO), Moscow, Russia
ttanya2001@gmail.com

Yakov M. Mirkin — DSc in Economics, Professor, Head of International Capital Markets Primakov National Research Institute of World Economy and International Relations of the Russian Academy of Sciences (IMEMO), Moscow, Russia
yakov.mirkin@gmail.com

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Changes in the Financial Function of Companies

V.D. Smirnov
Financial University, Moscow, Russia
https://orcid.org/0000-0002-1243-5349

ABSTRACT

The author examines the peculiarities of the functioning of corporate financial services, in the work of which much has changed over the past twenty years. The study aims to find the optimal balance of traditional, routine operations and analytical work of the company's financial service in a significantly complicated and unstable macroeconomic environment. The theoretical and methodological basis of the study was the scientific works of foreign scientists and experts on improving the efficiency of the financial service of corporations. The author used methods of qualitative and quantitative analysis of scientific publications, analytical materials of well-known consulting organizations, statistical data. As a result of the study, the author concludes that in order to increase the return on its work, the financial service should focus on an in-depth analysis of the corporation's activities and prepare proposals for improving its economic efficiency within the framework of the concept of stakeholder capitalism. At the same time, it is rational to transfer part of the work related to current settlement operations and credit support to the company's activities and related risks to organizations specializing in such activities.

Keywords: financial service; efficiency; analytical work; creating additional value

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INTRODUCTION

The macroeconomic environment in which companies have to operate has changed significantly in the XXI century. New technologies are rapidly being introduced into people's daily lives and are affecting business processes and models. Climate change has an impact on consumer behavior, on actions of governments in terms of modifying the regulatory environment and forcing companies to save energy and reduce the negative impact on nature. Companies' development priorities are shifting from short-term to longer-term and sustainable development objectives. In these contexts, companies' financial services cannot spend time compiling reports on events that have already occurred, a should, together with other departments, devote it to a deep analysis of the company's activities and preparation of proposals to increase its efficiency, add value and improve returns on equity.

CHANGES IN THE ECONOMIC ACTIVITY OF COMPANIES

The actions of any company are determined by the state of the environment in which it operates. In the XXI century this environment has undergone significant changes that have led, as noted by Klaus Schwab, founder of the World Economic Forum, to the Fourth Industrial Revolution, characterized by a combination of technologies that blur the boundaries between the physical, digital and biological realms. The features of the revolution are the speed with which technological innovations penetrate into our lives (rather, exponentially than linearly), as well as the destructive impact on traditional industries and the transformation of business models [1].

Another fundamental change in companies' operating environment, compared to 20th century, is the different public perception of market objectives. If the shareholder capitalism's goal is to provide a highest return on the capital invested by company's owners, then stakeholder capitalism, the concept of which is being actively promoted nowadays, requires the company to take into account interests and other parties, in addition to owners, which affected by its actions: employees, suppliers, consumers, local communities. Companies are forced to take into account this new approach to market relations in elaborating development strategies and individual operational actions, although this is not easy, since some interpret it as a refusal to make profit, which is the "cornerstone" of the market economy. However, there is evidence that this may be beneficial not only for the reputation of companies, but also in terms of financial performance. McKinsey Global Institute, looking at US public companies with large and medium capitalization in 2001–2020, concluded that those with long-term views (what is important for stakeholder capitalism) outperformed others in terms of profit, revenues, investment, and jobs growth. [2]

Closely related to the concept of stakeholder capitalism is the concept of sustainable development, in which the key issues are the responsible attitude of companies towards nature and coexistence with the society in which they operate, as well as ethical issues of corporate governance (principles ESG: Environment, Social and Governance). Wherein attention is mainly paid to on combating climate change, which has an impact on the quality of life, human work capacity, food systems, physical assets, infrastructure services and environment.[3] The greatest impact on companies in this context is possessed by consumers who do not want negative changes in their environment and therefore prefer the products of those companies, that adopt in their activities measures for preservation and prudent use of mineral resources, transition to renewable energy sources, lean land use, etc. For example, 80% of Russian consumers as respondents in the global consumer behavior survey for 2020 expressed environmental concerns and 47% are willing to pay more for goods and services that do not have a negative impact on the environment.[4] States actively support their electorates by adopting laws aimed at achieving carbon neutrality in the foreseeable future. Although initial sustainable development interventions often do not yield immediate benefits, they have a positive impact on the main economic indicators of the organizations implementing them in the medium and long term. For example, companies with consistently high environmental and social performances achieved 3.7 times greater operational profitability during 2013–2020, than companies with lower ESG indices, and produced a 2.6 times higher average annual shareholder return.[5]

In this context, it is important to resolve the conflict between short-term quarterly companies' performance indicators (including ones through accounting or financial tricks to increase short-term returns on reports), trend towards prioritization of which to value companies, according to McKinsey Corporate Horizon Index,[1] has developed in 1999–2017, and long-term building up of equity value by stakeholders. Banks mixing the two in the first decade of the 21st century triggered a financial crisis that eventually destroyed billions of dollars of equity value.[6]

The increased propagation speed and scale of new technologies, that are changing the business practices that have developed over decades, have a huge impact on the activities of companies.

[1] The Index is the world's first statistical evidence showing the positive impact of a company's long-term vision on its performance.

Modern communications have created conditions in which entire sectors of the economy are on the verge of collapse as new business models emerge: travel agencies are no longer needed by most of people because of introduction of such aggregators like Booking.com and Airbnb, while many retail trade chains have been damaged or ceased to exist as a result of development of electronic commerce by such companies like Alibaba and Wildberries. The many times used first stage of SpaceX rocket and electric motors in automobiles (like Tesla) show, how the new technologies can damage traditional approaches to launchings on the Earth orbit or destroy the internal combustion engine industry; and connecting consumers to its equipment (like coffee capsules for Nespresso coffee machine or blades for a single Gillette razor) can win competition in the segment of mass consumption.

The innovation of the last century in the form of shift from hand assembly to conveyor, that is human labor application in a different form, has been in use for more than a hundred years. Nowadays, modern technologies make it possible to get rid of routine processes performed by a person, as well as to take his/her analytical work to a new level. As shown by the special study of activities of 3000 largest companies in the world, conducted by McKinsey, 90% of the average annual economic profit[2] generated in 2010–2014 accounted for less than 1% of their number, that managed to digitize its internal processes as much as possible. No less important than digitization is to build a company's internal operating model in such a way that it helps to best interact with the product buyer. [7].

Greater specialization in goods production and the international division of labor have created global flows of goods and expanded the geographical distribution of supply chains of commodities and materials. At the same time, this has increased the dependence of companies on the economic and political situation of the locations where their producers are located and on the entire route of its delivery. For these reasons, failures of a month or more now occur on average every 3.7 years, resulting in significant financial losses. Adjusted for likelihood and frequency of disruptions, companies can expect to lose more than 40% of their annual profits on average every 10 years (approximately 7 pp of its decline). But one major event that interrupts production by 100 days (which happens on average every 5–7 years) in some industries can destroy almost annual earnings. McKinsey estimated that between 16 and 26% of world merchandise exports, amounting to between 2.9 and 4.6 trillion USD, could move to new countries within the next five years, if companies restructure their supply chains. This will enable companies with a flexible supply chain of raw materials to reduce the negative impact of these circumstances on EBITDA,[3] calculated on the basis of reporting data for 2018, by 23 p.p.— from 39% to 16% [8].

Tax laws are constantly changing. For example, in the first half of 2021, 7G Group of countries took the initiative to establish a global minimum corporate tax of 15% to combat offshore activities and to replenish government budgets. The USA is considering raising the tax from 21% to 28%, and for foreign earnings from 10.5% to 21%. However, in the context of competition among tax jurisdictions and given the many possibilities to reduce the amount of taxes payable provided for the Tax Code in the USA, real tax payments by the 52 largest multinational companies headquartered in the USA amounted to 16% in 2020 while 200 foreign companies, that these United States

[2] Economic profit equals total income minus the explicit (accounting) costs and costs implicit in the alternative distribution of capital, i.e., opportunities rejected by the company.

[3] Earnings before interest, tax and amortization gains.

companies consider to be their competitors, paid an average of 24%.[4]

TRANSFORMATION OF THE FINANCIAL FUNCTION OF COMPANIES

Historically, the work of companies' financial departments involved accounting processing of transactions only, then, as the business environment became more complex, there was a need for management reporting, financial planning and control. At the same time, the reported economic indicators themselves, presented by the financial service, reflect only "the part of the value creation history that is largely created and destroyed outside the balance sheet",[5] while the increase of this value is the main goal of any company. Therefore, the major efforts of both the CEO (who determines the strategic direction of the company), and the CFO (whose functions now include researching every area of company's activity from the point of view achieving the main goal and making proposals for its improvement) are directed to solving this problem. Strategic (what product to offer to the market and what advantages the consumer to have compared to available competitive offers) and operational (how and where to effectively manufacture a product) factors are often intangible. The willingness of society to accept the company's products and its innovations, intellectual property, human capital, excellence in business processes, relationships with suppliers and customers is also difficult to determine in monetary terms, but represent a significant part of the total market value of the company.

Future uncertainty regarding society, climate, macroeconomics, supply chains and related risks is likely to be a new norm for existence of companies from financial departments of which are now required to perform mainly analytical work (aimed at developing activities to manage the above external challenges and risks in order to achieve the strategic goals of the company), as well as greater involvement in the work of other departments of the company. Accordingly, the content of the financial function changes from passive collection of company statistics to active involvement in increasing their value through creation of mechanisms and incentives not only to improve the efficiency with which tangible assets are used, but also to increase intangible capital. Given the cross-cutting nature of impact of the financial service on the performance of all units in achieving value and profit objectives, its role becomes strategically important (especially because it is the best way to help to monetize business processes and to give a company a competitive edge).

The work of the financial service, which itself does not generate material capital, is largely reflected in the impact on intangible assets, such as organization of work, research, technology, software, and personnel. Under modern conditions, the share of tangible assets, including fixed assets, working capital and financial capital employed, is gradually reducing when the value of the company is determined. The above intangible assets are typically reflected in market premiums, which represent the difference between the market and book values of the enterprise, and thus this "intangibility" turns into something very material in the form of growth of capitalization of a company (since development of economy is increasingly based on skills, knowledge, digital and other technologies, rather than on physical or tangible assets). In the USA and the top 10 economies in Western Europe, investments in intangibles in 1995 accounted for approximately 30% in the total volume of capital investments, and in 2019 it was already 40%. McKinsey's March 2021

[4] Even after Biden tax hike, U.S. firms would pay less than foreign rivals. Reuters June 22, 2021 https://www.reuters.com/world/us/even-after-biden-tax-hike-us-firms-would-pay-less-than-foreign-rivals-2021–06–22/

[5] A vision for the CFO & finance function. International Federation of Accountants. 2019:23 URL: https://www.ifac.org/knowledge-gateway/preparing-future-ready-professionals/publications/vision-cfo-finance-function

global survey of the current state of the global economy across 21 industries showed that the fastest-growing large companies with an average growth rate of about 20%, (top quartile of gross value-added growth) invested 2.6 times more in intangible assets in 2018–2019 than companies with 3% average growth (they turned out to be about half of the 861 surveyed organizations). That is, the increase of investments in intangible capital is well correlated with a higher growth rate of the value of companies. [9]

The activities of the financial service concentrate on solving the internal problems of the company taking into account the external factors. This centrality on improving efficiency determines its focus on production, supply chain and sale of the company's goods / services and the use of information in the following areas:

1. Accounting: accounting for transactions, drawing up financial statements, financial controls.

2. Compliance: conformity with government and other regulatory entities' requirements.

3. Management and control: creating and using financial and related information to report, monitor and initiate operational actions to achieve organization's goals.

4. Strategy and risk: providing relevant information and influencing the development and implementation of the strategy, as well as risk management in terms of the balance of financial and non-financial outcome, short-term and long-term objectives, following trends or maintaining an objective assessment of the situation; availability of financing to the requirements of production plans implementation.

5. Funding: informing and interactions with investors and creditors, both current and potential, to obtain and maintain the level of financial resources needed to achieve the organization's goals.

While this work is important, shareholders and boards of directors often require that the cost of financial function be reduced and that the cost-effectiveness of the function be improved. The best companies in the business, which have simplified, standardized and automated their basic processes, achieved the cost of operating a financial service in the range of 0.55–0.61% of the company's total revenue (during 2009–2016 based on global research by PwC), while the average varies between 0.8–1.0%. At the same time, the larger the company the lower these costs: with companies' revenues above 6.7 billion pounds, such expenses reach 0.4% for the most advanced financial services and 0.87% with companies revenues of which below 0.7 billion pounds, while as on average for other companies these indicators are two times worse. The same difference can be observed for companies operating in several countries, where the higher the international involvement of the company the higher the cost of maintaining the financial services: even the best companies require 1.02% of their revenues for financial operations in more than 25 countries.[6]

With current budget kept and modern technologies introduced by them to automate routine transactions, the financial service has time to focus on creating additional value for the company, and thus move from a cost center to a profit center. Traditionally, financial services of companies spend 50% of their time on accounting, 30% on reporting and compliance monitoring, and only 20% on business process analysis and risk management. [10] Today the best financial teams try to change this situation, spending 28.8% of their time on business intelligence and 22.5% on monitoring and defining new rules for the company's activities.[11]

To overcome the skeptical approach to the financing its work, it is advisable for the finance department to devote their main attention

[6] Finance Effectiveness Benchmark Report. Pw C. 2017:68 URL: https://www.pwc.ch/en/publications/2017/stepping-up-ch.pdf .

and energy to those areas of analytics, the results of which the company's CEOs remain disgruntled. A global study by PwC found that in the last 10 years (2009–2019) there was a gap between the importance and the completeness of information, received by leaders of major companies, that almost unchanged and was about 75 p.p. in data on customer preferences and needs (where 100 p.p. means information availability on all aspects of the subject), 50 p.p.— on financial forecasts, 60 p.p.— on brand and reputation, 60 p.p.— on business risks, 50 p.p.— on research and development effectiveness. At the same time, the main driver of revenue growth, according to the leaders, is operational efficiency.[7] But these are the areas in which the financial service can and should demonstrate its knowledge and skills, collect and analyze information within the company and on the market, that will make it possible to work out proposals in cooperation with other parts of the company allowing to adequately assess the needs of the market and the potential for changes in a company's internal processes to increase the competitiveness of its products and capitalization. Use of modern technology to automate and increase the speed of operations and reporting, as well as consolidation of fragmented data certainly helps financial services focus on more complex tasks that contribute to the company's development. Large multinational companies actively engaged in this work have already achieved 60% automation level of traditional financial services operations by 2021, according to a study by Accenture [12].

Another area of improving the work of financial departments to increase the concentration on solving strategic problems is the use of organizations specializing in some specific activity, such as shared service centers. They are typically set up in large companies to provide services such as accounting and legal services, payment and credit transactions, management of accounts receivable, accounts payable, compliance, etc., in order to eliminate and thus reduce the cost of such services in its daughter companies and to consolidate and improve existing practices on related issues. However, the lack of competition in these activities does not motivate such essentially captive centers to improve its performance in terms of the quality of the service or its cost. An alternative to shared service centers is outsourcing part of the work of financial services, especially that related to current account transactions, their reconciliations, liquidity, accounting, foreign currency, interest and other risks. Wherein, according to KPMG,[8] there is a growing interest to outsourcing in areas such as taxes and treasury, which require teams with highly specialized knowledge and experience (which even not all global companies need or able to maintain). By outsourcing such operations, as well as customs and tax disputes, companies can draw on the skills and experience of experts from the world's best organizations in these areas.[9]

Shared service centers and outsourcing are important tools to reduce costs and improve the quality of related activities transmitted to a specialized organization within or outside the corporation. This gives the finance team more time to participate in solving company's strategic tasks through a deeper analysis of various areas of its activities and providing optimal solutions aimed at creating additional value. PwC experts consider this not only an opportunity, but also a necessity, a peculiar "addition by subtraction". "If the finance service wants to be engaged in strategic discussions at the highest level, it needs to sharply reduce the transaction burden and release its best

[7] 22nd Annual Global CEO Survey. CEOs' curbed confidence spells caution. Pw C. 2019:46 URL: https://www.pwc.com/gx/en/ceo-survey/2019/report/pwc-22nd-annual-global-ceo-survey.pdf

[8] One of the world's largest professional service networks.

