French experience: international mobility of researchers in light of implementing the governmental tasks to increase efficiency of innovative sectors of economy

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Abstract. The term "innovation" was first used at the beginning of the 20th century by renowned economist Joseph Schumpeter meaning the changes aimed at implementing and using new types of consumer goods, new methods of production and vehicles, markets and forms of organization in industry. However, it is in recent years that the innovative sectors of economy have become noticeable in the national space of various countries on the political and economic map of the world. According to consultancies, the leading positions in the sector of innovation are held by digital companies. The slogan of one of them (Apple) – Think Different – is a most accurate reflection of the general logic of the intellectual and, ultimately, economic increment within innovative companies. The G8 and G20 countries increasingly often invest huge amounts in national projects aimed at supporting the relevant spheres of innovation. For instance, in Russia over 1 billion rubles was invested in innovative projects by governmental funds in 2019. The race for breakthrough science-and-research technologies creates a global competitive background for presenting the best innovative products to the global science-and-research community. At the same time, it should be recognized that the innovative sectors of national economies, due to the peculiarities of the organization and activities thereof, objectively cannot take an isolated position in relation to international cooperation in general and international mobility of researchers in particular. This article gives a critical analysis of the institution of international mobility of researchers looking at the example of the French Republic, a traditional leader in the field of science, research, technology and innovation.

1. Introduction
In terms of social (public) needs, science is a global system. General laws of nature expand beyond political boundaries. This process is currently driven by an increase in the number of the countries actively participating in the research process; a significant increase in the number of international research teams and articles published by them; international citation, accounting for two-thirds of all references to research publications; an increase in the number of international grant programs.

In the rest of the world (outside Russia), international cooperation in the sphere of research and technology takes place at various levels and through various mechanisms of implementation. A special role in the system of international cooperation in the sphere of research and technology is played by mobility of researchers [mobility of science and research professionals / academic mobility]. In this
regard, the French Republic is an excellent sample for a critical analysis aimed at shaping the Russian model of international mobility of researchers in the innovative sectors of economy.

2. Research methodology

Both general and special methods of cognition were used in course of the research.

Formulation of doctrinal approaches to the international mobility of researchers would be impossible without a comparative analysis performed within the framework of interdisciplinary (comparison of the legal doctrine with the related spheres of knowledge, such as philosophy and sociology), cross-branch (comparative analysis of the approaches used in comparative law, philosophy and theory of law as well as in branch legal disciplines), cross-border (comparison of different national legal systems with each other and with international law provisions) as well as chronological (historical comparative analysis) approaches.

It is planned to identify the social foundations of international mobility in France using the sociological and legal modeling methods.

In addition, it is planned to rely on synergistic research in course of the analysis. The synergistic method allows modelling the map of evolutionary possibilities for the concept of international mobility of researchers in France.

3. Research results

The French Republic is one of the global leaders in the sphere of science, research and education, which is confirmed by statistics. France ranks first in the European Union and second in the world in terms of the number of institutions conducting activities in the field of innovation; international ratings also give the top position to the French system of science and research organizations, CNRS (Center National de la Recherche Scientifique) – an analogue of the system of institutions of the Russian Academy of Sciences; France has the second largest number of Fields Medals in the world (an international award in mathematics), the third largest number of researchers in the European Union (with almost a third (27%) being women), and the fourth largest number of Nobel Prizes in the world.

The country’s progress in the spheres of research and innovation is due in no small part to the noticeable attention of the French leaders to implementation and active promotion of the institution of the international mobility of researchers.

The international mobility of researchers in France is simultaneously represented at several levels of research governance:

Pan-European, represented, in particular, by the international projects within the framework of the Bologna Process and the Erasmus Program.

It should also be noted that, from the very start of a unified research area formation within the European Community, the mobility of researchers in its various forms, including international, was seen as a key mechanism for implementing this large-scale project. The promotion of the mobility of researchers is established as a fundamental principle by the basic regulations governing the common EU policy in the sphere of science, research and technology, and, more importantly, a ramified multi-level institutional infrastructure has been created to ensure the implementation of this principle in practice. Within the framework of the European policy in the sphere of science and research, the mobility of researchers, on the one hand, is considered as a means of professional development of the EU researchers, and, on the other hand, serves as an effective tool for including the research potential of third countries into the ERA formation process. The promotion of the mobility of researchers as the most important mechanism for the formation of a unified research area of the European Community was established in 1986 by the Single European Act, which formally finalized the legal framework of the Community’s common policy in the sphere of science, research and technology. In accordance with Article 24 of the Act, the EEC Treaty was amended by adding the section entitled Research and Technological Development containing eleven articles stipulating the goals, main directions, forms and methods, as well as the procedure of joint research financing. Stimulation of the training and mobility of researchers in the Community is recognized as one of the Community’s activities complementing the
measures taken by the Member States. In accordance with the Single European Act, the EU was authorized to promote the mobility of researchers within the region, as well as to develop cooperation in the field of research and technology with third countries (Single European Act, 1987, pp. 1–29) [1].

