Human and Technological Progress Towards the Socio-Economic Paradigm of the Future

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Human and Technological Progress Towards the Socio-Economic Paradigm of the Future

Part III

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Introduction

The combined problem of the digitization of the economy, the digitization of humanity as a whole and human existence in time and space as a subject has been actualized in recent times. Indeed, the projects of the future world economy are inextricably connected with the achievements of scientific and technological progress linked with global social and economic transformations at the system and intersystem levels.

Nevertheless, the question of urgency and the imminent necessity of these events arises. Is this process so necessary for modern Russia and other countries of the globalized world and what is its impact on the economic and social life of sociohistorical organisms? Back in the early 2000s, Robert Solow, winner of the Nobel Prize in Economics, wondered how the introduction of information technologies had an effect on the growth of labor productivity in various industries. The USA gave the answer – the staff of their Bureau of Statistical Analysis found out that the bi-factor productivity did not increase in any of the branches of the American economy, except for one – computer production. At the same time, there is a steady trend towards a decline in labor productivity and capital in the economy as a whole. In addition, the problem of universal access to information due to global Internet networks plays a less positive role in creating a favorable background of social comfort in the population of the countries of the global world. The standard of living of the notorious "golden billion", formed in the late 1950s and early 1960s due to the introduction of innovative technologies in all possible industries and a sharp jump in bi-factor productivity, is still not achievable for the remaining almost 5 billion people using all sorts of "Gadgets". This leads to the inevitable growth of social tension . . . Against the background of the "failures" of the modern socioeconomic system, some projects are offered to get out of this situation. Not all of these projects and proposals are unequivocal. Consequently, the outcome of their implementation is the same.

In modern society, it is very difficult for a person to manifest his or her creative purpose. The consumer function of administration has become the embodiment of life ideals, aspirations, ambitions, social significance and status weight. The problem of human creative and generative self-realization and realistic realization of ideas in the economy of the future has faced the present society.

Today, the variants of the future society are mostly drawn archaically harshly. However, we should not forget that, in accordance with the already established views, the acceleration of economic growth over the past 200–250 years of human existence was caused by three successive scientific and technical revolutions (STDs). The world is on the verge of the fourth. The West has always independently carried out technological "breakthroughs", relying on all sorts of incentives: trade and production incentives, financial advantages, better conditions for the functioning of capital, as well as global integration. Moreover, Russia has always been able to choose the

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path of forward-pragmatic-rational-emotional movement, which is able to bring out not only her and her satellites, but the rest of the world from the dimension of non-existence . . . In addition, if the future takes place, it will go along the development trajectory emotionally – an intuitive relationship space, remembering, of course, the ratio . . .

This volume is about these major trends in the development of humanity, society and economy.

Part III determines the specific features of socio-economic transformations of various spheres of the national economy with focus on the financial system, as an environment in which the recent financial crisis emerged. The authors consider the perspectives of development of industrial holdings in the electric energy sphere in the conditions of the world economy's globalization and study the influence of technologies on the development of the sphere of fish farming and fish breeding in modern Russia. The global factors of using the possibilities of digital technologies at the municipal level during creation of "green" and "smart" cities are analyzed.

The perspectives of development of tourism in the digital economy from the positions of supply and demand are determined. The specifics of the development of agricultural production in the age of digital transformations using the example of modern Russia are outlined, and "smart" agricultural platform, which allows for multiple increase of the agro-industrial complex's efficiency, is developed. New possibilities and the need for the reformation of the international monetary system in the conditions of the Fourth industrial revolution are determined.

The problems and perspectives of the development of Eurasian stock markets in current economic conditions under the influence of wide distribution of digital technologies are systematized. Specific features of the evolution of the forms of money – from gold to crypto currencies are – are distinguished. Specific features of benchmarking of depreciation of currencies (inflation) under the influence of globalization and regionalization of the international monetary system are determined. The authors present a concept of the banking system of the future in the conditions of macro-economic instability, which stimulates financial crisis management of the national economy, and determine the role of banks in aggregation and redistribution of monetary resources in economy in the context of digital transformations.

In addition, attention is paid to social consequences of the digital modernization of the financial system – transformation of human's social life in the age of innovative banking is shown. The effectiveness of online banking, as a new form of payment that is popular in the digital economy, is analyzed. The authors formulate competencies that employees of banks of the future, which will function in the digital economy, should have and study the perspectives of digitization of the practice of tax administration based on technological processing and analytics of Big Data using the example of experience of modern Russia, as well as related transformation processes in the existing practice of the tax system organization.

