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## Address

National Research University Higher School of Economics  
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Tel: +7 (495) 772-95-90 \*23147 and \*23149  
E-mail: [iorj@hse.ru](mailto:iorj@hse.ru)  
Web: <http://iorj.hse.ru/>

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## Адрес редакции

119017, Москва, ул. Малая Ордынка, 17  
Национальный исследовательский университет  
«Высшая школа экономики»  
Телефон: +7 (495) 772-95-90 \*23147 и \*23149  
E-mail: [ioj@hse.ru](mailto:ioj@hse.ru)  
Web: <http://ioj.hse.ru/>

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# Sustainable Economic Growth: Challenges and Opportunities

## Identification of Priorities for S&T Cooperation of BRICS Countries<sup>1</sup>

A. Sokolov, S. Shashnov, M. Kotsemir, A. Grebenyuk

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**Alexander Sokolov** – PhD, Deputy Director, Institute for Statistical Studies and Economics of Knowledge, National Research University Higher School of Economics (HSE); 20 Myasnitskaya St., 101000 Moscow, Russian Federation; E-mail: sokolov@hse.ru

**Sergey Shashnov** – PhD, Department Head, Department for Strategic Foresight, Institute for Statistical Studies and Economics of Knowledge, HSE; 20 Myasnitskaya St., 101000 Moscow, Russian Federation; E-mail: shashnov@hse.ru

**Maxim Kotsemir** – Junior Research Fellow, Quantitative Modelling Unit, Institute for Statistical Studies and Economics of Knowledge, HSE, 20 Myasnitskaya St., 101000 Moscow, Russian Federation; E-mail: mkotsemir@hse.ru

**Anna Grebenyuk** – Deputy Head, Department for Strategic Foresight, Institute for Statistical Studies and Economics of Knowledge, HSE; 20 Myasnitskaya St., 101000 Moscow, Russian Federation; E-mail: grebenyuk@hse.ru

*This article presents a methodology for the selection of priorities for science and technology (S&T) cooperation among the BRICS countries of Brazil, Russia, India, China and South Africa based on an analysis of international and national strategic documents of BRICS countries and a bibliometric analysis of joint publications by researchers from BRICS countries indexed in the Scopus database. The national S&T priorities for countries are systemized and a comparative assessment of capacities for S&T development in BRICS countries is developed.*

*Indicators of publication activity of all BRICS countries have significantly increased since 2000. Analysis shows that Russia must pay particular attention to the development of cooperation with China, which is already one of the leaders on the global S&T stage. Cooperation with India, Brazil and, in some research areas, with South Africa could also have a positive impact on the performance of research and development in Russia.*

*A list of 14 thematic priorities for S&T cooperation for BRICS countries is presented in the paper based on the analysis of a set of national, bilateral and multilateral strategic and forward-looking documents. Priorities of S&T development create a basis for more efficient and mutually beneficial cooperation between BRICS countries and allows individual scientists to broaden the range of research, use new tools for S&T cooperation and share best practices.*

**Key words:** science and technology cooperation; international partnership; priorities for STI cooperation; bibliometric analysis; BRICS

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<sup>1</sup> The editorial board received the article in November 2017.

## Introduction

One of the key principles formulated in the Russian Federation's S&T Development Strategy is striving for leadership in specific S&T areas, in conventional and innovative technology, product, and service markets alike, and creating a full-scale integrated innovation system [President of the Russian Federation, 2016]. In recent years, cooperation with BRICS countries in a wide range of subject areas, including science and technology, is increasingly becoming a high priority. Popular tools commonly applied to promote this development model include international S&T cooperation, international R&D integration, establishing efficient partnerships with international R&D centres, and agreeing S&T cooperation priorities with them [BRICS, 2014, 2015, 2016, 2017].

Meeting long-term socio-economic challenges requires the application of a systemic, integrated approach to identify key S&T development areas – those with the potential to make the biggest contribution to solving emerging problems on the national and international levels. Meanwhile, international priorities define the S&T areas, and research and innovation-related goals and objectives particularly important to groups of countries, which require joint effort to accomplish.

Most of the developed and developing nations, including BRICS countries, have been devoting considerable attention to S&T priority setting for quite a while now, since such priorities serve as a basis for their science, technology, and innovation (STI) policies [OECD, 2010; BILAT-USA, 2010; Gassler et al., 2004; Gokhberg et al., 2016; Grebenyuk et al., 2016; Cagnin, 2014; Kuwahara et al., 2008; Li, 2009; Pouris, Rapha-sha, 2015]. Relevant efforts are mainly focused on solving strategic socio-economic problems, and making efficient use of national competitive advantages [OECD, 2012, 2014; European Forum on Forward Looking Activities, 2015; Meissner et al., 2013; Shashnov, Poznyak 2011; Sokolov, Chulok, 2016]. S&T priorities are currently being set through a comprehensive assessment of their possible contribution to achieving sustainable socio-economic development, and strengthening the country's competitiveness.

Accordingly, identifying S&T priorities shared by BRICS economies becomes increasingly relevant for planning their cooperation [Kahn, 2015; Kotsemir et al., 2015]. This objective is partially accomplished in the scope of various bilateral S&T cooperation programmes implemented by BRICS countries. Developing joint approaches to setting S&T cooperation priorities is becoming particularly important, followed by their successful practical implementation. Especially interesting are cooperation areas where joining forces can potentially produce major synergies. The partner countries' long-term goal is turning BRICS into a full-fledged platform for ongoing and strategic interaction on key issues, including science and technology.

A long-term objective is turning BRICS into a reliable and efficient mechanism for current and strategic cooperation in key areas, including science and technology. Participating in drafting a common agenda for international cooperation, to obtain competitive advantages through S&T and innovation cooperation with foreign coun-

tries, is important to Russia and other BRICS nations. Such advantages include identifying promising S&T development areas, and stepping up relevant research through international cooperation; sharing risks and costs in the scope of promising large-scale S&T projects, and pooling resources required for their implementation; participating in meeting global challenges (energy efficiency, climate change, etc.); establishing long-term relations with leading R&D centres to create new knowledge and building infrastructure for joint activities, etc.

Putting in place a reliable information basis for designing a relevant agenda that is meaningful to all BRICS countries requires conducting a comprehensive analysis of S&T potential and the socio-economic objectives of specific countries. Building a system for setting long-term priorities for S&T cooperation between BRICS countries should play an important role in accomplishing this objective, as a major aspect of shaping policies to increase competitiveness of the R&D sector, and more efficiently use public resources allocated to support its development, accelerate its modernisation, and promote transformation of the national economies.

Setting up a common system of priorities should involve broad complementarity, which would help to address the existing limitations through closer cooperation of member countries, and application of their best practices.

In the future, shared priorities could provide grounds for stepping up BRICS countries' cooperation with other nations and international organisations. Such priorities should be identified through the application of various quantitative and qualitative techniques, involving top-level experts in priority setting and dealing with numerous other methodological issues emerging in the course of identifying and selecting S&T areas whose development would make the biggest contribution to accomplishing objectives common to BRICS countries.

## Approach to and Principles of Setting Priorities for BRICS Countries' S&T Cooperation

In most of the developed and developing economies (such as the UK, Germany, China, the Republic of Korea, Japan, etc.) the system of national science, technology, and innovation (STI) priorities is based on the results of major Foresight studies covering all the most important S&T development areas [Grebenyuk et al., 2016; Gokhberg et al., 2016; Johnston, Sripaipan, 2008; Choi, Choi, 2015; Kuwahara et al., 2008].

Foresight is a systemic process involving numerous participants, which allows the bringing together of their experience to shape common visions of the medium and long-term futures to support current decision making and taking concerted action [Gavigan et al., 2001]. Foresight methodology is typically employed to deal with emerging long-term socio-economic problems, when political decisions must be made to choose strategic alternatives or set development priorities, and build consensus between major stakeholders regarding the means of accomplishing agreed objectives.

Setting international priorities is just that kind of a task: such priorities should identify S&T areas particularly important to a group of countries, whose advancement should be supported by their joint efforts.

The following basic principles of setting common S&T development priorities can be suggested:

- orientation towards accomplishing major socio-economic objectives shared by a group of countries, and joining forces in relevant areas to strengthen their competitive positions and deal with relevant domestic issues;
- taking into account major global STI trends;
- providing member countries of the group with opportunities to implement their competitive advantages (such as S&T capacity, available resources, previously laid groundwork, etc.);
- setting a limited number of particularly important S&T priorities, to concentrate the available resources;
- applying more efficient STI policy tools.

Priorities for BRICS S&T cooperation can be subdivided into thematic and functional categories (Fig. 1).

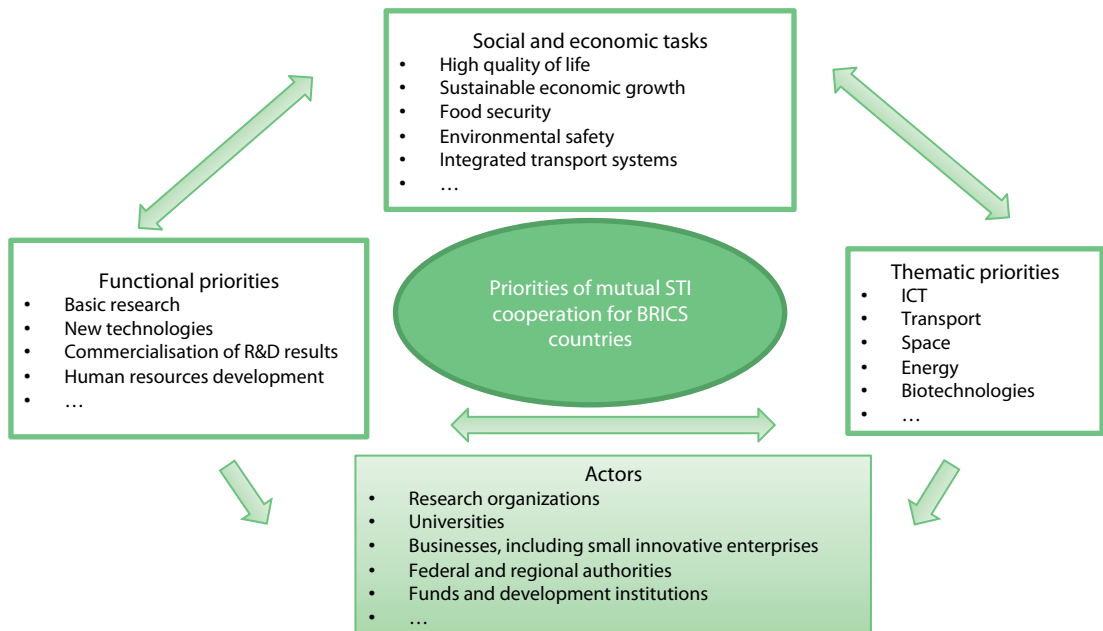


Fig. 1. Structure of system of priorities for BRICS S&T cooperation

Thematic priorities are presented as lists of major R&D areas (such as ICT, space systems, etc.) investing in which could bring significant social and/or economic benefits in the medium to long term: higher economic growth rate, increased competitiveness and accomplishing other key socio-economic and S&T objectives. Functional



priorities include objectives aimed at facilitating the development and performance of national research and innovation systems, e.g. accelerated development of human potential, commercialisation of R&D results, etc. Joint implementation of such projects would help accomplish major socio-economic objectives.

