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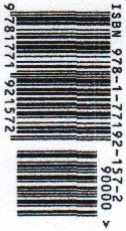
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счет сжарываемых ресурсов страны, однако, данный подход не является решением проблемы экономической отсталости России. Конечно, Россия богата природными ресурсами, что во многом и предопределило направление ее развития, однако, нужно понимать, что энергетические ресурсы страны ограничены и многие из них носят исчерпаемый характер.

Это обстоятельство вынуждает сделать как минимум два вывода. Во-первых, необходимо использовать получаемые от продажи нефти и газа финансовые ресурсы для преодоления монокультурной специализации и модернизации экономики. Во-вторых, необходимо это сделать в самое ближайшее время, поскольку становится всё труднее поддерживать добычу нефти и газа даже на прежнем уровне [5]. Именно развитие новой экономики, а прежде всего человеческого капитала позволит стране выйти на качественно новый уровень и превзойти однонаправленность национальной экономики.

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ТРАНСФЕР ЗНАНИЙ: ВОЗМОЖНОСТИ АССИМИЛЯЦИИ НАУЧНОГО ПОТЕНЦИАЛА РОССИИ

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KNOWLEDGE TRANSFER: ASSIMILATION POSSIBILITIES OF RUSSIA'S SCIENTIFIC POTENTIAL

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Аннотация: в статье рассматриваются каналы международного трансфера технологий в аспекте включения России в глобальную инновационную систему, а так же с точки зрения содержательного спроса и предложения научных знаний.

Ключевые слова: трансфер технологий, научный потенциал, патентная активность, инновационная система.

Abstract: the article considers the channels of international technology transfer in the light of Russia inclusion into the global innovation system, as well as in the view of substantial demand and supply on scientific knowledge.

Keywords: technology transfer, scientific potential, patents, citations.

In the modern world economy the main driving forces are the new knowledges, products, services and technologies that allow to characterize it as an innovative economy. Socio-economic development of countries, their economic and political position in the world arena are determined largely by scientific, technological and innovative development. Many of the "catching up" countries tend to quickly make up for a lack of innovative capacity through implementation of effective scientific policy, often based on derived practical experience from abroad. In this regard, the importance of international technology transfer is difficult to overestimate. First, the very essence of technology transfer implies a permanent process of technology motion, which mediates to innovation development in general. Second, contemporary technology transfer trigger development of such elements of innovation infrastructure as intellectual organization, market-intellectual enterprises, technology transfer centers, technological platforms, consulting in innovation, etc. Third, establishment and development of efficient technology transfer should strengthen the state's position on the world stage and facilitate international cooperation. The importance of this aspect is progressively growing, therefore, a comprehensive study of technology transfer and search of ways of its intensification are strongly required.

International technology transfer (ITT) is a comprehensive term covering mechanisms for shifting information across borders and its effective diffusion into recipient economies [8, p. 223]. Thus, it refers to numerous complex processes, ranging from innovation and international marketing of technology to its absorption and imitation. Particularly, it encompasses technology, trade, and investment policies that can affect the terms of access to knowledge. Policy making in this ar-

is especially complex and needs careful consideration, both by individual countries and at the multilateral level. Several channels exist through which ITT might occur. Firstly, trade in goods and services itself. Every export carries some potential for growth of the level of technological capabilities and information about the development of innovation. Import of capital goods and technologies may directly contribute to increase production productivity through the introduction of the production processes only in terms of recipient's capacity to absorb the technology. Openness of trade policy is necessary but not sufficient condition for attracting technology. What is more important here is the possibility of adapting that technology, in turn in order to have this it is essential to develop the system of research grants in educational institution as well as in businesses implementing innovation.

The second channel is the foreign direct investment (FDI). Transnational companies, as a rule, transfer of technological information with its affiliated companies, and consequently, some of them can 'spill over' to the host economy. This channel provides the necessary knowledge and skills for the transfer of in the host country and therefore the question of implicit knowledge in this channel transfer is solved exporter of capital [2, p. 37]. The third major channel of ITT is direct trading knowledge through technology licensing. This can occur in the framework of its subsidiaries or between unrelated firms. Licensing and FDI are often used interchangeably. What form is preferable for owners of technologies depends on many factors, including the degree of intellectual property rights protection. Patents, trade secrets, copyrights and trademarks serve as direct channels of knowledge transfer [1, p.17]. However, each type of intellectual property is of a different level of impact on the innovative potential of the host country. Although buying licenses implies that the patent includes all the necessary information for production of these products, this market does not involve personal contact between buyer and seller, and therefore does not allow the full development of new technology of production.

