УГРОЗЫ И РИСКИ ИНТЕЛЛЕКТУАЛЬНОЙ БЕЗОПАСНОСТИ РОССИИ В УСЛОВИЯХ МИРОВОЙ ГЛОБАЛИЗАЦИИ

КАЛЮГИНА СВЕТЛАНА НИКОЛОЕВНА,
доктор экономических наук, профессор,
Северо-Кавказский федеральный университет,
Ставрополь, Российская Федерация,
e-mail: s.kalyugina@gmail.com;

ПЬЯНОВ АЛЕКСАНДР ИВАНОВИЧ,
кандидат экономических наук, доцент,
Северо-Кавказский федеральный университет,
г. Ставрополь, Российская Федерация,
e-mail: alexpya2006@yandex.ru;

СТРИЕЛКОВСКИ ВАДИМ,
профессор,
Кембриджский институт современных знаний,
Кембридж, Великобритания,
Пражская Бизнес-школа,
Прага, Чешская республика,
e-mail: strielkowski@cantab.net


В условиях продолжающейся глобализации мировой экономики и растущей интернационализации общественной жизни все более важное место в региональном развитии занимает международная трудовая миграция. Естественным следствием этих процессов является увеличение межгосударственной миграции научных кадров и появление специфического явления, известного как «утечка мозгов». Наша статья демонстрирует, что наиболее существенные расхождения имеют место в оценках, во-первых, масштабов эмиграционного потока ученых и высококвалифицированных специалистов, и, во-вторых, последствий «утечки мозгов» для интеллектуальной безопасности государства. Многочисленные политизированные спекуляции на эту тему в мировых СМИ делают эту тему особенно обсуждаемой и освещаемой. Наши результаты показывают, что это во многом связано с тем, что на сегодняшний день написано слишком мало аналитических работ, изучающих миграционные процессы и их влияние на региональное развитие. Более того, нет единых подходов к оценке последствий «утечки мозгов» из-за активного включения его интеллектуального...
THREATS AND RISKS OF INTELLECTUAL SECURITY IN RUSSIA IN THE CONDITIONS OF WORLD GLOBALIZATION

SVETLANA KALYUGINA,
Professor,
North-Caucasus Federal University,
Stavropol, Russian Federation,
e-mail: s.kalyugina@gmail.com;

ALEXANDER PYANOV,
Associate Professor,
North-Caucasus Federal University,
Russian Federation,
e-mail: alexpya2006@yandex.ru;

WADIM STRIELKOWSKI,
Professor,
Cambridge Institute for Advanced Studies,
Cambridge, United Kingdom,
Prague Business School,
Prague, Czech Republic,
e-mail: strielkowski@cantab.net


World economy is undergoing constant globalization and internalization which can be seen in public life. However, the crucial place in all these processes is taken by the international labour migration. As a result, and an obvious outcome, comes the migration of scientists and highly-qualified specialists as well as the phenomenon called “brain drain”. Our paper studies these processes and points out at the inconsistences that emerge in the assessment of emigration of researchers and highly qualified specialists as well as in measuring the impact of “brain drain” on the state’s intellectual security. Due to the political economy and institutional aspects of these issues, they attract attention of the general public and mass media. Our results confirm that this might be due to the fact that are not enough research analytical works devoted to studying these processes and their effects for regional development. In addition, there is a shortage of approaches to studying the outcomes of “brain drain” and intellectual migration in
general international migration that emerged in the 1990s. Thence, we show that there is not enough evidence for evaluating the inter-dependence between “brain drain” and intellectual security and regional development.

**Keywords:** globalization; human potential; institutional change; regional development; brain drain; migration.

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**Introduction**

In the recent decades, our rapidly and unpredictably changing modern world began to provoke a plethora of conflicting opinions raised by the researchers and stakeholders (Chester, Markolf, Allenby, 2019). Some see in it the prospect of establishing a global world order, others see it as a sign of an imminent threat to this order, anticipate planetary environmental, socioeconomic disasters and the potential likelihood of a “clash of civilizations” (Lahoud, Collins, 2016; Marinelli, 2018; Hernandez-Moreno, 2019; Waalkes, 2019).

The main reason for the rapid and controversial changes in the modern world, according to most researchers, is the globalization of world’s space (Radulescu, 2018; Wood, 2019; Rishworth, Elliott, 2019). It reflects the process of formation, organization, development and functioning of the new world system based on interdependence and deepening interconnection in many areas of the international community (Banerjee, Bhattacharya, 2019).