A concept of organization and management of the national tax system in the conditions of robotization of production and consumption is developed, and the role of blockchain technologies in improvement of the modern Russian tax system is determined. The investment platform for the modern digital economy is identified and, as a result, the scientific paradigm of the formation of the digital financial system in the conditions of Industry 4.0 is formed.

For a better understanding all Russian sources have been translated into English. The responsibility lies with each author.

Marina L. Alpidovskaya and Elena G. Popkova

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Nikolay Rudenko

1 The Development of Industrial Holdings of Electroenergetic Industry in the Conditions of Globalization of the World Economy

Introduction

The branch of the electric power industry in Russia is a complex production and economic system, which was formed gradually over a long period of time. The conditions for transforming the electric power industry were formed after 1980. At this stage of development, signs of industry stagnation appeared: the renewal of production capacities grew at a slower pace than the increase in electricity consumption.

In domestic and foreign scientific literature, the authors consider various aspects of the reform of the electric power industry. So, Kazenova T.M. in her study notes that the process of reforming the industry, as well as the goals and objectives are fixed by the Government of the Russian Federation dated July 11, 2001 No. 526 "On the re-formation of the electric power industry of the Russian Federation". (Kazenova, 2006).

The goal of reforming the electric power industry has created conditions for stimulating investment, ensuring uninterrupted supply to end-users of electric power, and improving the performance of electric power companies (Nizayeva, 2012). In this regard, radical changes are taking place in the industry: a competitive electricity market is developing, the system of state regulation of the industry is changing, industrial holdings are being formed. Pestov I.P. believes that the changes have captured the structure of the industry: the division of natural monopoly (transmission of electricity) and competitive functions in terms of the production and sale of electricity happened (Pestov, 2010). The main mechanism for reforming the electric power industry of the Russian Federation was the formation of a new form of interrelationships between industry subjects, based on foreign experience of competitive electricity markets, taking into account the specifics of the activities of Russian electric power enterprises. The result of the reform of the industry is the creation of a clear separation of enterprises for certain types of activities, including: electricity sales to the population, operational dispatch management, electricity generation, transmission and distribution of electricity (Gadzhiyev, 2009).

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The works of foreign authors, such as Tompson William, Kennedy Da-vid, Gore Olga, also address the issues of the state of the Russian power industry in the period of its reform (Tompson, 2005; Kennedy, 2003; Gore, 2012).

Plekhova Yu.O. highlights the following factors affecting the development of enterprises in the electric power industry:

- the emergence of innovative technologies
- the predominance of factors of intensive development in all areas of production activities
- globalization of economic relations and increased competition in existing markets for goods and services (Plekhova, 2008)

In modern conditions, globalization of economic activity is developing in three key areas: the international movement of factors of production, including capital (in the form of direct foreign investment portfolio) and labor (in the form of workers' migrations), international trade in goods, works and services, international financial transactions.

According to A.V. Lazarev, the existing processes of globalization of economic entities stimulate the formation of processes of combining enterprises on an economic basis into groups, as a result of which the actual form of building the structure of organizations are related groups of companies called holding companies (Lazareva, 2016).

In the scientific literature, a number of researchers such as A.S. Kamashev and L.K. Prokopenko distinguish various models of the organization of the electric power industry, including:

- model of independent producers
- model of a single buyer
- vertically integrated model

The characteristics of each model are presented below (see Table 1.1).

Table 1.1: Models of the electricity industry.

Mode	Characteristics	Positives	Negatives
Model of independent manufacturers	Competitive relationships are possible in this model in the field of generation, transmission and distribution. Electric power can be supplied by one company or by several organizations, and generation by independent producers.	Generation can be carried out by independent manufacturers	State guarantees are required to attract private capital to the industry.

Table 1.1 (continued)

Mode	Characteristics	Positives	Negatives
Model of independent buyers	Competition takes place between electricity suppliers in order to obtain a contract for the supply of electricity to a single purchaser, which provides electricity to sales companies	Opportunity to attract private investors	Lack of security criteria of transparency of the "single procurement"
Model of vertical integration	All stages from production to the sale of electricity (transmission, distribution: supply, generation) occur within single enterprise	Control over pricing; predictability for consumers and the state	The need for state participation in the financing industry

Source: According to Kamashev (2011) and Prokopenko (2017).