Next channel to be considered is labour turnover and collaborative international projects. The former could happen in two main ways in international perspective. First one is connected with people returning to the home country after spending limited amount of time abroad where they have acquired new knowledge and skills through education or job and what is more important implementing that in their country. Second way deals with attracting foreigners who carry relevant expertise. The core problem here especially for developing countries is preventing moving to permanent residence and foster home-coming so that advance local development. The latter channel slightly eliminate those problems at the same time preserving the key aspect, namely acquiring non-codified knowledge. That kind of education/training is significant for enhance the countries' capacity of transferring "invisible" parts of purchased technology and adapting it. The quicker knowledge acquired by staff the more beneficial the search for new technology is.

Geographical and cultural proximity influences international scientific collaboration. The widespread use of English and information and communication technologies has helped to extend the scope of international research collaboration. While Europe increases scientific collaboration in the European research area, the rest of the world reaches out to emerging economies. Co-inventions are an indicator of formal R&D cooperation and knowledge exchange among inventors located in different countries. International co-invention is affected by countries' skills endowment and conditions of relevance. International co-invention typically involves multinational corporations with units in several countries and joint research ventures between firms and institutions of various types (e.g. universities, public research organisations). While co-invention with the BRICS continues to increase, it remains limited as only about 1.7% of European patents and around 2.2% of US patents are co-invented with partners in BRICS economies (figure 1). As soon as to

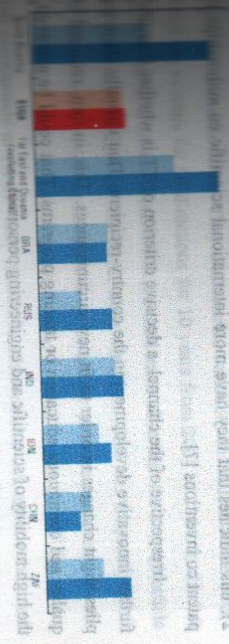


Figure 1. Scientific collaboration with BRICS countries, 2001 and 2011. Source: World Bank Data Base

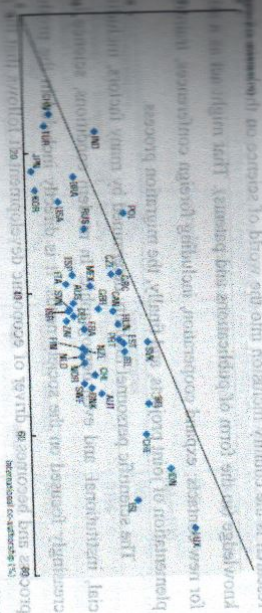


Figure 2. International collaboration in science and innovation, 2011. Source: OECD Patent Data Base, 2013

International scientific publications co-authorship is calculated as the share of articles featuring authors joined with foreign institutions in total articles produced by domestic institutions. Co-inventions evaluate as the share of patent applications with at least one co-inventor located abroad in total patents invented domestically. Luxembourg shows outstanding results in both directions: more than 70% of publications involve co-authorship with abroad institutions. For Russia, the level of scientific co-authorship is slightly more than international patent co-invention.

tion, which just exceeds 20%. Virtually all countries fall below the 45° line (figure 2); this indicates that they have more international scientific co-authorships than patent co-inventions [7].

Respective of the channel, a decisive criterion of TT is whether it promotes further innovative development in the country-recipient. That virtually always implies slight changes in order to fit new circumstances. This, in turn, required high quality and continuous education or training programs. That could be achieved by the high mobility of scientific and engineering personnel.

In terms of open innovation, transfer contains all stages of innovation, including the stage of research. Forms of knowledge transfer in modern conditions are diversifying, but the most powerful stimulus to the contacts development in the research is the country inclusion into the world of science on the basis of codified knowledge (in the form of publications and patents). That might act as a stimulus for new contacts; expand cooperation, including foreign conferences, training, implementation of joint projects, and finally, the migration process.

The scientific personnel mobility determined by many factors, including social, institutional, and even demographic. In modern conditions, science has increasingly focused on the society needs. It is directly included in the production process and becomes a driver of economic development. It follows that the possibility of exchange of knowledge do not depend on the physical distance between countries, but from the "economic" distance, which is primarily determined by the mutual interest for some kind of knowledge, i.e. the knowledge supply and demand.