Approaches based on Foresight methodology play a major role in setting STI priorities in all BRICS countries [Shashnov, Poznyak, 2011; Chan, Daim, 2012; Sokolov, Chulok, 2012; Cagnin, 2014; Li, 2009; Pouris, Raphasha, 2015]. The selected priorities tend to be oriented towards dealing with strategic socio-economic development issues. To take such issues into account in the course of priority setting, and subsequently facilitate their implementation, relevant stakeholders become involved in the process – public authorities, companies, and members of the academic community, for example. A wide range of experts also take part in priority setting.

Looking at the Russian experience, in the course of updating S&T priorities in 2014–15, particular attention was paid to drafting a list of major socio-economic objectives, which would determine an S&T areas' relevance over the next ten years [Grebenyuk et al., 2016]. For this purpose, a wide range of information sources was analysed, including national-level, industry-specific, and regional strategic documents and forecasts (such as addresses and decrees by the RF President, RF national programmes, industry and regional-level programmes and development concepts). On the basis of this analysis, a list of major socio-economic objectives was drafted, which subsequently served as a key milestone for identifying priority S&T areas and critical technology for the Russian Federation.

The application of the above approaches resulted in drafting lists of priority development areas and critical technology, long-term forecasts of S&T development prospects based on qualitative and quantitative Foresight techniques. Subsequently these results were applied in various strategic documents on the implementation of the identified priorities. In most BRICS countries, such documents comprise STI development strategies, strategic plans, and programmes.

A similar approach was employed to design a system of S&T cooperation priorities for BRICS countries. The application of Foresight methodology implies considering an integrated set of goals and objectives reflected in official international and national documents, taking into account their S&T potential and the opinions of the expert community. The approach was based on the need to advance the BRICS countries' S&T potential and concentrate it on major economic and social development areas, while keeping in mind expected technological breakthroughs. Particular attention was paid to making use of the countries' competitive advantages: only a limited number of especially important S&T priorities were identified for full support for their implementation to be provided.

A wide range of methodologies and techniques were applied in the course of S&T priority setting, including document analysis, bibliometric analysis, and various expert-based procedures (Fig. 2).

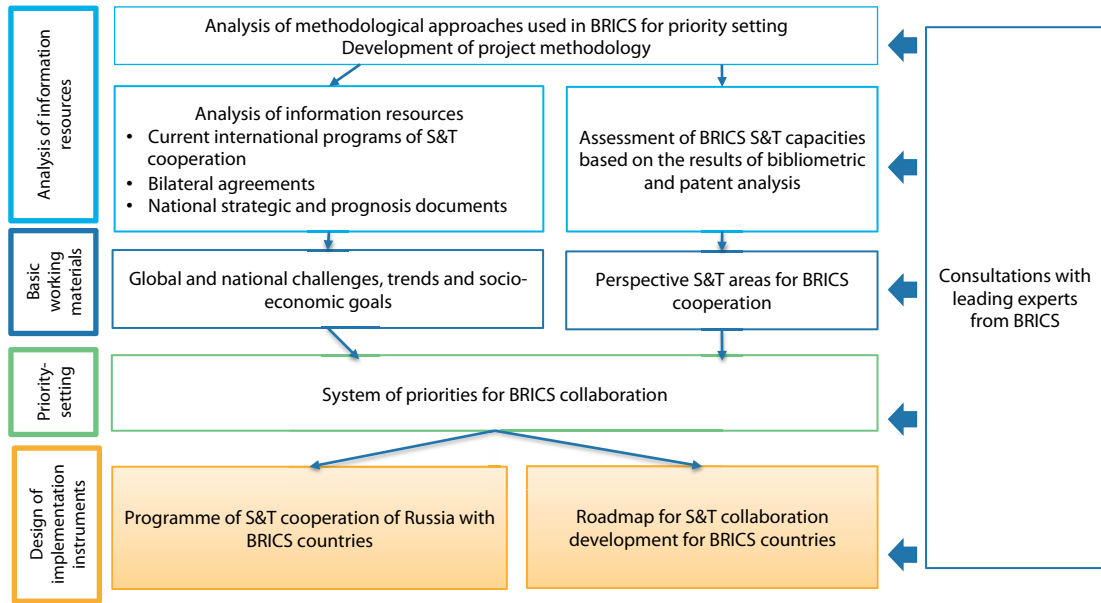


Fig. 2. Scheme of defining priorities for S&T BRICS country cooperation

## Analysis of BRICS Countries' International and National Strategic and Forecasting Documents

The information basis for designing a common system of S&T development priorities for BRICS countries comprised the following:

- Each BRICS country's Official documents on S&T cooperation (bilateral and multilateral), approved by the countries' governments or government ministries responsible for shaping and implementing S&T and innovation policies;
- Strategic national documents and Foresight reports from BRICS countries related to STI development.

As was already noted, results of national long-term Foresight studies serve as a basis for designing a system of S&T development priorities. A major objective of such studies is building an information basis for subsequent priority setting exercises, among other things taking into account major global STI development trends. Concerning relevant Russian experience, three rounds of S&T Foresight studies were implemented in the country in recent years [Gokhberg, Sokolov, 2017]. E.g. the results of the Russian S&T Foresight 2025 (2007–2008) were applied to adjust the lists of priority development areas and critical technology. These materials were used to assess global and national-level challenges to socio-economic development; identify prospective innovative product and service markets, and technology that would help Russia progress along the advanced sustainable innovation-based development path.

In 2011–2013, Russian S&T Foresight 2030 was conducted, approved by the RF Prime Minister on 3 January 2014. The goal of this exercise was to identify S&T develop-

ment areas with the best long-term prospects for Russia, together with appropriate technology and technological solutions that could potentially enable the country to make use of its competitive advantages, taking into account global challenges and windows of opportunity.

The project combined the “technology push” and “market pull” approaches, and covered seven major S&T areas: information and communication technologies; biotechnology; medicine and health; new materials and nanotechnology; efficient environment management; transport and space systems; energy efficiency and energy saving. A wide range of analytical and expert-based techniques were applied in the course of the study, including interviews, expert surveys, and expert panel discussions [Sokolov, Chulok, 2016].

Threats to, and windows of opportunity for, Russia were identified in each of the above seven areas on the basis of: previously identified trends, along with relevant prospective markets, product groups and potential segments of demand for innovative Russian technology and solutions; descriptions of priority S&T subject areas prepared; more than 1,000 priority R&D objectives were formulated. The current state of Russian R&D in these areas was assessed and benchmarked against the world leaders.

The results of this Foresight study (which took into account global S&T development trends) were applied to draft preliminary lists of priority areas and more specific thematic fields for cooperation with BRICS countries.

In line with the suggested principles and methodological approaches to setting priorities for S&T cooperation among BRICS countries, major national-level strategic documents and forecasts were analysed, together with bilateral and multilateral agreements between those nations (Table 1).

The relevant documents were analysed in terms of the thematic or functional priorities they reflect. E.g., the first thematic priorities for international cooperation between BRICS countries were set in documents drafted following the first and second meetings of BRICS education and science ministers [BRICS, 2014, 2015]. These documents stress the need to strengthen STI cooperation to help meet common global and regional socio-economic challenges on the basis of shared experience, complementary efforts, joint creation of new knowledge, the development of innovative products, services and processes using relevant funding mechanisms and investment promotion tools, and encouraging partnership with other strategic players in emerging countries.

The above-mentioned documents identify several particularly important areas for international cooperation (such as food security and sustainable agriculture; managing natural disasters; new and renewable energy sources and energy efficiency; nanotechnology; information and computer technology, etc.).

A number of fundamental documents such as the Moscow Declaration on BRICS Countries’ S&T Cooperation, approved by BRICS science, technology and innovation ministers in 2015, and the BRICS Science, Technology and Innovation Work Plan for 2015–2018, play a major role in promoting international activities. Agreeing priority S&T areas is also necessary for implementing the BRICS Multilateral Research Initiative in the scope of the BRICS Framework Programme.