In large enterprises, the formation of vertically integrated models can be one of the main directions of development and the main lever for increasing the efficiency of the industry. The vertically integrated model allows us to combine the holding companies with the generating ones, sales and management functions of the enterprises of this industry.

This model is able to concentrate and direct the electric power industry to a further increase in competitiveness.

Methodology

In the process of research of industrial holdings in the electric power industry in the Omsk Region, the following scientific research methods were used: comparative and statistical analysis, expert evaluation method.

The paper assesses the state of the industrial holdings of the electric power industry in the Omsk Region based on the analysis of the production index and the technological structure of industrial holdings. The coefficient analysis of the movement of fixed assets was carried out, the technical and economic indicators of industrial holdings of the electric power industry for 2015–2017 in the Omsk Region were analyzed. A scheme has been developed for the sustainable development of industrial holdings in the electric power industry.

Results

There are branches of industrial holdings in the Omsk Region, such as: IDGC of Siberia PJSC, FGC UES PJSC, Inter RAO PJSC, Rosseti PJSC, SO UES JSC.

The electric power complex of the region is an infrastructure-based economy, which not only ensures the livelihoods of all types of economic activity, but also largely determines the formation of parameters for the socio-economic development of the Omsk Region. Today, the power industry provides existence for the livelihoods of all branches of the regional economy and in many respects determine the formation of the main parameters of the socio-economic development of the Omsk Region.

The share of value added by industrial holdings of the electric power industry accounted for more than 10 percent of the total value added of industrial production, of which more than 55 percent accounted for the type of production, transmission and distribution of electrical energy, more than 37 percent – production, transmission and distribution of steam and hot water; air conditioning and about 8 percent – the production and distribution of gaseous fuel (Promyshlennoye proizvodstvo Omskoy oblasti: Stat. sbor, 2018).

Let us consider the dynamics of the production index of industrial holdings in the electric power industry, which is presented in (Figure 1.1).

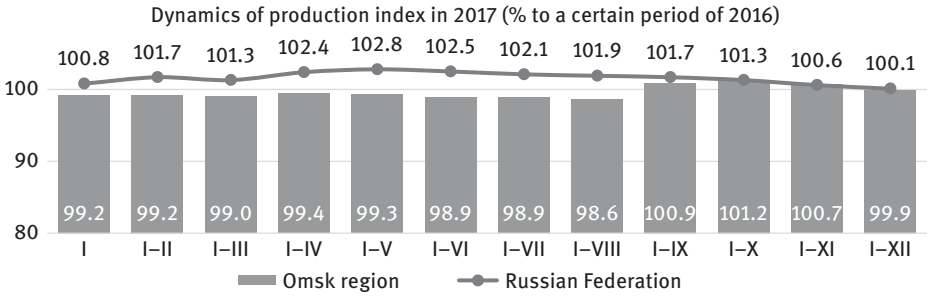

Figure 1.1: Dynamics of production index by industrial holdings for 2017.

At the end of 2017, the production index by type of economic activity provision of electric energy, gas and steam; air conditioning by 2016 in the Omsk region corresponded to 99.9 percent (in the Russian Federation – 100.1%).

The production index by type of activity "production, transmission and distribution of electricity" by 2016 corresponded to 101.8 percent, "production, transmission and distribution of steam and hot water; air conditioning" – 97.2 percent, "production and distribution of gaseous gas fuel consumption" – 95.5 percent. (Promyshlennoye proizvodstvo Omskoy oblasti: Stat. sbor, 2018).

The technological structure of industrial holdings for the 2015–2017 year is presented (in Table 1.2).

Table 1.2: Technological structure of industrial holdings.

Period	Fixed assets, mill. Rub.	The degree of depreciation of fixed assets, %	Technological structure of fixed assets, %				
			buildings	facilities	machines and equipment	transport	Other fixed assets
2015	89591,7	44.8	8.2	60.3	29.9	0.8	0.8
2016	74889,1	39.8	9.7	60.7	27.7	0.9	1.0
2017	74371,1	42.9	10.0	60.2	28.0	0.8	1.0

During the study period of the activities of industrial holdings from 2015 to 2017, there has been a decrease in fixed assets by 17% and as of the last reporting date the amount of fixed assets amounted to 74371, 1 million rubles. Considering the technological structure of fixed assets, it is clear that in the analyzed period, the largest share falls on machinery and equipment – 60.2%, and the smallest is other fixed assets of 1%. (Razvitiye promyshlennogo proizvodstva Omskoy oblasti: Doklad, 2018).