[9] Being the best: Inside the intelligent financial function. KPMG. 2013:45 URL: https://assets.kpmg/content/dam/kpmg/pdf/2013/12/being-the-best-v2.pdf

staff so that they can focus on creating value for the organization."[10] Moreover, transfer of various arrays of internal and external data to shared service centers or outsourcing entities leaves the financial service time to interpret the results of its processing. It is an intellectual work that identifies the likelihood of problems arising and proposes solutions, helping businesses to be more cost effective, more focused and better prepared for what lies ahead.

Elaboration of proposals for creation of additional value presupposes a joint work of the financial service with other divisions of the company. Accordingly, an important result of such cooperation is not the level of impact of the financial service on business results, but progress in implementation of jointly created or modified internal processes and systems, and creation of new value in the end. For example, improving productivity and quality in a particular production area is an operational problem, but besides production process management issues, it also affects a possibility of generating additional profits, working capital issues and other factors that are already in competence of the financial service. In view of these points, the CFO can offer cash bonuses to encourage production volume increase and reduction of scrap. Additionally, it is possible to reduce the number of workers servicing specific equipment, with increase remuneration of the remaining specialists at the expense of a part of the salary fund of those who left, while maintaining productivity by improving the organization of the production process. For such a work, the service needs to completely immerse itself in the specifics of the unit's activities and try to work out a comprehensive solution to the problem together with its leaders. This approach does not mean interfering with the job responsibilities of the head of the unit, nor does it violate the vertical of power necessary for the production management, but creates new opportunities for the company through a vision of a more complete value chain, the implementation of which creates a holistic view of the problem solution, additional value and benefits for the unit and financial service.

An integrated approach can be very effective, so 72% of CFOs (in a global survey conducted by Accenture in 2021) consider that their companies need to completely rethink internal processes and operating models. Providing expertise and timely long term oriented ideas, financial directors will exponentially improve their company's ability to identify new markets and customers, products and services as well as channels for its promoting to the market.[12]

An essential part of financial department work is assessment of all kinds of risks that related to the company's activities and coming up with suggestions to manage its. Wherein cash management risks (liquidity, foreign currency, debt, interest) are not major ones. Much more significant, from a company's existence point of view, are the risks associated with the entire supply chain of raw materials and components, production risks (related to equipment workability, the balance of different technological stages to meet market demands, the productivity of individual production sites and the enterprise as a whole, competitiveness of the company in terms of quality, price, storage capacity of the finished product, corresponding payables and receivables), as well as commodity and country risks. These risks are not covered by insurance company's policy and require specific management actions. Since the implementation of such risks leads to financial consequences, financial services are directly interested in contribution to mitigate or eliminate them.

With regard to cash management specifically a global review by Deloitte in 2019 revealed that the main concern of financial services (especially large transnational companies) is the inability to see a current liquidity position

[10] Finance Effectiveness Benchmark Report. Pw C. 2017:68 URL: https://www.pwc.ch/en/publications/2017/stepping-up-ch.pdf .

in real time, status of open financial positions (primarily foreign currency) and interest rate risks,[11] *that is mainly related to the multitude of accounts and banks through which transactions are conducted. Companies try to solve this kind of problem by creating captive in-house banks or by pooling cash positions of various divisions. However, 51% of HSBC's large corporate clients reported in 2018 that it was more difficult for them to manage foreign currency risks, and 75% of them said that they have to outsource some current operations in order to be able to deal with issues that will add value to its company.*[12]

Dividing production and monetary risks is important because no one but the company is able to manage the first ones, the solution of which determines the company's competitiveness, while the management of the latter is a specialization of commercial banks.

The above leads to the conclusion that the financial function of an enterprise requires a three-dimensional transformation:

• Changing the focus of the financial service from reporting, performing accounting processing of current transactions and other routine operations to analysis and interpretation of the company's operating activities (taking into account external factors with a corresponding reorientation of employees and more efficient use of the budget allocated to the service's operation). Successful work in this direction requires additional efforts to improve the performance of the company, that reported in 2018 85% of 1,037 CFOs of large companies around the world in the dedicated global survey;[13]

• Cooperation with other units of the company to develop comprehensive solutions to existing operational problems (which, perhaps, these divisions do not see, since the problems are outside their direct responsibility and competence), as well as subsequent control over its implementation;

• Develop proposals for managing strategic internal and external risks.

As a result of these measures, financial service efficiency will be increased in terms of return on the funds spent on its functioning, of participation in reducing costs and increasing revenue by improving efficiency of internal operational processes, as well as of assistance at company's board level in solving strategic tasks that contribute to increasing the value of the company. These results of financial service work to promote the company's well-being can be summarized in the short formula "quantity + quality + value", where "quantity" refers to the performance of this service within the budget, increased production and reduced costs, "quality" refers to speed and error-free routine operations execution, appearance of new products, increasing customer satisfaction and reputation with suppliers, strengthening the company's brand, reducing the level of fraud, setting strategic goals for products and markets, managing production risks, and "value" is expressed in increasing the company's capitalization.

Leading financial services focus their efforts on such areas that best contribute to the growth of the company's value (analysis of individual situations in production, supply, sales and reliable forecasting of financial results through advanced analytics and artificial intelligence). While issues of company's financing (working capital, treasury operations, foreign exchange risks) are seen as derivatives of these key tasks for the company's success.[13]

In this context, the role of the finance department may be particularly striking, because the exploration of the future may not necessarily be based on extrapolation of the dynamics of the past. If everyone sees a trend,

[11] 2019 Global Treasury Survey. A journey toward adoption of new technology. Deloitte. 2019:18 URL: https://www2.deloitte.com/content/dam/Deloitte/dk/Documents/risk/us-2019-global-treasury-report%20(1).pdf .

[12] Rethinking treasury. CFO Treasury survey. Executive summary. HSBC. 2018:7

[13] Innovation in the Finance Function. Global Survey 2018. FSN Publishing Limited; 2018

it is likely that the opportunities it represents will be (or have already) been exploited by competitors. BCG experts in a joint study with NetBase Quid noted that "in order to take advantage of emerging trends, companies must identify them when they are embryonic — not in theory, but not yet widely known. At this stage, the signs will be simply anomalies: weak signals that are somewhat surprising but not entirely clear in scale or importance. Of course, most anomalies don't become significant trends. But some companies that identify and interpret them early on overtake competitors". [14]

Financial services research in now priority areas is the most important in their work currently, since it allows them to find unexpected, bold decisions, in both internal operating processes and strategic company development directions that help the company to develop faster than competitors do, especially in the aftermath of crises. This is because new technological opportunities and changing consumer preferences will make the growth of companies different from those that existed before the crisis. Indeed, according to BCG, during the previous recession, there was very little correlation between business segments that grew above average before, on time and after the crisis. In the five years after the last two economic crises (before the COVID-19 recession) revenue growth has provided 42% of total shareholder returns of the companies, which surpassed competitors in their industry in this indicator, a further 39% increase in this income resulted in an increase in multiplier price/earnings (company's market capitalization / total net earnings), that reflect investors' expectations for future growth potential. A significant contribution to this development was made by the persistent desire of such companies to find growth points in their industry without trying to go beyond it. BCG researchers found that 80% of the post-crisis growth of companies comes from business segments, which account for only 40% of their pre-crisis revenues, that indicate that differentiated growth opportunities within industries are driving its forward. Wherein, market leaders implement the growth in the peripheral business segments of their activity in which they have found new opportunities: non-core segments accounted for 25% of the growth of leading companies, compared with 9% of the laggards [15].

NEW EXPECTATIONS OF COMPANIES FROM COOPERATION WITH BANKS

Having decided on the above-mentioned main tasks of the modern financial function, aimed at increasing the value of the company through a deeper penetration into the business, and realizing that no one from the outside can do the job, and taking into consideration the need for research and the realization of new opportunities to develop a company within its competencies and industry, the financial service must establish:

- what areas of work it can and should carry out independently and in cooperation with other departments with maximum use of possibilities of new technologies to solve existing problems;
- what types of work (which, although important, do not allow the company to stand out from its competitors) are, in a sense, a side effect of its main activity, in which the financial service does not have sufficient competencies (or they are not developed at the level of world leaders) and there is not enough time and money to reach this level. These functions should be identified and delegated to organizations that specialize in such work.

The very fact of transfer some important functions to third-party organizations is a difficult choice for any financial service that is inherently conservative, especially when it comes to outsourcing to specialized agencies. But in the circumstances described above, this is

the choice. While the most appropriate for such transfer are voluminous current operations of companies' treasury (i.e. the cash management and related risks) and the issues of strategic funding of companies' activities, requiring high qualifications, outsourcing of these functions is not a priority yet, it is considered by about 20% of large non-financial organizations (for small and medium-sized businesses, this figure is higher). Meanwhile, fintech companies have come to play a significant role in trade finance, treasury and foreign exchange management.[14] However, not many financial services believe that digital organizations (each of which still does not develop all the areas of financial support that companies need to finance their activities) can meet their needs. Many financiers still view fintechs as service providers for retailers and niche innovators. They don't see them mature enough to deliver critical services required.

At the same time, financial services view banks as safe havens because they are tightly regulated and have considerable institutional strength and monetary resources. Companies' long-standing relationship with their traditional banks build this confidence, which makes it difficult for other banking service providers to enter the market even if they are licensed. A key requirement of companies is to work with partner banks that understand and comply with local and international rules. The fact that banks use their balance sheet to finance a company makes them a privileged partner, also interested in the success of the company. Moreover, since bank financing is often long-term in nature, the standing creditor-borrower relationship can be further strengthened. Fintech companies and suppliers of enterprise resource planning programmers cannot establish the same connection. It is uncomfortable for most CFOs to share its data with fintech partners because they feel that "if they provide data to the fintech they will be available to all".[16]

It is no longer enough for companies to have digital channels of communication with banks, they want to move away from purchase of individual products provided by the bank to a banking service that will automatically meet the company's specified range of payment and credit requirements, and manage related risks. Due to the deep immersion of financial services of companies in analytical work, they need banking specialists' independent assessment of the industry in which the company operates. Assistance of banks in optimizing supply chains of raw materials is also actual for companies nowadays.

As can be seen from the above the financial services of companies have already changed or are in the process of changing their perception of the nature and purpose of their work. Certainly, they would like to transform their interactions with banks to make their work more effective, that obviously would benefit the banks if their corporate clients became more competitive as a result. Change the model of interaction from company/bank purchase/sale of individual products to multilateral service, in which a number of functions of the company's financial service for organizing settlements for current operations, credit support of the company's activities and management of the corresponding risks are transferred to the bank in framework of outsourcing, radically changes the approaches of banks to corporations' servicing and can be beneficial not only for companies, but also for banks.

At present, perhaps only the world's largest banks are able to invest in creation of services that can fully serve the needs of large companies, but even they do not succeed in everything: Western Europe's largest banks in 2010–2016 served about 34% of large companies, Japan — 25% and only the largest US banks — 75% of

[14] Being the best: Inside the intelligent financial function. KPMG. 2013:45 URL: https://assets.kpmg/content/dam/kpmg/pdf/2013/12/being-the-best-v2.pdf

such clients.[15] According to the BCG, if banks do not make a fundamental and long-term commitment to revising their operating models applying technology companies' best practices and becoming more agile, they risk losing a large share of business to fintech suppliers of enterprise resource planning programs and treasury management systems. [16]

In order to get the service they need, companies are forced to re-evaluate their relationships with banks. Wherein, many large corporations indicate the need for better integration of banking services into their existing systems as a major problem. One driver of such requirements is the ongoing centralization of the treasury's cash and risk management function, including foreign currency operations, that in turn encourages companies to concentrate their operations in as few banks as possible. For example, 29% of large companies and 38.7% of smaller companies are interested in a single portal through which a company can access all banking services.[16] Another sign indicating the requirement for closer cooperation between companies and banks is a need for companies' financial services to adapt banking instruments and solutions for cash flow forecasting, in-depth understanding of the capital market, working capital efficiency analysis and payment analytics to corporate systems. [17].

The outsourcing of certain functions allows the use of subject matter and functional expertise, market knowledge, process discipline, and updated third-party provider technologies that finance service is lacking. Thus, by becoming not a performer of such functions, but a customer who determines parameters of its implementation and conditions motivating outsourcer to increase its efficiency, the company can create additional value that did not exist before. Financial services of large companies see a possibility of generating additional value for corporations in improvement working capital management service by banks and maximum use of opportunities of new technologies (especially regarding compliance, fraud prevention and management of regulatory requirements) that not associated with reduction of direct funding of the services (such as in the case of doing its by financial services itself), which can reduce costs almost immediately by 4–6% in the first two years [18].

Of course, there is a risk of more competitive offers of outsourced services from other banks, but this problem is easy to resolve, given how hard banks fight for their corporate clients' operations. Therefore, by seeing a competitive offer, the current banking service provider is likely to find a compromise with the company.

As can be seen from the above, companies' need for closer cooperation with banks is increasing, and banks as reliable, trusted and professional providers of specific services are increasingly important, even despite fintech companies' fierce competition. Many companies are trying to use the banks' competences in managing money and related risks, but the transfer of these functions to banks is still at an early stage. The benefits of outsourcing many of the non-financial functions of companies by third-party providers are evident and proven through long-standing practice; however, the transfer of some functions from the financial service is still a very "sensitive" issue, although, as shown above, absolutely necessary. In this context, it is useful for companies to consider outsourcing solutions of certain financial tasks not as an anomaly, but rather as the beginning of a new trend, participation in the development of which will enable them to become more competitive by concentrating their efforts and resources on adding value to their shareholders,

[15] Large Corporate Banking Relationships Evolving. Greenwich Associates. 2016:6 URL: https://www.greenwich.com/account/large-corporate-banking-relationships-evolving.

[16] CGI Transaction Banking Survey 2019. The Global Treasurer. 2019:50 URL: https://www.theglobaltreasurer.com/resources/transaction-banking-survey-2019/.

employees and consumers in full accordance with the interests of the parties. While companies underestimate yet the prospects for such outsourcing, it is correct to note that many banks are not prepared to change the pattern of bank-corporate relationship.

CONCLUSION

New macroeconomic conditions are forcing financial services to automate routine operations as much as possible in order to study in-depth all aspects of their companies' activities to find reserves to increase their efficiency and develop proposals together with other divisions to create additional value. That is to do a complex and comprehensive job that no one outside the company will do. These circumstances do not leave financial services, in terms of a limited budget for their operations, a capacity to maintain the status quo ante, in which they focused on ongoing operations, verifying its correctness and reporting. Thus, financial services are forced to transfer some of their specified functions, primarily those related to settlement and credit support of their companies and the management of related risks to specialized organizations for which such activities are the main ones.

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ABOUT THE AUTHOR

Vladimir D. Smirnov — Cand. Sci (Econ.), Associate Professor, Department of World Finance, Financial University, Moscow, Russia
vdsmirnov@fa.ru

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Analysis of Marketing Features in Russia in the Context of Digitalization

P.V. Evstigneeva
Financial University, Moscow, Russia
https://orcid.org/0000-0002-9194-4394

ABSTRACT

In the modern world, constantly changing business trends require more attention to promoting the brand and attracting an audience. The need to study and analyze the effects of marketing tools and tools has increased significantly with the advent of digital technologies. In response to the daily challenges associated with the changing level of competition in the market, globalization, and consumer awareness, small and medium-sized businesses are forced to adapt. There is a change in the course of conducting the promotion policy, and preference is given to the Internet space. In this regard, new platforms for market relations come to the fore. For entrepreneurs, the question arises "how?" and "where?" should they conduct their activity. The article discusses the features of the trend of transition to Internet marketing and the results of scientific research. Also, the author considered the issue of the relevance of digital promotion tools.