France is known to be one of the main masterminds not only behind the Bologna Process, but also behind the creation of a single European educational space [2]. One of the aims of the Bologna Process defined in the Bologna Declaration is promotion of mobility by overcoming obstacles to the effective exercise of free movement. The Erasmus Program was launched in 1987. In 2014, the program was named Erasmus+. Its funding up to 2020 amounted to €14.7 million.

One of the landmark EU cooperation framework programs is Horizon 2020 (H2020) launched in 2014. Importantly, the key criteria for project selection within the framework of Horizon 2020 are the interdisciplinarity of research, innovative proposals related to new areas of research, or proposals introducing unconventional, innovative approaches to research. According to official statistics, in course of the program implementation, France has supported 3017 projects initiated by public entities and 2456 projects initiated by private entities.

National. One of the most successful French projects in this context is, perhaps, IDEX – Investments for the Future. It should be noted that France is not alone in this vector of reform in the sphere of science, research and education (similar projects accumulating the initiatives aimed at enhancing the excellence of national universities in the global arena were launched in other European countries as well). However, the French experience in this area is considered a most successful one globally.

Funded through government loan, the program is aimed at selection of and financial assistance to research laboratories involved in excellence initiatives in order to create 5 to 10 clusters of education and research at an international level, and to stimulate innovative professional education and training [3].

Regional. One of the successful initiatives of this kind is the Campus Bordeaux project. It has been selected by the French Ministry of Higher Education, Research and Innovation among the top 6 projects of this kind. The financing is complex: €475 million was invested into the project from the budget of the French Republic, €112 million – from the regional budget, and €54.6 million – from the budget of the Bordeaux metropolis. It is also planned to attract private investment (in particular, from the European Investment Bank) for the project implementation.

It should be noted that the system of research governance in France was being reformed even before 2019. Over the past decades, a number of other regulations related to science, research and education came into force in France: Law No. 2007-1199 dated 10 August 2007 on Liberties and Responsibilities of Universities [or the Universities Freedom and Responsibility Act]; Decree No. 2009-460 dated 23 April 2009 on the legal status of research lecturers, as well as Law No. 2006-450 dated 18 April 2006 on research evolution (guidance). A noticeable change in the architecture of research and innovation is going to be enabled in connection with adoption of the Multi-Annual Research Programming Law [Loi de programmation pluriannuelle de la recherche (LPPR)]. The project of the current modernization of research and education was announced by French Prime Minister Edouard Philippe in February 2019. To develop it, three working groups were formed involving members of the research lecturers’ community representing different branches of science. The first working group focused on the financial side of the reform, the second one concentrated on the labor issues in the sphere of research, and the third one dealt with the development of innovation.

In connection with the proposed reform, an increase in the amount of funding for innovation, as well as in the number of projects related to the international mobility of researchers, is expected. This, in particular, is seen as positive influence on the system of organizing activities in the sphere of science, research, education and innovation in the country. At the same time, the research community has been rather critical with regard to some of the reform’s aspects. The first reform vector, involving ranking of French universities with introduction of a system of differentiated funding thereof based on the ranking status, was bashed as an element of “inequality and Darwinism” in the research sphere, the second vector, involving change in the composition of expert committees dealing with research funding (with
replacement of researchers by government “appointees” and representatives of large corporations), was, in its turn, criticized as loss of the principle of professionalism in research project evaluation.

In conclusion to the article, we may fully agree with Stanislav Sergeev who believes that, with a balanced alignment by the government of its foreign and domestic policy, the international mobility of researchers can become an instrument of a country’s soft power. In order to implement this, it is necessary to build a discourse in the direction of creating an image of the country as an influential player in the international academic arena. The correct use of science and research as a soft power tool enables creation of an international academic platform for dialogue between scientists and researchers [4].

4. Conclusions
One of the effective tools for increasing the efficiency of the research and innovation space is academic mobility. The developing globalization is accompanied by a rapid growth in the exchanges between countries in the sphere of research and innovation. This contributes to the expansion and strengthening of international cooperation in this area, as well as to the formation of high international quality standards, the enhancement of innovative activity, and the competitiveness of national systems. In the context of academic mobility, not only people but also programs become mobile: projects in the sphere of research and innovation are distributed between research centers, which leads to the formation of innovative networks and alliances thus creating a more flexible social space.