The concept of globalization of the world’s space appears to be rather multilateral. In a broader sense, this is the transfer of regional and national problems to world problems and the formation of a new natural-biological, social and economic global environment. In a narrower sense, this is the process of transformation of economic structures towards the formation of a global unified integrity of geo-economic reality (Utkin, 2001; Lee, Wainwright, Glassman, 2018).

The formation of world geo-economic reality is expressed in the process of changing the global space, transforming it into a single zone for the unimpeded movement of goods, services, information, technology, capital, and labour (Deniozos, Vlados, Chatzinikolaou, Digkas, 2019). Ideas are spreading in this space just as easily and their carriers are moving, contributing to the development of relevant institutional formations and setting up systems of interaction between them. In other words, the phenomenon of globalization of world space is not limited to the sphere of the economy, but to a large extent affects all key areas of society – ideology, culture and politics.

The consequences of globalization of world space are characterized by an increase in the inconsistency of all processes and the entire global social integrity takes on the form of a chaotic pile of various trends (Kostin, Borozdin, 2013; Kılıçoğlu, Kılıçoğlu, Hammersley-Fletcher, 2019). Such inconsistency, interconnected with the differentiation of social actors, is becoming increasingly greater within each society. Social behaviour of people is less and less mediated by macroeconomic factors and sociocultural standards (Manstead, 2018).

This paper focuses on the intellectual security and regional development with regard to the impending risks and threats for those two components in the modern globalised world. The paper is structured as follows: Section 2 provides a concise literature review. Section 3 outlines some methodological concerns and provisions for further research. Section 4 tackles the issues of intellectual security and regional development using a case study from Russia. Finally, section 5 concludes the paper by drawing overall conclusions and policy implications.
Literature review

In the context of the ongoing scientific and technological revolution and the transition of the most developed countries to the sixth technological order, the main resource of modern development clearly becomes human potential (Sagiyeva, Zhuparova, Ruzanov, Doszhan, Askerov, 2018; Heikkurinen, 2018; Stock, Obenaus, Kunz, Kohl, 2018). The rate of regional economic development and the competitiveness of modern states largely depend on the availability of educated and competent specialists who create and use innovative technologies that increase the productivity of professional activities (Omelyanenko, Semenets-Orlova, Khomeriki, Lyasota, Medviedieva, 2018).

Globalization has proved to be an effective means of influencing the main factor of modern development, namely the human being (Naumenko, 2018). Moreover, globalization has proved to be an effective means of influencing the main resource of modern development, namely the human personnel (Ding, Peng, 2018). As a result, his intellectual resource was at the epicentre of world competition. Using various forms and methods of attracting foreign intellectual resources, the state can achieve:

- concentration of specialists in promising areas of science, engineering and technology in their own country;
- slowing down the pace of development of the intellectual potential of its competitors, provoking the mass departure of prominent scientists and other categories of highly qualified specialists from developing countries.

According to Turchinov (2010), in the context of globalization, taking into account the high rate of renewal of professional knowledge and the considerable duration of specialist training, it has become more profitable to engage in personnel parasitism, attract foreign specialists than to invest our own resources in the training and education of our scientific and pedagogical personnel, and the formation of scientific, professional and technological schools.

For the states of the first type, a rapid increase in their intellectual potential at the expense of other countries and a significant reduction in the cost of training professional specialists at the expense of their own resources became real (David, Foray, 2003). For the states of the second type, and especially countries with the seal of the “resource curse”, this process has far-reaching geopolitical consequences for their specialization in the international division of labour, the development of science and education, and the preservation of their cultural code (Hearn, 2018).

Methodological concerns

In many scientific publications related to intellectual topics, there is a block of problems devoted to the relationship of the country’s intellectual potential and its national security (Osadchy, Akhmetshin, 2015; Halbert, 2016). Since the aim of this work is to study risks and threats to the intellectual security and regional development, it is necessary to determine the content of the basic notions we use and their relationship with each other. This is due to the fact that in the scientific literature quite often there is a substitution of notions that are close in meaning to each other. This is due to the fact that in the scientific literature quite often there is a substitution of notions that are close in meaning to each other. Especially often it happens when using concepts such as “human potential” and “human capital”, “intellectual potential”, and “personnel potential”.