Keywords: small and medium business; business; marketing; promotion; digital marketing; SMM; social networks; marketing tools; research; survey

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In the last two decades, business attitudes to marketing have changed dramatically. Whereas business used to look at marketing as an optional addition to its current business activities, shaping the company's image and incurring significant costs, it is now a mandatory activity for even the smallest organizations. Companies implementing strategic marketing planning systems are more successful.[1] However, almost half of companies in Russia are still not aware of the need to introduce marketing.[2]

For an overview of the current status of marketing in small and medium-sized businesses, the author conducted a study in which 153 organizations participated: mostly small companies and individual entrepreneurs in different spheres of activity.

On average, small businesses have up to 50 employees, some of whom are involved in marketing. 56.9% companies are supported by marketing staff; 20,8% have at least one staff member who deals with marketing, combining this activity with other tasks; in 15.3% of cases the owner assumes the role of marketer. Agencies are the least used by firms (4.8%) or freelancers (2.2%).

In most industries, small-scale enterprises are aware of the need for marketing and develop marketing competencies within the company, either through the allocation of special jobs or by adding additional functions to their employees.[1] Practice shows that it is much more effective to form a team within a company than to hire someone from outside. For small businesses, the issue of efficiency is particularly acute because of limited resources and financial flow. With the right policies and tools in place, small businesses can perform well even with limited assets and multi-tasking staff.[3]

Most small and medium-sized companies do not develop marketing strategies but use separate promotion tools. For example, in the last few years, social media marketing has become the most common tool to increase brand recognition, consistently outpacing all other communication media.[4] It is followed by e-mail marketing, content-marketing and electronic media advertising. These four tools form the main pool of marketing activities of small businesses developing their own brand.

However, companies need integrated strategic planning, that to link targets to outcomes and adjust tactical and operational targets. The ultimate goal of any marketing campaign — is to attract new customers. The client attraction model has changed over the past 10 years: major communication channels, modes of information consumption, types of interaction with clients have changed. The traditional tools of interaction with target audiences (television, radio, print media, etc.) have been replaced by digital tools (social networking, context advertising, search engine optimization, etc.). Small businesses have access to tools previously used only by large brands due to high costs: outdoor advertising, advertisements for bloggers and opinion leaders, promotional events, all kinds of Internet advertising.[5]

At the same time popular tools in the 2000s: print, television and radio advertising, as well as SMS-marketing are used less and less frequently (*fig. 1*).

From *fig. 1*, it can be concluded that small and medium-sized enterprises use almost all available marketing tools, but still prefer Internet-technologies as the most economical and efficient way to promote. Moreover, the pricing of advertising services on the Internet — is dynamic, which means that the price for coverage and conversion will vary depending on industry, demand, season and other factors. This allows companies to use advertising budgets more effectively.

In terms of attracting new clients, statistics are almost identical to data showing sources of

[1] Marketing trends for small business. Research. RUSABILITY. URL: https://rusability.ru/internet-marketing/trendy-marketinga-dlya-malogo-biznesa-issledovanie/ (accessed: 06.01.2020).

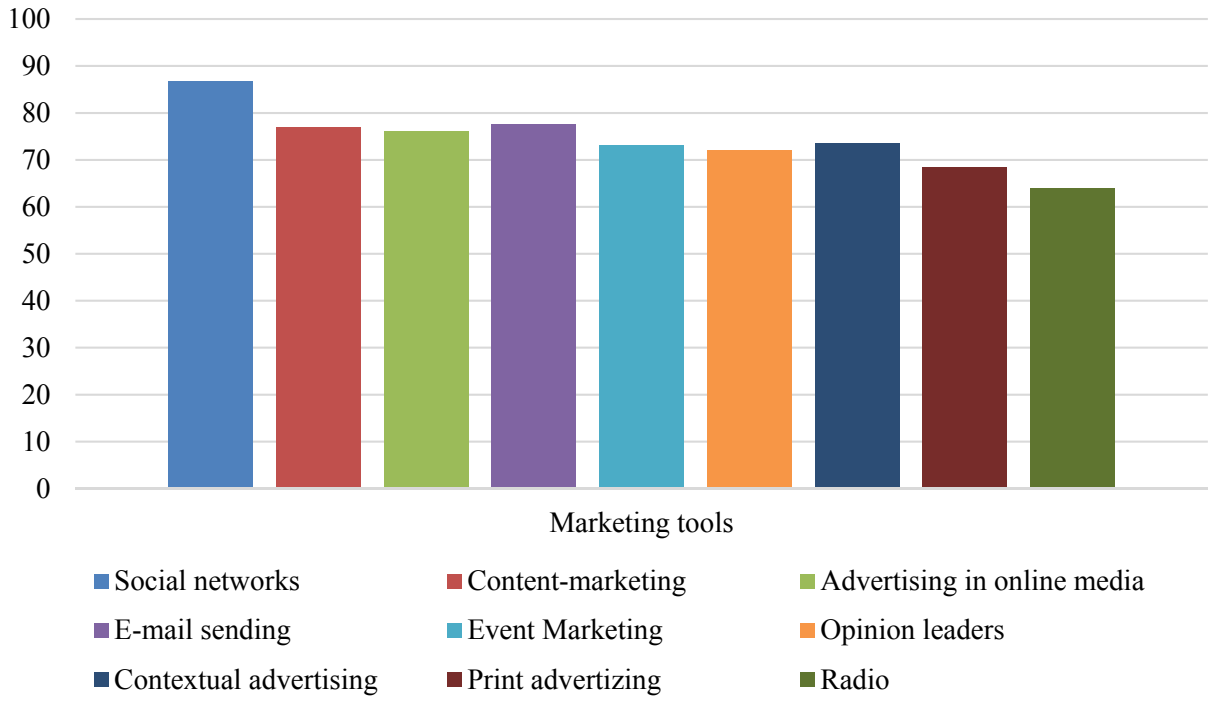


Fig. 1. **Marketing tools used by small and medium enterprises**

Source: compiled by the author.

coverage: main inflow — from social networks, further — leads[2] from e-mails sending and special projects to Internet media, event marketing[3] and video-marketing.

By retrospective analysis of marketing tactics, a set of best practices can be identified and the budget reallocated to their benefit.[6] Find out which tactic small businesses are going to use to optimize their marketing budget.

Small businesses plan to increase spending on digital-marketing (78%), social-media (73%), email-marketing (57%) and event-marketing (55%). Traditional marketing, such as print, television and radio advertising, outdoor advertising, etc., may become the main focus of budget cuts (56%). 36% of respondents don't plan to change their marketing strategy.

Overall, it is evident that most small enterprises are seeking to increase their marketing budgets across the board, and very few plan to reduce spending on certain tools as part of their marketing strategy and budget. This is a positive trend: small enterprises have found the most efficient tools on an experimental basis and now intend to use their resources more rationally.

Despite the fact that social-media doesn't guarantee the security of personal data (which is very important for business abroad), Russian entrepreneurs use it as the main source of client attraction to avoid the costs of creating and promoting their own site. So many companies, differing by retail, tourism, or restaurant business, build all communication and content strategy on their social-media pages. The disadvantage of social networking is the constant updating of the algorithms for news, advertisements and targeting users, which affects the effectiveness of promotion when using the tool inexperienced.

Based on the above data, most respondents plan to increase or maintain their email-

[2] Potential customers who may purchase.

[3] Promotion through the organization of events.

marketing costs. Mailing has proved to be an effective tool in retail (combined with content marketing and stock promotion). According to entrepreneurs, they are one of the leading channels of communication with clients in terms of return on investment. Today email-marketing continues to show good results and solves the most important marketing challenges of small business.[7] However, about a third of the respondents plan to reduce their e-mail spending costs.

Combining SMM (social media marketing) and email marketing is good: these platforms open direct communication channels and allow for closer contact with their audience. They cultivate authenticity, help build trust with potential clients and increase the likelihood of subscribers converting to brand lawyers.[4] These two communication channels close the entire core pool of marketing tasks of small and medium-sized businesses. Consider the marketing challenges facing small businesses.

The goal of any business — is to maximize profits, and therefore to reduce costs and increase revenues, i.e. sales. Therefore, the most important and basic task of small business — is to attract clients. This is followed by a task closely related to the previous one — increasing the number of potential clients and leads. Next is an increase in web traffic, social network subscribers and conversions. Important but not essential tasks for marketers are also to maintain current clients, maintain loyalty programs, increase the e-mail spending base and work with opinion leaders.[8]

On the basis of current marketing objectives, it's possible to schedule the main objectives of the marketers of small and medium-sized enterprises:

1. Attracting new clients.
2. Retention of existing clients.
3. Increasing the lifetime value[5] of the client.
4. Content-strategy formation.
5. Building audience loyalty.
6. Client path construction and improvement.
7. Increase in customer's average check.
8. Widening the e-mail spending base.

As mentioned above, social media and e-mail spending can do some of these things. Although social media have proved to be better than other channels of communication with the audience (sites, e-mail spending, call-centers, contextual advertising, etc.), many companies note that the results do not always meet their expectations. This may be due to the lack of social media strategies and competences of staff on the tool.

The most popular social networks in Russia are YouTube — 41.2 million Russians and VKontakte come here every month with 38.2 million active users per month. The top-10 social-media and resources also include Instagram (30.7 million users per month) and Odnoklassniki (23.4 million).[6] (*fig. 2*)

Note that VKontakte and Instagram are most popular with the audience of 16–24 years, and Facebook — in people over 45 years of age. Among the older age group (55 and over) YouTube, Odnoklassniki and VKontakte are popular. All of this is worth taking into account when formulating a marketing strategy. However, the survey showed that most entrepreneurs don't social network analyst and choose the cheapest promotion channels to guarantee maximum coverage. Most often it is Instagram and Vkontakte, whose main audience is young people — the least paying category of users. Consequently, companies should rethink their communication

[4] Regular customers who act as brand advocates and recommend the product.

[5] Total revenue from all transactions of the client less costs of engagement.

[6] Digital technologies in 2020 / We Are Social и Hootsuite. URL: https://wearesocial.com/digital-2020 (accessed: 20.08.2020).

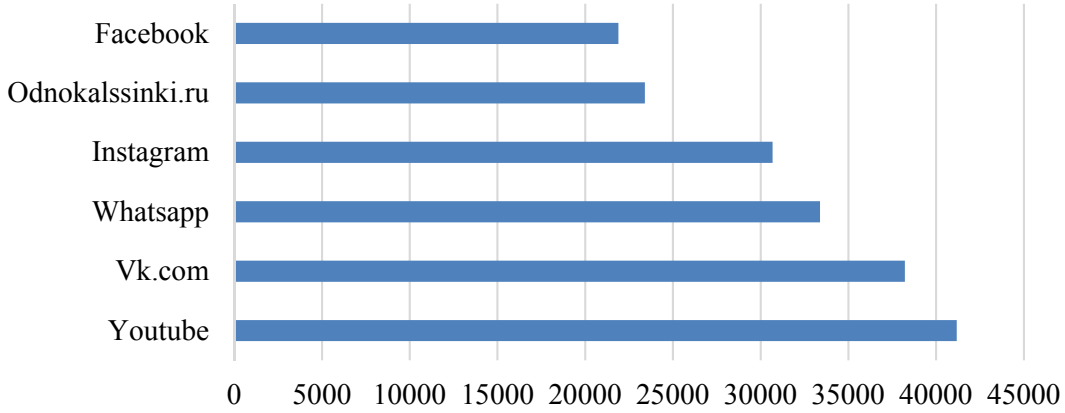
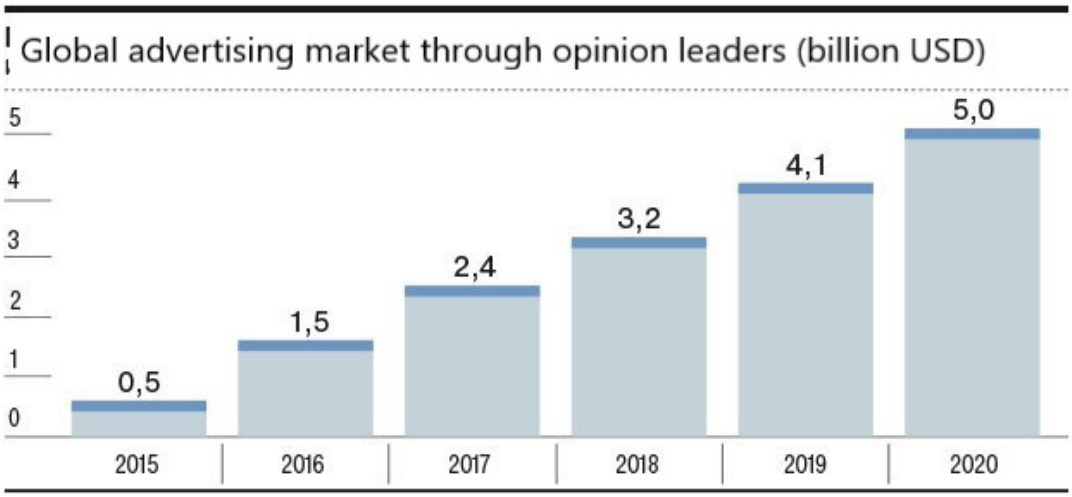


Fig.2. **Rating of social networks of the Russian Internet by the number of users per month**

Source: Mediascope, webindex. URL: https://mediascope.net/news/1209287 / Mediascope, webindex. URL: https://mediascope.net/news/1209287.



Puc. 3 / Fig 3. **Глобальный рынок рекламы у лидеров мнений / The global influencer advertising market**

Source: MEDIAKIX. URL: https://mediakix.com/blog/instagram-influencer-marketing-industry-size-how-big / MEDIAKIX. URL: https://mediakix.com/blog/instagram-influencer-marketing-industry-size-how-big.

strategy and reallocate the budget in social-media.

In the survey, respondents looked at almost all available marketing tools and chose the ones best suited to them. The most frequently mentioned were social media, targeted and contextual advertising, media advertising and mass mailing (e-mail and sms).

To date, one of the most effective ways to attract clients is to work with opinion leaders. This type of activity includes both standard advertisements from bloggers and the engagement of brand ambassadors who will take part in marketing activities and give a boost to business development.[7] The brand-ambassadors communicates about companies to friends and subscribers, sharing publications and e-mails. They provide good coverage and narrow the sales funnel to remove the objection of potential customers. Over the last five years, the advertising market for opinion leaders has grown more than tenfold (*fig. 3*).

[7] Bloggers sell more. Kommersant. URL: https://www.kommersant.ru/doc/4053013 (accessed: 17.08.2020).

