МИРОВАЯ ЭКОНОМИКА
WOLD ECONOMY

УДК 339.1 **DOI: 10.18413/2409-1634-2022-8-2-0-2**

[1]Соколова Е.С.,
[2]Леонтьева Л.С.,
[3]Шкарина В.С.

ПЕРСПЕКТИВЫ РОССИЙСКО-КИТАЙСКОГО СОТРУДНИЧЕСТВА ПО ОБМЕНУ ТЕХНОЛОГИЯМИ В СФЕРЕ ЦИФРОВИЗАЦИИ: ТЕКУЩИЕ ТЕНДЕНЦИИ И ПУТИ РАЗВИТИЯ

[1]Финансовый университет при Правительстве Российской Федерации,
пр-кт Ленинградский, д. 49/2, Москва, 125167, Россия
[2]Московский государственный университет им М.В. Ломоносова, Ленинские горы, д. 1, Москва, 119991, Россия
[3] Российский государственный гуманитарный университет,
Миусская пл., д. 6, корп. 7, Москва, 125993, ГСП-3, Россия

e-mail: sokolovaes65@mail.ru

Аннотация.
Актуальность. Сегодня Китай и Россия являются одними из самых технологически развитых стран Азии и технологический обмен между ними в контексте заинтересованности обоих друг в друге выглядит очень мощным инструментом дальнейшего развития взаимовыгодного сотрудничества, особенно с учетом складывающейся сложной ситуации на рынке технологии и ограничения доступа к ним со стороны третьих стран. Проблема. Существует ряд преград на пути к развитию технологического сотрудничества между странами, которые не позволяют с уверенностью говорить о долгосрочном союзе; поэтому возникает вопрос о будущем этих отношений. Исследование. Авторы ставят целью статьи ответить на вопрос о том, будет ли партнерство между Российской Федерацией и Китаем долгосрочным, путем исследования основных показателей научного развития двух стран. Результаты. Авторы вводят классификацию технологического сотрудничества, а также оценивают эффективность патентно-инвестиционной деятельности в исследуемых странах. Основной задачей статьи является оценка общего влияния обмена технологиями на экономику обеих стран, чтобы доказательство двусторонней выгоды было основано на фактах. Основными выводом работы является ответ на поставленный вопрос: авторы склонны считать, что сотрудничество КНР и России нельзя назвать союзным. Авторы также предлагают рекомендации по повышению эффективности принимаемых мер сотрудничества. Важнейшим вкладом статьи является доказательство того, что несмотря на то, что обмен технологиями жизненно важен для обеих экономик, их политические и экономические курсы различны, а страны объединились лишь на время.
Ключевые слова: Россия, Китай, обмен технологиями, сотрудничество, цифровизация, партнерство.

Информация для цитирования: Соколова Е.С., Леонтьева Л.С., Шкарина В.С. Перспективы российско-китайского сотрудничества по обмену технологиями в

сфере цифровизации: текущее тенденции и перспективы // Научный результат. Экономические исследования. 2022. Т.8. № 1. С. 13-22. DOI: 10.18413/2409-1634-2022-8-2-0-2

Elizaveta S. Sokolova, Lidia S. Leontieva, Vera S. Shkarina

PROSPECTS OF RUSSIAN-CHINA TECHNOLOGY EXCHANGE PARTNERSHIP AND DIGITALIZATION: CURRENT TRENDS AND FUTURE DEVELOPMENTS

[1]Financial University under the Government of the Russian Federation,
49/2 Leningradsky Ave., Moscow, 125167, Russia
[2]Lomonosov Moscow State University, 1 Leninskie Gory, Moscow, 119991, Russia

e-mail: sokolovaes65@mail.ru

Abstract.
Relevance. Today, China and Russia are among the most technologically advanced countries in Asia, and the technological exchange between them in the context of the interest of both in each other looks a very powerful tool for further development of mutually beneficial cooperation, especially given the current difficult situation in the technology market and restrictions on access to it by third countries. **Problem.** There are a number of barriers to the development of technological cooperation between countries that do not allow us to speak with confidence about a long-term alliance; so the question of future relationships arises. **Study**. The authors aim to answer the question of whether the partnership between the Russian Federation and China will be a priority by examining the main indicators of the scientific development of the two countries. **Results.** The authors classify the cooperation of the technological process, and also evaluate the effectiveness of patent and investment activities in the countries of the Union. The main purpose of the article is to analyze the analysis of the technology of infection with pathogens in order to identify bilateral benefits found on the facts. The main **conclusion** of the work is the answer to the question posed: the authors tend to believe that the cooperation between China and Russia cannot be called an alliance. The authors also offer recommendations on how to improve the effectiveness of the cooperation measures taken. The most important contribution of the article is to prove that although the exchange of technology is vital for both economies, their political and economic courses are different, and the countries are united only temporarily.
Key words: Russi; China; technology exchange; cooperation; digitalization; partnership

