

# *Knowledge Economy in Russia*

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**Abstract:** Advanced countries, such as Japan, South Korea, Singapore and others, have achieved a high level of economic development and well-being of the people on the basis of turning science into a direct productive force. According to experts, the economic growth in these countries was ensured of the human factor, than capital and natural resources combined. An important role in the process of preparing highly qualified personnel for the economy is played by the higher education system. In a number of post-Soviet states, including Russia, universities and institutes of the Academy of Sciences play a significant role in shaping the knowledge economy. However, in recent years, due to low quality of graduates of higher education, a situation has arisen in Russia where, with an excess of graduates, the need for the sectors that make up the knowledge-based economy is not satisfied. The author attempt not only to show the leading role of higher education in the development of the knowledge economy, but also to analyze what problems prevent Russia today from reaching the front lines in the world.

## 1. Introduction

Conceptual approaches to the study of the economy of knowledge were founded by an Austro-American scientist, Fritz Machlup, an American sociologist, D. Bell, Benoit Gaudin, and later L.E.Mindeli, L.K. Pipia, M.V. Nonaka, H. Takeuche, J. Dozy. N. Rosenberg, M. Porter, B. Lundvall, R. Nelson, C. Freeman, V.L. Makarov, O.N. Minaev and others. So, in the article by L.E.Mindeli and L.K. Pipia "Conceptual Aspects of Knowledge Economy Formation" foreign experience in studying the main economic trends associated with the production and dissemination of knowledge was summarized, the main aspects of the knowledge economy were revealed: new quality of economic growth, science and innovations, development of network structures, information and communication technologies, high-tech sector services [1].

The works of A.A. Zagainova, M. Markova, O. A. Komarova, E.V. Peshina, T.E. Stepanova, M.V. Fedorov, D.I. Chuprunova and others are devoted to theoretical and practical substantiation of the needs of the Russian economy for specialists with higher professional education and scientific personnel, and also to the advantages of knowledge economy. So, in the articles by Zagainova A.A. "The main problems of the educational services market in modern Russia" (2013), "Features of the development of the knowledge economy in Russia: theory and practice" (2015), knowledge economy is defined as a type of economy in which "knowledge and information become the main factors of production" [2].

The methodological foundations of knowledge economy are developed in the works of such authors as A.V. Barysheva, A.V. Buzgalin, S.Yu. Glazyev, V.I. Inozemtsev, G.B. Kleiner, V.L. Makarov, B.Z. Milner, L.E. Mindeli, E.V. Pilipenko, E.V. Popov, A.I. Tatarkin and others. Thus, in the monograph “Microeconomics of Knowledge” and a number of his articles, Professor G. B. Kleiner calls the fundamental features of the knowledge economy: 1) knowledge becomes a full-fledged commodity; 2) any manufactured product carries unique knowledge; 3) knowledge becomes one of the main factors of production along with labor and capital [3]. Economists E.V. Peshina and M.V. Fedorov classify knowledge as a factor in the competitiveness of a modern enterprise. Practice confirms this conclusion: with the introduction of innovations based on knowledge, the so-called “know-how”, into production, the company is able to create goods with new qualities that their competitors in the market do not have [4]. Human capital becomes the determining factor in the emergence and development of knowledge economy [5].

## 2. Purpose and Questions of Research

The purpose of this study is to examine the problems that Russia must solve in order for its economy to become a knowledge economy. Only on the basis of the knowledge economy can Russia be developed even faster and caught up with those countries that went far ahead.

In this study, the authors consider the following questions.

1. Clarify essence of knowledge economy, show its role and determine the reasons Russia for lagging behind the leading countries of the world.

2. Determine the role and place of the higher education system in the formation of human capital and the economy of knowledge.

3. Clarify on the issue of effectiveness of public administration of the economy and higher education in the Russia.

President V. Putin must solve in the new six-year term if he intends to fulfill his election promises and tasks formulated in his letter to the political and economic elite to which he spoke on March 1st, 2018. He urged the elite to accelerate the pace of economic development, to enter the top-5 largest economies in the world. The gross domestic product (GDP) is one of the most important economic indicators for any country. It is for him in the first place experts determine the largest economy. So far, Russia is in nominal GDP only in 12th place in the world. This is clearly seen in the following table [6].