*Table 1.* Key strategic and forecasting documents in BRICS countries

Countries, groups of countries	Strategic and forecasting documents
BRICS documents on collaboration	Memorandum of Understanding on Cooperation in Science, Technology and Innovation between the Governments of The Federative Republic of Brazil, The Russia Federation, The republic of India, The People's Republic of China and The Republic of South Africa/ Brasilia. 18 March 2015 First BRICS Science, Technology and Innovation Ministerial Meeting (2014) Cape Town Declaration. 10 February 2014 Moscow Declaration of BRICS countries' Science, Technology, and Innovation Ministers of 26 October, 2015
Brazil	National Strategy for ST&I 2016–2019 Growth Acceleration Program The Greater Brazil Plan
Russia	Russian S&T Development Strategy Priority S&T Development Areas for the Russian Federation National Technology Initiative Russian S&T Foresight 2030 Priority S&T Development Areas of the Russian Science Foundation RF National Programme “Development of Science and Technology for 2013–2020
India	Science, Technology and Innovation Policy 2013 Twelfth Five Year Plan Vision 2030; National Action Plan on Climate Change Atal Innovation Mission
China	National Medium and Long-term Plan for the Development of Science and Technology 13th Five-Year Plan for Economic and Social Development Innovation Driven Development Strategy Strategy 2050 20 Strategic Emerging Industries 2010–2020 National Key Technologies R&D Programme
South Africa	Our future – make it work National Development Plan 2030 Innovation Towards A Knowledge-based Economy The Ten-Year Innovation Plan for South Africa 2008–2018 The New Growth Path Strategic Plan 2016–2021

*Source:* composed (by the authors) on the basis of analysis of BRICS countries' national strategic and forecasting documents (see Appendix 1).

In 2015, BRICS education and science ministers signed the Moscow Declaration on Cooperation, which outlined its major future areas and the support tools to be used, including establishment of work groups on major research infrastructures, funding multilateral research projects, technology commercialisation, and innovation. It paid particular attention to setting up a joint research and innovation platform to coordinate how the national research communities within BRICS countries' approached each of the five agreed (and assigned to specific countries) areas of S&T cooperation:

- Prevention and management of natural disasters (supervised by Brazil);
- Water resources, and prevention of water pollution (supervised by Russia);

- Geospatial technology and its application (supervised by India);
- New and renewable energy; energy efficiency (supervised by China);
- Astronomy (supervised by South Africa).

Along with the above-mentioned, other national and international documents were also analysed (see Appendix 1). The provisions of these documents were summarised in tables reflecting BRICS countries' national and international S&T priorities (Table 2), grouped by major global S&T development areas. It served as the basis for drafting lists of S&T areas (fields) whose advancement would make the biggest contribution to accomplishing socio-economic and STI development objectives common to all BRICS countries.

The draft list of S&T development priorities for BRICS countries assumed they should meet the following requirements:

- the priorities should cover major S&T development areas being advanced by several BRICS countries, and match global S&T trends; these areas should have similar levels of commonality, while the subject fields covered should overlap as little as possible.
- the names (designations) of subject areas should to the maximum possible extent match STI development priorities reflected in national and international strategic documents.

Keeping these requirements in mind, eight areas were initially selected, covering all major avenues of global STI development. Some of them were subsequently broken down into more specific subject fields, e.g. life sciences were divided into two areas: health and medicine and biotechnology; energy – into three areas: energy efficiency and energy saving, nuclear energy and renewable energy. Also, the names of certain areas were changed to more accurately reflect relevant goals and objectives.

To assess the practicality of the second requirement, BRICS countries' S&T development resources were analysed, along with conducting bibliometric and patent analysis of their S&T potential; the results allowed the identification of particular countries' specialisation areas and therefore more promising fields for cooperation.

## BRICS Countries' S&T Development Resources

All BRICS countries, except South Africa (SAR), are among the world's largest economies and have significant potential for meeting current global challenges provided that they pool and efficiently apply their resources.

China is the biggest scientific power in the BRICS group (Fig. 3). In terms of gross domestic R&D expenditures (GERD) (\$408.8 billion in purchasing power parity (PPP) in 2015) it comes second after the US (\$502.9 billion). In 2015, the Chinese GERD exceeded the total GERD of the EU28 countries, and amounted to more than three times the combined GERD of all other BRICS countries.

Table 2. BRICS countries' national S&amp;T and innovation development priorities, and priority cooperation areas

Area	Brazil	Russia	India	China	South Africa	International documents
Information and telecommunication systems	Economics, and digital society; Information and communication technology; Cybersecurity	Information and communication technology; Big Data systems, machine learning, artificial intelligence; Quantum communications; Control and management systems	Information and communication technology; Telecommunication technologies	Information technology; Cyberspace, including cybersecurity; Advanced electronics; Telecommunications	Information and communication technology; Digital economy	Information and communication technology; High-performance computing; Photonics
Life sciences	Health; Pharmaceuticals; Biomes and bioeconomics; Biotechnology	Personalised medicine, high-tech healthcare, health-improving technology; Medicine and health; Genomics and synthetic biology; Neurotechnology; Biotechnology	Health; Pharmaceuticals; Medical equipment; Biotechnology	Health, health-care; Medicine; Neuroscience; Pharmaceuticals; Biopharmaceutics; Biotechnology	Health; Biotechnology; Pharmaceuticals; Bioeconomy	Medicine and biotechnology; Biomedicine and life sciences (biomedical engineering, bioinformatics, biomaterials); Biotechnology and biomedicine, including health care and neuroscience
Agriculture	Food supply; Agriculture; Biodiversity; Biotechnology	Highly productive green agriculture and aquaculture; efficient chemical and biological crops and farm animals protection systems; efficient storage and processing of agricultural products; production of safe, high-quality foods; Biotechnology; Personal food and water production and delivery systems	Sustainable agriculture; Animal farming; Biotechnology	Agriculture; Agrifood products; Food industry; Biotechnology	Agriculture; Fisheries; Food supply; Biodiversity; Biotechnology	Food security, and sustainable agriculture; Biotechnology
New materials, nanotechnology	Nanotechnology	New materials and design techniques; New materials and nanotechnology	Materials	New materials; Nanotechnology	Nanosystems and materials; Nanotechnology	Nanotechnology; Materials science
Efficient environment management	Environment protection; Climate change; Water resources; Ocean, and coastal areas; Hydrocarbon production; Green economy; Preserving biodiversity	Efficient environment management; More efficient production and deep processing of hydrocarbons; Reducing risks, and managing consequences of natural and anthropogenic disasters; Countering anthropogenic and biogenic threats	Climate change; Predicting climate change impact; Environment protection; Water resources; Marine studies; Geosciences, seismology; Himalayan ecosystem; Green technology; Non-fuel mineral resources; Waste management	Water and mineral resources; Ecology; Environment; Deep prospecting and drilling; Deep-water exploration; Water resources; Mineral production; Oceanography; Marine technology	Climate change; Production of mineral resources; Green economy; Water resources; Environment; Waste recycling	Water resources, managing water pollution; marine and polar areas studies; Geospatial technologies and their application; Prevention and management of natural disasters; Marine and polar studies, and relevant technologies; Geospatial technology and its application

Area	Brazil	Russia	India	China	South Africa	International documents
Energy	Energy; Nuclear energy; Renewable energy sources; Biofuel	Environmentally safe, resource-saving energy generation; new energy sources; new energy transmission and storage technology; Energy efficiency and energy saving; Nuclear and thermonuclear energy; New energy sources	Energy; Energy efficiency; Nuclear energy; Solar energy; Renewable energy sources	Energy; Hydroenergy; Energy saving; Next-generation nuclear energy, renewable and non-renewable energy sources	Energy	New and renewable energy sources; Energy efficiency; Clean coal technologies; Natural gas and unconventional gas sources
Transport and space systems	Aerospace technologies; Space; Transport, including high-speed systems	Smart transport and telecommunication systems; transportation and logistics systems; development of airspace and outer space, oceans, Arctic and Antarctic areas; Transport and space systems; Distributed unmanned aerial vehicles systems; Unmanned transportation systems	Space exploration and technology Urban transport	Space exploration; Aerospace equipment; Space technology; Navigation; Transport; High-speed railways; Automobile industry; Aircraft engine production; High-tech vessels Railway equipment	Aerospace technology Astronomy	Space exploration and development; aviation sciences; Astronomy; Earth observation; Geospatial technology and its application
Production	Industry	Advanced digital and smart production technologies; Additive technology; Smart technology for robotic and mechatronic systems; Instruments and devices based on nano- and microsystem technology; Sensory systems; Bionics	Industrial production; Manufacturing	Advanced production technologies; Smart production systems; Robotics; additive production systems	Advanced production technology	
Security	Cybersecurity	Countering anthropogenic, biogenic, socio-cultural threats, and cyberthreats		Cyberspace, including cybersecurity	Information security	

*Source: prepared by authors on the basis of analysis of strategic documents of STI policy of BRICS countries (see Appendix 1).*

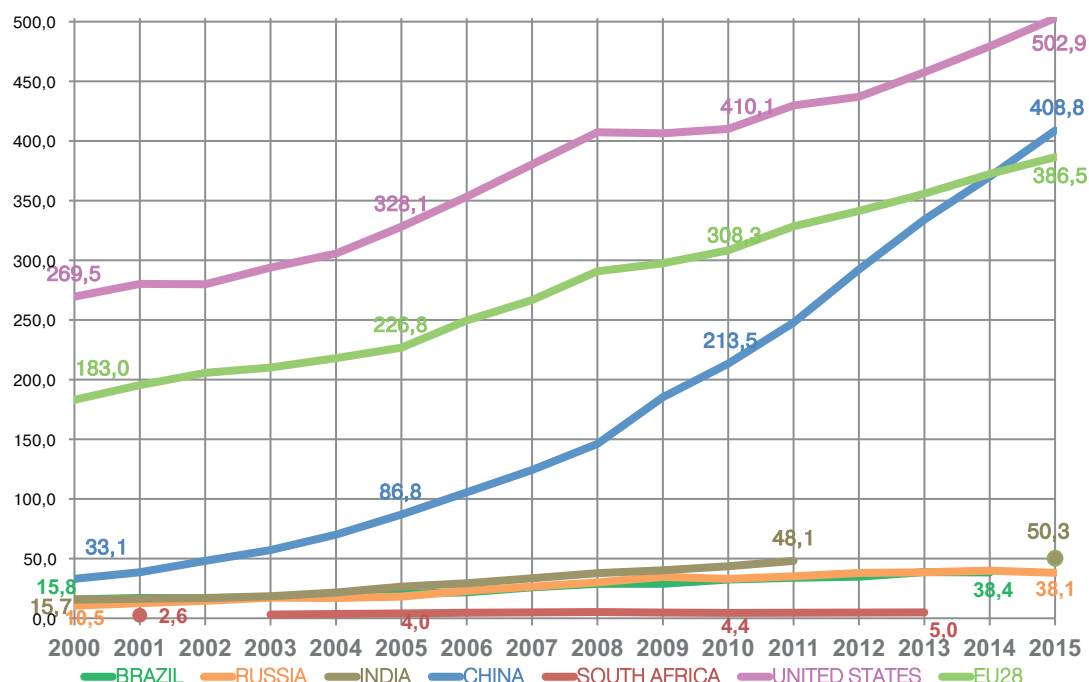


Fig. 3. Dynamics of volumes of gross expenditure on research and development (bln. USD, PPP) in BRICS, EU28 countries, and the USA in 2000–2015

Note. PPP means “purchasing power parity.”