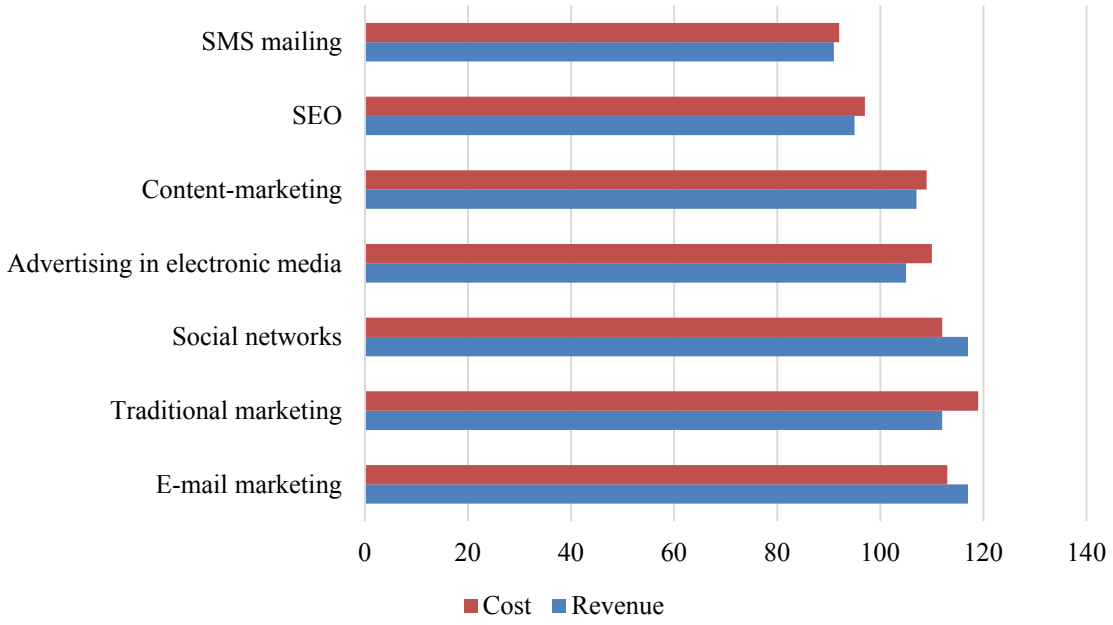


Fig 4. **The ratio of income and expenses for individual marketing tools in small and medium-sized businesses**

Source: compiled by the author.

Based on the results of the research, most small enterprises consider the marketing of influence to be the most complex technique whose results are difficult to evaluate. This way of attracting customers is therefore the exception rather than the rule in the marketing of small and medium-sized enterprises. Besides, working with bloggers is a rather expensive tool that not all enterprises can afford. Especially if they are famous people.

The issue of budget allocation in small companies is particularly acute. Small businesses spend the most on traditional marketing, SMM and email-marketing. They are followed by context advertising and content-marketing. Setting of SEO (search engineering optimization) and SMS-marketing are the smallest items of expenditure due to lack of high conversion efficiency in sales. The leading suppliers are e-mail marketing and social-media. This explains the distribution of promotion costs, although the correlation is indirect. Consider the ratio of revenue to cost of selected marketing tools in more detail (*fig. 4*).

Fig. 4 presents statistics on the number of companies that have budgeted for a given instrument and have received returns on investment (a total of 153 enterprises participated in the study). We can see in the *graph* that almost every kind of activity generates the company's revenue. However, the costs of traditional marketing and content marketing are higher than the profits they generate. Here, it is important to stress that these types of marketing address a number of other tasks not directly related to sales: providing a wide audience, positioning the brand and forming the company's image, creating a community and creating a pool of potential customers close to the brand.

Based on the above data we can conclude that small business focuses on direct communication with consumers through channels such as social networks and e-mail marketing. The ability to make personal contact helps to find and maintain loyal clients who will not only provide constant income, but will also be able to become brand advocates and bring in new customers.[9]

Important phase in marketing strategies — evaluation of marketing performance. It includes an analysis of the results of each communication channel individually and the overall success of the enterprise as a whole. To assess the effectiveness of marketing tools, indicators of audience coverage, lead cost and final sales are used. An indisputable advantage of digital-marketing is the ability to accurately measure contacts and conversions, which allows for the rapid reallocation of the budget to more efficient channels of communication. The most common indicators used to measure effectiveness are:

- Income: total income, income from regular customers, income from each marketing channel, income of each manager.
- Costs: total customer engagement costs (CEC), costs per individual communication channel, lead costs, buyer costs, outsourced client costs.
- Integrated indicators: margin, client life cycle (CLC), LCL-to-client ratio, conversation rate (sales of total bids), ROI (return on investment).[9]

The analysis of the marketing cost structure allows for a more efficient allocation of the budget between communication channels. Understanding overall marketing costs enables product price management. In low margin products and products with high demand elasticities, it is particularly important to limit advertising budgets, as increasing the cost of attracting users and subsequently increasing prices can have a negative impact on final demand.[10]

By summing up the above, we can identify a trend of shifting the focus of companies towards digital-marketing. Not surprisingly — Internet use in Russia has increased significantly in the last few years and 81% of the total population has access to it[8] (118 million person). Ease of access, as well as minimum investment required, contribute to the growth of online-business. The transparency and efficiency of investments in electronic business tools make them unparalleled in all marketing activities.

The experience of foreign markets shows that small businesses in developed countries focus on direct interaction with potential customers, choosing social networks and e-mail marketing as the main channels of communication. The possibility of personal communication helps to form a loyal attitude of the client and to gather a circle of brand lawyers. It is interesting that in the issues of use of social networks as a tool of interaction with the audience Russian market has moved forward: our companies are better acquainted with content strategy, customization of targeted advertising and community-management. For example, some foreign companies note that Facebook has shown better efficiency among other sales channels. Some companies, on the other hand, claim that Facebook's advertising budget was wasted. This difference in results may be due to a lack of professional experience in dealing with social-media. According to foreign counterparts, e-mail remains the simplest platform for interaction with users, showing better financial returns in a digital environment.[9]

In summary, it may be noted, that the best results are obtained by combining marketing tools into a single marketing strategy tailored to the specific industry, target audience and enterprise needs.

[8] Audience of social media in Russia. Popsters. URL: https://popsters.ru/blog/post/auditoriya-socsetey-v-rossii (accessed: 13.08.2020).

[9] 75+ small business statistics to help your digital marketing strategy. BlUE CORONA Measurable Marketing Solutions. URL: https://www.bluecorona.com/blog/29-small-business-digital-marketing-statistics/ (accessed 10.01.2020)

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ABOUT THE AUTHOR

Polina V. Evstigneeva — Senior Lecturer, Department of Tourism and Hotel Business, Financial University, Moscow, Russia
metelkinapolli@mail.ru

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Analysis of the Online Education Market in Russia in the Context of the Theory of Economic Dominance

A.V. Govorova[a], I.P. Suslova[b], S.V. Shcholokova[c]
Lomonosov Moscow State University, Moscow, Russia
[a] https://orcid.org/0000-0001-7263-9282; [b] https://orcid.org/0000-0002-7483-1910;
[c] https://orcid.org/0000-0002-7233-1322

ABSTRACT

The coronavirus crisis has destroyed the well-established concept of the familiarity of life. One of the few areas that showed stable growth during this period was the online education market, which proved to be an effective alternative to offline education. Using the online education market as an example, the authors study the concentration of online educational projects, based on the theoretical concept of stratification by levels depending on institutional conditions, the situation of the dominance of representatives of one level over another. As one of the main conclusions, the authors highlight the absence of independent Alpha players due to the relatively small size of the market, the presence of unique factors of dominance (IT, ecosystem, support from the state and venture capital companies) and the dependence of the online education market on the expansion of external Alpha empires.

Keywords: online education market; economic dominance theory; institutional rent; Alpha empires

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INTRODUCTION

The online education market has become one of the few that have benefited from the coronavirus pandemic — in this context, the need for new distance education products and technologies has increased enormouslyThis market is still significantly smaller than other IT-markets and is relatively young, which can ensure its steady growth in the medium term. [1] In 2016, according to EdMarket research,[1] the Russian online-education market was estimated at 20.7 billion rub., representing 1.1% of the total education market; according to the results of 2019, the volume of the market was 38.5 billion rub., with an average annual growth rate of 20%.[2] According to RBK data, as of the Q3 of 2020 total revenue of top-50 companies of the online education market since the beginning of the year amounted to more than 18 billion rub., and at the end of 2020 — about 34 billion rub. (for the Russian market as a whole — 55–60 billion rub.).[3] This growth cannot but be accompanied by significant structural and institutional changes, and the purpose of the article is to assess how deep transformations of the online-education market are taking place and can take place in the near future.

ONLINE-EDUCATION MARKET IN RUSSIA IN 2020–2021

To date, leadership in all segments of the online education market has been retained by professionals who originally did so. The growing interest of major players from adjacent markets in launching their own online educational services, platforms and ecosystems cannot be ignored. It's also worth noting that since the second half of 2018, people with no experience in any educational activity, and not only online, are increasingly entering the online education market. They mostly replicate existing successful models, occupy underdeveloped niches and compete with marketing budgets.

According to the analyst company HolonIQ, as a result of the coronavirus crisis, the online-education market attracted 8.3 billion dollars in venture capital in the first three quarters of 2020, setting a record in the sector all along. [4] With regard to investment in Russian online-education, according to EdMarket data, total investment as of August 2019 amounted to 34.5 million dollars. Investments in Russian online education for 2017–2019 distributed by segments as follows: 27% — school education, 20% — language education, 20% — additional professional education, 11% — corporate education, 22% — other.

Due to the large state presence in the pre-school segment, the online-format is mainly represented in supplementary education of children only. However, it is worth noting that according to the State Program of the Russian Federation "Development of Education" for 2013–2020, the expansion of the role of the non-State sector in the provision of pre-school and supplementary education for children has been established as one of the areas of educational development. Experts predict that the online share of this segment will be 5.5% in 2021.

The situation is similar in general secondary education. Despite the over-conservative nature not only of the general secondary education system, but also of parents' attitudes towards the online-formats of general education, the situation with coronavirus revealed the vulnerability of the segment to the trend of digitization of educational methods: according to expert forecasts, the penetration of online format into the general secondary education segment in 2021 will reach 1.5% and supplementary education for schoolchildren will reach 6.8%.

The situation in higher and secondary vocational education is due to the lower

[1] Study on the global and Russian online learning market TalentTech, Нетология and EdMarket.

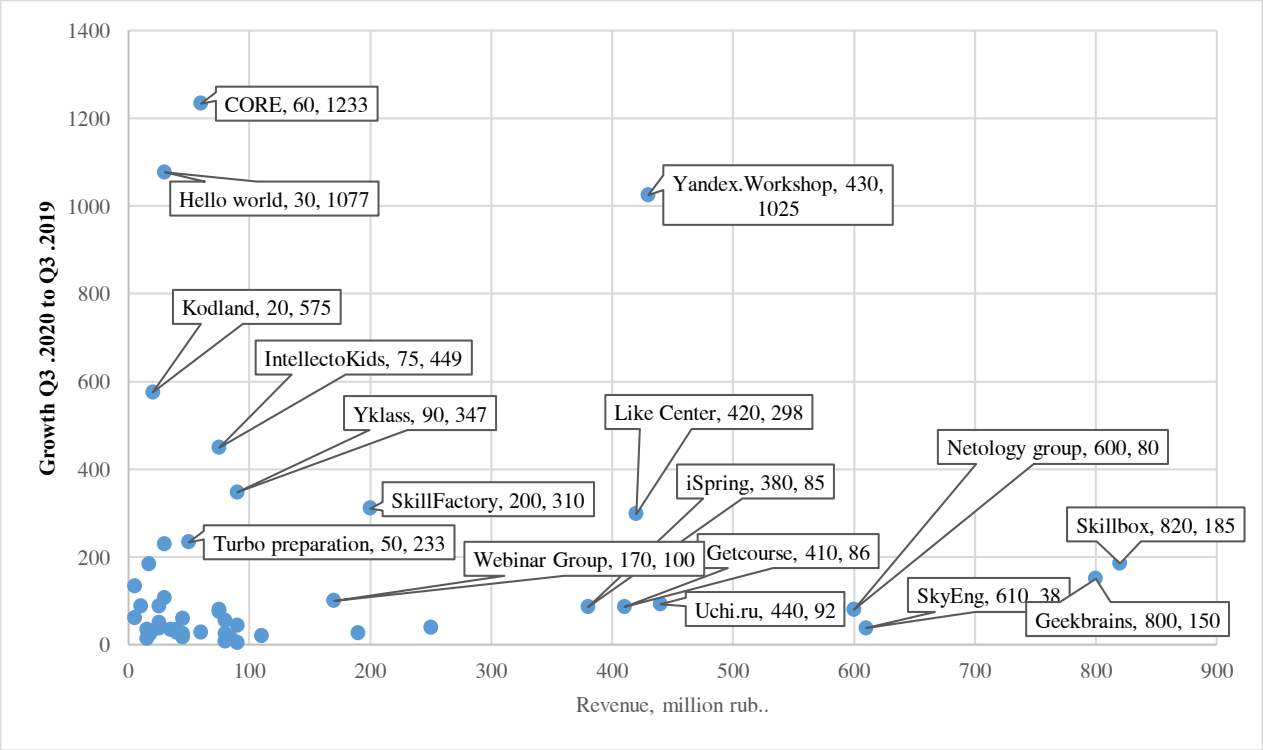

Fig. **Comparison of companies in the online education market in Russia in terms of revenue and growth rates**

Source: Complied by the authors based on data from the Talent Tech, Smart Ranking 2020. URL: https://trends.rbc.ru/trends/education/5fdbadc69a7947b8cfb7d086.

participation of the State in this segment [5]: EdMarket official statistics for the school year 2015/2016, 59,1% higher education institutions — State universities, 40,9% — private. The share of online training here is projected by experts to be 4.4% in 2021. In the area of additional professional education, the online-format is more widely used than in others, and experts predict that in 2021 it will be 10.9%.

If you look at the distribution of Moscow startups in education, according to EdMarket data, the largest number of them in additional professional education is 45% and school education — 20%. However, since 2016, online-market players are expected to expand into the corporate sector, and according to experts, this is becoming a strategically important growth point for educational online-business.

The statistics provided are not only due to the presence and participation of the State in each of the segments, but also to sociological factors — the capacity of the recipients of educational content and their attitude to online education. This was particularly evident during the extreme transition to distance learning in the context of the COVID-19 pandemic, which highlighted not only the main problems of face-to-face education (low quality of educational content and imbalance in teaching burden), but also the disorganized nature of the recipients of educational content in time and space in remote setting. [6] Also, the factors that determine loyalty to online-education, can be considered involvement of the educational level and organization in the international community. For example, according to the data of the all-Russian survey of university teachers on the development of a remote format, conducted by the Social Research Laboratory of RANEPA, universities integrated into the international community

have a fairly high level of loyalty to a remote format.

STRUCTURAL AND INSTITUTIONAL TRANSFORMATION OF THE ONLINE-EDUCATION MARKET IN RUSSIA

Economic dominance theory may be chosen as a convenient tool for analysing institutional change, proposed by A. A. Blochin [7] and further developed jointly with I. V. Lomakin-Rumyantsev and S. A. Naumov [8, 9]. It describes how the trends of concentration of business in the Russian economy led to its stratification into three levels with different institutional conditions and domination of the upper levels (alpha-business) over the lower levels (beta- and gamma-business).

The theory is partly a continuation of François Perroux's idea that market players are inherently inequitable and interconnected as enterprises expand and adopt new technologies.[10]

Trends in the stratification of businesses by different institutional levels are characteristic of the entire Russian economy. Examples include online-education.

Turn to Talent Tech, Smart Ranking for 2020 to identify and compare the main players of online-education market in Russia. As a base for analysis take companies that, along with positive returns, showed growth in the Q3 of 2020 compared to the Q3 of 2019 (see *figure*).

Starting from the idea of economic dominance theory, to describe the segmentation of the online-education market, it is necessary to identify the factors that determine the differences in institutional conditions. In order to solve this problem, we will get acquainted with the stories of some companies which have appeared in the top rating and shown in the *figure* in the lower right zone.

The Skillbox education platform was launched in 2016. At the beginning of 2019 Mail.Ru Group acquired 3% of the company, after a month increased the share to 10.33%, and already at the end of 2019 it had a controlling interest — 60,33%, which according to the annual report of Mail.Ru Group cost it 1,6 billion rub.

SkyEng Language School was founded in 2012, with an initial investment of 400 thous. rub., then — 300 thous. dollars. In 2013, the school also launched its own education platform, which cost it 500 thous. dollars, in 2016 — mobile application and TV series language learning service. In 2017, SkyEng entered the USA and Latin America markets and opened two new areas of activity in Russia. In 2018, the school is attracting investment from Baring Vostok foundations, and since then has been actively launching new services and entering new markets.