Table 1. - Place in the world by nominal GDP in 2018

<b>A country</b>	<b>GDP in billion \$</b>	<b>Place in the world</b>
USA	20513.32	1
China	13457.26	2
Japan	5070.62	3
Germany	4029.14	4
U. Kingdom	2808.89	5
France	2794.69	6
India	2689.94	7
Italy	2086.67	8
Brazil	1909.44	9
Canada	1733.70	10
South Korea	1655.32	11
Russia	1576.55	12

The table shows that in terms of the main economic indicator Russia lags behind not only the United States and China, but also countries such as South Korea, Brazil, India, Italy and etc.

The main reason for Russia's lagging behind is bad mistakes of the president and the government. They talk more and do less, pay little attention to the development of the knowledge economy in their country. The effectiveness of state management of the knowledge-based economy, as in advanced countries, is very low. The author wrote about this in a number of his works [7].

The Decree of the president V. Putin of May 7, 2018 "On national goals and strategic tasks of the development of the Russian Federation until 2024" set the task in 6 years to enter the TOP-5 of the world's largest economies. Among the world's largest economies, TOP-5 is the UK which produces goods and services for 2.6 trillion dollars. To drive the UK out of the top five economies of the world and take its place, Russia should almost double its production of goods and services in six years. The growth rate of the Russian economy should be at least 16% annually. However, the growth rates of the Russian economy in the last five years (2014-2018) do not give hope for the implementation of V. Putin's plans. The following table shows how far Russia is lagging behind in terms of GDP growth rates from other countries of the world, in particular, from China, India, Vietnam.

Table 2: The growth rate of the Russian economy in comparison with other countries of the world (in %) [8].

<b>A country</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>For 5 years</b>
World average	3,4	3,4	3,6	3,6	3,6	17,6
China	7,3	6,9	6,7	6,9	6,6	27,5
India	7,4	8,2	7,1	6,7	7,2	36,6
Vietnam	9,0	3,0	5,2	9,4	7,0	33,6
Russia	0,6	- 3,7	-0,2	1,5	1,8	0

It follows from the table that the growth rates of the Russian economy in the last 5 years were several dozen times lower than in China, India, Vietnam. It turns out that all these years the country was in stagnation, did not develop.

Due to the lack of significant changes in the country, already in 2013 a stagnation began, which after the introduction of sanctions and the fall in oil prices in 2015–2016 turned into a recession. The decline of the economy in 2017-2018 started being gradually overcome, but on the whole Russia did not manage to handle the prolonged stagnation in the economy. Over the last decade (2009-2018), Russia's GDP growth on average did not exceed 1% per year.

The biggest failures in the Russian economy in the last 10 years have occurred in the crisis years: 2009 - minus 7.8%, 2015 - minus 3.7%. The reason for these failures is simply explained: the world price of oil and gas, the main export raw material of the Russian Federation, has fallen. The rate of the presidents of Russia for raw materials instead of innovations, for pipelines instead of knowledge and technology has made this country a raw materials appendage of the West and China. As a result, time was irretrievably lost for the development of an economy based on modern knowledge and IT-technologies.

Meanwhile, the higher education system of Russia which is the basis of the knowledge economy and the basis of human capital, trained highly qualified personnel not for its own economy, but for foreign ones. Graduates of universities in tens of thousands left for work abroad, leaving Russia, where their knowledge turned out to be unnecessary neither by the state nor by businessmen.

The change in the role and place of higher education in the Russian economy at the present stage is expressed in a significant increase in the number of higher educational institutions and the number of students studying. In 2000 there were only 965 universities in which 4.7 people were studying in the Russian Federation, and then, according to the federal portal "Russian Education", by 2017 their

number had exceeded 2660 universities, having increased by almost 3 times in 16 years. All national and federal universities, supporting universities with a military department and other higher educational institutions of the country were already training more than 5.5 million students [9]. In quantitative terms Russia began to occupy one of the leading positions in the world. Such rapid growth of the number of students combined with slow development of the economy had inevitably led to the fact that graduates with higher education could not find a job in Russia in the specialty acquired at university.