Source: USA, EU28, China, Russia, SAR – OECD MSTI (Main Science and Technology Indicators database); Brazil, India – UNESCO Institute of Statistic database (section “Science, technology and innovation”). Data were updated at September 2017.

Russian, Indian, and Brazilian GERD in recent years were comparable, at about \$35–\$50 billion (PPP). South Africa’s R&D investments were much smaller, at about \$5 billion (PPP) during the last few years (Table 3).

In China, GERD has increased 11.2 times in the last 15 years; in other BRICS countries the growth has been much lower, from 1.85 times in India to 4.23 times in Russia. It should be noted that in China, annual GERD growth (at about \$30–40 billion) was in recent years comparable with the total annual GERD in Russia, India, and Brazil.

During the last 15 years, R&D intensity steadily grew in China, while in other BRICS countries relevant indicators remained largely unchanged, especially during the last 5 years. E.g. GERD as a percentage of GDP in China has grown from 0.90% in 2000 to 2.07% in 2015, exceeding the relevant figure for the EU28 countries for 2013. In the EU and US, GERD, measured as a share of GDP during the last 15 years, grew insignificantly.



Table 3. Key indicators of BRICS countries' R&amp;D potential

Country	2000	2005	2010	2015
<b>Gross expenditures on research and development (GERD), billion USD (purchasing power parity (PPP)), in current prices</b>				
Brazil	15.8	20.5	32.5	38.4 (2014)
Russia	10.5	18.1	33.1	38.1
India	15.7	26.5	43.7	50.3
China	33.0	86.8	213.5	408.8
South Africa	2.6 (2001)	4.1	4.4	5.0 (2013)
USA	269.5	328.1	410.1	502.9
EU28	183.0	226.8	308.3	386.5
<b>GERD as % of GDP</b>				
Brazil	1.00	1.00	1.16	1.17 (2014)
Russia	0.99	1.00	1.06	1.10
India	0.74	0.81	0.82	0.63
China	0.89	1.31	1.71	2.07
South Africa	0.72 (2001)	0.86	0.74	0.73 (2013)
USA	2.62	2.51	2.74	2.79
EU28	1.67	1.66	1.84	1.96
<b>Number of researchers (full-time equivalents)</b>				
Brazil	73.9	109.4	138.7	...
Russia	506.4	464.6	442.1	449.2
India	115.9	154.8	192.8	283.0
China	695.1*	1 118.7*	1210.8	1619.0
South Africa	14.2 (2001)	17.3	18.7	23.3 (2013)
USA	983.3	1 101.1	1198.8	1380.0
EU28	1 117.8	1 374.8	1601.1	1840.7
<b>GERD per researcher, thousand USD (PPP), in current prices</b>				
Brazil	214.3	187.8	234.5	...
Russia	20.7	39.0	74.9	84.9
India	135.1	171.4	226.5	177.6
China	47.5	77.6	176.3	252.5
South Africa	183.3 (2001)	234.1	236.8	213.1 (2013)
USA	274.1	298.0	342.1	364.4
EU28	163.8	164.9	192.6	210.0

*Note.* For all countries in the table, the number of researchers is calculated according to the OECD Frascati Manual: Proposed Standard Practice for Surveys on Research and Experimental Development. In China, researcher data has been collected in line with the Frascati Manual definition since 2009 only. Beforehand, this was only the case for independent research institutions, while for the other sectors data collection was in accordance with the UNESCO concept of “scientist and engineer.”

*Source:* USA, EU28, China, Russia, SAR – OECD MSTI (Main Science and Technology Indicators database); Brazil, India – UNECO Institute of Statistic database (section “Science, technology and innovation”). Data were updated at September 2017.

China has the largest number of researchers in the world – 1.62 million in 2015 (in full-time employment equivalents). In the US, the figure (for 2014) is 1.35 million and the EU28 total is 1.81 million. Russia, with 446.2 thousand researchers (in full-time employment equivalents) lags only behind China, the US, and Japan (662.1 thousand). The numbers of researchers in India (192.8 thousand in full-time employment equivalents, 2010) and Brazil (138.7 thousand in full-time employment equivalents, 2010) are comparable. South Africa has much fewer researchers than other BRICS countries – 23.3 thousand in full-time employment equivalents (2013).

In terms of R&D expenditure per researcher (in full-time employment equivalent) Russia has the lowest figure among BRICS countries, at \$80– \$90 thousand (PPP) over the last 5 years. In other BRICS nations relevant figures in recent years were between \$200–\$250 thousand, which is comparable with the average for EU28 countries (\$200–\$210 thousand) but much lower than in the US (\$340–\$355 thousand).

Analysis of R&D resource availability in BRICS countries revealed that China became a leading global scientific power, dominating the BRICS group both in terms of R&D expenditure and the number of researchers. Regarding GERD, China is gradually getting closer to the US, the world leader and is already ahead of the EU28. In terms of the number of researchers (in full-time employment equivalents) China achieved the leading global position in 2015.

China has the potential to support R&D in a wide range of priority areas; other countries' abilities are much more modest, this implies the need to set a sufficiently limited number of priorities.

## Publication Activity in BRICS Countries and International Cooperation

The following analysis of publication activities is based on the 'Scopus' international academic citation database (for details see [Shashnov, Kotsemir, 2015; Kotsemir, Shashnov, 2017]).

The number of publications authored by BRICS country researchers has significantly increased since 2000, along with their proportion of the global research community (Fig. 4).<sup>2</sup> In 2010, the total number of publications by BRICS researchers exceeded that of the US, and in 2014 came very close to the relevant figure for EU28 countries. This was largely due to the exceptionally high growth in Chinese publication activity. In 2000–2015, the number of publications by Chinese authors grew 8.5 times, while the overall growth rate of global publication activity in the last five years has declined. Accordingly, between 2000–2015, China has moved up from 6<sup>th</sup> to 2<sup>nd</sup> place in terms of total publications. Due to its relatively high growth in publication activity over recent years, China has managed to come much closer to the US, which has recently displayed a rather low growth in publication numbers.

<sup>2</sup> All calculations are based on Scopus data. Types of publications included: articles, reviews, and conference papers.

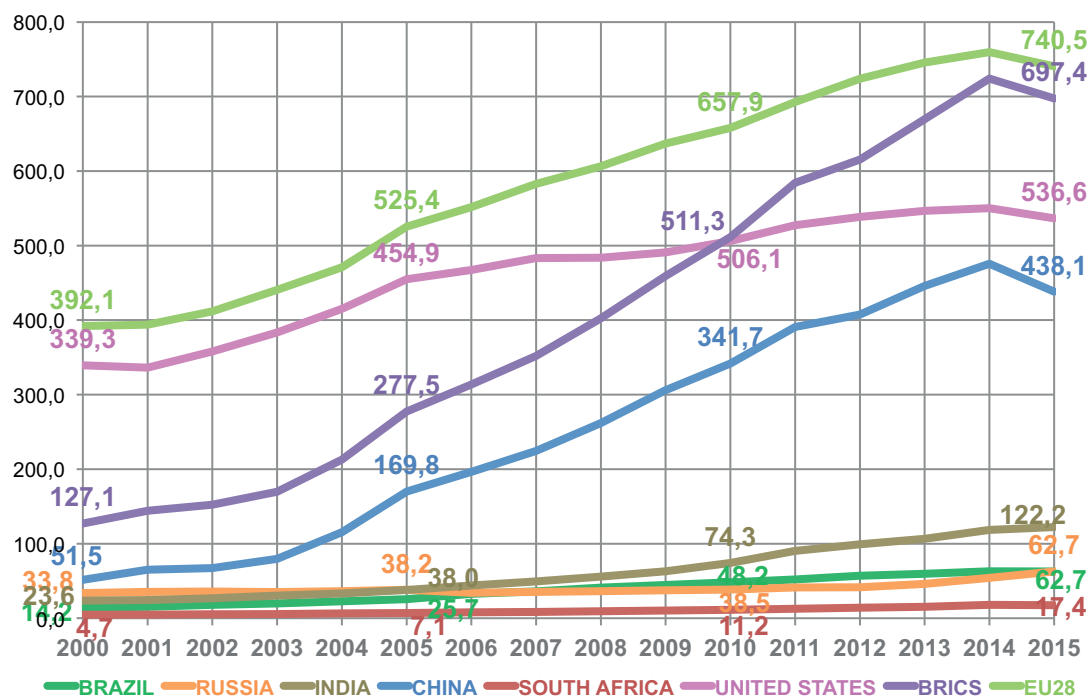


Fig. 4. Growth of the number of publications indexed in Scopus in BRICS, EU28, and US in 2000–2015 (thousands)

Source: authors' calculations based on Scopus SciVal Benchmarking Toolbox. Types of publications included: articles, reviews and conference papers (last update: March 2017).