In a broad sense, the human potential of society is the totality of the physical and spiritual forces of people that can be used to achieve individual and social goals – both instrumental, related to providing the necessary living conditions, and existential, including the expansion of human capabilities and the possibilities of self-realization (Kara-Murza, 2013). Quite often, this concept is often substituted by the concept of “human capital”. This creates certain confusion in the interpretation of their content. The reason for the confusion is that these notions are relatively identical, but not equivalent. This is due to the fact that the concept of “human potential” is a sociological category, and the concept of “human capital” is an economic category (Marvel, Davis, Sproul, 2016).
Based on the fact that these categories belong to different sciences and in order to eliminate possible confusion human potential should be considered as human capital in its real value plus the socio-economic conditions for its formation, development and use (Pereverzeva, 2011). This makes it possible to take into account not only the economic aspect of investing in a person, but also the characteristics of the social environment that forms the personality: the level of development and quality of healthcare and education systems, the degree of employment of the population, and the accessibility of participation in political life.

A qualitative characteristic of human potential, along with the physical and social components, is its intellectual component. Being an integral reflection of human resources, the intellectual component is the most essential characteristic that covers the accumulation of professional knowledge, skills, and experience in general (Bontis, 2001; Bontis, Janošević, Dženopoljac, 2015). In other words, intellectual potential is a kind of projection of one of the sides of human potential.

Intellectual potential is a cumulative intellectual resource accumulated by a person, which allows its owner to professionally participate in production processes and bring him income. Its social essence consists in the realization of its main function – to support the life activity and self-development of an individual included in various forms and orders of consolidated professional activity. The failure to use intellectual potential leads to its rapid aging and loss of value of this resource. Therefore, the most important requirement regarding intellectual potential is its constant updating through expanded reproduction of the intellectual resource and its use.

The content of the concept of “intellectual potential” is genetically closely related to the content of the concept of “personnel potential”, which is professionally prepared society’s resources capable of participating in various differentiated activities (Dixon, Yssel, McConnell, Hardin, 2014). Based on this definition, the concept of “personnel potential” in its content is somewhat narrower than the concept of “intellectual potential” in the sense that it should be considered as one of the components of the intellectual potential of society.

The concept of “intellectual potential” is an integrative category, which includes all types of intellectual, professional and creative activities of people. The use of many fixed results of these activities and their involvement as the main factor of production becomes the driving force behind the innovative development of the economy and society. In this sense, the country’s intellectual potential should be regarded as its national treasure which opens up the possibility of innovative dynamics and maintaining the proper level of civilizational development. In this regard, the state must ensure the safety of the development of society and protect it from external and internal threats.

A special place of intellectual security in the complex of various types of security that make up the national security of the country is due to a number of objective reasons. First, intellectual security determines the scientific support and implementation of all other types of national security. Secondly, the current situation provides some reasons to talk about the problems of intellectual security as the most important state, economic, social and political problem. Thirdly, the consequences of an intellectual crisis can be much more dangerous than, for example, political or military, economic or informational, and overcoming it will require several decades, and maybe centuries. Fourth, the multidimensionality, complexity, scales and depth of the problem of preservation and development of intellectual resources makes ensuring this security (along with environmental problems) one of the most pressing problems of our time.

In the scientific literature there is a variety of interpretations of the content of this notion. In some sources, intellectual safety is seen as protecting the products of people’s creativity (Liu, Zhang, Liao, Hao, Mao, 2016). In others, an equal sign is placed between intellectual safety and intellectual property (Chapman, 2002; 2018). There is an extended interpretation of its content, since intellectual security might also represent the ability of
society to creative activity and innovative development on the basis of accumulated socio-cultural and intellectual experience which is a prerequisite for maintaining its integrity, stability and vitality.

In general, we can identify three aspects of intellectual security of the state from the perspective of a systematic approach:

- intellectual security is an integral part and subsystem of a higher level – the national security system;
- intellectual security is a complex multi-level system, including its own subsystems (components) of a lower order;
- intellectual security is the internal or external state of the state, in which there are no real and potential threats and risks to the intellectual interests of the individual, society and the state, and when they arise, the state has a system of measures to ensure the protection of carriers of intelligence and products of their mental work.

Thus, intellectual security is a complex multi-level system which is defined by the following concepts of “intellectual resources”, “state interests”, “threats and risks” and “intellectual protection”.