Information for citation: Sokolova E. S., Leontieva L. S., Shkarina V. S. “The prospects of Russia-China technology exchange partnership and digitalization: current trends and future prospects”, *Research Result. Economic Research,* 8(2), 13-22, DOI: 10.18413/2409-1634-2022-8-2-0-2

Introduction

Russia and China are among the leading powers in technological development in the world. Of course, the superiority in this pair belongs to China [Chi Hung KWAN, 2017], [Xielin Liu, Sylvia Schwaag Serger, Ulrike Tagscherer, Amber Y. Chang, 2017], but Russia also has a number of basic technologies and the desire for their development; some of these technologies are necessary for China. In the context of the turn to the East, which characterizes Russian politics in the post-sanction years, and China’s interest and its institutions in establishing a Eurasian partnership (if not in the format of Greater Eurasia) the partnership in the high technology and

digitalization field seems to be one of the most successful directions for the development of both countries' economies.

Russian economy needs a powerful driver in its partnership to be equitable with China. The PRC economy needs innovation and support from other states in the fight against US pressure in the trade and information war [Jonathan Gruber and Simon Johnson, 2019]. All this leads to the fact that cooperation in the field of investment to innovation and economy's digitalization, which allows reducing transaction costs, and also new technologies' joint development, becomes as beneficial for both parties as also necessary for survival.

Within the research, three main areas of partnership can be distinguished: scientific-educational, patent-investment, digitalization-institutional. In addition, the creation and exchange of dual-use technologies and military developments play a key role in cooperation, but since these industries have other specifics and are not directly quantifiable, their consideration within the framework of the article will not contribute to its content.

The authors see the key article's goal in an answer to the question of what is happening in the technological cooperation field between Russia and China: whether there is a creation of a new powerful research centre on a global scale or whether there is simply the search for development paths in a world with high barriers and numerous obstacles to two economies' development. A more private form of this goal can be considered the task of determining the form of interaction between the RF and the PRC in the field of high technology: long-term alliance or partnership until the first significant obstacles.

The basis for this research lies in the sphere of Russia-China cooperation studies. This sphere is highly politicized, so many important works, such as [Samuel Bendett, Elsa B. Kania, 2019] bear a significant political context. Another article [Maxim Kotsemir, Tatiana Kuznetsova, Elena Nasybulina, & Anna Pikalova, 2015] covers scientific cooperation in general, not specifying the geographical partners of Russia [Weissmann, M., Carlsson, M., & Oxenstierna, S., 2015] concentrates on competition, in this way serving as another politicized source. The general conclusion is that the current study in this sphere lies in the field of politics, rather than science and economy.

These trends force the authors to stick to the sources on national innovative development. The general situation in the sphere of technologies is described in [Sidorova E., 2018], where the authors put forward the idea of BRICS as the cooperative institute in technology development in the BRICS countries. The idea is transferred to the cooperation of Russia and China in this article. The fundamental work on the issues of Russian technological development presents very important ideas on the measures to make the depressive situation better, while [Alexander Y. Chmykhalo, Olga V. Mikhailova, Nikolay A. Vtorushin, Roman A. Bykov, 2016] evaluates the potential for the development. For China, innovation is an important part of economic development; the idea of innovation as a driving force of the economy is expressed in [Yanrui Wu., 2010] and in (Paper 5).

As mentioned in the introduction, the authors divide technology partnerships into three main areas according to the authors' classification:

1) a scientific and educational partnership implies cooperation in the human capital's development and the common research institutes' formation for given problems;

2) Patent-investment partnerships imply cooperation in the creation of institutions to use existing knowledge and support the formation of new knowledge through financial mechanisms;

3) digitalization-institutional partnership is the most common type of partnership. It implies cooperation in the field of the economy's digitalization, scientific institutions transplantation and also the intangible assets transfer from one jurisdiction to another (in particular, this includes cultural exchange).