Analyzing the degree of depreciation of fixed assets of industrial holdings, it can be concluded that, on average, a possible future replacement as depreciation was financed by 40% over the analyzed period.

We will carry out a coefficient analysis of the fixed assets of industrial holdings engaged in economic activity "Provision of electrical energy, gas and steam, air conditioning", which is presented (in Table 1.3).

Table 1.3: Coefficient analysis of the movement of fixed assets.

The name of the coefficient	Calculation formula	Obtained results, %		
		2015	2016	2017
Admission rate, %	$K\,adm. = \frac{The\ cost\ of\ received\ fixed\ assets}{The\ cost\ of\ annual\ fixed\ assets}$	16.5	34.3	4.3
Refresh rate, %	$K\,ref. = \frac{The\ cost\ of\ new\ fixed\ assets}{The\ cost\ of\ retired\ fixed\ assets}$	4.2	8.0	3.7
Retirement rate,%	$K\,ret. = \frac{The\ cost\ of\ retired\ fixed\ assets}{The\ cost\ of\ assets\ for\ the\ start\ of\ the\ year}$	12.7	1.1	0.7
Liquidation ratio,%	$K\,liq. = \frac{Liquidated\ mainassets}{Main\ assets\ for\ the\ start\ of\ the\ year}$	0.2	0.2	0.1

For the period under review, there was a decrease in all indicators, in particular, the update rate decreased from 4.2% in 2015 to 3.7% in 2017, which indicates the absence of updates to fixed assets in the industry (Razvitiye promyshlennogo proizvodstva Omskoy oblasti: Doklad, 2018).

The coefficients of disposal in the study period are less than the coefficients of income, and therefore, has an expanded reproduction of the main funds. The excess of the coefficient of income over the disposal of fixed assets for 2015–2017 makes it possible to judge that the industrial holdings of the industry are undergoing a process of renewal and physical deterioration of fixed assets only at a too slow pace.

At the final stage of the analysis of the state of industrial holdings we will make a calculation on the main indicators of work for 2015–2017, (see Table 1.4).

Table 1.4: Technical and economic indicators of industrial holdings by type of economic activity "provision of electric energy, gas and steam; air conditioning".

Indicators	2015, million rubles	2016, million rubles	2017, million rubles
Turnover of holdings	75,991.5	77,614.9	74,404.0
The volume of shipped goods of own production, completed works and services by own forces	48,643.1	53,804.0	50,745.6
Fixed investment	7,136.4	5,622.6	4,029.9
Average number of employees, people	22,514	22,548	18,157
Average monthly nominal accrued wages, rubles	29,210.1	31,553.5	35,305.7
Profitability of goods, products (works, services) sold, %	8.1	7.0	6.7

In 2017, the turnover of industrial holdings for the provision of electric energy, gas and steam; air conditioning was below the 2016 level by 4.1 percent and the 2015 level by 2.1%. During the analyzed period, there was a slowdown in the growth of investments in fixed assets, so by the end of 2017, a decrease of 28.3% compared with 2016 and 43.5 compared to 2015 was observed (Promyshlennoye proizvodstvo Omskoy oblasti: Stat. sbor, 2018).

There is also a decline in the profitability of goods sold from 8.1% in 2015 to 6.7% in 2017, i.e., 1 ruble, which is spent on the production and sale of products and will bring 6.7 rubles to industrial holdings.

At the same time, the volume of own-produced goods shipped, work performed and services produced on its own increased by 4.3% over the analyzed period and

amounted to 50,745.6 million rubles as of the last reporting date. The growth is due to the increase in electricity production, the volume of distribution of gaseous fuels and the increase in prices of producers of industrial goods in this type of economic activity.

Conclusion

Thus, according to the results of the analysis, a decrease in the coefficients of the movement of fixed assets, a reduction in the turnover of industrial holdings, a decrease in the volume of investment in fixed capital by industrial holdings in the electric power industry, and an increase in the degree of depreciation of fixed assets of industrial holdings were revealed.

Current trends in the development of the Russian and world economies pose to industrial holdings new challenges, the solution of which will allow them to increase their competitiveness, increase the market value of their business, make a significant contribution to accelerating the socio-economic development of the Russian Federation and ensure their sustainable development.

Under the sustainable development of industrial holdings understand the voluntary type of business, which includes economic, environmental, social criteria.