Due to the loss of the principle of compulsory distribution of university graduates at the request of enterprises and organizations, as it was the case under the Soviet regime, highly educated specialists with university diplomas found jobs as ordinary sellers in numerous trade enterprises, calling themselves "sales managers." The most desperate Russians searched for applying their professional knowledge and skills abroad, increasing the so-called "brain drain" at times. The statistics were alarming: in 2010 only 35 thousand people went abroad in search of a better life, but already in 2015 there were already ten times more - 353 thousand people [10]. Olga Golodets, who has been managing social policy and social issues within the Russian government for a long time, acknowledged that, according to various estimates, more than 1.5 million people with Russian passports work outside the Russian Federation, and this is a dangerous trend. According to the vice-premier, the "brain drain" abroad is happening due to low wages in Russia [11]. These figures and facts convincingly show that millions of citizens, including those with higher professional education, did not see any prospects for themselves in Russia. In addition, they were not satisfied with low wages, combined with unstable economic conditions, increased taxes, high risks for personal and business security and the lack of opportunities to move along the social scale in Russia.

Having studied this negative trend for the country, in 2017 the Government of the Russian Federation took a number of measures aimed at a significant reduction in the oversupply of higher education institutions and, respectively, a reduction in the number of specialists with higher education. The Ministry of Education and Science has become quite insistent to achieve high-quality higher education. Only in the last two years (2017-2018) 500 universities were deprived of licenses [12].

On May 15, 2018, the Russian President V. Putin signed a Decree "On the Structure of Federal Executive Bodies", which transformed the Ministry of Education and Science into two independent departments: the Ministry of Education and the Ministry of Science and Higher Education. By the same decree, the Federal Service for Supervision in the Field of Education and Science (short name - Rosobrnadzor) became directly subordinate to the government of the country [13]. According to the report on the results of control and supervisory measures conducted by Rosobrnadzor for the four previous years, the number of accredited universities decreased more than twice - from 2,605 in 2013 to 1,100 in 2017, and the number of branches of non-state universities - more than nine times - from 523 to 56. Now, according to the head of the department, Rosobrnadzor is planning to extend the approach implemented during school accreditation to the accreditation of universities, which implies checking not the formal performance indicators, but the level knowledge students [12].

Based on the fact that the main content of production activities in the conditions of development of knowledge economy is in the process of creating, disseminating and using knowledge, fundamental education is becoming critical. At the same time, the role and importance of higher professional (basic) education are increasing immeasurably. An indicator of competitiveness of the Russian higher education system in comparison with the leading countries of the world today is a place in the world ranking. According to the Minister of Education and Science of the Russian Federation O.Yu. Vasilieva, 11 Russian universities were included in the TOP-100 world rankings by the end of 2017, and also 13 Russian universities were included in the TOP-300 world rankings [14].

The priority project “Universities as centers for creating innovation space” aims at including at least 10 leading Russian universities into the TOP-100 world universities rankings by 2025 for at least two consecutive years and also at creating at least 100 university centers of innovation, technology and social development in the constituent entities of the Russian Federation. According to the head of the ministry, the first results of implementation of the priority project have already allowed for a stable entry of leading Russian universities into the TOP-100 and TOP-300 world university rankings. The following table shows which Russian universities are in these rankings [15].

Table 3: World ranking of the leading universities of the planet.

Place	Institution	Country	Score
1	Massachusetts Institute of Technology	US	100
2	Stanford University	US	98.7
3	Harvard University	US	98.4
4	Caltech United States	US	97.7
5	University of Cambridge	US	95.6
6	Oxford University	UK	95.3
95	Moscow State University named after M. V. Lomonosov	Russia	65
250	Novosibirsk National Research State University	Russia	41.3
291	MSTU named after N.E. Bauman	Russia	38.2

As follows from the table compiled from materials of the QS World University Rankings, the leading universities in the world ranking are located in the US and the UK. Russia takes a very modest place in the world table of ranks: only one university has made it into in the first hundred and two more universities ranked in the third hundred countries included in this prestigious rating.