It should be noted that the authors pay special attention to the second aspect of cooperation, because it is within this aspect that cooperation must begin.

The authors evaluate the effectiveness of countries' patent-investment activities, using four performance criteria, divided into 2 blocks: private and public. The private block includes the patents/investments index, and state patents / GDP:

$$I_{P/I} = \frac{P}{I}, I_{P/GDP} = \frac{P}{\%GDP}$$

Where P is the number of patent applications, I is the investments volume in dollars, %GDP is the investments volume as a GDP percentage for research and development. The first index allows to evaluate the effectiveness of the research institution for commercial structures, the second index allows evaluate the state's effectiveness.

Main part

Cooperation between Russia and China in the science and education field is quite active; moreover, this track of cooperation is one of the most promising at the initial stages. Today, more than 720 universities on both sides maintain and develop partnerships [Fedotova N.L., Solovyeva E.B., Vtorov V.B., Yun L.G., 2019]. It is necessary to notice that a similar positive trend is observed in the field of science development partnership: today, there are at least seven large joint scientific projects [Fedotova N.L., Solovyeva E.B., Vtorov V.B., Yun L.G., 2019]. At the same time, it should be noted that this partnership between the two countries has historically been well developed. Let us turn to the data on patent-investment cooperation.

Here the situation is more complicated. Investing in science has always been a weak point of the Russian budget process [Natalia Puchkova., 2019]. Moreover, the investments institution in the scientific cooperation between the Russian Federation and the PRC is significantly complicated by the protecting intellectual property problems: both countries (but, first of all, the Russian Federation) fear their developments illegal use. Moreover, in Russia there is a certain distrust to Chinese developments and innovations: there is still an opinion about Chinese products (and about innovations too), as about something, having poor quality [Dmitri Trenin., 2012] Let us turn to Figure 1, which shows the investments' dynamics and their forecast in the research as a GDP percentage.

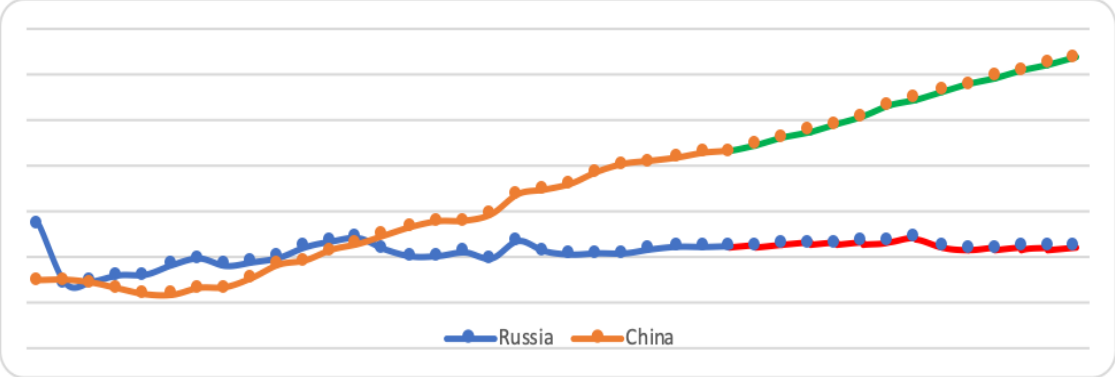

Рис. 1. Инвестиции в исследования (% от ВВП), составленные авторами
Fig. 1. Investments in research (% of GDP), compiled by the authors [13].

Figure 1 clearly demonstrates the need for a policy change for the Russian Federation, but at the current moment, the forecast is disappointing. One of the key conclusions is the Russian institutions' quality and adaptability to global realities is much worse and lower than Chinese ones, especially taking into account the number of patents (Fig. 2) [The World Bank,2021]. It is necessary to notice the forecast is not the only possible option for the events' development: it is determined by the past development and it can change significantly during the scientific sphere's institutional structure changes.