The number of Russian publications indexed in Scopus grew just 1.86 times in 2001–2015, with the bulk of growth occurring over the last five years. Despite that fact, Russia has moved down in the “Number of publications” rating from 9<sup>th</sup> to 13<sup>th</sup> place in the same period. In 2000–2012, the number of publications by Russian researchers remained at about 30–38 thousand a year, and only in recent years has Russian publication activity begun to increase rapidly. India, and to a lesser extent Brazil, along with China displays a high growth rate of publication activity. The number of publications by Brazilian authors indexed in Scopus in 2000–2015 grew from 14.1 thousand to 62.0 thousand. In the global “Number of publications” rating, Brazil moved up from 17<sup>th</sup> place in 2000 to 14<sup>th</sup> in 2015. In 2000–2015, the number of Indian Scopus-indexed publications has grown from 23.5 thousand to 122 thousand. South Africa is also showing a rapidly growing rate of publication activity. However, the high growth rate is largely due to the “low start” effect. The number of publications by South African researchers grew 3.75 times from 2000 to 2015, 4.6 thousand to 17.1 thousand. In the overall “Number of publications” rating, South Africa is low in the top 40. Generally, in 2015, BRICS countries produced almost 29% of the world’s total number of Scopus-indexed publications; of which; China contributed 18%, India – 5%, Russia and Brazil – 2.6%

each, and South Africa – 0.72% (see table 4). In terms of the total number of Scopus-indexed publications, BRICS countries came very close to the EU28 (30.5% of the world's total in 2015).

*Table 4.* Share of BRICS, EU-28 and the USA in the global volume of publications in Scopus in 2000 – 2015

Country/Country group	2000, %	2005, %	2010, %	2015, %
Brazil	1,2	1,6	2,3	2,6
Russia	2,8	2,3	1,8	2,6
India	2,0	2,3	3,5	5,0
China	4,3	10,3	16,0	18,0
South Africa	0,39	0,43	0,53	0,72
BRICS	10,7	16,8	24,0	28,7
United States	28,5	27,5	23,8	22,1
EU28	33,0	31,8	30,9	30,5
<b>World</b>	<b>100,0</b>	<b>100,0</b>	<b>100,0</b>	<b>100,0</b>

*Source:* authors' calculations based on Scopus database. Types of publications included: articles, reviews and conference papers (last update: March 2017).

South Africa shows the most active involvement in international research cooperation among all BRICS countries (Table 5). Since 2005, more than 40% of the nation's Scopus-indexed publications were co-authored with scientists from other countries. Note that the share of internationally co-authored publications in South Africa has been growing over the last five years.

*Table 5.* Share of publications in international collaboration in total number of publications in Scopus in BRICS countries in 2000–2015

Country	2000	2005	2010	2015
Brazil	29,5	27,6	23,9	30,1
Russia	25,9	33,6	28,3	25,5
India	15,3	18,5	17,8	16,6
China	15,2	13,6	14,6	20,2
South Africa	29,8	40,5	42,2	47,4

*Source:* authors' calculations based on Scopus database. Types of publications included: articles, reviews and conference papers (last update: September 2016).

In Russia, the share of internationally co-authored publications for the last 15 years has remained at 25–35%. Note that in Russia, unlike South Africa, China, and Brazil, this figure has been steadily decreasing in recent years – from 33.6% in 2005 to 25.5% in 2015. The level of participation by Brazilian scientists in international research cooperation was somewhat lower than in Russia (25–20% during the last 15 years). As in South Africa, the share of internationally co-authored publications by Brazilian researchers has grown in the last 5 years (from 23.9 to 30.1%). In India and China, scientists are integrated into international research cooperation to a lesser extent than in other BRICS countries (the relevant figure is about 15–20% for the last 15 years). In the last 5 years, China has managed to increase its share of internationally co-authored publications from 14.6% in 2010 to 20.2% in 2015. In India, the relevant figure has slightly dropped during the same period, from 18.5% in 2005 to 16.6% in 2015. At the same time, Asian countries with advanced research systems tend to display rather low participation in international scientific cooperation, for example, in 2015 only 20.9% of Scopus-indexed publications by Iranian authors were internationally co-authored; for Turkey the figure was 21.1%, for Japan – 26.6%, for the Republic of Korea – 26.5% [HSE, 2017].

The involvement of BRICS countries in international research cooperation (except South Africa) is much lower than that of European countries'. E.g. in France in 2015, 51.8% of all Scopus-indexed publications were internationally co-authored; for the UK the relevant figure was 50.0%, for Germany – 48.5%, and for Italy – 43.9%. In Scandinavia the relevant values are even higher: 59.1% in Sweden, 58.5% in Denmark, 57.1% in Norway, and 56.0% in Finland. In the US the share of internationally co-authored publications in 2015 was 32.8% [HSE, 2017].

BRICS countries do not yet constitute key research partners for each other (Fig. 5).

The main partner for all BRICS countries in 2015 was the US (as in all other years). E.g. 44.6% of all internationally co-authored Chinese publications were written jointly with American scientists, while the share of China's second biggest partner (the UK) was just 9.9%. No BRICS country was among China's ten biggest research partners. Russia's structure of research partners is different from China's, Brazil's, and India's. It has two key research partners – the US and Germany, with 25.4% and 23.7% internationally co-authored publications in 2015, respectively. Then, in descending order: France (14.1%), the UK (13.2%), Italy (9.6%), and China (8.4%). Other BRICS countries play much smaller roles in Russia's international cooperation. The share of internationally co-authored Russian publications written jointly with Brazilian scientists is 3.9%; the relevant figure for India is 3.8%, and for South Africa – 2.1%.

As the above data shows, an explosive growth in both R&D expenditure and publication activity allowed China to become a new scientific superpower on a par with the US. If the current publication activity growth rate remains, in the next 3–5 years, China may well get ahead of the US by total number of publications indexed in the Scopus database. No other BRICS country has demonstrated such a high growth in

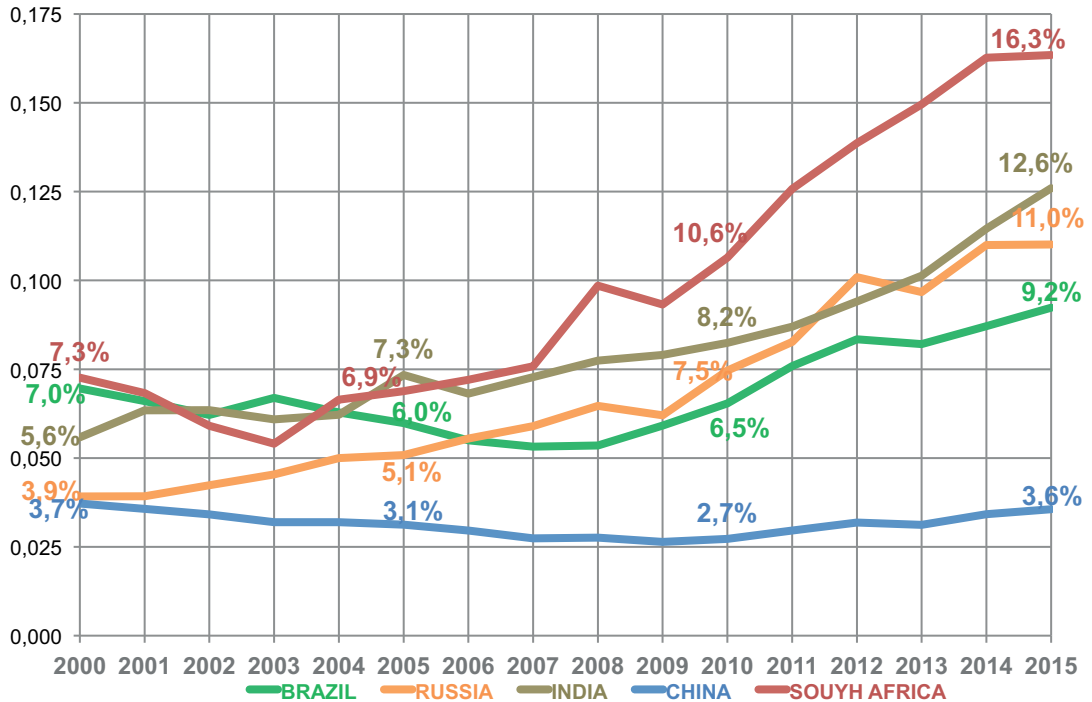


Fig. 5. Share of publications in collaboration with other BRICS countries in the total number of internationally collaborated publications of BRICS countries in Scopus in 2000–2015

Source: authors' calculations based on Scopus database. Types of publications included: articles, reviews and conference papers (last update: March 2017).

publication activity. Still, all of them became more “visible and important” within the international academic community. They have managed to increase both the number of scientific publications indexed in Scopus, and their citation indices. Unlike other BRICS countries whose publication numbers steadily grew throughout the period in question, Russia was only able to radically increase its presence in the Scopus database over the last three years. This implies a significant accumulated growth in the BRICS countries' S&T potential, which can be applied more productively if members of the group coordinate their efforts.