The critical analysis of the palette of the international mobility of researchers in France confirmed the general thesis put forward in the introduction to this article: France can be considered a sample model for comparative analysis purposes.

At the same time, in the context of accepting the international model of presentation of the research and innovation sector of economy, Russia is in the zone of two vectors:

On the one hand, the institution of the international mobility of researchers is a return to the pre-revolutionary traditions of higher education and research.

On the other hand, in recent decades, Russia has expanded the international mobility of researchers both quantitatively and qualitatively, in particular, in terms of active involvement into the Bologna Process and other forms of integration-based cooperation, as well as in terms of including not only research, but also innovation into the content of the mobility of researchers.

In the future, when reforming the socially significant sectors of economy, Russia should take into account the French experience of expanding the national levels of the international mobility of researchers. Federal national projects should be complemented by a comparable number of regional projects.

At the same time, the mobility of researchers in innovative sectors of economy should not mean uncontrolled outflow of the country's intellectual potential to scientific centers abroad. In this regard, the French experience cannot be considered entirely successful. Although the PDOC program initiated by the French Ministry of Higher Education, Research and Innovation aimed at repatriation of young researchers is currently functioning in France, statistics shows that French scientists continue to leave their homeland, attracted by more financially lucrative projects on the other side of the Atlantic – in particular, in the United States and Canada.

The experience of Israel in this respect is demonstrative. In 1973, Israel created the Center for Integration in Science, basically, for Jewish immigrants from the Soviet Union largely including scientists, researchers and other academic professionals. The Center's task was to assist them in finding a job in Israel corresponding to their skills and qualifications, as well as in adapting to the Western practices and lifestyle, which was meant to and really did hugely benefit the country's economy. According to the Israeli Ministry of Aliyah and Integration, 9800 of the 13275 Jewish scientists who arrived in Israel from the USSR/CIS in the period from 1989 to 1998 got jobs in the sphere of science and research (8390 of which found employment through the Center); 4040 repatriate researchers are employed in the private sector and 2250 – at universities [5].

The implementation of Mega-Grant type projects in Russia, aimed, in particular, at encouraging the return of world-class Russian researchers to their homeland, should be continued.
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References
[1] Titova T P 2015 Development of the international mobility of researchers: the European Union experience Sociology of Research and Technology 6 (1) 91–93
[2] Schraeder H 2008 Die Universitätsreform in Frankreich — ein gelungener Auftakt (Berlin) p 6
[3] Aghion P 2010 L’excellence universitaire: leçons des expériences internationales – Rapport à Mme pp 26–45
[4] Sergeyev S O 2015 Academic mobility as a tool of soft power of science Humanities, Socio-Economic and Social Sciences 198
[5] Masyukova I V 2000 Russian-Speaking Professionals and Researchers from the CIS in Israel: Problems of Integration Russia and the East: A View from Siberia at the End of the Century (Irkutsk) 2 219
[6] François-Poncelet J 1999-2000 La fuite des cerveaux: mythe ou réalité? Rapport d’information de la Commission économique du Sénat 388
[7] Chatel L and Galut Y 2014 Rapport d’enquête sur l’exil des forces vives de France – Assemblée nationale
[8] Coulombe S and Tremblay J-F 2009 Migration and skills disparities across the Canadian Provinces Regional Studies 43 (1) 5–18
[9] Dolado J, Goria A and Ichino A 1994 Immigration, human capital and growth in the host country Journal of Population Economics 7 (2) 193–215
[10] Ortega F and Peri G 2014 The Aggregate Effects of Trade and Migration: Evidence from OECD Countries (Springer International Publishing)
[11] Ennafaa R and Paivindi S 2008 Fuite ou mobilité des cerveaux Formation Emploi 103 (juillet)
[12] Bellais R 2005 Recherche et défense, vers un nouveau partenariat? Innovations, Cahiers d’économie de l’innovation 21 145–166
[13] Boyer R 1998 Etat, Marché et développement: une nouvelle synthèse pour le 21ème siècle? Cahiers du CEPREMAP 9907 (Paris)
[14] Branscomb L and Keller J 1998 Investing in Innovation (Cambridge: MIT Press)
[15] Branscomb L and Auerswald P 2001 Taking Technical Risks: How Innovators, Executives, and Investors Manage High Tech Risks (Cambridge MA: MIT Press)
[16] Coppin O 2002 Le milieu innovateur: une approche par le système Innovations, Cahiers d’économie de l’innovation 16 29–50
[17] Lachmann J 2000 L’apport du capital-risque au financement de l’innovation Innovations, Cahiers d’économie de l’innovation 11 121–138