The following principles underlie the sustainable development of industrial holdings in the context of globalization:

- diversification of production;
- the scale of investment;
- an increase in the share of innovative technologies in the production process.

Figure 1.2 presents the scheme of sustainable development of industrial holdings in the power industry.

Consequently, modern economic trends in the development of industrial holdings in the electric power industry are their sustainable development, the ongoing processes of digitization of the energy sector and the introduction of blockchain technologies into the energy industry.

Further sustainable development of industrial holdings of the electric power industry in the context of globalization should bring the national economy of Russia to a qualitatively new level of development and ensure the investment attractiveness of the Russian Federation.

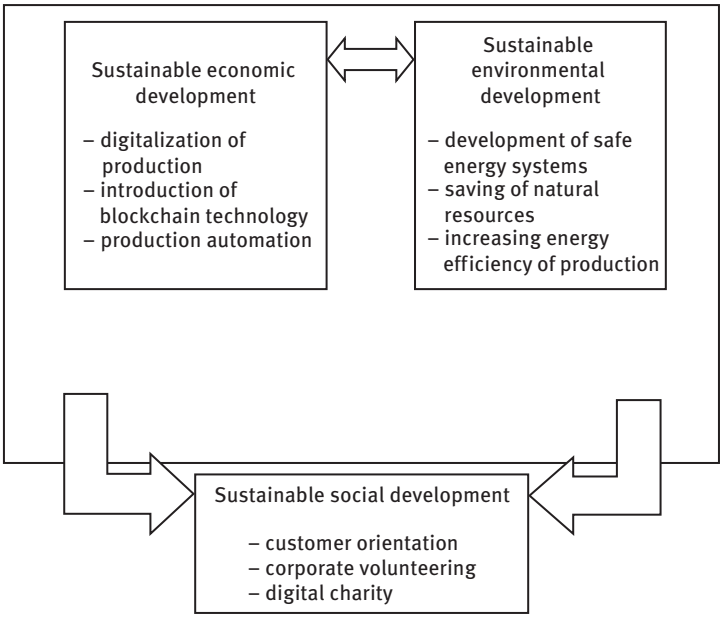

Figure 1.2: Scheme of sustainable development of industrial holdings in the power industry.

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2 The Impact of Technology on Development of Sea Fishing in Russia

Introduction

Russia is rich in various types of resources, including aquatic biological. Humanity has been actively engaged in fishing for many centuries. With the development of scientific and technological progress, people are increasingly using resources that were previously inaccessible. The share of fish stocks that are within biologically sustainable levels tends to decrease: from 90.0 percent in 1974 to 66.7 percent in 2016. In contrast, the share of stocks caught at biologically unstable levels increased from 10 percent in 1974 to 33.3 percent in 2016, with the largest increase in the late 1970s and 1980s. This trend will grow in a few next year. The result of this trend may be an increase in environmental problems.

Nowadays, one of the promising areas of development is the Arctic region of the Russian Federation, which has significant aquatic biological resources for industrial fisheries. Its species diversity includes about 289 species of fish. Currently, more than a third of fish and seafood is harvested in the seas of the Arctic Ocean and about a fifth of all canned fish is produced. However, today, fishing on a significant scale is conducted only in the Barents, Greenland seas and the northern part of the Norwegian Sea, where in certain periods up to 4.5–5 million tons are catch annually. Fishing in the area is carried out by 28 countries, but on a regular basis it is conducted by such countries as Norway, Russia, Iceland, the Faroe Islands, Greenland (Denmark) and a number of EU countries.

Methodology

In Russia, the organization of the process of processing fish and seafood interests many entrepreneurs. On the one hand, they are attracted by the rich resource potential: the proximity of large rivers, lakes, seas and oceans. On the other hand, the processing of river fish together with marine fish is extremely promising from an economic point of view. The segment width makes it easy to find your niche in it.

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It is not surprising that there are so many small and medium enterprises in the fish market that are designed to meet the needs of a certain group of consumers. Thanks to the latest technologies, the output of the final product increases every year, the waste is processed more efficiently, and for organizing a business you no longer need to have large production capacity – just buy ready-to-use semi-finished product.