## Thematic structure of BRICS countries' publications

Structures of publications by BRICS country scientists were assessed using 27 major subject areas of the Scopus database, and compared with the global publication structure to calculate each country's Index of Scientific Specialisation or Revealed Comparative Advantages Index (RCA index) (see table 6). The RCA index of country 'j' in scientific field 'i', is calculated as the relationship between the share of its publications in scientific field 'i', the total number of publications by country 'j' and the equiva-

Table 6. Thematic structure of publications and Revealed comparative index values in BRICS countries in 2011–2015

Subject area	World Struct.	Brazil		Russia		India		China		South Africa	
		Struct.	RCA	Struct.	RCA	Struct.	RCA	Struct.	RCA	Struct.	RCA
Agricultural and Biological Sciences	7,9%	20,3%	2,57	5,7%	0,72	8,7%	1,09	6,4%	0,81	16,4%	2,07
Arts and Humanities	3,7%	1,9%	0,51	2,1%	0,57	0,6%	0,16	0,5%	0,14	8,7%	2,31
Biochemistry, Genetics and Molecular Biology	12,0%	11,2%	0,93	9,3%	0,77	12,9%	1,07	11,1%	0,93	9,8%	0,82
Business, Management and Accounting	2,2%	1,6%	0,72	0,9%	0,41	1,7%	0,80	1,2%	0,55	3,2%	1,49
Chemical Engineering	4,5%	3,5%	0,78	5,1%	1,12	6,8%	1,51	6,7%	1,48	3,0%	0,66
Chemistry	8,9%	7,2%	0,82	15,0%	1,69	14,2%	1,60	12,6%	1,42	7,6%	0,86
Computer Science	12,4%	8,9%	0,72	6,9%	0,56	15,4%	1,24	15,5%	1,25	6,8%	0,55
Decision Sciences	1,0%	1,3%	1,29	0,5%	0,48	0,9%	0,89	0,9%	0,96	0,8%	0,81
Dentistry	0,5%	2,8%	5,50	0,0%	0,02	1,0%	1,90	0,1%	0,28	0,2%	0,32
Earth and Planetary Sciences	4,4%	3,7%	0,84	10,0%	2,25	3,7%	0,83	5,6%	1,27	7,5%	1,68
Economics, Econometrics and Finance	1,5%	0,8%	0,53	1,3%	0,88	0,9%	0,62	0,5%	0,31	4,1%	2,68
Energy	3,3%	2,3%	0,70	4,2%	1,29	3,5%	1,08	4,9%	1,49	2,6%	0,81
Engineering	21,3%	11,7%	0,55	18,5%	0,87	21,8%	1,03	38,4%	1,80	10,1%	0,48
Environmental Science	5,0%	5,8%	1,17	3,2%	0,64	5,8%	1,17	5,1%	1,03	7,3%	1,46
Health Professions	1,1%	1,7%	1,49	0,7%	0,66	0,4%	0,39	0,3%	0,29	1,0%	0,93
Immunology and Microbiology	2,8%	4,3%	1,54	1,6%	0,58	2,6%	0,94	2,1%	0,76	4,6%	1,65
Materials Science	10,3%	6,3%	0,61	18,1%	1,77	12,4%	1,20	15,8%	1,54	6,2%	0,60
Mathematics	6,9%	5,3%	0,78	10,5%	1,54	6,2%	0,90	8,1%	1,18	5,1%	0,74

Subject area	World Struct.	Brazil		Russia		India		China		South Africa	
		Struct.	RCA	Struct.	RCA	Struct.	RCA	Struct.	RCA	Struct.	RCA
Medicine	*	<b>29,5%</b>	<b>1,05</b>	8,5%	0,30	<b>19,8%</b>	0,70	<b>14,8%</b>	0,53	<b>25,6%</b>	0,91
Multidisciplinary		0,7%	0,72	1,2%	<b>1,26</b>	1,6%	<b>1,58</b>	1,4%	<b>1,42</b>	0,5%	0,53
Neuroscience		2,7%	<b>1,15</b>	0,9%	0,39	0,9%	0,36	1,2%	0,51	1,0%	0,43
Nursing		2,5%	<b>1,64</b>	0,3%	0,19	0,3%	0,22	0,3%	0,17	1,2%	0,82
Pharmacology, Toxicology and Pharmaceutics	*	3,8%	<b>1,13</b>	1,6%	0,47	9,8%	<b>2,93</b>	3,1%	0,92	2,8%	0,84
Physics and Astronomy	*	<b>10,0%</b>	0,82	<b>33,4%</b>	<b>2,72</b>	<b>13,8%</b>	<b>1,13</b>	<b>15,5%</b>	<b>1,26</b>	<b>10,0%</b>	0,82
Psychology		1,9%	0,86	0,4%	0,20	0,4%	0,16	0,3%	0,12	2,7%	<b>1,25</b>
Social Sciences		6,0%	0,79	4,1%	0,54	3,3%	0,43	2,3%	0,30	<b>16,6%</b>	<b>2,20</b>
Veterinary	*	3,7%	<b>4,42</b>	0,1%	0,06	1,2%	<b>1,44</b>	0,3%	0,34	1,4%	<b>1,74</b>
Total number of papers for 2011–2015		<b>285 454</b>		<b>2 092 672</b>		<b>239 799</b>		<b>525 853</b>		<b>75 234</b>	

*Note.* In this table we present the shares of different subject areas in the total number of publications by a given BRICS country. The sum of the shares of 27 subject areas exceeds 100% because some publications relate to several different subject areas.

*Source:* authors' calculations based on Scopus. Types of publications included: articles, reviews and conference papers (last update: September 2016).



lent global figure. Those fields where the RCA value is greater than 1 are classified as areas of the country's scientific specialization. Subject areas where RCA index is significantly greater than 1 (e.g. more than 1.5. or 2) may be called key areas of scientific specialisation.

The Russian research sector has a predominantly "physics and technology" profile whose origins go back to the Soviet era. The subject area with the highest presence of Russian researchers (Scopus-indexed publications in 2011–2015) was Physics and Astronomy – 33.4% of all Russian publications. Other major subject areas being researched in Russia include Engineering (18.5% of all Russian publications in 2011–2015), Materials Science (18.1%), and Chemistry (15%). Such fields as Neuroscience, Business, Management, and Accounting, Health, Decision Making, Psychology, Nursing, Veterinary, and Dentistry are represented very poorly in the structure of Russian publications (less than 1% of the total number of published works). The share of Physics and Astronomy publications by Russian researchers in all Scopus-indexed publications (33.4%) is much higher than the relevant world's average figure (12.3%).

Russia's Scientific Specialisation Index (SSI) within the Physics and Astronomy subject area was 2.72. It is the highest specialisation level in this area among all BRICS countries. To compare, China's SSI for this area is 1.26, India's – 1.13, and in South Africa and Brazil the figure is 0.82. A high SSI in the structure of Russian Scopus-indexed scientific publications was noted for Earth and Planetary Sciences – 2.25 in 2011–2015. Again, it is the highest value among all BRICS countries. SSI ranging between 1.5 and 2.0 were noted in subject areas such as Material Science (1.77), Chemistry (1.69), and Mathematics (1.54). At the same time, very low SSI values were noted in Psychology (0.20), Nursing (0.19), Veterinary (0.06), and Dentistry (0.02).

China's status as the "global manufacturer" is supported by its Scopus thematic profile. The main area of Chinese research is Engineering (38.4% of all publications). Other prominent areas in the structure of publications by Chinese authors include Material Science (15.8%); Computer Science (15.5%), Physics and Astronomy (15.5%); Medicine and Health (14.8); Chemistry (12.6); Biochemistry, Genetics, and Molecular Biology (11.1%). At the same time, numerous subject areas are very poorly represented in the structure of Chinese publications (less than 1% of the total number in 2011–2015): Decision Making; Humanities; Economics, Econometrics, and Finance; Health; Veterinary; Psychology; Nursing; Dentistry.

China's main specialisation areas include Engineering (SSI of 1.80 in 2011–2015, the highest value among all BRICS countries), Material Sciences (1.54), Chemical Technologies (1.48), and Chemistry (1.42). Less important subject areas include Earth and Planetary Sciences (1.27), Physics and Astronomy (1.26), and Computer Sciences (1.25). The largest subject area (Engineering) accounts for 21.8% of all Scopus-indexed publications in 2011–2015. Other major areas of Indian research include Medicine (19.8%), Computer Science (15.4%), Chemistry (14.2%), Physics and Astronomy (13.8%); Biochemistry, Genetics, and Molecular Biology (12.9%); and Material Science (12.4%). Analysis of the country's Scientific Specialisation Indices for the 27 top-

level subject areas clearly reveals an Indian profile shift towards pharmaceuticals and chemical sciences. The country's main specialisation area (in terms of Scopus-indexed publications by local researchers) is Pharmacology and Pharmaceutics. India's SSI in this area in 2011–2015 was 2.93 (the highest among all BRICS countries; to compare, the relevant figure for Brazil was 1.13, and in other BRICS nations is below 1). Other areas of specialism for Indian scientists include Dentistry (1.90); Chemistry (1.60); Interdisciplinary Studies (1.58); Chemical Technologies (1.51); and Veterinary (1.44).

Brazil's and South Africa's publication structures are quite different from other BRICS countries. Brazil gravitates towards medical and biological research, with major Scopus-indexed areas being Medicine (29.5% of all publications by Brazilian researchers in 2011–2015) and Agricultural and Biological Sciences (20.3%). Other important fields include Engineering (11.7%), Biochemistry, Genetics, and Molecular Biology (11.2%), and Physics and Astronomy (10.0%).

Brazilian publications stand out with extremely high SSI values in Dentistry (5.50 in 2011–2015) and Veterinary (4.42). These are the highest figures among BRICS countries and among the highest in the world (for countries with a significant number of publications). Other Brazilian specialisation areas include Agricultural and Biological Sciences (2.57), Nursing (1.64 – the highest SSI in this area among BRICS countries), Microbiology and Immunology (1.54), and Health (1.49).

In South Africa, the main research area, as in Brazil, is Medicine (25.6% of all Scopus-indexed publications by South African scientists in 2011–2015). Other important research areas include Social Sciences (16.6%), Agricultural and Biological Sciences (16.4%), Engineering (10.1%), Physics and Astronomy (10.0%).

South Africa, unlike other BRICS countries, specialises in social sciences and humanities. Its SSI in these areas exceeded 2.00 in 2011–2015: Economics, Econometrics, and Finance (2.68), Humanities (2.31), and Social Sciences (2.20). These are the highest SSI values among all BRICS countries: their relevant figures in the above areas remain below 1. South Africa also has relatively high SSI in the following areas: Veterinary (1.74), Microbiology and Immunology (1.65), Management Technology (1.49), and Environmental Sciences (1.46). Brazil and South Africa also display high SSI values in Immunology and Microbiology.

The thematic structure of intra-BRICS publications strongly gravitates towards Physics and Astronomy (Table 5). This area's share in the total number of intra-BRICS publications in 2011–2015 amounted to 35.8%. It remains the biggest field in all possible pairs of BRICS countries, and in many cases dominates their S&T cooperation. The importance of Physics and Astronomy is particularly evident in the structure of Russia's cooperation with BRICS countries – the overall share of relevant publications is 55.9%, while in the total number of joint Russian-Brazilian publications, the share of this subject area is 75.6%; for joint Russian-Indian publications it is 72.3%.