In turn, the global scientific community demand on science is determined by government policy. Most developed countries are now completing structural shift to scientific disciplines, aimed at improving human well-being, including health-related science, ecology, and information technology. At the same time, the current state of the world's scientific potential characterized by a steady path dependency. Therefore, large military sector research, inherited from the cold war, has been preserved and continue to be restoring in the leading countries. In table 1 figures are

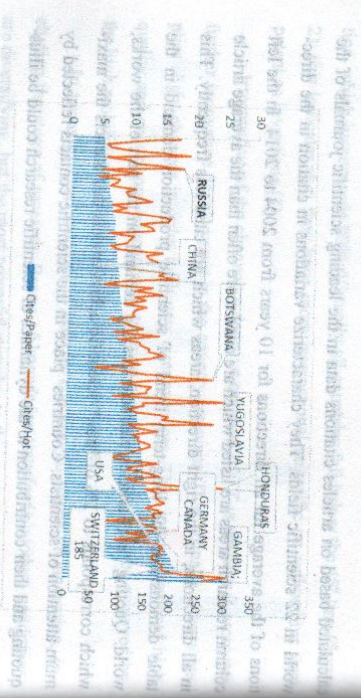
additional based on article citations data in the leading scientific journals of the world in 22 scientific fields. They characterize variations in citation in the direction of the average for all directions for 10 years from 2004 to 2014. In the left column research areas are listed which are cited more often than the average article in all directions, in the right direction, areas which are cited less frequently. This table demonstrates the long-term trend of scientific production demand in the world. Quoting "hot" articles characterizes the demand on the part of the works, which corresponds to 1% of "new" scientific achievements that attracts the maximum attention of scientists. Countries' place in the scientific contacts reflected by quoting and their contribution to the dynamics of scientific research could be illustrated by the figure 3.

Table 1. Prevalence of citation ratings for 22 fields of science, 2004-2014

Research Field	Mean citation rate=100	Research Field	Mean citation rate=100
Mathematics	307%	Geosciences	96%
Molecular Biology & Genetics	222%	Physics	91%
Immunology	171%	Materials science	80%
Neuroscience & behavior	156%	Plant & animal science	76%
Space science	147%	Agricultural sciences	68%
Biology & biochemistry	146%	Economics & business	62%
Microbiology	134%	Social sciences	54%
Chemical medicine	111%	general engineering	50%
Chemistry	109%	Computer science	45%
Pharmacology & toxicology	109%	Mathematics	34%
Environmental/ecology	107%		
Psychology/psychology	104%		

(Own calculation based on InCites « Essential Science Indicator» Thomson Reuters)

Figure 3. *Cites/Paper and Cites/Hot Paper by Countries - 2013*
 Source: *InCites « Essential Science Indicator » Thomson Reiter*



First, most highly cited articles often appear in countries that do not belong to recognised leaders. In the number of links to hot articles, Gambia is in the same row with Switzerland, and Germany and Canada do with Honduras. Moreover, the demand on hot articles from developing countries is significantly higher than from science-leader countries. The article focuses on Russian scientific potential, but it should be noted that the reasons for getting articles in the number of hot so diverse that this issue requires special analysis. This diversity leads to the risk of mechanical borrowing of best practices in the transformation of the organization of science for countries coming to the knowledge economy [5, p. 10]. Russia is not considered to be in the number of science leaders, primarily because of the fact that institutional characteristics of scientific potential impede the mobility of its scientific staff [4, p. 1620-1630]. Furthermore, according to official statistics more than 80% of research activities are devoted to natural and technical Sciences, out of which more than 60% focuses on technical. Compared to this figure with the data in table 1, it is clear that the great number of studies are held in those fields of science, the demand for which in the world of science is falling. At the same time citation in-

tion of Russian scientists' articles in the areas that are of interest to the global scientific community corresponds to the level of advanced countries (e.g. immunology - 6 links to the article, pharmacology - 6, neuroscience - 5) [3].
 Thus, it can be argued that the demand for Russian scientists studies is maintained at a high level. According to Russian Federal Statistics Service, the only type of agreement by which the balance of foreign trade technology payments has a positive balance is scientific research and development (figure 4).

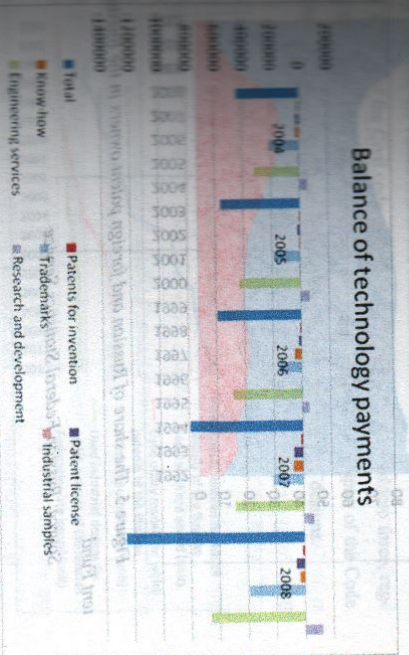


Figure 4. *Balance of technology payments by categories of agreements in Russia*
 Source: *Indicators of innovative activity: 2011*

Patent activity plays a major role in assessing the level of country's innovation development. In the light of TT channel and transferring tacit knowledge, it is important to analyse the share of foreign patent holders, which remained virtually stable from 1995 to 2002 [6, p. 8]. Then it significantly rises and reaches a peak of 14% in 2006, followed by sharp decrease to the level of 1992 year. This could be explained by consequences of global crisis. Another crucial element is how patents

implements (figure 5,6). As can be seen, more than 30 % of patents issued in the Russian Federation are owned by non-residents, also a high proportion of patents registered abroad are obtained by the co-authors of the Russian Federation and foreign researchers.