Intellectual resources are the unity of carriers of intelligence and the results of their intellectual activity. An intellectual resource is an integral part of the intellectual potential mobilized to perform specific work on the production of high-tech products, and together with the latest knowledge forms intellectual capital. In the process of reproduction of intellectual resources, part of them can be materialized and used by other entities separately from the carrier of these resources. Another part of these resources (implicit knowledge) is not separable from their carriers. None of the traditional types of resources in the aggregate possess such qualities as an intellectual resource.

The interests of the state are vital and long-term. Their essence boils down to the efficient use and reproduction of intellectual resources, development, preservation and accumulation of the intellectual potential of society. There are also special consequences for regional development – the regions deprived of their intellectual force and potential suffer economic downturns and recession. Moreover, they also lack innovations and valuable human capital which further contributes to their demise.

Danger manifests itself in two main forms – threat and risk. A threat is a concrete, immediate and addressable form of danger. Risk is the realized possibility of a negative event with certain consequences that will develop in time and space. Thus, the risk is not the damage caused by the implementation of the decision, but the possibility of deviation from the goal for which the decision was made. It is due to the uncertainty of the activity, the possibility of adverse and undesirable consequences. Therefore, risks determine the lowest level of danger, and threats determine its highest level. If risks turn into threats, then this is an undoubted sign of serious failures in any security system.

Threats and risks to intellectual security come from both inside and outside. Internal threats and risks come from the state itself, the activity of which significantly reduces, and in some cases excludes the effective use of the intellectual potential of society. External threats and risks are produced by policies of other states aimed at depleting the intellectual potential of others.

Therefore, the intellectual security of the state as a systemic phenomenon has its own points of vulnerability. It appears that in order to identify possible threats and risks, a targeted and effective impact on them should become the key to success in protecting it and tackling it effectively.

Intellectual security and regional development: a case of Russia

Intellectual security largely depends on the level and quality of development of intellectual potential. Moreover, the demographic situation is also very important within
this context. With this regard, migration trends are also very important (Fursov, Krivokora, Strielkowski, 2019).

![Graph showing emigration and immigration processes in Russian Federation (2000–2018)]

**Fig. 1.** Emigration and immigration processes in Russian Federation (2000–2018)

**Source:** Own results based on Federal State Statistics Service (2019).

Migration from Russia is growing (Fig. 1), however the intellectual migration is the most damaging of all. At the end of the 1980s, 12 million people worked the research and development (R&D) al around the world of which 3 million people (25%) were in the Soviet Union (1.5 million people in Soviet Russia alone) (Etzkowitz, Webster, Gebhardt, Terra, 2000). By the number of scientific researchers per capita, Soviet Russia was in first place in the world. Only in 1984, the country was registered 15 major scientific discoveries in nuclear physics, astrophysics, solid-state physics, geophysics, chemistry, biology, and medicine. More than 23 thousand inventions and about 4 million rationalization proposals were used in the national economy. According to the number of scientific publications, Russia was in fourth place in the world. About 26 billion rubles were spent on scientific research a year (in terms of current prices of 2.6 trillion rubles). Education expenses did not fall below 7.5% of total expenses (Boyarintsev, Fionova, 2010). Special scientific and research centres were created not only in Moscow of Leningrad, but also in the remote places of Siberia, as well as regional centres (such as Gorky, Novosibirsk, Sverdlovsk), or peripheral regions. All of these contributed to the cohesion and positive regional development of the country. In general, the financing of science in Soviet Russia, amounted to 3.5% of GDP, and its knowledge-intensity was 2.89% (Varshavsky, 2001).

In the first two decades of the late 20th century and the beginning of the 21st century. Russian science has suffered tremendous damage. The consequences of this damage still have a significant negative impact on its condition and development (Fedorov, Mikhaylov, 2019).

The deteriorating situation began with a sharp reduction in state funding for research activities in the 1990s. During these years, the total expenditure on civil science averaged 0.2% of GDP and 1.7% of the federal budget expenditures. All domestic expenditures on
research and development in 1995 amounted to 0.85% of GDP. The expenses for the purchase of scientific equipment were reduced by 15 to 20 times. The average age of most scientific equipment exceeded 20 years. In the period 2000 – 2005 domestic research and development costs grew very slowly. In 2000, they amounted to 1.05%, and in 2005 – 1.07% of GDP. The coefficient of renewal of fixed assets in the branch “Science and Scientific Services” in 2000 was 0.7%. In 2006, this indicator increased to 1% (Kara-Murza, 2013).