Another major area of BRICS country research cooperation is Medicine: it accounts for 18.9% of intra-BRICS publications in 2011–2015. Medicine is particularly important for joint Brazilian – South African publications (33.1%), and least impor-

tant for joint publications by Russian and Chinese researchers (8.3%). The share of medical publications co-authored by Russian and BRICS countries' scientists (10.3%) is much lower than the relevant figures for other BRICS nations: 17.1% for China, 21.5% for India, and 24.1% for Brazil. The thematic structure of Russia's research co-operation with BRICS countries matches both the overall structure of Russian Scopus-indexed publications, and the structure of internationally co-authored publications by Russian scientists. As for other BRICS countries (especially Brazil and China), there is a certain mismatch between the thematic structures of intra-BRICS collaboration and the overall structure of internationally co-authored publications by those countries' researchers.

Our analysis revealed 15 S&T areas where BRICS countries have the highest relative shares or specialisation indices (marked with \* in Tables 6 and 7). These are among the top-priority areas for R&D cooperation, since BRICS countries have already laid the groundwork. In some of these areas (first of all Physics and Astronomy, and to a lesser extent Engineering), BRICS countries are already collaborating quite actively; in others (Biochemistry, Genetics and Molecular Biology, Material Science, Agricultural and Biological Sciences), cooperation between BRICS countries is less active, though they maintain good contacts with other nations. Comparing subject areas selected at this stage with those specified in BRICS countries' strategic documents (see Table 2) allowed to draft a list of priorities for group members' S&T cooperation.

## Priorities for S&T Cooperation between BRICS Countries

On the basis of analysing BRICS countries' strategic documents and assessing their S&T potential, 14 subject areas were selected for inclusion in the list of those countries' priorities for S&T cooperation:

- Information and telecommunication technology;
- Nanotechnology and next-generation materials;
- Advanced production technology and robotics;
- Space systems and astronomic observations;
- Transport systems;
- Energy efficiency and energy saving;
- Nuclear energy;
- Renewable energy sources;
- Search, exploration, production and mining of mineral resources;
- Climate change, environment protection, natural disaster management;
- Water resources and their management;
- Food security and sustainable agriculture;
- Health and medicine;
- Biotechnology.

The above subject areas are considered priorities by all (or almost all) BRICS countries, as confirmed by their national strategic documents (development strategies,

strategic plans, five-year plans, initiatives, mission statements, etc.). These areas are also included in most of bilateral agreements signed by BRICS countries. These areas have a wide scope for practical application, and open opportunities for making use of national comparative advantages (such as territory, available resources, S&T potential, etc.). In the framework of overall priority systems, the issue of wide complementarity can also be considered, which would help tackle existing S&T problems and limitations through increased cooperation and exchanges between participating countries, and the sharing of best practice. Furthermore, in most of these areas, BRICS countries have a significant S&T potential – evidenced by their science specialisation and citation indices calculated on the basis of Scopus data. All calculations were made using the following conversion table (from Scopus subject areas and subject categories to the 14 priority areas; see conversion table in Appendix 2).

The number of publications, specialisation and citation indices for the summary list of national S&T areas are presented in Table 9. In one of the above subject areas (Search, Exploration, Development and Mining of Minerals) four BRICS countries have RCA values in excess of 1; in seven other areas, there are three such countries; and only in four subject areas – one or two such countries.

In only three areas (Transport Systems, Health and Medicine, Biotechnology) does a single BRICS country have SSI above 1, while for all others that value is below 1. At the same time, these areas were still included in the list of priorities, since they of great importance to all BRICS countries – which is reflected in relevant national and international strategic documents adopted by them.

Citation impact figures in the selected subject areas in most cases are below the global averages. Only in two areas (Energy Efficiency and Energy Saving, and Renewable Energy Sources), do four BRICS countries have citation impact figures higher than world average values; in two other areas, two or three countries have relevant values higher than 1; in the remaining areas either a single country has a citation impact in excess of 1, or all of them are below global averages. In most of the selected areas, BRICS country researchers display significant publication activity, though their citation levels remain relatively low. Note that SAR and China have the highest citation figures. Analysis of SSI and citation values allowed assessing the scope for stepping up BRICS countries' cooperation in implementing S&T priorities.

All BRICS countries are active in areas where Russia could organise cooperation on a parity basis, or act as either a “leader” or a “catch up” country. E.g., Russia conducts active research in energy efficiency and energy saving areas, but citation of relevant Russian publications is lower than of those published by scientists from four other BRICS countries. Russia could significantly increase the number of, and demand for publications in this field by establishing close cooperation with BRICS countries. To increase productivity of Russian research and development, stepping up cooperation with China as the principle partner would seem a wise course. A positive effect could also be achieved by collaborating with India, Brazil, and in certain areas, with SAR.

Table 7. Thematic structure of joint publications of BRICS countries in Scopus in 2011–2015

Subject Areas		World structure	BRICS countries	IntraBRICS collaboration	Structure of internationally collaborated publications									
					Brazil		Russia		India		China		South Africa	
					All collab	BRICS collab	All collab	BRICS collab	All collab	BRICS collab	All collab	BRICS collab	All collab	BRICS collab
Agricultural and Biological Sciences	*	7,9%	8,1%	10,5%	17,2%	9,2%	7,5%	7,6%	8,7%	9,0%	9,5%	10,9%	19,7%	14,2%
Arts and Humanities		3,7%	1,0%	0,6%	1,2%	0,5%	1,0%	0,3%	0,7%	0,6%	0,8%	0,7%	3,8%	0,8%
Biochemistry, Genetics and Molecular Biology	*	12,0%	11,2%	11,4%	14,5%	10,5%	9,9%	8,0%	14,2%	12,0%	15,8%	11,3%	12,7%	10,6%
Business, Management and Accounting		2,2%	1,3%	0,9%	1,2%	0,9%	0,5%	0,3%	1,5%	1,0%	1,7%	1,0%	1,9%	1,1%
Chemical Engineering		4,5%	6,2%	4,1%	3,6%	2,0%	3,7%	2,5%	7,4%	5,2%	6,5%	3,7%	3,1%	4,7%
Chemistry	*	8,9%	12,4%	11,3%	7,6%	5,0%	13,1%	9,0%	17,4%	12,8%	13,0%	10,6%	8,1%	10,5%
Computer Science	*	12,4%	14,3%	5,8%	9,6%	4,7%	6,3%	3,3%	11,4%	6,3%	16,7%	6,2%	4,9%	4,4%
Decision Sciences		1,0%	0,9%	0,6%	1,2%	0,4%	0,6%	0,3%	1,1%	0,6%	1,5%	0,7%	0,6%	0,7%
Dentistry	*	0,5%	0,5%	0,5%	2,3%	1,1%	0,0%	0,0%	0,4%	0,2%	0,3%	0,6%	0,1%	0,4%
Earth and Planetary Sciences	*	4,4%	5,5%	10,7%	6,1%	8,0%	11,0%	12,3%	5,9%	9,1%	6,9%	9,2%	10,2%	13,1%
Economics, Econometrics and Finance		1,5%	0,7%	0,6%	0,8%	0,5%	0,6%	0,2%	1,1%	0,7%	1,2%	0,7%	1,7%	0,8%
Energy	*	3,3%	4,4%	2,7%	2,4%	1,7%	2,9%	2,2%	3,1%	2,4%	4,1%	2,9%	2,0%	2,6%
Engineering	*	21,3%	31,3%	13,4%	12,5%	10,4%	15,3%	12,8%	17,5%	12,8%	25,4%	14,5%	8,6%	12,5%
Environmental Science	*	5,0%	5,2%	4,9%	6,4%	3,9%	3,4%	2,6%	6,1%	5,6%	6,5%	5,2%	7,8%	5,9%

Subject Areas	World structure	BRICS countries	Intra-BRICS collaboration	Structure of internationally collaborated publications							
				Brazil		Russia		India		China	
				All collab	BRICS collab	All collab	BRICS collab	All collab	BRICS collab	All collab	BRICS collab
Health Professions	1,1%	0,5%	0,4%	1,6%	0,7%	0,3%	0,2%	0,5%	0,4%	0,5%	0,4%
Immunology and Microbiology	2,8%	2,4%	3,2%	5,1%	3,7%	2,2%	1,7%	3,5%	3,2%	3,0%	3,0%
Materials Science	10,3%	14,4%	11,9%	7,9%	7,3%	18,5%	11,5%	16,6%	12,8%	15,1%	10,9%
Mathematics	6,9%	7,7%	7,9%	7,6%	6,9%	9,9%	6,6%	8,4%	7,2%	9,5%	8,4%
Medicine	28,1%	17,4%	18,9%	31,2%	24,1%	11,3%	10,3%	22,1%	21,5%	20,0%	17,1%
Multidisciplinary	1,0%	1,3%	1,5%	0,9%	1,5%	1,1%	1,3%	1,2%	1,3%	1,7%	1,8%
Neuroscience	2,4%	1,3%	1,1%	3,3%	1,6%	1,2%	0,6%	1,3%	0,9%	2,2%	1,3%
Nursing	1,5%	0,5%	0,5%	1,3%	0,7%	0,1%	0,1%	0,7%	0,8%	0,5%	0,5%
Pharmacology, Toxicology and Pharmaceutics	3,3%	4,2%	2,6%	3,4%	2,5%	1,6%	1,0%	5,3%	3,3%	2,9%	2,3%
Physics and Astronomy	12,3%	15,7%	35,8%	16,4%	42,6%	45,0%	55,9%	22,0%	33,8%	16,9%	36,2%
Psychology	2,2%	0,5%	0,7%	1,6%	1,1%	0,6%	0,5%	0,7%	0,6%	0,9%	0,7%
Social Sciences	7,5%	3,3%	2,0%	3,6%	2,1%	2,1%	1,0%	3,1%	2,2%	3,1%	1,9%
Veterinary	0,8%	0,8%	0,5%	1,8%	0,7%	0,1%	0,1%	0,5%	0,5%	0,3%	0,5%

*Note.* In this table we present the shares of different subject areas in total number of publications of a given BRICS country. Sum of shares of 27 subject areas is more than 100% since some publications are attached to several subject areas.