Netology Group company was formed in 2014 by merging the project "Netology" and the start-up "Foxford". In the same year the company became a resident of Skolkovo, and venture fund of the InVenture Partners invests in it in two rounds totalling 1.6 million dollars. In 2015, the company received a 2.1 million dollars additional investment from Buran Venture Capital and InVenture Partners. In 2017, Buran Venture Capital and InVenture Partners withdrew as shareholders of the company, and 40% bought "Severgroups".

The Getcourse platform started as an educational project that needed investment, and paid off only two years later, in 2017, when the boom in educational online-project began.

Thus, the essence of institutional rents in the online education market of the companies represented in the *figure* can be expressed by several factors:

1. *Mergers and Acquisitions*. Promising projects and startups in the online-education market are often bought in whole or in part by major corporations, giving them additional investment and access to donor-company capabilities and resources.

Table

Bundle of companies in the online education market by Alpha empires

Alpha-Empire Mail.Ru Group	Alpha-Empire TalentTech	Alpha-Empire Yandex	"Clean" alpha
SkillBox, Geekbrains, Uchi.ru, SkillFactory, Tetricka, Algorithmics	Netology-group	Yandex.Workshop	SkyEng, Getcource, iSpring, Maximum Education, Webinar Group

Source: Complied by the authors based on data from official companies' websites.

2. *Platform*. Unique educational platforms attract investors and become a competitive, often critical, advantage for users.

3. *Support*. Educational projects and platforms in areas of strategic importance to the State are supported by venture capital investments.

ALPHA-, BETA-, GAMMA-, AND ALPHA-EMPIRES IN RUSSIAN ONLINE-EDUCATION

The largest companies with a strong platform solution and support from the state and/or venture investors constitute the alpha business group (in the *figure* are located in the lower right zone). They are characterized by high revenues and stable growth rates. They are well placed to further strengthen their market position through organic development, the absorption of smaller companies with unique performance, the development of product lines and the broadening of the customer base.

The group "beta" are large companies which either avoid direct competition with the "alpha" or lose the market in the course of the competition for customers. They also have strong platform solutions, but attracting investment is more expensive (in the *figure* clearly define the location of the companies of the group "beta" is problematic, among them can be attributed to the companies of the top left and a number of companies of the lower left zone, except for the cluster area — companies of the group "gamma").

Gamma-companies are those that operate in the market, replicating successful alpha- and beta- company models. To survive in this group, they have to work on a unique proposal and customize the conditions (figure on bottom left — low-income, low-growth cluster).

B.A. Vertograd proposes to distinguish also "alpha-empires" — combining of all three types of companies (or their distribution among influential alpha-leaders) into integrated systems to obtain synergistic effects. [11] Members of the alpha-empire may operate in one ecosystem, on one technology platform or within established codes and regulations, — this will be their advantage over other market participants (see *figure*).

In the Russian online-education market there are three major alpha empires belonging to Mail.Ru Group, Yandex and TalentTech. For example, 6 companies ranked by Smart Ranking are members of the alpha-empire Mail.Ru Group, because they are wholly (Geekbrains) or partly (Skillbox — 70%, Uchi.ru — 25%, SkillFactory — 18%) owned by an Internet-giant. [12] The listed companies occupy significant shares in certain segments

of the Russian online-education market, which allowed them to be classified as beta-level companies before joining the common ecosystem. This alpha-empire also includes gamma-firms: Tetricka and Algorithmics (Mail.Ru Group owned 45% and 11.7% respectively), occupying school niches in information technology and programming.

The Yandex alpha-empire includes all companies with the "Yandex" or "Y" console as well as the School of Data Analysis, the School of Managers and Flow. Most of Yandex's projects are more in the gamma level, as they occupy separate niches of the online-education market. For example, Flow — part of a larger Y. Workshop — is a platform for learning English.

TalentTech's third alpha empire includes Netology-groups, which includes an online school to prepare for Primary State Examination, Unified State Examination and "Foxford" olympics, Netology — is a platform of online-courses for adults, EdMarket (distance learning) and "Digital education".

Thus, it can be noted that IT-factor is prevalent in the Russian market of online education, since all alpha-empires are controlled by IT-holding. Moreover, non-alpha-empire players are also partners of major companies in computer software development (Maximum Education) or have subsidiaries in this area (SkyEng). Due to the high degree of influence of the sphere of information technology — the companies participating in the market of online-education services have tendencies to explosive growth and quickly move from one level to another.

For companies at the "gamma" level in the online-education market two development scenarios are available: 1) form a unique trade offer, attract "smart" investments and escape into the segment of "beta" or even join the alpha-empire (through partnership or absorption); 2) develop your customer base and settle for the current level of earnings and profits, staying forever in the group "gamma".

The first development scenario, for example, took advantage of the former "gamma" SkillBox, attracting investment and experience of Mail.ru, ensuring its explosive growth. The second scenario was chosen by Uniweb, beginning its history with universities and providing online training programs. Over time, the company has been able to develop its product into a platform where machine learning can provide the necessary courses to train the company's employees. By focusing only on a specific segment, the company avoids direct competition but cannot sustain rapid growth.

Mirapolis on its platform enables HR-services to manage the entire process of human capital development, including the implementation of online-learning. Antiphishing focused on training people to counteract digital attacks. The company thus occupied a narrow niche, becoming the only player in it, but it is the narrowness of this niche that prevents the company from leaving the gamma- segment. The goal of the beta- and gamma-level companies may well be to capitalize and invest, as well as to sell to a major market player — "alpha" or alpha-empire. It is not possible to track such a strategy because of the opacity of the market: there is little published information on loss. For example, according to Interfax, Coursera's net loss in January-March 2021 was 21.1% of revenue, in the same period 26.6% of revenues were generated in 2020, while in the Q1 of 2021 revenues increased by 64% and registrations by 5 million.

CONCLUSION

Analysis of the online-education market in Russia generally confirms the basic ideas of the theory of economic dominance: market segmentation exists, with alpha-leaders taking

advantage of opportunities to access the less expensive resources and infrastructure of alpha-empires to gain dominant positions in online-learning. For these reasons, market forecasting needs to take into account the institutional changes taking place in the market.

The distinctive features of the online-education market are:

• First, the dominance of either alpha-empire units or companies integrated with alpha-companies in other markets. This may indicate that for small industry-sized micro-vertical markets the emergence of independent "alpha" is problematic or impossible at all, since market size does not allow for sufficient market power comparable to the alpha-leaders of larger markets.

• Second, there is a near absence of beta-players, which is generally not the case in the education market (the use of economic dominance theory is justified for the analysis of the higher education market) [13].

• Third, the ability of gamma players in the online-education market to develop depends to a large extent on their relationships with alpha-players and access to their institutional resources. The market, however, is not as definite as its relative youth, as well as opportunities of entry of alpha-players from other markets and development of "beta" and "gamm" through integration with profile "alpha", including — from the venture market.

It is also interesting to highlight the example of Mail.Ru, which is actually represented on the market by several gamma- and beta-satellites, each of which acts under its own brand and competes with "related" companies. It may be that this alpha-empire approach, through the creation of several competing units/projects, is optimal for fast-growing new markets.

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ABOUT THE AUTHORS

Angelina V. Govorova — Engineer, Department of Economics of Innovation, Faculty of Economics, Lomonosov Moscow State University, Moscow, Russia
angelinagovorova@yandex.ru

Irina P. Suslova — Engineer, Department of Management, Faculty of Economics, Lomonosov Moscow State University, Moscow, Russia
suslovairena@gmail.com

Svetlana V. Shcholokova — Cand. Sci. (Econ.), Associate Professor, Department of Management, Faculty of Economics, Lomonosov Moscow State University, Moscow, Russia
shcholokova@gmail.com

Authors' declared contributions:
A.V. Govorova — analysis of alpha empires.
I.P. Suslova — analysis of the online education market.
S.V. Shchelokova — analysis of alpha, beta, gamma companies.

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Trends, Features and Problems of the Development of Nuclear Energy in France

A.B. Sekacheva
Diplomatic academy of the Ministry of Foreign Affairs, Moscow, Russia
https://orcid.org/0000-0003-3735-0066

ABSTRACT

This article analyses the trends and problems associated with the peculiarities of the development of nuclear energy in France. This country has always paid particular attention to the fuel and energy sector. Its significant potential allows it to occupy one of the top places in the world in the use of nuclear technologies in the national economy. At the same time, the relatively hostile policy of the European Union concerning nuclear energy in connection with the implementation of its course on the "green" economy creates many problems in the relations of Paris with the leadership of this integration association. Given that Germany in 2022 completely closes its nuclear power plants (NPP), and France becomes the leading country in the EU for the use of nuclear energy, the leadership of this country under the influence of political factors often has to make mutually exclusive decisions in this area. France's position as the most significant nuclear power in the EU is complicated because it faces increasing competition in the global nuclear market. The leading positions on it are traditionally occupied by the United States, Russia, and China. Time will tell whether France will be able to cope with these threats. One thing is certain: France seeks to maintain and strengthen its position as the leading nuclear power in the EU and worldwide. France's long-term experience in designing and building nuclear power plants and ensuring their safe operation can also be useful for Russia, as it is generally recognized that our country has been and is one of the world leaders in nuclear energy.

Keywords: nuclear power; energy policy; France; nuclear reactors; nuclear power plants (NPP)

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WORLD ATOMIC ENERGY AND EUROPEAN UNION ENERGY POLICY

According to the World Nuclear Association[1] as of September 2020, the number of operating nuclear power plants in the world was 441 and their total installed capacity reached 391.7 GW.

53 reactors are under construction at present on the planet with total capacity 59.2 GW, of which 12 — in China, 7 — in India, 4 — in Russia. Planned construction of 106 additional nuclear reactors (total capacity 113.8 GW), including in countries that previously did not have nuclear power plants (NPP) — Egypt and Uzbekistan. The possibility of building an NPP is being considered in Kazakhstan, Poland, Saudi Arabia. According to British Corporation forecasts BP, NPP power generation will increase by 2050, but its dynamics will depend on many factors, and therefore the scenarios for the development of nuclear power will be different..[2] The International Energy Agency (IEA) also anticipates an increase in NPP electricity of 28–62% by 2040 and 50–100% by 2070.[3]

The share of nuclear energy in global primary energy consumption was 4.3% according to BP

[1] Official website. URL: https://www.atomic-energy.ru/organizations/vsemirnaya-yadernaya-assotsiatsiya-wna.

[2] Energy Outlook 2020. URL: https://www.bp.com/en/global/corporate/energy-economics/energy-outlook.html.

[3] World nuclear energy prospects are linked to climate objectives. URL: https://www.eprussia.ru/news/base/ 2020/3962253.htm.

data in 2019, in electricity generation — 10.4% (4.9 and 10.2% respectively according to the EU assessment).[4] According to the International Atomic Energy Agency (IAEA) published in 2019, the pessimistic scenario up to 2050 assumes a 6% reduction in NPP capacity worldwide and optimistically — 80% growth, particularly from developing countries..[5]

The development of world nuclear energy is constrained by its security concerns. French experts point out that "due to the secrecy of governments and companies owning nuclear power plants", in some situations it's difficult to determine the extent and consequences of a nuclear accident. They listed nine incidents involving operational nuclear reactors, the largest of these is the Chernobyl NPP accident (Ukraine,1986), Three Mail Island NPP (the USA,1979 r.) and Fukushima NPP (Japan, 2011).[6] The problem also concerns France. Thus, in 2017 in the north-west of this country there was an explosion at the Flamanville NPP, in which several people were injured. According to public authorities, there was no threat of radioactive material being released.

It is generally recognized that the development of global nuclear energy is also affected by the challenges of reducing human pressure on the environment. It is assumed that they can be solved by a transition to the so-called "green" economy. Therefore, the President of the World Economic Forum (WEF), K. Schwab in his book, co-written by French journalist T. Malleret "Covid-19: The Great Reset", argued that "the green economy encompasses a range of opportunities, from greener energy to ecotourism and closed-loop economies". Further this book notes that the European "green" deal initiated by the European Commission (EC) — "this's a major event and the most tangible manifestation of the government's decision not to let the COVID-19 crisis go to waste". For this purpose, is planned to allocate 1 trillion euros to reduce greenhouse gas emissions and invest in a circular economy to make Europe the first carbon-neutral continent by 2050 and "separate economic growth from resource use". Given the fall in energy consumption during the coronavirus pandemic, K. Schwab and T. Malleret claim that it had a positive impact on the environment. Therefore, British Corporation BP reduced the value of its assets by 17.5 billion USD, concluding that COVID-19 "will accelerate the global shift to cleaner forms of energy".[1]

The ideas of the "green" economy are actively promoted because, according to experts of the World Economic Forum (WEF), environmental risks are constantly increasing. His latest, 16th Global Risk Report in 2021, states that "they rank first in impact and probability alongside infectious diseases".[7] In this regard, there is a lively debate in the global media about the role of nuclear energy in the world economy and the question is asked: to what extent does its development contribute to the protection of the environment? The IEA report 2019 noted that over the past 50 years, nuclear energy has reduced carbon dioxide emissions by about 60 Gt, which is roughly equivalent to the world total emissions for two years. It also states that without nuclear power these emissions would be about 20% higher.[8]

The EU currently contributes 8% to greenhouse gas emissions, compared to 29% in China and 15% in the USA[9] NPP accounts for about 30% of European Union electricity generation and about the same share of

[4] EU energy in figures (2020). URL: https://op.europa.eu/en/publication-detail.

[5] Energy, electricity and nuclear power estimates for the period up to 2050. 2019 edition. International atomic energy agency vienna, 2019. URL: https://www-pub.iaea.org/MTCD/Publications/PDF/19–00521_web.pdf.

[6] Le nucléaire en France en 2021: production, avantages et risqué. URL: https://selectra.info/energie/guides/ comprendre/nucleaire.

[7] Global Risks Report 2021. URL: https://www.weforum.org/.

[8] Nuclear Power in a Clean Energy System. Fuel report — May 2019. URL: https://www.iea.org/reports/nuclear-power-in-a-clean-energy-system.

[9] EU energy in figures (2020). URL: https://op.europa.eu/en/publication-detail.

renewable energy (RE). But after the Chernobyl accident (1986), Germany decided to stop building new nuclear power plants, so the last plant in this country was put into operation in 1989. In 2002, it had passed a law prohibiting the construction of new nuclear power plants and planned to close them down completely by 2022, so there was an urgent need to increase the use of either natural gas or hard coal in Germany.

These highly controversial assessments and actions are bound to affect the energy policy of the European Union, particularly of France. Although the IEA predicts that by 2040 approximately half of the EU nuclear capacity will be decommissioned, four reactors are being installed in three EU member countries (Finland, France and Slovakia). According to the World Nuclear Association, an additional eight EU countries are planning to build [2] which inevitably creates differences between them and Germany. However, the EU Summit in December 2019 recognized the right of EU countries to determine for themselves the list of types of energy they intend to use in national economies.[10] Therefore, according to the European Union's strategy "Clean Planet for All", approved in 2018, the share of nuclear energy in EU domestic energy consumption will be almost unchanged by 2050 (10–16%),[11] although IAEA predicts that it may decrease to 3.2–5.2%. The European "green" line adopted by the EC at the end of 2019 also doesn't provide for the exclusion of nuclear energy from energy consumption by 2050.[12] This is consistent with global trends. Thirty countries currently have NPP, but the number of States using nuclear energy is far greater. This exists because, for example, countries such as Denmark and Italy that do not have nuclear facilities receive about 10% of their electricity from NPP located in other countries.[13] However, the anti-nuclear policies of Germany, Austria and Luxembourg resulted in the European Parliament removing nuclear energy from the list of "green" technologies in March 2019. But not all politicians and social organizations in the EU agreed to this decision.