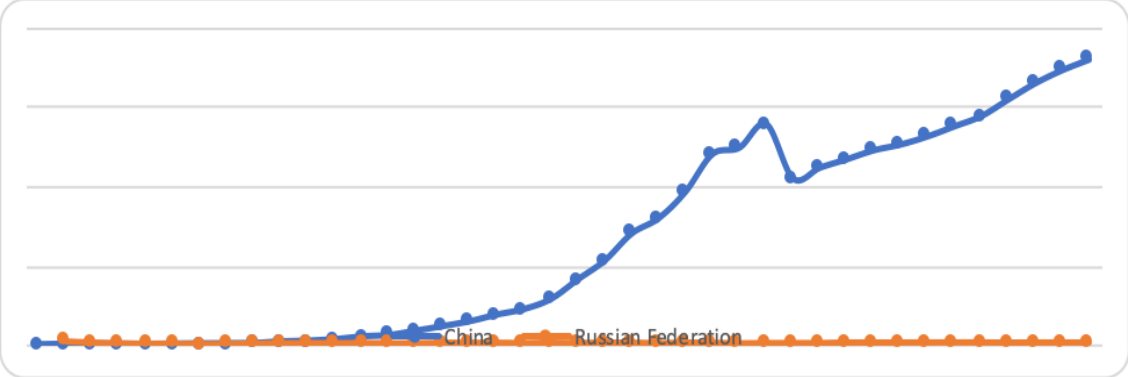

Рис. 2. Количество патентных заявок (составлено автором);
Россия находится на правильном уровне
Fig. 2. The number of patent applications (compiled by the author); Russia is on the right scale

As Figure 2 shows, the number of patent applications in Russia is also incomparably lower than in China. There is a mismatch between government funding and research results. This is confirmed by the fact that the amount of research funding in real terms has been steadily increasing both in the PRC and in the Russian Federation for a fairly long post-crisis period. This fact allows us to conclude that the Russian economy does not have institutions powerful enough to control the intangible assets' movement (Fig. 3).

Let us consider the dynamics of the institutions' effectiveness while their current state maintenance in both countries (Fig. 4).

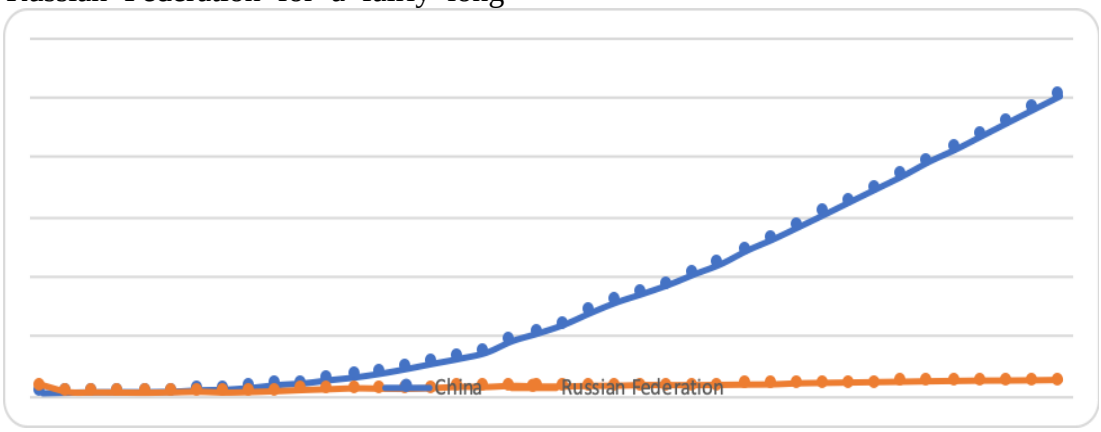

Рис. 3. Объем финансирования исследований (миллион долларов);
Россия находится на правильной стороне
Fig. 3. The amount of research funding, ($ million); Russia is on the right side