According to another rating compiled by Times Higher Education, Oxford University ranks first, Cambridge University ranks second, California Institute of Technology ranks third, and Russian universities again are outsiders of world higher education: even Moscow State University named after M.V. Lomonosov ranked only 194 out of 200 universities in the world, having scored 61.1 points [16]. The compilers of the Times Higher Education rankings had studied universities from 79 countries and selected the best universities in the world regarding quality of teaching and research, the level of dissemination of knowledge and innovation. Also, the effectiveness of universities and the quality of their material base is evaluated by the based on financial indicators. The compilers of the Shanghai Ranking (Academic Ranking of World Universities), preferring Harvard University and other US universities (in the TOP-15, there are only two universities from the UK and 13 from the USA) gave the leading Russian university (Moscow State University named after M.V. Lomonosov) only the 93rd place in 2018, St. Petersburg State University ranked from 301 to 400th, and Novosibirsk National Research State University ranked at the very end of the list from 401 to 500 out of 500 universities in the world [17].

The compilers of the ranking of the best universities in the world, QS World University Rankings rate universities according to six indicators: research, teaching, employer opinion and career potential, the number of foreign students and teachers. The merit of Harvard University is such an indicator that its graduates became presidents of the USA: Theodore Roosevelt, Franklin D. Roosevelt, John F. Kennedy, George Bush and Barack Obama.

The leader of the world ranking, the Massachusetts Institute of Technology (MIT) is a private research institution and a world leader in the sciences and technologies. MIT traditionally occupies the first lines of the world rankings of the best educational institutions and is considered one of the most prestigious universities in the world. Founded in 1861 to train engineers and technicians, it made a great contribution to the development and distribution of digital technologies. In the mid-1980s, several of the largest organizations related to IT, software and the Internet were created: Richard Stallman's GNU Project and the Free Software Foundation and others. During one and a half century, 80 graduates of this university became Nobel laureates [18]. This is several times more than the number of all Nobel Prize winners prepared by Soviet-Russian universities.

While compiling the world ranking of RUR Natural Sciences, 800 leading universities from 84 countries of the world were analyzed. According to the results of the study, 625 universities from 71 countries of the world were selected, which were included in the subject ranking in the field of natural sciences. The year 2018 was a record for Russia - 41 universities took part in this prestigious ranking. (For comparison, there were only 31 universities in 2017). Also, 2018 was a record year in terms of absolute positions: three universities entered the TOP-100 world ranking at once: National Research Nuclear University MEPhI (52nd place in the world), Moscow Institute of Physics and Technology (69th place) and Tomsk State University (84th place). Previously, no Russian university had ever been among the first hundred universities in the natural sciences [19].

After analyzing the five world rankings compiled by quite authoritative agencies, it is possible to make a well-founded conclusion that, unfortunately, Russian universities are not leaders: even the leading Russian higher educational institutions, such as Moscow State University named after M.V. Lomonosov, St. Petersburg State University, MSTU named after N.E. Bauman, take places either at the end of the first hundred (Moscow State University), or even in the third hundred out of 500 countries that participated in the competition. Of course, such modest places do not contribute to improving the competitiveness of Russian universities in the international market for higher education.

In order to increase the competitiveness of Russian universities, an inter-program priority project "Development of the export potential of the Russian education system" was launched. The project provides for a multiple increase in the number of foreign students receiving education in Russian universities, especially full-time students. Within the framework of this project, it is proposed to optimize (improve) the conditions of their stay and study in Russia. According to the authors of the document, the amount of extrabudgetary funds received from the export of Russian education should increase from today's 90 billion rubles up to 373 billion rubles by the end of 2025 [12].

Along with the support of leading universities competing in the global market, work is underway to form a group of competitive universities focused on high-quality training of specialists in demand in regional labor markets. So, in 2017, state support for implementation of development programs in the amount of over 3 billion rubles was received by 33 support universities established in 32 constituent entities of the Russian Federation (22 support universities were selected on the basis of competitive selection in 2017). The volume of budget allocations for state support of supporting universities in 2018-2020 will be about 30 billion rubles.