Fish processing enterprises can be divided into three categories:

- fish processing plants located in close proximity to the catch sites. Such enterprises carry out only basic processing of raw materials, clean it, cool it to a temperature of – 5 degrees Celsius, freeze or salt it. Then fish and seafood are sent for further development in the form of an industrial semi-finished product or a whole. Mostly, procurement stores are located in the basins of the Far East, North-West and Kaliningrad – 95% of all fish destined for processing is harvested here.
- fish processing plants located near wholesale and retail outlets. These enterprises produce industrial semi-finished products. They buy cheap raw materials from primary processing enterprises, and then sell semi-finished products in bulk in the production of finished products.
- enterprises in the final sale of products. Here, semi-finished products and fish raw materials are transformed into a finished product, which is immediately sold to the consumer. Such firms are much more mobile, they are acutely responsive to demand and can quickly adjust the range. It is in this segment most of all small and medium enterprises.

Fish and seafood go a long way from the place of fishing to our table. The process and technology of processing fish and seafood directly depend on what product should ultimately be: chilled, frozen, dried, canned, salted, smoked, already prepared, for example, in the form of meatballs, minced meat and, of course, live.

It would seem that you can do with living fish, so that it does not become dead and does not go on sale in the wrong form? It can and should be: get it from the fishing gear, sort it by type and size, and then put it in the tank in which it will be located until the moment it is sold. In order for a fish to survive, it must feel comfortable in its "pool" – the water quality, oxygen content, temperature and the availability of a water purification system are important. Live fishing is mainly river or commercial fish of the carp and sturgeon family, as well as sea fish caught near the coast.

If it is not about living fish, then it is that it remains fresh until the next stage of processing. Cooling fish is the process of lowering the temperature to minus 1–2 degrees Celsius. This can be done in three ways – put in the refrigerator, fall asleep with ice or put in a cold pickle. When placed in a refrigerator, the appearance of the fish deteriorates, so the fish most often sinks into finely crushed ice.

Chilled fish can be stored no more than 5 days, which significantly reduces the possibility of its transportation and processing. Therefore, in order for fish and seafood to go on sale in general, they are frozen at a temperature of up to -18 degrees Celsius. Refrigeration equipment for fish processing is divided into equipment of continuous and periodic flow. It is extremely important, that the effect of negative temperatures on a product that is in the process of cooling, freezing, transporting and storing is constant until it is sold.

The finished, that is, the primary fish (fresh, chilled or frozen) is divided and, depending on the variety, size and type, and then sent for cutting, pickling and salting, dried or dried, smoked, canned or preserved.

Arrived at the place of processing raw materials first thawed, if necessary, and then cut. The fish processing industry, as a rule, is equipped with special equipment for cutting: aggregates, nozzles for removing heads, saws for cutting the peritoneum, equipment for removing scales and skin, various fish scalers, etc. from one end of the conveyor and waste from the other.

Fish processing products (large bones of the spine, skin, and so on) are used in the production of bone meal, which is actively purchased by animal feed manufacturers. It is safe to say that processing fish waste is no less beneficial than working with fish itself.

It is extremely important that enterprises working with such perishable products closely monitor fish processing technology, as well as strive to maximize the use of raw materials, improve product quality and use the maximum production capacity of the equipment in which they work.

At the present stage of development of the fishing industry and its competitiveness in the world market, it is necessary to update its production and technical base of enterprises and, above all, the fishing fleet.

Russia's transition to a market economy led to a decrease in the number of reefer vessels. In order to meet international requirements for quality standards, fish factories were modernized with replacement of technological equipment for production. Since the mid-nineties, vessels that were in operation were acquired mainly from Western countries with developed fishing (Kuranov, 2017).

Since 2009, only 16 fishing vessels have been built, including 10 low-tonnage vessels. With a standard service life for various categories of vessels 16–20 years, according to the beginning of 2016, the average age of fishing vessels in the basins was: The Far Eastern basin – 26.3 years out of 640 vessels in the field; The Northern Basin is 25.7 years from 199 vessels in the field. However, the oldest fleet is operated in the West Basin (97.6% of the ships operate above the standard operating life) and on the Caspian – 97.4% of the ships. It can be assumed that the target figures of the strategy for catching bio-resources by 2020 (6 million tons) are unattainable due to the critical state of the fleet (Meyler and Moyseenko, 2017). Moreover, aging and reduction of the fleet is sustainable.

Since the beginning of the 2000s, the number of vessels built in Russia has increased from 9 to 17 (the period up to 2016), while the number of vessels that were in service from 37 to 69 has increased. (http://www.rucompany.ru)

Results

Today, fisheries provide food security, employment, socio-economic development and population of coastal areas. The activities of companies in this market lead to increased competition, in connection with which it is especially important to understand the state of competition of fisheries in the sea to regulate the fisheries complex and successfully manage them.