In April 2021, a group of 46 non-governmental organizations (NGO) from 18 States sent a letter to the President of the European Commission, U. von der Leyen, requesting the inclusion of nuclear energy in the list of development priorities for the production of so-called "green" investment. In addition, in early April 2021, the EU's Joint Research Centre (JRC) presented a report on problematic aspects of nuclear power development. According to the centre's experts, "nuclear energy is no more harmful to human health or the environment than any other energy production technology that is considered sustainable (solar, wind, etc.)". It can therefore claim the status of a "green" technology. But the environmental representatives of Greenpeace strongly disagreed with these conclusions.[3]

Meanwhile, the French leadership has stated that it will fight for the recognition of nuclear power as a "green" technology in accordance with EU sustainable financing rules. French Minister of Economy Bruno Le Maire emphasized the "French determination" to get the right to "green" investments for nuclear power, and therefore final decision on this issue in the EU was never taken.[14] Thus, Paris has made it clear that it will become a champion of nuclear energy at the pan-European level and will continue to use it. As a result, Germany is rather negative about French attempts to finance its nuclear program with EU funds,

[10] EU summit December 2019. URL: https://www.consilium.europa.eu/en/meetings/euro-summit/2019/12/13/.

[11] 8/11/2018 — COM (2018) 773 — 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.

[12] 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.

[13] Situation de l'énergie nucléaire dans le monde. URL: https://energie-nucleaire.net/situation.

[14] The EU decision on the "greenness" of nuclear and gas power is postponed. URL: https://regnum.ru/ news/polit/3245597.html.

and the nuclear issue create a profound crisis between the two countries. However, Paris's position is understandable: at the beginning of 2021 in France, nuclear power accounted for more than 70% of electricity generation, in Germany, before the accident at the Fukushima NPP — only 25%, and now about 12%.[15] But this provision enables Paris to exert pressure on Germany through other energy projects.

Dr. Yunus Furuncu, energy expert of the Turkish Foundation for Political, Economic and Social Research (SETA), noted that France does not have a clear position on the project "Nord Stream — 2": "French energy company Engie is also involved in this project. France considers the "Nord Stream — 2" as a tool it can use in its relations with Germany". Then he noticed: "When we look at France's energy consumption, we see that it uses more nuclear energy. France, like Germany, will have to satisfy natural gas energy needs that will arise if the NPP closes. France, on the other hand, does not have a policy of closing the NPP. Stopping the "Nord Stream — 2" project will mean punishing not only Russia, but Germany as well".[4]. Thus, Paris is trying to make the most of its unilateral dependence on nuclear power to strengthen its position in the EU. It is understandable that this dependence has been a long-term one and is due to very objective circumstances.

HISTORY OF NUCLEAR POWER IN FRANCE

Immediately after the end of World War II in 1945, General Ch. de Gaulle established the Atomic Energy Commission (CEA) to investigate the use of atomic energy in France for both military and civilian purposes. This commissariat exists to the present time, and since 2010 has received the prefix "and on alternative forms of energy". It is responsible for the development and implementation of all nuclear-related research and development programmers, which include power generation, defense, medicine, radiation protection, safety, etc. As for the French civil sector, Ch. de Gaulle planned to create a fully independent national nuclear power plant, as it held the view widely known in France that economic sovereignty is priceless.

The first nuclear reactors appeared in this country in the middle of the last century around the same time as in the United States and the Soviet Union. In 1956, the first nuclear reactor with a capacity of only 2 MW, which operated until 1968, was commissioned in south-eastern France at Marcoule. Two other 40 MW experimental reactors were commissioned in 1958 and 1960 (they worked until 1980 and 1984 respectively). Until the early 1970s, eight more nuclear power plants were built, and in 1973, nuclear power accounted for about 8% of France's electricity generation.[16]

In response to the oil crisis of the early 1970s "France decided to switch to nuclear power on a massive scale and began an ambitious NPP program",[17] to make France an independent energy power. For this, the Prime Minister of France, P. Messmer, had drawn up a plan of action for the construction of nuclear reactors, which had been approved by Parliament in March 1974. It envisaged the commissioning of 44 NPP with a total capacity of 50 000 MW by 1980. However, 40 of them, at the insistence of President G. Pompidou, were to be licensed by the leading American corporation Westinghouse, and only 4 were to be created for French projects. A total of 170 NPP were planned to be built in the country by 2000, but France had to import 100% of the uranium for further enrichment.[5]

Currently, most French nuclear reactors are licensed by the Westinghouse Corporation, but when France received it from the United States,

[15] The end of nuclear power in Germany. URL: https://islam.kz/ru/news/v-mire.

[16] Histoire de l'électronucléaire en France. URL: .

[17] Nuclear energy in France. Embassy of France in Moscow. URL: https://ru.ambafrance.org/Atomnaya-energetika-vo-Francii.

the NPP project was renamed in FRAMATOME (France-America-Atom). As the USA has increased the lifetime of its nuclear power plant from 40 to 60 years and plans to extend it even to 80 years, accordingly, France is now also extending their working time.[6]

The political decision on the development of nuclear energy taken by the country's authorities was based on the fact that France possessed highly skilled engineering personnel and appropriate technologies, but had no unlimited access to energy resources like the USA in the Middle East. Since the State had strict control over the design and construction of the NPP, France was able, in the opinion of the vast majority of experts, to create an efficient nuclear power plant. All reactors operating in the country are water-only, with only three operating models and only one type of reactor at each NPP.

In 1999, discussions in the French Parliament identified three main directions of French energy policy: ensure security of supply (since the country imported more than half of the energy consumed in some years); establish a system for environmental protection and reduction of greenhouse gas emissions; manage radioactive waste. The dominant view was that natural gas had no economic advantage over nuclear power, and its prices are very volatile and depend on the world energy market. It has become generally accepted that, despite the "intensive efforts", such an increase in renewable energy (RE) is not expected in the near future and such energy-saving measures are not expected to be introduced, that could completely replace nuclear energy.[18]

Given the high profile of the American NPP accident in Three Mail Island in 1979, in parallel with the development of nuclear power in France, an anti-nuclear movement has emerged and spread. It began to take shape in the late 1970s, i.e. a few years after the President of V. Giscard d'Estaing declared the need to accelerate the transition to nuclear power. One of the first successes of this movement was the so-called "Plogoff case", named after a small village in Breton (Plogoff), whose inhabitants managed in 1981 to abort the project of building the NPP.

It should be noted that the debate on the future of nuclear power is still rife in French society. For example, according to the influential newspaper "Figaro", in 2018, 53% of French respondents opposed nuclear power generation.[19]

CHARACTERISTICS OF THE FRENCH NUCLEAR INDUSTRY

According to the World Nuclear Association, in January 2021 France had a total of 56 nuclear reactors capable of generating 61 370 MW of total capacity and one reactor under construction. In addition, 14 reactors were dismantled. The country remains the world's "nuclear one" with approximately 70% of total electricity generated by nuclear power generation.[20]

Since the 1980s, no new nuclear power plants have been built in France, primarily for political reasons, so that the average life expectancy is already 30.5 years. 15 reactors have been in operation for 35 years. Proponents of the development of nuclear energy point out, as a positive example, that 97% of the electricity generated in the country, thanks to NPP and hydropower, is not related to greenhouse gas emissions. Therefore, France has one of the lowest per capita rates in the world. In addition, nuclear power plants provide, unlike RE with their so-called "ragged" rhythm of work, permanent and stable electricity production. This enables industry to technological processes

[18] L'énergie nucléaire en France. URL: https://energie-nucleaire.net/situation/energie-nucleaire-france.

[19] 53% des Français opposés à l'énergie nucléaire. URL: https://www.lefigaro.fr/flash-actu/2018/10/25/.php.

[20] Nuclear Power in France. URL: https://www.world-nuclear.org/information-library.aspx.

more efficiently and don't create energy storage tanks as required for hydrocarbons.

French experts consider that, as a result of this decision, their country now enjoys a high level of energy independence and has the lowest electricity cost in Europe. That is why in France, which is often criticized for the "peaceful atom", the cost of kilowatt-hour of electricity (16.9 cents) is almost half that of Germany (31.47 cents). That is, if we compare prices, the cost of kilowatt electricity in the nuclear industry is much lower than that of wind, biofuels and solar panels.[7]

Nevertheless, as mentioned above, in the EU there has been a steady trend in recent years towards the phase-out of nuclear energy in favour of RE, which in turn prevents the development of full-scale scientific research in this field and the transition to the construction of new generation reactors. However, as many experts note, the price of electricity produced by nuclear power plants is artificially low, as the lifetime of reactors is continuously extended. Accordingly, the price will increase continuously to ensure future funding for dismantling and commissioning.[6] Moreover, since nuclear reactors in France are over 30 years old, the equipment for their unintended operation needs to be changed more frequently, thus increasing the cost of electricity generation. Referring to the fact that the nuclear reactors in France had been operated safely for almost two thirds of their operating life, the Ministry of Energy and Sustainable Development extended the lifetime of the NPP by 10 years by a decision dated 28 February 2016.[8] Since nuclear power in France has developed on the initiative and with the help of the State, it has so far strictly regulated and controlled the design and construction of NPP.

In addition to the Commissariat for Nuclear Power and Alternative Energy, the Agency of Safety Nuclear (ASN) holds a key position among the public actors in the nuclear industry. It's a State institution that controls all activities in the field of civil nuclear energy, including — nuclear safety, radiation protection and informing citizens of the situation in this field, especially in emergency situations. The Agency participates in the development of the regulatory framework for the nuclear industry and advises on draft decrees, circulars, directives and resolutions of the Government. Since 2006, the agency has operated independently of the Government, although it is subordinate to the Ministry of Environment and Energy Transition.

Less well known, even in France itself, another structure is the Radioactive Waste Management Agency (ANDRA), founded in 1991.[21] It is a non-profit organization under the joint supervision of the three Ministries of Industry, Environment and Research. Its creation was prompted by the development of the anti-nuclear movement and public concern about the fate of radioactive waste.

Since the market economy operates on a corporate basis, the State has decided to establish large enterprises in the nuclear industry that could compete successfully in the world's nuclear market. The most important power generating company and the world's largest NPP operator in France was EDF (Électricité de France), 85% of whose shares belong to the state. It is the customer and operator of all nuclear power stations in the country and 20 NPP outside the country. Thus, EDF is both a producer and a supplier of electricity, and in the field of nuclear power is in an exceptional position.[22] In doing so, this not only controls French nuclear plants, but also their monopoly owner.[9] EDF is also actively offering services to other countries to decommission nuclear facilities and dispose of spent nuclear waste. To this end, this and Veolia have formed a joint venture between Graphitech for the dismantling of graphite reactors, which

[21] Le nucléaire en France en 2021: production, avantages et risqué. URL: https://selectra.info/energie/guides/comprendre/nucleaire.

[22] Présentation de la société ELECTRICITE DE FRANCE (E.D.F.). URL: https://www.societe.com/societe/electricite-de-france-552081317.html.

operates not only in France but also in other EU countries and Japan.

In recent years, the French media have witnessed an increase in critical material about EDF activities. It is justifiably accused of having incurred millions of dollars in over-expenditure on various projects that are then covered by the country's budget. After 2008, the profitability of EDF declined significantly, was unable to pay bank debts and underwent a number of significant restructurings, with massive layoffs. In addition, the company experienced technological difficulties due to the longer construction time of the NPP and increased construction costs, and the problems of radioactive waste disposal and dismantling. [10] All these difficulties inevitably lead to an increase in the cost of nuclear energy.

The second major company in the French nuclear industry, Areva, renamed Orano in 2018, is a multinational nuclear corporation. In addition to French, its shareholders include American and German companies. It was organized in 2001 by merging three French companies — Framatome, Cogema and Technicatome. They were formerly subordinate to the Atomic Energy Commissariat, and are therefore now the main shareholders of Orano. Thus, one of the world's largest vertically integrated energy holdings was created, the development strategy of which is aimed at further accumulation of all competencies and technologies of nuclear business. Orano (Areva) — is the only Western corporation that engages in all activities related to the production of nuclear energy.

The weakness of France's nuclear power industry is that, unlike Russia, it does not have uranium deposits on its territory and therefore all uranium is imported from abroad. There it is extracted from Orano (Areva) wholly or partly controlled enterprises, the main ones being Kazakhstan, Canada and Nigeria.[9] Uranium is also imported from Australia and Russia (mainly under long-term contracts) and enriched only within the country. But this industrial company, like EDF, has serious problems: Orano (Areva) for a long time cannot finish the construction of the third power plant Olkiluoto in Finland, which started in 2005. A 10-year delay in the construction schedule and the high cost, which was three times greater than the 3.2 billion euros stipulated in the original contract [11], severely damaged the company's image. It's expected that the next generation reactor (1 600 MW) with the largest capacity in the EU will not be operational until February 2022.

Human resources are another major problem for all French nuclear power. In 2020, the sector had 220 thousand jobs in more than 2 600 companies, including small and medium-sized enterprises. These jobs are held by more skilled workers than the average for French industry. However, there is a loss of skills in the industry in many areas and a lack of quality control at all stages of design and construction involving suppliers is observed.[23] But, as many French experts rightly point out, there is no shortage of managers and financiers, but there is a shortage of engineers and scientists.

Thus, France's nuclear power industry, apart from its clear positive aspects, also has negative effects whose negative effects increase over time (see *table*).

Many analysts and politicians warn, that France needs to prepare for a long period of modernization of the nuclear industry, since outdated infrastructure and a decline in the skills of its personnel have led to an increasing number of violations of the operation of the NPP during inspections. However, monitoring identifies new problems related to technology violations in the manufacture of equipment. In particular, the high carbon content of steel parts supplied to nuclear plants has been found, resulting in their premature failure. In recent years, the total number of violations of NPP

[23] Comment l'industrie nucléaire française peut-elle rester à la pointe de l'excellence? URL: https://www.capgemini.com.

Table

Advantages and disadvantages of nuclear power in France

Advantages	Disadvantages
1. Ensures the country's energy independence. 2. Sufficient to satisfy the needs of the population. 3. Does not emit greenhouse gases	1. Complexity of nuclear waste management. 2. The growing problem of nuclear safety. 3. Limited uranium reserves. 4. High cost of NPP.

Source: Le nucléaire en France en 2021: production, avantages et risqué. URL: https://selectra.info/energie/guides/comprendre/nucleaire.

rules during the inspection period has increased from 33 to 83. On one Flamanville NPP the number of violations increased from 2 to 20 during inspections.[24] This is largely due to the fact that all nuclear power plants in the country were built using the same type of pressure water reactor (PWR). This standardization, on the one hand, has facilitated the rapid and efficient construction of a large number of reactors. But, on the other hand, given their age, it increases the risks of operation, as technical problems detected at one NPP could potentially affect other power plants. This requires continuous and large-scale inspections of reactor safety.[25]

In addition, with the development of digital energy, new threats — cyberattacks — have emerged. For example, in January 2003 in the United States a "viral worm" penetrated the NPP's corporate network in Ohio. In September 2010, about 30 thousand computer systems of industrial facilities in Iran were infected with a virus, which led to the shutdown of more than 1 300 centrifuges for uranium enrichment and the postponement of the launch date of Bushehr NPP. The Iranian authorities accused them of hacking into US intelligence networks. Cyberattacks were carried out at NPP in South Korea in 2014 and Germany in 2016.[12]

Discussions on the need to reduce nuclear energy in the energy balance of the country resumed in 2011 under the President F. Hollande after the accident at the Fukushima NPP.[26] France announced a 25% reduction in the share of nuclear power (from 75 to 50%) by 2025, with an estimated 22 nuclear power plants to be shut down by that date. This goal has now been rescheduled for 2035 and the "Energy transition for green growth" bill was finally approved by the National Assembly in July 2016. Thus, France's energy policy has to take into account the EU's requirements.

The first reactor at the oldest French Fessenheim NPP was shut down in February 2020, and its second reactor was shut down in June 2020. But unlike Germany, France has not yet reduced the share of nuclear power plants in energy consumption and has no specific road map for their closure.[5]

France's recent decision to resume construction of the NPP came as a complete surprise to the EU. At the end of 2020, the French Government, on its own, without informing any of its European partners, commissioned EDF to prepare a project for the commissioning of six new-generation nuclear reactors in 2021. The deadline was later extended by two years. President E. Macron considers nuclear energy as a guarantee of the country's sovereignty and believes that France should develop it further on the basis of new technologies. There is every reason to do so. Thanks to the NPP, France is an

[24] France's Atomic Crisis: Why the French Massively Shut Down Reactors. URL: http://новости-мира.ru-an.info/.