In 2017, within the framework of the priority project, a new large-scale direction was started on formation of university centers of innovation, technological and social development of regions in the constituent entities of the Russian Federation. It is assumed that their activities will be based on partnership with enterprises in terms of solving the tasks of socio-economic development of the constituent entities of the Russian Federation through the saturation of regional labor markets with highly qualified specialists. According to the results of the 2017 competitive selection, the status of a center of innovation, technological and social development of the region was received by 51 universities from 39 constituent entities of the Russian Federation (including 22 supporting

universities, 10 federal universities, 3 national research universities). Such information is contained in the report of the Ministry of Education and Science of the Russian Federation "On the results of the activities of the Ministry of Education and Science of the Russian Federation in 2017 and the tasks for 2018 [20].

Regarding the question of effectiveness of state management of the economy of knowledge and the sphere of higher education in our country, the following should be noted.

An important step towards implementation of new tasks of higher education was the development of the National Doctrine of Education Development in the Russian Federation, in accordance with which one of the main tasks of education is to provide training for highly educated people and highly qualified specialists capable of professional growth and professional mobility in the conditions of informatization of society and development of new high technologies. This document, approved on October 4, 2000, rightly noted that in "the last decade, many achievements of national education have been lost, therefore, the doctrine is intended to help change the direction of state education policy, strengthen public perception of education and science as the determining factors of development of modern Russian society "[22].

The goals, objectives and amounts of funding for activities aimed at modernizing higher education are defined in the State Program of the Russian Federation "Development of Education", approved by the Government Decree of December 26, 2017, No. 1642. The priority project of this program is the project "Universities as centers of space for creation of innovations". The project provides for increasing the sustainable global competitiveness of leading Russian universities by 11 times, creating at least 55 university centers for innovation, technological and social development of the regions in the regions of the Russian Federation in 2018 and at least 100 - in 2025. In 2020 such centers are supposed implement at least 10 technological and social projects in their technoparks, engineering centers and business incubators at the expense of enterprises, organizations of the regional economy and (or) regional and municipal budget [23]. According to the Decree of the Government of the Russian Federation No.1642 of December 26, 2017 to finance the State Program of the Russian Federation "Development of Education" for 2018-2025, the total amount of financing is supposed to be 31658304047 rubles (approximately 487 billion US dollars) [23].

However, despite the presence of all sorts of government programs and projects, including national and priority ones, aimed at innovative development of higher education, the effectiveness of government in this area cannot be called unambiguously positive. This is due to the loss of the state's leading role as the main regulator of permanent processes in the public sector. It became obvious that the centralized control system that had been dominant for many decades began to fail, which can be seen in the actualization of the following problems of Russian higher education:

- Reduction of availability of higher education for graduates from rural areas and low-income families due to commercialization of higher education: the proportion of university students enrolled at the expense of individuals and legal entities increased from 32.8% in 2010 to 59,4% in 2016. At the same time, the volume of paid educational services per capita increased by 69.7% and reached 3,868 rubles in 2016 [24].

- Violation of partnerships between higher educational institutions and enterprises (organizations, institutions), as a result of which it becomes difficult and impossible to consolidate theoretical knowledge in the process of practical training; moreover, the gap between employers' demands on the quality of the workforce and the level of its training is growing.

- Increased imbalance and tension in the labor market of graduates of higher educational institutions: the proportion of graduates who were sent to work decreased from 47.3% in 2010 to 33.7% in 2016; the number of unemployed people with higher education increased from 834 thousand in 2010 to 868 thousand in 2016 (by 4.1%) [24].

The main reasons for the decline in the general education fund of high school graduates are:

- imperfection of the mechanism of formation and placement of the state order for training specialists with higher education;
- destruction of the system of vocational guidance of youth;
- lack of an effective system of informing the population about the prospects for development of the labor market;
- excess of the supply of labor over the demand for it due to the disparity between the volumes and profiles of personnel training and the needs of economic sectors, etc.
- insufficient level of material and technical base of universities, which negatively affects the improvement of the quality of training based on the use of the latest equipment and the introduction of innovative teaching aids (for example, in 2016, 100 university students accounted for 23.8 computers and only 21.5 computers had Internet access);
- narrowing of higher education personnel potential due to reduction in the total number of faculty members and deterioration of its qualitative structure: during 2010-2018 the number of faculty members of universities decreased by 95 thousand people (or 26.6%) and amounted to 261.8 thousand people; the proportion of doctors of science in the total number of professors and teaching staff decreased from 44.0% to 40.3% over the same period, and that of professors - from 35.8% to 28.5% [25].
- reduction of opportunities of the higher education sector to improve both qualitative and quantitative indicators of its activities as a result of the decrease in state funding: in relation to GDP, state spending on education decreased from 3.7% to 3.6% in 2010-2016, on higher education - from 0.8% to 0.6%. Budget funds are provided only on the basis of an approved budget and are allocated primarily to ensure protected items of the budget classification (wages, scholarships, etc.). At the same time, the spending on development of the material and technical base of the education system is scanty. At the same time, educational institutions do not have enough freedom to manage extra budgetary funds earned for the provision of paid services and, accordingly, cannot independently solve the pressing problems of strengthening material and technical potential and personnel.