In 2014, fishing in Russia was subject to the imposition of sanctions, but nevertheless, it is a fairly dynamic industry with high profitability ratios. The profitability of fish farming increased from 16.5% in 2013 to 49.9% in 2017. (www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1135075100641). While profitability in agriculture is no more than 3%, mining is about 26% (Varvus, 2018).

According to the UN FAO, the world catch of fish and seafood is 95 million tons. Russia accounts for 5.5% of the global volume of fish (which corresponds to the fourth place in the world (www.fao.org/3/I9540RU/i9540ru.pdf). Only China, Indonesia and the United States are ahead). With the introduction of economic sanctions in 2014. fish imports decreased by 10% from some countries (Norway, etc.) (http://ru-stat.com/date-M201611-201711/RU/export/world/0103) (Table 2.1).

Table 2.1: Characteristics of import and export of aquatic biological resources.

Import, bln.$		Export, bln.$	
2013	2.86	2013	2.81
2014	2.57	2014	2.87
2015	1.36	2015	2.79
2016	1.37	2016	3
2017	1.63	2017	3.43
2018	1.16	2018	2.41

In 2017, more than 1/3 of the volumes caught were exported. This is due to the lack of modern fish processing enterprises and the specifics of inspections at border and customs controls (basically, this is extra time for inspection if the vessel goes more than 12 miles from the coast). The largest buyers are China, South Korea, and Japan.

The structure of fish imports is impressive: frozen fish accounts for 42.2%, fresh fish – 21.9%, crustaceans – 13.2%, dried fish – 6.1%. The leaders among importing countries in 2013 were Chile (18.3%), Norway (15.8%), the Faroe Islands (13%), and China – 12.4%. In 2018, the leaders changed – Chile, the Faroe Islands, China, Belarus (respectively, 23.1%; 20.9%; 14.85; 6.1%) (http://ru-stat.com/date-Y2013–2018/RU/import/world/0103). Seafood consumption is growing at an average of 15–18% per year (i.e., the fish saturation limit has not yet been established). This development was due to population growth, on the one hand, and urbanization processes, on the other. On the recommendation of the Ministry of Health of the Russian Federation for the normal reproduction of the Russian citizen must eat 19–20 kg. fish at the recommended level of 22 kg.

Fisheries are experiencing the effects of both the factors of the microenvironment of enterprises and the macroenvironment. The first group of factors includes a low level of investment in the industry, the absence of fishing vessels from enterprises. The second group of factors (macro environment) include:

- population growth: By 2050, the world's population will reach 10 billion people, which will need to be provided with food, including fish. According to the FAO UN, the population of Russia by 2050 will be 150 million. Therefore, fishermen are counting on increased consumption of aquatic biological resources;
- global warming: The change in temperature in the sea in the Far East changes the migration of fish – salmon moves to the north, and sharks and tuna go to the south (Tropnikova, 2017; Kuranov, 2017; Meyler and Moyseenko, 2017; Tropnoikova, 2017);
- institutional changes in the industry: Contradictions in the legislation in the field of control during the transportation of fish from the place of extraction to processing force us to say that the extraction of fish and its processing are not related industries. At the same time, from 01/01/2019 the order of distribution of quotas for the extraction of aquatic biological resources is changed.

Stopping in more detail on this factor, we would like to note that the industry was reformed three years ago. The main idea of the state was to update the fixed assets and the flow of investment. A program was developed to allocate 20% of quota "under the keel" to companies that were willing to invest in the construction of new fishing vessels and fish processing enterprises. Crab auctions were introduced. There is also an active discussion in the industry – reducing the time limits for granting quotas for catching aquatic biological resources from 15 to 3–4 years. If the last initiative is adopted, there will be changes in the concentration of firms in the market, which will subsequently lead to an increase in the cost of fish products.

Another Russian feature is quality water, which allows us to grow ecologically clean fish, which is a competitive advantage. The federal law on organic products adopted by the State Duma (it will enter into force only from 01/01/2020) [6] does not directly apply to fishery products, but regulates aquaculture. By introducing

voluntary certification of their production facilities, aquaculture growing enterprises will emphasize that their products are environmentally friendly, which will further enhance the value of products and enter new markets.