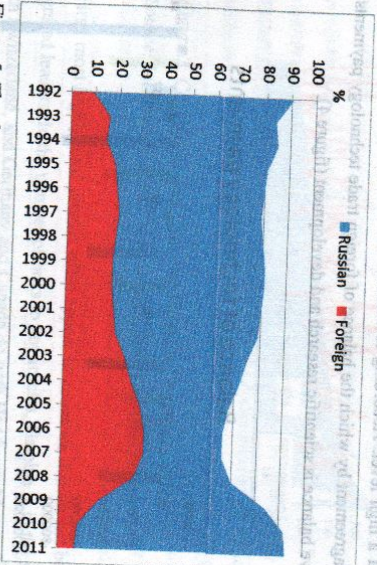


Figure 5. The share of Russian and foreign patent owners in the Russian patent fund

Source: Russian Federal Statistics Service

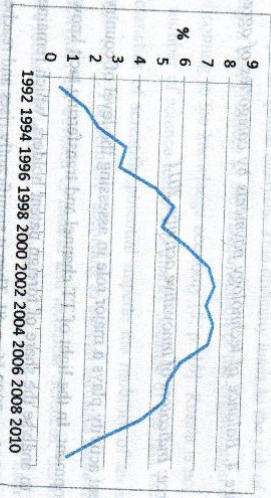


Figure 6. The share of commercialized patent in Russia

Source: NBK-group statistics

... to the commercialized patent, the number of used inventions is ... (figure 7). That might be explained by the improvement of patent legislation in 1992 it was launched on the preparation of special legislative acts on the regulation of copyright relations. The first was the Law of the RF "On legal protection of computer programs and databases" of September 23, 1992, entered into force the Law of the Russian Federation "On copyright and allied rights" July 9, 1993. In 2000, the Patent law of the Russian Federation has lost its action and passed the part of the Civil code of the Russian Federation entered into force, regulating the legal relationship in the area of patent rights. This Chapter of the Code is devoted to the rights for inventions, utility models and industrial designs.

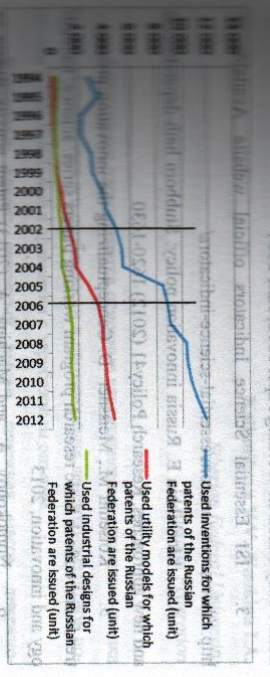


Figure 7. The number of used inventions

Source: Russian Federal Statistics Service

Consequently, the following conclusions can be drawn. First, the choice of technology transfer channels is closely linked to the scientific potential, so the acquisition of new technologies abroad depends on countries' readiness to receive and perceive implicit knowledge associated with their use. Second, traditionally the high level of research in Russia corresponds to the industries interest in which of the science world is reducing. Russian scientific journals with impact factor greater than 1 are devoted primarily to physical, chemical and mathematical Sci-

ences. Third, high demand for Russian science is limited by a number of factors, due to traditions, organization, and institutional features of Russian science, which significantly reduces its effective participation in the transfer of knowledge and technology. *Abstract* *Keywords*

Введение Третье, высокое требование к российской науке ограничено рядом факторов, обусловленных традициями, организацией и институциональными особенностями российской науки, что существенно снижает ее эффективное участие в передаче знаний и технологий. **Ключевые слова**

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ОСОВЕЩЕНОСТИ ДЕНЕЖНОГО РЫНКА СОВРЕМЕННОЙ РОССИИ

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MONEY MARKET CHARACTERISTICS OF MODERN RUSSIA

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Аннотация: рассматриваются основные характеристики денежного рынка России, выделяются его особенности и противоречия денежно-кредитной политики в нем (сравнение в сравнении с зарубежным опытом).

Ключевые слова: денежный рынок, денежная масса, денежно-кредитная политика, центральный банк.

Abstract: reveals the basic characteristics of money market in Russia, highlighting its peculiarities and contradictions of monetary policy associated with it in comparison with foreign experience

Keywords: money market, money supply, monetary policy, the central bank

Актуальность исследования особенностей денежного рынка в РФ обусловлена его активной интеграцией с другими валютными рынками. К тому