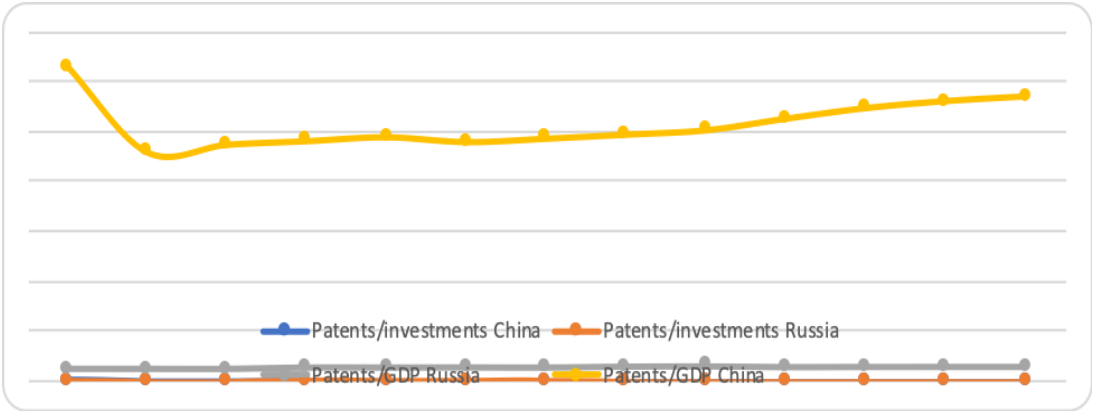

Рис. 4. Значения индексов научной эффективности (рассчитанные авторами)
Fig. 4. Values of scientific performance indexes (calculated by the authors)

Calculations show that the patent investment institutions' effectiveness in Russia is much lower. This explains the low Chinese investors' interest in the research financing in Russia except for narrow areas (energy and military-industrial complex); while Russian companies cannot enter the Chinese market due to high competition. Thus, Russia sees cooperation with China in high-tech and consumer technology and banking innovation as a way to accelerate its economy and find a path less dependent on oil and gas revenues. At the same time, a cautious attitude towards Chinese partners is caused by their high influence on Russian companies and by the fact that Chinese innovations are often focused on a less liberal economic model. This cooperation to a certain extent is beneficial to the Chinese side. As previous results show, the PRC economy's innovative development is possible without Russia's participation, but certain vital areas for China, such as energy, primarily the nuclear and aircraft industries [Keegan Elmer, 2019], metallurgy and other fundamental industries depend on an external technologies' influx; in fact, the technological boom in China has arisen due to a foreign technologies' influx. As long as Russia is ahead of China in these areas, cooperation will be beneficial to the Chinese side and the PRC will support the technologies exchange with Russia.

Let us speak about digitalization. As shown earlier, Russian institutions for the development of science are of inferior quality to those in China, and there is currently no full-scale transfer of institutions. As it was shown in [L. D. Kapranova, 2018], the digital economy's development in Russia is still at the initial stage, but its specific features are already visible: we speak about the banking sector's high penetration into the digital sphere, low share of the producing sector. In fact, digitalization in Russia has taken the service sector's path; sectors, which service digitalization, has a high quality, this is also due to quality education. The PRC is characterized by a different model: Chinese digitalization is aimed at replacing foreign products with Chinese ones [Hamid Bouabid, Adèle Paul-Hus, Vincent Larivière, 2016]. That's why the share of the manufacturing sector is very high, although the goods' quality is lower than in developed countries, their price is also lower which makes them competitive in emerging markets (attached file). At the same time, the digital services sector in China is rather poorly developed, especially in the banking sector: high information barriers and the population's commitment to traditional services do not allow this area to develop actively. Thus, with the partnership in the field of economy's digitalization between Russia and China, we are talking about an attempt to pair two completely different models; that's why it is necessary to understand that cooperation in the digitalization field should come from business, but it shouldn't come from the state. Moreover, if there is successful testing of the business cooperation model between the Russian Federation and China, this area of individual decisions can be directed to the state level (as, for example, in the case of Tencent, which successfully develops the server business in Russia, or in the case of mutual models' penetration – Alibaba and Mail.ru) [Yoshikazu Watanabe, 2019].

The research shows that the Russian and Chinese high-tech development and digitalization models are different. To achieve a long-term alliance in this area it is necessary to have a large amount of effort on both sides. Steps have already been proposed to optimize the two countries models to achieve the greatest synergy effect from cooperation [Larisa Smirnova, 2014]. Nevertheless, there is still an imbalance and uncoordinated efforts in this area. The partnership between the Russian Federation and China in the technology field is still at a low level; its institutionalization is required. The authors suggest a series of actions to increase activity and to have a greater effect from scientific cooperation.