As a research object, a sample of enterprises engaged in marine fisheries (OKVED code 3.1) was carried out throughout Russia according to SPARK. Based on the sample, we calculated that, according to SPARK, the average age of the 10 largest companies in marine fisheries is 25 years. Industry leaders are concentrated in the Murmansk and Arkhangelsk regions, Primorsky and Kamchatka regions. The dynamics of changes in the number of enterprises in the industry is clearly presented in the table 2.2:

Table 2.2: Dynamics of change in the number of firms in the marine fisheries of Russia since 2015–2017.

Number of firms in the industry	2015	2016	2017
	800	799	817

The total revenue of the companies for the three-year period (2015–2017) was:

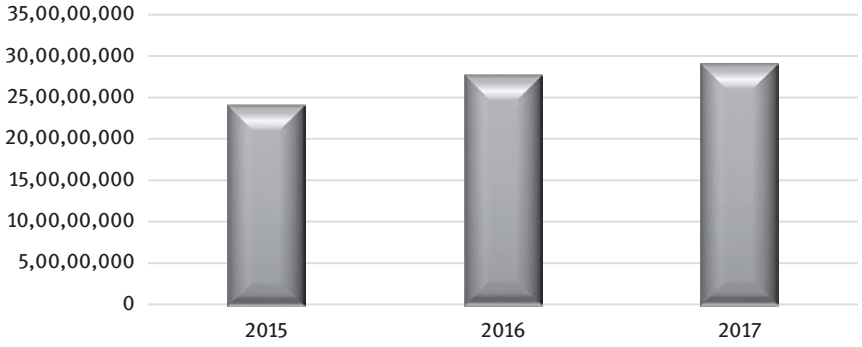

Figure 2.1: Changes in the revenue of Russian sea fishing companies from 2015 to 2017, in rub.

Based on the data presented (Figure 2.1), it can be concluded that the high profitability in the industry has attracted new firms, which is reflected in the growth of revenues of companies in this market. To calculate the indicators of concentration of sellers, we determined how market shares are distributed among its participants. In this case, the authors of this study calculated the indicators of the concentration of sellers in the market (dispersion of market shares, concentration indices, Herfindahl-Hirschman index, relative entropy index).

According to the analysis, approximately 46% of the market is distributed among firms with a market share of 1 4.5%. The other part is occupied by small

enterprises with a market share below 1%. The concentration index [1] of the three largest companies in the industry over the past three years shows that the three largest companies account for about 10% of the entire Russian marine fisheries market. The share of the ten largest companies accounts for 23.7% of the market in 2017 (CR10) (Figure 2.2).

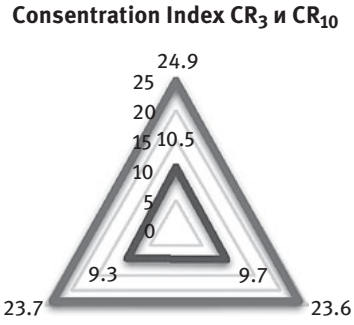

Figure 2.2: Dynamics of changes in concentration index from 2015 to 2017, in %.

The Herfindahl-Hirschman index calculated by us (Varvus,2018) is negligible and characterizes the industry as perfect competition.

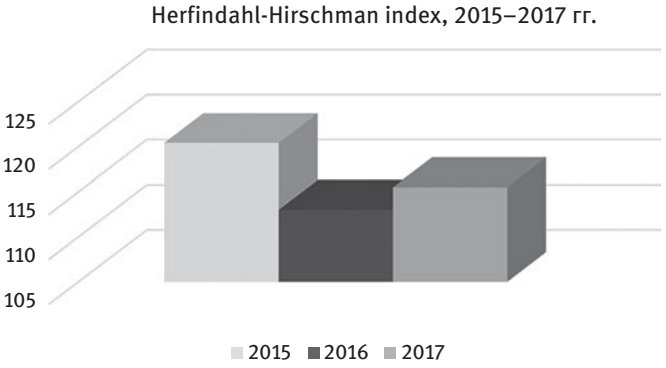

Figure 2.3: The dynamics of the Herfindahl-Hirschman index from 2015–2017.

As the analysis of the chart shows, HHI in 2017 increased by 2.2 percentage points compared with 2016 and amounted to 115.5. At the same time, the value of the specified index in 2016 reached a minimum level of 113 (Figure 2.3).

The high value of the relative index of entropy suggests that the industry is characterized by a low concentration of firms (Figure 2.4).

Despite the high rates of profitability, government regulation of this market should continue, since the fishermen alone will not be able to cope with current