[25] The future of France's nuclear power industry.URL: https://www.el-info.ru/budushhee-atomnoj-energetiki-francii/.

[26] Le nucléaire en France en 2021: production, avantages et risqué. URL: https://selectra.info/ energie/guides/comprendre/nucleaire.

exporter of electricity, supplying in particular neighboring Germany and Spain. As the Russian expert D. Kosyakov rightly points out, "anti-nuclear" course of these states is based on French NPP. In addition, the supply of electricity to the EU brings France about 3 billion euros per year and is one of the main profitable exports. [10] So, the value of France's electricity group exports in 2019 was 3 billion dollars and imports amounted to 776 million dollars.[27]

In general, as French analysts have noted, France has taken a significant share in international markets for nuclear supplies to foreign countries, exporting of goods and technology 5–10 times more than the French average.[28] At present, France is supplying its nuclear technology to China, Finland, South Africa, South Korea and the United Kingdom, with the intention of building a NPP in Vietnam.

France pays particular attention to China, since the first nuclear power plants in that country (1986 and 1987) were built using French technology. But the construction of NPP Taishan was delayed by AREVA [9], and its two new generation power units were put into operation in 2018 and 2019, i.e. later than the planned dates.

INNOVATION IN FRENCH NUCLEAR ENERGY

After the end of the World War II, France began its own nuclear energy research and development, and therefore now possesses its own technologies for the design and construction of reactors, nuclear fuel enrichment and radioactive waste management. Such a strategy is very similar to Russia's nuclear industry development strategy. It was this similarity that led to the signing in July 2019 of a plan for cooperation in the peaceful use of atomic energy between the State Corporation "Rosatom" and the Commissariat for Atomic Energy and Alternative Sources of Energy of France. The Parties fixed their intention to cooperate in the field of renewable energy, the construction and operation of NPP, the digitization of energy resources and other areas.

Hinders innovation in the French nuclear industry, according to experts, the absence of a national nuclear energy strategy, which should include a mandatory lifetime extension of all existing nuclear power plants to 2030. Given that the construction period of the reactor is 7–8 years, the construction sites should be operational by 2022. [13] The absence of such a strategy is due to fluctuations in the country's energy policy as a result of diametrically opposed approaches to the future of nuclear power. It is true that nuclear energy is considered environmentally friendly in terms of greenhouse gas emissions, but also dirty in terms of nuclear waste. Proponents of its development believe that the main challenge — is to ensure a rapid transition from obsolete second-generation reactors to safer third- and even fourth-generation reactors.

Despite the complexities of the nuclear industry, France is building a third-generation EPR reactor. It's a new European pressure reactor or "european pressurized reactor" (hence the acronym EPR). This project was developed by Orano (Areva) in the 1990s and 2000s, but the construction of these reactors in France and Finland faced technological problems. For example, the initial construction of the third EPR power unit at the Channel la Manche in Flamanville was a joint German-French project, but since Germany's withdrawal, the reactor has not been built yet, and its cost has already exceeded 12 billion euros. In 2019, EDF corporation officially announced that construction would not be completed until late

[27] France | Imports and Exports | The World | Electricity | Value (USD) and Price change, years (%) | 2008–2019. URL: https://trendeconomy.ru/data/h2/France/271600.

[28] Comment l'industrie nucléaire française peut-elle rester à la pointe de l'excellence? URL: https://www.capgemini.com/fr-fr/ressources/comment-lindustrie-nucleaire-francaise-peut-elle-rester-a-la-pointe-de-lexcellence/.

2022.[29] Consequently, the cost of the reactor will increase even further — according to the Court of Accounts of France it will be 19.4 billion euros. Meanwhile, as mentioned above, the first such reactor was put into operation at the Chinese NPP Taishan at the end of 2018. At the same time, Orano (Areva) originally intended to build them outside France in order to gain the necessary experience to enable it to move immediately to the construction of units of the fourth generation. Although the initial objectives of the new generation of reactors were to achieve a high level of safety and cost-effectiveness of the NPP, their construction was not a success in Finland, and in France itself. The period from the beginning to the end of the works was estimated at 4.5 years, but was actually more than twice as long. However, the third EPR project in Europe was launched in the UK in Hinckley-Point in 2018.[30]

France has now decided to develop fourth-generation reactors. Research focuses on three main areas: build fast neutron reactors with sodium heat carrier; development of fast gas-cooled reactors; establishment of high-temperature gas-cooled reactors. However, the first two tracks are in competition with each other, as it is possible to compare their performance, which would allow a final choice between them.[9] And although France has gained considerable experience in the construction of fast neutron reactors called "Phoenix" (1973–2010) and "Superphoenix" (1885–1998), it was not enough. These power plants suffered a number of accidents and were therefore closed.

By comparison: fast neutron reactors commissioned in Russia are generally considered to be much safer. At Beloyarsk NPP the first such reactor works since 1981, the second — since 2016. Construction of the third reactor is scheduled to begin in 2025. Among their unquestionable merits are the fact that they do not emit greenhouse gases into the atmosphere and "allow materials such as uranium-238 and thorium-232 to enter the fuel cycle. In this way, they can dispose of the most hazardous waste in spent nuclear fuel". [7]

But the most promising direction in the development of nuclear power is considered to be the creation of a controlled thermonuclear reaction. The reactors to be built on this basis would be much safer from radiation. Since the problem has proved to be very costly, the major nuclear countries have joined forces to address it. France, however, has made its territory available for the realization of this idea.

To this end, a site for the construction of an international experimental nuclear reactor was identified in the south in 2005 (ITER project) — Cadarache Nuclear Research Centre. In 2007, ITER was established, and 35 countries, including Russia, began cooperation to develop this world's largest nuclear device. It is created to prove the possibility of thermonuclear fusion as a large-scale, carbon-free source of energy based on the same principle as stellar radiation.[31] The practical challenge is to gain experience in the design and operation of future fusion plants.

The total cost of the project is estimated at more than 20 billion euros, which automatically places ITER at the top value of all scientific installations. Between 2020 and 2022 alone, Russia allocated some 12 billion rub.[32] In June 2016, the ITER Board of Directors announced that the initial completion forecasts had not been confirmed, and therefore December 2025 is the most realistic date. In November 2016, he announced that "Deuterium-tritium fusion experiments", i.e.

[29] Snag-hit new French nuclear power station delayed by further 3 years. URL: https://news.yahoo.com.

[30] Le nucléaire en France en 2021: production, avantages et risqué. URL: https://selectra.info/ energie/guides/comprendre/nucleaire.

[31] ITER — The Grand Project of Modernity. URL: https://pikabu.ru/story/ityer.

[32] Figure of day: how much will Russia spend on an international fusion reactor? URL: https://news.rambler.ru/asia/42895661.

on the creation of a basic nuclear reaction within a controlled fusion, would begin in 2035.[33]

Delays in the completion of the reactor are due to both organizational and technological difficulties. A number of countries have repeatedly violated their delivery schedules, resulting in the continued postponement of the reactor launch. However, in July 2020, the ITER project officially moved from the construction phase to the assembly phase of the reactor.

According to expert estimates, in an optimistic scenario, the first thermonuclear plants will be available by 2050 and humanity will receive an almost unlimited source of energy.[34] France, which, despite the objective difficulties of the development of the nuclear industry, has never stopped working to improve its nuclear technology, will certainly be a credit for this.

CONCLUSION

To sum up, we can state with confidence that France's nuclear power will continue to dominate its fuel energy complex. The country has significant experience in the design, operation and safety of existing NPP, and that allows it, along with the USA, Russia, and China, to occupy one of the leading positions in the world's nuclear market. The construction on its territory of an international experimental nuclear reactor (ITER Project) to achieve thermonuclear fusion as a large-scale, carbon-free energy source supports this thesis.

At the same time, there are many problems in the country's nuclear power industry, the main one being the technological gap with the USA and Russia, as a result, the installation of new nuclear power plants is delayed and the cost of their construction is increased, not only in the country but also abroad. In addition, the absence of a national strategy for the development of the nuclear industry prevents the French leadership from consistently defending its interests in the European Union, which advocates the gradual decommissioning of existing NPP. At the same time, Paris often makes contradictory and mutually exclusive decisions on these issues, which in general hamper the innovative development of national nuclear power.

Given these factors, it is essential for France to establish full-fledged cooperation with Russia, since the nuclear industries of the two countries share similar characteristics and have a central role for the State in their operation. Signed in July 2019, the plan of cooperation in the field of the peaceful use of atomic energy between the State Corporation "Rosatom" and the Commissariat for Atomic Energy and Alternative Sources of Energy of France gives us hope that its implementation would bring benefits to both parties. There is no doubt that the development of cooperation in this area between Russia and France will make it possible to accelerate the development and introduction of new nuclear technologies, which in turn will help to solve many of the problems of development of national economies.

[33] L'énergie nucléaire en France. URL: https://energie-nucleaire.net/situation/energie-nucleaire-france.

[34] When will the thermonuclear power plants be available? URL: http://www.sib-science.info/ru/institutes/energiya-31082016.

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ABOUT THE AUTHOR

Alla B. Sekacheva — Cand. Sci. (Econ.), Associate Professor, Department of World Economy, Diplomatic Academy of the Russian Foreign Ministry, Moscow, Russia
aline_ph@rambler.ru

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Assessment of Employment Motivation of Remote Workers of the Higher Education System*

E.A. Pondo
Financial University, Moscow, Russia
https://orcid.org/0000-0002-4484-1982

ABSTRACT

The article proposes a methodology for assessing the level of motivation of a remote employee of an organisation. It includes surveying according to the developed author's questionnaire, aimed at assessing the motivation of this group of employees depending on economic, digital, and socio-psychological factors and environmental factors; calculation of the motivation index, which allows identifying the most significant aspects of influence. The technique has been tested on the example of higher education institutions due to a considerable proportion of teleworkers in these organisations. As a result, the author revealed the most significant impact on the motivation of remote employees of educational organisations of various kinds of material incentives.

Keywords: telecommuter; higher education institutions; digitalisation; labour motivation; index method

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INTRODUCTION

In the current context of the knowledge economy and the digitization of social relations, the development of any State is impossible without highly qualified specialists. In this connection, the development of higher education, including through the provision of higher education institutions with professional staff with a high motivation for teaching and research activities, assumes special significance, which increases significantly as a result of the accelerated transition to a remote format caused by the spread of a new coronavirus infection COVID-19. This is evidenced, in particular, by the data obtained by the author during the monthly monitoring of the hh.ru job search site between 2019 and 2021, which was aimed at identifying industries with the greatest need for remote employees and showed that the education sector had entered the top 5 sectors of the economy in terms of job placement by employers.

It should be noted, however, that distance work is a relatively new phenomenon and the influence of the digital environment on motivation processes has not been sufficiently studied to date.

The purpose of this paper is to assess the level of motivation of distance workers using the example of institutions of higher education and to identify factors, which have the greatest incentive effect on the performance of their work functions in a remote employment format.

A review of the current scientific work of domestic and foreign scientists led to the conclusion that there is a sufficient number of studies in various branches and economic activities that address to varying degrees the measurement of motivation and job satisfaction (for example, these papers [1–4]). In the area of personnel management, however, should be noted these papers J. P. Wiegand, F. Drasgow, J. Rounds [5], G. Steffgen, P.E. Sischka, M.F. Henestrosa, [6], S. Jha, [7], L.G. Pochebut and O.E. Koroleva.[8] These studies deserve special attention from the perspective of authors' approaches to scientific tasks such as:

1. Description of potential mismatch in terms of job equivalency, performance satisfaction and productivity.
2. Characterization of several types of voice behavior: flexible voice representing the category of workers who agree with the majority; defensive voice that allows the worker to defend himself; pro-social (constructive) voice that creates a pool of altruistic types of employees capable of producing constructive and creative proposals for the benefit of other employees of the organization.
3. Monitoring of changes in the labor market and their impact on the working conditions of the worker, which led to the development of a series of indicators of work quality, including indicators of psychosocial working conditions.

In addition, it's necessary to mention articles devoted to the study of the relationship between job satisfaction and productivity and examining the relationship between staff development and organizational equity in health, on the grounds that, like education, the sector is a budgetary area. Here the papers should be noted C. Blanchard, A. Baker, D. Perreault, L. Mask, M. Tremblay [9], B. Pungnirund [10], O.A. Lasebikan, O. Ede, N.N. Lasebikan, U.E. Anyaehie, G.C. Oguzie, E.D. Chukwujindu [11], C.C. Falguera, J.A.A. De los Santos, J.R. Galabay, C.N. Firmo, K. Tsaras, R.A. Rosales, L.J. Labrague, [12], E.L.A. Matsumoto-Takahashi, P. Tongol-Rivera, E.A. Villacorte, R.U. Angluben, M. Jimba, S. Kano.[13]

The studies identified are important in examining the assessment of prospects for the use of core human resources management practices that can improve staff efficiency. The

flaws of these papers include a lack of analysis of the factors affecting the employee's job satisfaction from the perspective of the influence of the external environment, as well as a lack of attention to economic factors.

And it must be noted the paper A.G. Tyurikov, O.S. Borovinskikh, K.A. Golubeva, D.A. Kunizheva [14], on the analysis of the quality of educational services through the evaluation of the list of basic personal, professional and universal competences acquired already in the course of education. The methodology of the study is to conduct a survey of teachers and students, employers and graduates, and a content analysis of the requirements for vacancies in the labor market, followed by an index method on the basis of which a scale has been formulated and presented to help determine the level of competence.

Thus, a critical analysis of the work shows that a significant number of studies are available on the subject matter, however, should be noted that there is a lack of a comprehensive approach to assessing staff motivation, as well as a low level of development of the topic of assessing the motivation of remote employee.

MATERIALS AND TECHNIQUES

The survey questionnaire was developed by the author and is aimed at assessing the impact of 4 sets of factors (economic, digital, socio-psychological and environmental factors) on the motivation of the organization's staff in the context of an active transition to a digital, remote format. The selection of influencing factors was based on a review of theoretical works of domestic (database of the E-library and Cyberleninka; sources located in the Russian State Library) and foreign authors (citation and analytic bases Scopus and Web of Science), and analysis of cases and taking into account current events that have a significant impact on the investigated issue (COVID-19 — Coronary Infection Pandemic).[15]

The responses to the questionnaire were formulated in such a way that the data obtained (which allows for the analysis of disparate indicators not to be added[1]) could be used to calculate the motivation index. Thus, the responses are consistently graded [from the factors that most strongly influence the level of motivation of the distance worker to those that have the least influence (coefficients from 1 to 0)] or equal in importance so that the respondent chooses something appropriate to his or her perception (coefficients from 6 to 1). The question sheet also contained synonymous questions for the camouflage of the research objectives required to form, trace and receive a candid response to the topic claimed (*table 1*).

Then, for each group of questions, a formula was developed to calculate a private motivation index for each of the questions in the study group (1):

$$i_{\text{individual } k} = \Sigma A_n * m_n, \quad (1)$$

where A_n — coefficient values assigned to responses;

m_n — percentage of respondents' responses converted to numeric value up to thousand;

n — number of responses to the questionnaire;

k — number of questions included in the research group of factors.

The next step was the calculation of a private motivation index for the group of factors studied (2):

$$I_{\text{individual}} = \Sigma i_{\text{individual } k}, \quad (2)$$

where $I_{\text{individual}}$ — general index for a group of factors;

[1] URL: https://finzz.ru/indeksnyj-metod-analiza-primery-kratko.html.