Within the Eurasian Economic Union, there is already a development bank, we mean the Eurasian Development Bank. China has become the main initiator of the Asian

Infrastructure Investment Bank (AIIB) creation. On both institutes' fields, many projects have been implemented. As part of the search for solutions to start cooperation in the technological exchange and digitalization field, it would be reasonable to use both institutions' potential in the following way: it is necessary to create centres for controlling intellectual property on their basis, and centres for promoting mutual investments in innovative industries and enterprises. These organizations will be able to attract more investment; an innovative enterprises' register of both sides should be formed too.

The second interesting step in the same direction should be the digital enterprises' formation: these enterprises will develop prototype models which will be interesting for both countries. This is a direct way to digitalizing economies from below, as it allows you to purposefully develop and, accordingly, buy those products which were created specifically for a narrow market. In addition, this will help create a unified software infrastructure for solving specific problems and this measure will assist the state security programs realization of both countries in the information space; as this base should contain national developments and Western software analogues. Over time, this measure will assist to improve the quality of domestic digital products.

In addition, it is necessary to continue active cooperation between universities and research centres in the sphere of partnership programs realization. It is also necessary to continue the two countries' cultural rapprochement. These measures will lead to easier institutions' interpenetration and will create conditions for improving the quality of human capital in both countries.

Conclusion

During the research, the authors identified the weaknesses of the current science's state in both countries and noted that cooperation in the scientific field can and should be classified to avoid partnership stimulation programs generalization to the framework statements. It was revealed that both countries need innovation and the mechanisms for technology development in Russia are weaker than in China.

It was revealed that today the partnership in the technology and technological exchange field has an episodic and highly specialized nature and, with the same dynamics, it cannot bring significant benefits to either side.

The authors proposed measures to initially intensify cooperation directed to the business community and supranational institutions, as it is irrational to seek ways to stimulate scientific development in the Russian Federation in the conditions of its institutions' proven inefficiency.

Digitalization in Russia is very different from that in China; that's why we cannot talk about direct cooperation and institutions transfer in this area. It is necessary to realize a digitalization program as part of a business partnership; this measure will allow to adapt institutions to local realities and test their effectiveness.

On the whole, the answer to the question of what the partnership between the Russian Federation and the PRC will be is the technological hub option for the current development. But both countries fear deeper integration, that's why the partnership, although long-term, is much more probable than a development union.

Список литературы

1. Вайсман М., Карлссон М., & Оксенштерна С., 2015. Китай и Россия – Исследование сотрудничества, Конкуренции и недоверия. Экономика. Доступно по адресу: https://www.semanticscholar.org/paper/China-and-Russia-A-Study-on-Cooperation%2C-and-Weissmann-Carlsson/f55a3c6e3630322477ecf26a602955080c33e00d#citing-papers (дата обращения: 10.03.2022).

2. Всемирный банк, 2021. Патентные заявки, резиденты. Доступно по адресу: https://data.worldbank.org/indicator/IP.PAT.RESD (дата обращения: 10.03.2022).

3. Джонатан Грубер и Саймон Джонсон, 2019. Чтобы Противостоять Китаю, Перехитрите Его. Доступно по адресу: https://www.foreignaffairs.com/articles/china/201

9-09-12/counter-china-out-invent-it (дата обращения: 10.03.2022).

4. Есикадзу Ватанабэ, 2019. Быстрая конвергенция с высокотехнологичными технологиями, Китаем и Россией. Доступно по адресу: https://inosmi.ru/20191113/246212283.html (дата обращения: 10.03.2022).

5. Зелин Лю, Сильвия Шваг Серджер, Ульрике Тагшерер, Эмбер Й. Чанг, За пределами догоняющего – может ли новая инновационная политика помочь Китаю преодолеть ловушку среднего дохода? Наука и государственная политика, Том 44, Выпуск 5, октябрь 2017, Страницы 656-669, https://doi.org/10.1093/scipol/scw092 .

6. Капранова Л. Д., 2018. Цифровая экономика в России: ее состояние и перспективы развития. Экономика, налоги и право 11(2):58-69. DOI: 10.26794/1999-849X-2018-11-2-58-69.

7. Киган Элмер, 2019. Китай и Россия планируют активизировать научное сотрудничество с акцентом на искусственный интеллект и другие стратегические области. Доступно по адресу: https://www.scmp.com/news/china/diplomacy/article/3043787/china-and-russia-plan-boost-scientific-cooperation-focus (дата обращения: 10.03.2022).