The preservation of these negative tendencies and problems in the field of higher education “hinders” the development of knowledge economy of Russia. If you believe the objectivity of foreign ratings, the indicator “the level of development of the knowledge economy” in Russia today is very modest - 55th in the world [26].

The effectiveness of state administration in higher education and the level of development of knowledge economy are also determined by the Information and Communication Technology (ICT) Development Index, calculated on the basis of such sub-indices as ICT access, ICT use, ICT practical skills. Russia occupies only the 45th place in the ranking of countries on the ICT development index, the 50th - on access to ICT, but at the same time it has a rather high index of practical skills in the use of ICT (the 13th position in the ranking) [27].

### 3. Purpose and Questions of Research

The purpose of this study is to examine the problems that Russia must solve in order for its economy to become a knowledge economy and for the country itself to turn into a prosperous one.

In this study, the author consider the following questions.

1. Clarify the definition and essence of knowledge economy, show its role in the Russian Federation and determine the reasons for lagging behind the leading countries of the world.
2. Determine the role and place of the higher education system in the formation of human capital and the economy of knowledge.
3. Show the trends in the development of higher education in Russia; analyze the reasons for its low competitiveness compared with the leading countries of the world.



4. Comment on the issue of effectiveness of public administration of the economy and higher education in the country.

#### 4. Research Methods

The following methods are used in this study.

1. Comparative method, which allows to compare the higher education system of the Russian Federation with developed European countries.

2. The systemic and structural-functional approaches allow us to form a holistic view of public policy in the field of higher education conducted by President V.Putin and the Government of Russia, its achievements and shortcomings, mistakes and miscalculations made in 2000–2018. As a result, the knowledge economy occupies a small share in the raw material economy of our country.

3. The institutional approach makes it possible to analyze the influence of various state institutions on the formation of policies for the training of highly qualified professional personnel in Russia, to identify the real reasons for its lagging behind the developed countries of the world and the lack of competitiveness in the educational services market.

#### 5. Conclusion

Thus, the conducted study allows us to draw the following conclusions.

1. The modern Russian the economy needs import substitution due to anti-Russian sanctions, introduction of new, innovative technologies into production in order to increase the competitiveness of Russian enterprises. The role and value of creative, theoretical and other knowledge for breakthrough socio-economic development of the country is becoming more and more important. In this regard, the president and the government began to pay more attention to improving the system of higher education, the development of human capital. This is evidenced not only by their public speeches, but also by national priority projects in this area, approved in 2018.

2. Taking into account the fact that science is increasingly becoming a real factor in innovative high-tech production, it is necessary to increase investment in national science, fundamental and applied research, both from the state through federal and regional budgets, and from business. It is also advisable in every way (materially, financially, morally) to support scientists who make a significant contribution to the economy of knowledge.

To this end, it is necessary to significantly increase the salaries of university professors and researchers (the May Presidential Decrees of 2012 are practically not fulfilled in this regard), to optimize the regulatory framework in the field of education and science, that is, to arrange it in such a way that scientists and other highly qualified specialists educated in Russia do not go abroad in search of a better life. Unfortunately, the Russian government failed to stop the “brain drain” abroad, despite numerous assurances and public statements by the country's political leadership.

3. The scientific, technological and human potential accumulated lately allows us to hope that with a proper economic strategy, industrial, scientific and technical policy of the government regarding implementation of the May (2018) Presidential Decree, the development of the knowledge economy can accelerate significantly.

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