As a result of the low level of financing during 1990–2006 the number of scientific and design organizations decreased by 7.8 times; experimental design bureaus – 3.6 times; scientific and technical divisions at industrial enterprises – 1.8 times. The level of inventive activity in the country decreased by 90%. 800 research institutes ceased to exist. This actually led to the withering away of the concept of “branch science” (Nosov, 2006). The elimination of so many scientific institutions and organizations led to the mass dismissal of scientists. According to the Federal State Statistics Service, the number of scientists in Russia decreased by 4 times; from 1.5 million in 1990 to 375 thousand in 2008 (Federal State Statistics Service, 2019).

According to Ushkalov and Malakha (2016), in the 1990 and 2000s, the number of scientists and specialists who went abroad from research institutes and enterprises of the military-industrial complex amounted to at least 70 thousand people. Among Russian emigrant scientists, 18% had a Ph. D. and 55.8% had academic degree of Candidate of Sciences. In the same years, 70 – 80% of leading mathematicians and 50% of leading theoretical physicists left Russia. In 1996, of the 100 most famous Russian scientists in the field of natural sciences, 50 lived and worked abroad.

Indirectly, these estimates are confirmed by the high emigration potential among scientists and highly qualified specialists in these years. According to rough estimates, 200–250 thousand programmers from Russia wanted to emigrate from the country to work abroad. About 10% of Russian scientists were looking for a job abroad, 20% focused on temporary labour emigration abroad.

The departure of specialists of this level causes tremendous damage to the donor state. According to UNESCO experts, Russia by the mid-1990s lost more than $ 30 billion from scientists emigrating. According to the calculations of Russian experts, the direct financial losses of Russia from the “brain drain” during the 1990s amounted to $ 50 billion annually (Yurevich, Tsapenko, 2019).

This trend is also noted by foreign migration statistics. If in the early 2000s the share of natives of Russia with higher education in the OECD countries was 27%, in 2010 – 2011 it amounted to approximately 35%. According to OECD estimates, the level of education of emigrants from Russia is one of the highest among emigrants from all countries of the world, including developed countries. Moreover, in Russia itself, the share of people with higher education at these dates was 19% and 28%, respectively (OECD, 2019). An increase in the number of people with higher education and a high level of qualification in the emigration stream from Russia can be considered as one of the probable factors of increasing risk in relation to its intellectual security.

Intellectual emigration from Russia continues. Only from 2013 to 2016 the number of highly qualified specialists who left Russia under a labour contract increased from 20 thousand to 44 thousand people (Zvezdina, 2018). In addition, there is a relatively high level of emigrant sentiments among young Russian people which indirectly confirms the possibility of an increase with regard to the increasing risk in relation to the Russia’s intellectual security. It becomes quite obvious that if the migration attitudes of young Russians coincided with their ability to go abroad to fulfil their professional and labour needs, the intellectual potential of Russia would be really dealt a significant damage and the resulting outcomes for the country’s regional development might be devastating.
Conclusions and implications

The migration of highly qualified specialists is characteristic not only for Russia. In fact, it constitutes an integral feature of the globalization process. The movements of migrants will always be directed to where they face more attractive opportunities for decent income, interesting work, high-quality and low-cost education, medical services, safe living, political freedoms, etc.

In the 1990s, the “brain drain” from Russia other countries was compensated by the influx of “brains” represented by Russian-speaking migrants from the former Soviet countries. But already in the 2000s, the potential of this source was largely exhausted. Like other developed and successful developing countries, Russia needs to take a step towards “brains” from other countries (similar to what United States or Canada have been successfully doing for decades).

In the context of globalization, the scale of this process will only increase. Therefore, for Russia or any other country in question there is not and cannot be any special “cure for brain drain”, except for a clear state policy regarding highly qualified migrants from among scientists and specialists. International migration of this category of workers is often circular in nature, when migrants move from one country to another, while returning to their homeland. Such circular migration facilitates the exchange of knowledge, scientific and organizational ideas, and in this sense can be very useful. All of these has serious implications for regional development, since human potential becomes its key factor and the geographical spread of intellectual capital across countries or regions can become one of the most decisive factors of their growth and prosperity.

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