8. Коцемир М., Кузнецова Т., Насыбулина Е. и Пикалова А., 2015. Определение направлений научно-технического сотрудничества России. Форсайт, № 9. (4). С. 54-72.

9. ОЭСР, 2021. Валовые внутренние расходы на НИОКР. Доступно по адресу: https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm (дата обращения: 10.03.2022).

10.Пучкова Н., 2019. Бизнес в цифровой экономике: российский и зарубежный опыт. IOP Conf. Сер.: Матер. наук. англ. 667 012084

11.Смирнова Л., 2014. Россия – Китай: 20 предложений по экономическому, научному и гуманитарному партнерству. Режим доступа: Электронный ресурс. https://russiancouncil.ru/analytics-and-comments/analytics/rossiya-kitay-20-predlozheniy-dlya-ekonomicheskogo.

12.Сидорова Е., 2018. Инновационное развитие стран БРИКС: предпосылки и перспективы сотрудничества. Журнал исследований международных организаций, том 13, № 1, стр. 34-50. DOI:10.17323/1996-7845-2018-01-02.

13.Сэмюэл Бендетт, Эльза Б. Кания, 2019. Новое китайско-российское партнерство в области высоких технологий. Доступно по адресу: https://www.aspi.org.au/report/new-sino-russian-high-tech-partnership (дата обращения: 10.03.2022).

14.Тренин Д., 2012. Настоящие партнеры? Как Россия и Китай видят друг друга. Доступно по адресу: https://www.cer.eu/publications/archive/report/2012/true-partners-how-russia-and-china-see-each-other (дата обращения: 10.03.2022).

15.Чмыхало А.Ю., Михайлова О.В., Вторушин Н.А., Быков Р.А., 2016. Инновационное развитие в России: ценностный аспект. Сеть конференций SHS. DOI: 10.1051/ shsconf/2016280 10 21.

16.Чи Хун КВАН, 2017. Китай становится Крупной инновационной державой: возможности в области исследований и разработок приближаются к возможностям развитых стран. Доступно по адресу: https://www.rieti.go.jp/en/china/16120501.html (дата обращения: 10.03.2022).

17.Федотова Н.Л., Соловьева Е.Б., Второв В.Б., Юн Л.Г., 2019. Реализация Китайско-российских образовательных программ по подготовке китайских инженеров. Интеграция образования = Интеграция образования. 23(2):164-181. DOI: 10.15507/1991-9468.095.023.201902.164-181.

18.Хамид Буабид, Адель Поль-Гус, Венсан Ларивьер, 2016. Научное сотрудничество и обмены в области высоких технологий между странами БРИКС и G-7. Наукометрия 106(3). DOI: 10.1007/s11192-015-1806-0.

19.Янруй У., (2010). Инновации и экономический рост в Китае. Диччуцччионный документ 10.10.

References

1. Alexander Y. Chmykhalo, Olga V. Mikhailova, Nikolay A. Vtorushin, Roman A. Bykov, (2016). Innovation development in Russia: the value aspect. SHS Web of Conferences. DOI: 10.1051/ shsconf/2016280 10 21.

2. Chi Hung KWAN, (2017). China Becoming a Major Innovation Power: Research and development capabilities approaching those of developed countries. Available at: https://www.rieti.go.jp/en/china/16120501.html (Accessed 10 March 2022).

3. Dmitri Trenin., (2012). True partners? How Russia and China see each other. Available at: https://www.cer.eu/publications/archive/report/2012/true-partners-how-russia-and-china-see-each-other (Accessed 10 March 2022)

4. Fedotova N.L., Solovyeva E.B., Vtorov V.B., Yun L.G., (2019). Implementing Sino-Russian Educational Programs for Training Chinese Engineers. Integratsiya obrazovaniya = Integration of Education. 23(2):164-181. DOI: 10.15507/1991-9468.095.023.201902.164-181

5. Hamid Bouabid, Adèle Paul-Hus, Vincent Larivière, (2016). Scientific collaboration and high-technology exchanges among BRICS and G-7 countries. Scientometrics 106(3). DOI: 10.1007/s11192-015-1806-0

6. Jonathan Gruber and Simon Johnson, (2019). To Counter China, Out-Invent It. Available at: https://www.foreignaffairs.com/articles/china/2019-09-12/counter-china-out-invent-it (Accessed 10 March 2022).