Table 1

Examples of questions and answers to be indexed

Number of questions	Example of a response to a question	Assigned coefficients	Note
Economic factors			
What do you find most appealing in remote work?			
5	Wage	6	The distribution of coefficients will depend on the response of respondents in an organization
	Cash reward	5	
	Monetary savings spent on way to and from work	4	
	Announcement of gratitude	3	
	Hours paid according to wage standards	2	
	Social, cultural and housing benefits	1	
Digital factors			
How has your work motivation changed as part of your transition to remote work due to the introduction of self-isolation due to the spread of coronavirus infection COVID-19?			
5	Significant increase in motivation	1	Distribution of coefficients doesn't vary according to respondents
	Slight increase in motivation	0.75	
	No impact on the level of motivation	0.5	
	Slight decrease in motivation	0.25	
	Significant reduction in motivation	0	
Socio-psychological factors			
Do you think that distance technologies motivate the most efficient job performance and also contribute to successful working contacts?			
5	Fully agree	1	Distribution of coefficients doesn't vary according to respondents
	Partially agrees	0.66	
	Partially disagrees	0.33	
	Totally disagrees	0	
Environmental factors			
Is working in a prestigious organization with high ratings an important motivating factor for you?			
5	Motivates and makes you feel important	1	Distribution of coefficients doesn't vary according to respondents
	Doesn't motivate much, but it's nice to work in a place like this	0.5	
	No, it's not an incentive to work for me	0	

Source: compiled by the author.

Table 2

Percentage distribution of answers to the question of the economic block for each organisation

Replies to the question asked		Distribution of respondents by organization, %		
№	Economic factors	A	B	C
1	Wage	37.5	28.1	29.7
2	Cash reward	26	33.4	26.8
3	Monetary savings spent on way to and from work	16.1	10	12.9
4	Announcement of gratitude	7.3	8.5	6.3
5	Hours paid according to wage standards	5.5	7.1	8.4
6	Social, cultural and housing benefits	3	5.5	4.6

Source: compiled by the author.

$i_{\text{individual } k}$ — individual motivation index for each of the questions in the research group.

A level scale was then introduced to allow:

1) distribution of the individual indices obtained by the degree of influence of the group of factors studied on the work motivation of remote employee in the high to low levels;

2) bring the different approaches used in determining weights of private motivation indices into a single measurement system;

The overall motivation index for remote employee was proposed to be calculated as the sum of the four private indices mentioned above (3):

$$I_{total} = i_{econ} + i_{dig} + i_{s\text{-}p} + i_{ext}, \quad (3)$$

where i_{econ} — index of the motivation of remote employee by economic factor group;

i_{dig} — index of the motivation of remote employee by digital work;

$i_{s\text{-}p}$ — index of the motivation of remote employee by socio-psychological group of factors;

i_{ext} — index of the motivation of remote employee by external environment influence.

The treatment of the index of the values obtained is also done within the level scale.

RESULTS

The author's questionnaire was distributed in September-December 2020 to distance workers from three educational organizations: Financial University under the Government of the Russian Federation, Moscow Automobile and Road Construction State Technical University (MADI), Moscow State University of Food Production.

Due to restrictions on possible publication actions, related to the confidentiality policy of the organizations participating in the survey, randomly assigned a letter value to the institutions of higher education being

Table 3

An example of calculating the motivation index of teleworkers by the economic group of factors for each of the organisations participating in the study

№	Organization	Calculation of an index of the motivation of teleworkers by economic results of work	Total for the organization	Total by industry
1	A	(6*0.375) + (5*0.26) + (4*0.161) + (3*0.073) + + (2* 0.055) + (1*0.03) = 4.553	$I_{econ\ A}$ = 4.553	$I_{econ/edu}$ = 12.872
2	B	(6*0.334) + (5*0.281) + (4*0.1) + (3*0.085) + + (2*0.071) + (1*0.055) = 4.257	$I_{econ\ B}$ = 4.257	
3	C	(6*0.297) + (5*0.268) + (4*0.129) + (3*0.084) + + (2*0.063) + (1*0.046) = 4.062	$I_{econ\ C}$ = 4.062	

Source: compiled by the author.

Table 4

The maximum and minimum coefficients obtained in the course of calculating the motivation index of teleworkers by the economic group of factors by organisations

№	Organization	max	min
1	A	2.25	0.03
2	B	2	0.055
3	C	1.782	0.046

Source: compiled by the author.

analysed (A, B, C), further used in this work to enforce secrecy policies and prevent leakage of information.

The survey conducted in designated organizations was a representative sample based on locally acquired information on the number of staff in a given entity. Respondents, who were interviewed, were professors, academics and administrative and managerial staff. A total of 847 persons were interviewed.

On the basis of a review of research studies on approaches to employee motivation and job satisfaction, the author concluded that economic factors were significant. Respondents confirmed that the greatest influence on the motivation of workers in the remote form of work of the group of economic factors. Illustrate the calculation of the motivation index with the example of the private index of the motivation of remote workers for the group of economic factors (i_{econ}).

Percentage distribution of respondents to the first question of the economic cluster of the questionnaire in *table 2*.

For the subsequent calculation of the motivation index for the economic group of factors (i_{econ}) it's necessary to distribute

Table 5

Calculation of the size of the working part of the level scale by organisations

№	Organization	Formula for calculating the working part of the scale (*V*)	Amount of work part of level scale
1	A	*V* = max – min	2.22
2	B		1.945
3	C		1.736

Source: compiled by the author.

Table 6

Calculation of the size of the step between levels by organisation

№	Organization	Formula for calculating the step between levels (*V* шага)	Amount of step between levels
1	A	*V* шага = *V*/3 (number of levels)	0.74
2	B		0.648
3	C		0.578

Source: compiled by the author.

the numerical coefficients between the respondents' replies in order of decreasing the coefficient value while decreasing the percentage of respondent's responses.

Distribution will be done by differentiating ratios between equally important responses to the questionnaire by economic group, therefore, it should be noted that in this case only the answer that has not been chosen by the respondents will be assigned a value of "0".

It should be emphasized that this action reflects the content and value of each answer to the question from the economic bloc, which is why the author chooses the whole value to be used in future calculations.

The maximum response rate that the largest number of respondents gave will be "6", and the ratio of the maximum to the number of responses will be the "average step". It should be noted, however, that although the maximum value has already been assigned, it must be taken into account in the total number of replies in order to obtain a minimum coefficient not equal to zero: 6/6 = 1.

The next step was the calculation of the index (*table 3*).

The results of the calculation showed that the overall index of motivation of remote workers by economic group of factors in educational organizations ($I_{econ/edu}$) is 12.872.

Then the maximum and minimum ratios of the remote employee motivation index for the economic factor group by organization were calculated (*table 4*).

The data allowed the calculation of the working part of the scale, which is the difference between the maximum and minimum numerical coefficients, results from the calculation of index of the motivation of remote employee by economic factor group (*table 5*).

The number of levels was then given and the step value was set as the ratio of the

Table 7

Values assigned to each of the three levels (high, medium, low) by organisation

№	Organization	Values assigned to each level
1	A	High degree of influence: from 1.51 to 2.25 Average degree of influence: from 0.76 to 1.50 Low degree of influence: from 0.03 to 0.75
2	B	High degree of influence: from 1.352 to 2 Average degree of influence: from 0.703 to 1.351 Low degree of influence: from 0.055 to 0.702
3	C	High degree of influence: from 1.204 to 1.782 Average degree of influence: from 0.625 to 1.203 Low degree of influence: from 0.046 to 0.624

Source: compiled by the author.

Table 8

Calculation of the general motivation index of teleworkers based on educational organisations

№	Organization	Calculation $I_{total} = i_{econ} + i_{dig} + i_{s\text{-}p} + i_{ext}$	Value
1	A	4.553+2.683+2.711+6.528	16.475
2	B	4.257+3.434+2.535+7.132	17.358
3	C	4.062+2.915+2.99+7.097	17.064

Source: compiled by the author.

working part of the scale to the number of levels. The number of levels was determined by the researcher. In the calculation of the defined index, the three-tier classification of index values was applied in this study: high, medium and low, indicating the degree of motivation of the work of the remote employee by means of the responses received by the respondents in the survey.

Calculate the size of the step between the levels (*table 6*).

The calculations made it possible to assign the following values to the levels indicated by subtracting the step between the levels from the maximum coefficient (calculated within the desired index) and the subsequent subtraction of the step between levels from the previously obtained value (*table 7*).

The next step was to identify factors that, based on the results of the defined index, have a different influence on the motivation of the remote employees of the participating organizations.

The same calculation scheme was used to calculate the remaining private and general motivation index (*table 8*).

CONCLUSION

On the basis of the results of the calculation of the general motivation index, it can be concluded that the most motivated among educational organizations are employees

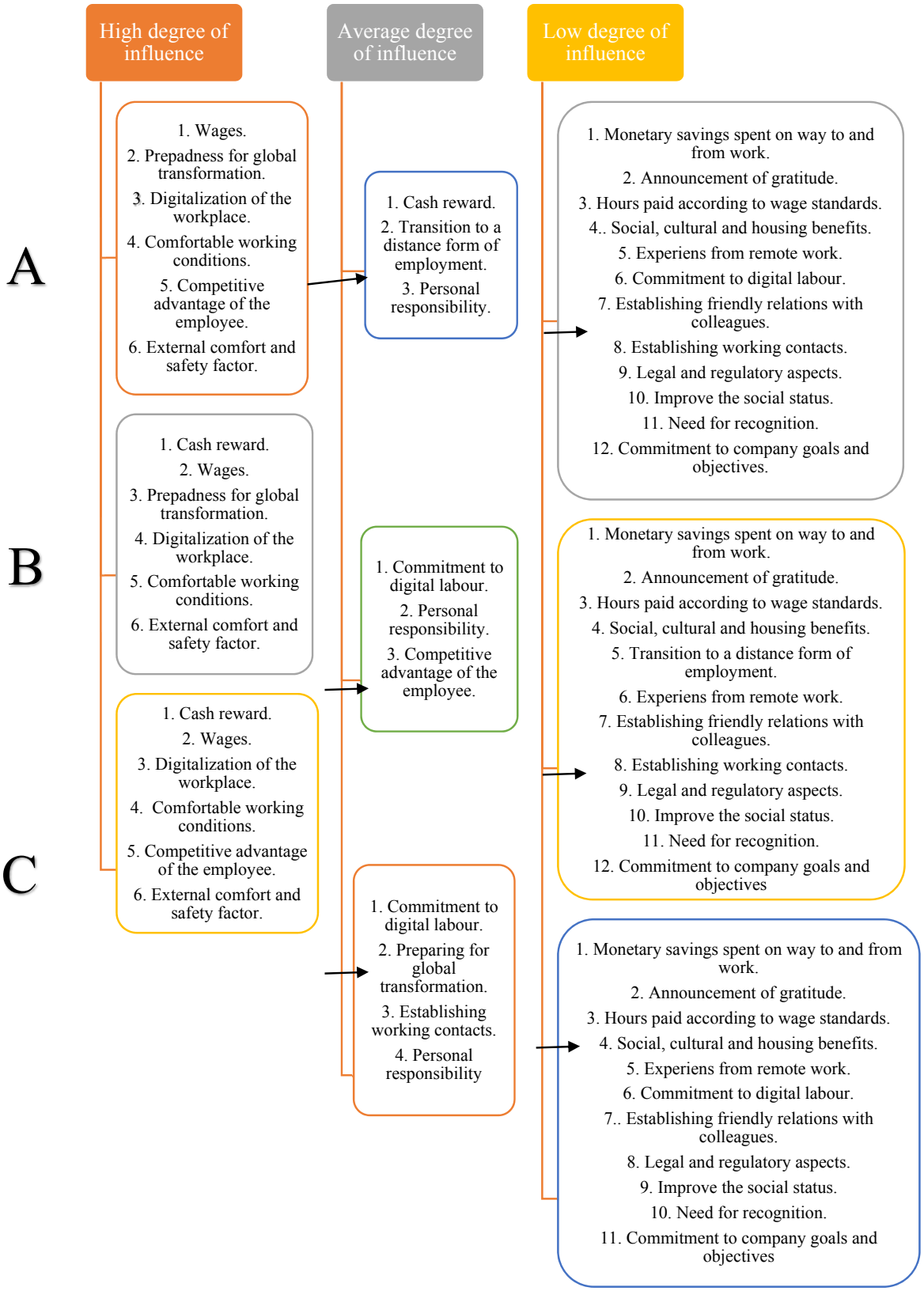

Fig. **Factors that have a high, medium or low degree of influence on the motivation of teleworkers of organisations — survey participants**

Source: compiled by the author.

of the organization B, and least motivated — employees of the organization A.

The calculation of private motivational indexes for remote personnel revealed a number of differences between organizations in terms of the impact of certain factors on staff motivation. For example, pay and readiness for global transformation have a high impact on staff in organization A, and for organizations B and C — the predominant factors are the cash premium and pay factor.

A distinguishing feature of the educational organization B from other organizations participating in the research, in part because of factors that have a moderate degree of influence on the motivation of the work activity, was the factor of competitive advantages of the employee.

It should be noted that the staff of organization C were the only ones to attribute the establishment of working contacts to a group with little influence on motivation.

The consolidated results of the study, reflecting the high, medium or low influence of the various factors in the organizations, are presented in the *figure*.

Based on the study data obtained by calculating the index of motivation of remote workers by economic group of factors, it may be noted that respondents from all organizations participating in the study clearly indicated a high degree of influence of wage factors and a cash reward with a low degree of influence on the motivation of other factors within a given group.

The data obtained in the course of the research concerning the calculation of the index of the perception of teleworkers of the digital form of labor interaction revealed the following distribution of factors of work motivation, into the questions on levels of influence on the motivation of remote employees. For example, workers in educational institutions less frequently noted the transition to remote work and commitment to digital labor as factors, having a strong influence on the motivation of remote employees. The readiness for global transformation shared by all participating organizations is noteworthy.

The results of the calculation of the index of motivation of remote workers with socio-psychological factors showed, that most of the staff members of the organizations participating in the study are more motivated by comfortable working conditions. At the same time, respondents noted a reduced level of personal responsibility on the remote worker, with a significant motivation factor — maintaining competitive advantage against the backdrop of the digital transformation of the economy.

In addition, the results of the study showed that all respondents had a low degree of influence on the motivation to work of such socio-psychological factor as establishing friendly relations with colleagues. This factor is the least influential in combination with the establishment of working contacts.

With regard to the external influence index on the motivation of remote workers, all participating organizations highlighted the high degree of influence of the external comfort and safety factor and low influence of other environmental factors analysed, including: regulatory, social status, recognition, commitment to company goals and policies. There are no factors that have a moderate influence on the remote employees.

The results of the calculation of the index of influence of the external environment on the motivation of remote employees are confirmed by the data of the study of the personnel company Unity, which interviewed 647 workers from various Russian organizations. For example, 78% of respondents reported comfortable working conditions expressed in the ability to focus on important work issues and processes at home, and 56% indicated a comfortable workplace as one of the elements

of telecommuting that have a positive impact on labor efficiency.[2]

In conclusion, the overall employee motivation index requires detailed consideration on the basis of each individual organization. A high level of employee motivation can be said to mean that an organization finds itself in a process of major structural change (which leads to an increase in the motivation of workers to keep their jobs and, as a consequence, a sharp increase in productivity), and the serious level of personnel development, which is reflected in the high degree of involvement of employees from different parts of the company in related internal work processes, which contributes to raising the overall level of motivation of an individual employee of a designated organization. In addition, research was conducted on the digital form of labor, and it seems likely that a high level of job motivation may exist in organizations that have used remote forms everywhere, including before the coronavirus infection pandemic COVID-19, which involved a number of structures in a remote process suddenly and unscheduled.

[2] URL: https://pro.rbc.ru/demo/5e90352d9a7947a0fa9c1df8.

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ABOUT THE AUTHOR

Ekaterina A. Pondo — Post-graduate student of the Department of Psychology and Human Capital Development, Faculty of Sociology and Political Science, Financial University, Moscow, Russia
ice-world@mail.ru

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