7. Keegan Elmer, (2019). China and Russia plan to boost scientific cooperation with focus on artificial intelligence and other strategic areas. Available at: https://www.scmp.com/news/china/diplomacy/article/3043787/china-and-russia-plan-boost-scientific-cooperation-focus (Accessed 10 March 2022).

8. Kapranova L. D., (2018). The Digital Economy in Russia: Its State and Prospects of Development. Economics Taxes & Law 11(2):58-69. DOI: 10.26794/1999-849X-2018-11-2-58-69. (in Russian)

9. Smirnova Larisa, (2014). Russia – China: 20 proposals for economic, scientific and humanitarian partnership. Access mode: Electronic resource. https://russiancouncil.ru/analytics-and-comments/analytics/rossiya-kitay-20-predlozheniy-dlya-ekonomicheskogo. (Accessed 10 March 2022).

10.Maxim Kotsemir, Tatiana Kuznetsova, Elena Nasybulina, & Anna Pikalova, (2015). Identifying Directions for Russia's Science and Technology Cooperation. Foresight, No. 9. (4). pp. 54-72.

11.Natalia Puchkova., (2019). Business in the digital economy: russian and foreign experience. IOP Conf. Ser.: Mater. Sci. Eng. 667 012084

12.OECD, (2021). Gross domestic spending on R&D. Available at: https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm (Accessed 10 March 2022).

13.Samuel Bendett, Elsa B. Kania, (2019). A new Sino-Russian high-tech partnership. Available at: https://www.aspi.org.au/report/new-sino-russian-high-tech-partnership (Accessed 10 March 2022).

14.Sidorova E., (2018). The Innovation Development of the BRICS Countries: Preconditions and Prospects for Cooperation. International Organisations Research Journal, vol. 13, no 1, pp. 34–50. DOI:10.17323/1996-7845-2018-01-02

15.The World Bank, (2021). Patent applications, residents. Available at: https://data.worldbank.org/indicator/IP.PAT.RESD (Accessed 10 March 2022).

16.Weissmann, M., Carlsson, M., & Oxenstierna, S., (2015). China and Russia – A Study on Cooperation, Competition and Distrust. Economics. Available at: https://www.semanticscholar.org/paper/China-and-Russia-A-Study-on-Cooperation%2C-and-Weissmann-Carlsson/f55a3c6e3630322477ecf26a602955080c33e00d#citing-papers (Accessed 10 March 2022).

17.Xielin Liu, Sylvia Schwaag Serger, Ulrike Tagscherer, Amber Y. Chang, Beyond catch-up—can a new innovation policy help China overcome the middle income trap?, Science and Public Policy, Volume 44, Issue 5, October 2017, Pages 656–669, https://doi.org/10.1093/scipol/scw092. (Accessed 10 March 2022).

18. Yanrui Wu., (2010). Innovation and Economic Growth in China. DISCUSSION PAPER 10.10.

19.Yoshikazu Watanabe, (2019). Rapid convergence with high-tech technologies, China and Russia. Available at: https://inosmi.ru/20191113/246212283.html (Accessed 10 March 2022).

Информация о конфликте интересов: авторы не имеют конфликта интересов для декларации.

Conflicts of Interest: the authors have no conflict of interest to declare.

Соколова Елизавета Сергеевна, доктор экономических наук, профессор, кафедра Государственного и муниципального управления, Финансовый университет при Правительстве Российской Федерации, (г. Москва, Россия)

Elizaveta S. Sokolova, Doctor of Economics, Professor, Department of Public and Municipal Administration, Financial University under the Government of the Russian Federation, (Moscow, Russia)

Леонтьева Лидия Сергеевна, доктор экономических наук, профессор, факультет

государственного управления, кафедра регионального и муниципального управления, Московский государственный университет им М.В. Ломоносова, (г. Москва, Россия)

Lidiya S. Leontieva, Doctor of Economics, Professor, Faculty of Public Administration, Department of Regional and Municipal Management, Lomonosov Moscow State University, (Moscow, Russia)

Шкарина Вера Сергеевна, кандидат экономических наук, преподаватель кафедра теоретической и прикладной экономики, Российский государственный гуманитарный университет, (г. Москва, Россия)

Vera S. Shkarina, Candidate of Economic Sciences, Lecturer, Department of Theoretical and Applied Economics, Russian State University for the Humanities, (Moscow, Russia)