*Source:* authors' calculations based on Scopus. Types of publications included: articles, reviews and conference papers (last update: September 2016).

Fourteen top-level priority areas have been selected so far. Subsequently they will be broken down into smaller categories/groups: about 70 major subject fields (on average, five subject fields per subject area). E.g., the following fields are suggested for consideration in the Information and Communication Technologies subject area:

- high-performance computing architectures and systems;
- technology and communication infrastructure for high-speed data transfer;
- data analysis and processing technology, artificial intelligence;
- human-machine interfaces, neural and cognitive technology;
- smart control systems, smart infrastructures, machine-to-machine interaction, the internet of things;
- new component bases, electronic devices, quantum technology;
- information security technology.

Information about the importance of these subject fields and the potential for their implementation will be collected by polling experts in all BRICS countries. Similar subject fields will be identified for all other priority areas. Their names will be formulated using, to the maximum possible extent, the names of relevant subject fields specified in national and international strategic documents adopted by BRICS countries. Depending on the readiness of most of the technology required for the implementation of these priority areas, specific STI policy tools will be chosen.

Priorities can also be structured on the basis of potentially interested participants and technology readiness level: e.g. cooperation between R&D organisations and universities to develop technology, which requires public support; public-private partnerships at pre-competitive stages; the participation of businesses, including small innovation companies, in developing prototypes and applying advance technological solutions, etc. Shared S&T development priorities create a basis for mutually beneficial cooperation, in the framework of which scientists from different countries would be able to extend the scope of their research, step up collaboration, share experience, and ultimately strengthen Russia's S&T cooperation with other countries. The list of priorities for BRICS country S&T cooperation may be useful for drafting inter-agency agreements with BRICS countries on conducting R&D, preparing work plans (roadmaps) for stepping up S&T cooperation, and applying other relevant tools and mechanisms.

Based on the results of assessing BRICS countries' potential, calls for joint R&D project proposals can be arranged (aimed at developing innovative technology, promoting S&T-based entrepreneurship, and the application of R&D results with high commercialisation potential). The results of such projects could subsequently be integrated into a database to be used by various participants in national innovation systems, which would help them quickly identify suitable areas for further S&T cooperation with BRICS countries, find partners (including R&D organisations, universities, companies operating in various industries), and identify more efficient and productive cooperation mechanisms and formats.

*Table 9.* Number of publications in Scopus, Relative comparative advantages index values and field-weighted citation impact values for priority areas in BRICS countries for 2011–2015

Priority areas	Number of publications in Scopus					Revealed comparative advantage index (RCA)					Number of subj. Areas with RCA>1	Filed-weighted citation impact				
	Brazil	Russia	India	China	SAR	Brazil	Russia	India	China	SAR		Brazil	Russia	India	China	SAR
1. Information and communication technologies	26 091	17 366	83 235	331 226	5 399	0.72	0.56	1.24	1.25	0.56	2	0.82	0.93	0.75	0.77	0.81
2. Nanotechnology and new materials	18 163	44 339	65 799	335 146	4 711	0.61	1.77	1.20	1.55	0.60	3	0.84	0.65	0.97	1.05	0.91
3. Advanced manufacturing and robotics	24 937	33 356	76 608	417 316	5 520	0.69	1.00	1.05	1.69	0.55	3	0.89	0.68	0.97	0.86	1.27
4. Space systems and astronomical observations	3 075	7 334	5 771	38 976	1 795	0.64	1.91	0.66	1.29	1.35	3	0.98	0.72	0.99	0.71	1.35
5. Transport systems (including aerospace)	1 022	395	3 004	18 763	214	0.49	0.25	0.76	1.43	0.44	1	0.86	1.03	0.87	0.77	0.92
6. Energy efficiency and energy saving	4 243	7 721	9 155	66 191	1 254	0.74	2.11	0.95	1.66	1.08	3	1.22	0.34	1.05	1.02	1.30
7. Nuclear energy	858	2 678	2 604	15 375	230	0.53	1.95	0.87	1.30	0.54	2	0.99	0.65	1.15	0.99	1.42
8. Renewable energy resources	2 007	836	7 405	26 125	894	0.70	0.34	1.39	1.24	1.17	3	1.22	1.10	0.97	1.86	1.19
9. Search, exploration, development and mining of minerals	4 189	11 137	7 496	70 183	2 411	1.03	2.33	0.61	1.60	1.45	4	0.70	0.69	0.90	0.92	1.26
10. Climate change, environmental protection and disaster management	18 462	10 524	33 668	120 599	6 191	1.16	0.73	0.73	0.88	1.73	2	1.09	0.87	0.87	1.19	1.24
11. Water resources	7 222	5 708	9 856	36 244	2 432	1.27	1.34	0.94	0.87	1.48	3	0.75	0.59	0.71	0.92	1.30
12. Food security and sustainable agriculture	31 091	3 337	31 104	55 194	4 970	3.34	0.32	1.65	0.73	1.78	3	0.73	0.80	0.62	0.99	1.07
13. Healthcare and medicine	87 882	22 636	108 790	321 297	20 375	1.27	0.49	0.54	0.41	0.92	1	0.86	0.66	0.82	0.87	1.45
14. Biotechnology	18 634	12 313	42 775	138 343	3 930	0.88	0.83	1.39	0.98	0.80	1	0.87	0.71	0.76	1.04	1.10

*Note.* According to Scopus SciVal analytical toolbox Field-weighted Citation Impact (FWCI) is “the ratio of citations received relative to the expected world average for the subject field, publication type and publication year”. Averaging is carried out for all publications of the same type, year and field of science. This measure is convenient because its values can be compared both across the different disciplines, and time for individual countries/organisations/authors. See more in SciVal metrics Guide book [https://www.elsevier.com/\\_\\_data/assets/pdf\\_file/0020/53327/scival-metrics-guidebook-v1\\_01-february2014.pdf](https://www.elsevier.com/__data/assets/pdf_file/0020/53327/scival-metrics-guidebook-v1_01-february2014.pdf)

*Source:* authors' calculations based on Scopus. Types of publications included: articles, reviews and conference papers (last update: December 2016).



## Conclusion

As the experience of BRICS countries shows, S&T priorities are usually set in the context of designing long-term sustainable development strategies, to support the accomplishment of key national and global socio-economic objectives. The results of our analysis allowed a number of prospective S&T areas to be identified in which BRICS countries may be interested in stepping up bilateral and multilateral cooperation and thus more efficiently implement their own national priorities. The similarity of S&T and innovation development priorities within BRICS countries is a major factor in promoting the establishment of sustainable long-term partnerships between them. Furthermore, recent cooperative practice shows that such partnerships tend to strengthen the participants, specifically in the scope of projects implemented in priority subject areas, with the potential to produce significant economic and social effects. Cooperation between BRICS countries becomes more efficient and productive the more it covers all stages of the innovation cycle – from creating new basic knowledge to its practical application – new technology, products, and services. This implies that such stages may be “distributed” between BRICS countries, in line not only with their respective S&T priorities but also their production potential. Subsequently, an information database could be created on the basis of the obtained results to support the various participants in national innovation systems, so that they would quickly be able to identify suitable subject areas for S&T cooperation with other BRICS countries, find partners (including R&D organisations, universities, industrial enterprises specialising in various sectors of the economy, etc.), and identify the best formats and mechanism for cooperation. Acting in the international arena as a single group, BRICS countries could become a global node of advanced STI development.

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- Voynilov N., Gorodnikova L. Gokhberg et al. (2017) *Science and Technology Indicators: 2017: Data Book*. Moscow: National Research University Higher School of Economics.

## Appendix 1. List of Strategic Documents on BRICS Countries' S&T Policy Analysed in the Course of the Study

### **Brazil**

Government of Brazil (2008) National Plan on Climate Change.

MINISTÉRIO DA SAÚDE (2011) Plano Nacional de Saúde – 2012-2015.

MCTI (2016) “Estratégia Nacional de Ciência, Tecnologia e Inovação 2016-2019”, Brasília.

### **Russia**

RF National Programme “Development of Science and Technology for 2013-202”,

S&T Development Strategy of the Russian Federation (approved by the RF Presidential Decree on 1 December, 2016 N 642). [in Russian]

Foresight of Science and Technology Development in the Russian Federation: 2030 (approved by the RF Prime Minister's order № DM-P8-5 of 3 January, 2014). [in Russian]

State Programme of the Russian Federation “Development of Science and Technology in 2013-2020” (approved by the RF Government Regulation of 15 April, 2014 № 301). [in Russian]

Federal Targeted Programme “Research and Development in Priority Areas for the Russian S&T Complex in 2014-2020”. Approved by the RF Government Regulation of 21 May, 2013 № 426. [in Russian]

Lists of priority S&T areas for the Russian Federation. Approved by the RF Presidential Decree of 07.07.2011 № 899. [in Russian]

Lists of critical technologies for the Russian Federation. Approved by the RF Presidential Decree of 07.07.2011 № 899. [in Russian]

Agency for Strategic Initiatives (2016). National Technology Initiative. [in Russian]

### **India**

Department of Science and Technology (2007) Information and Communication Technology. Research & Development and Innovation Strategy, South Africa.

Ministry of Environment, Forest and Climate Change (2008) National Action Plan on Climate Change, India.

Department of minerals and energy (2009) National Energy Efficiency Strategy of the Republic of South Africa.

Government of India, Ministry of Water Resources, River Development and Ganga Rejuvenation (2010) National Water Mission.

Ministry of Agriculture and Farmers Welfare (2010) “National Mission for Sustainable Agriculture”, India.

Government of India (2012) Twelfth Five Year Plan (2012-17).

Government of India (2013) Science, Technology and Innovation Policy. New Delhi.

Government of India, National Institution for Transforming India (2016) Atal Innovation Mission, India.

Department of Water Affairs (2013) National Water Resource Strategy, South Africa.

Department of Agriculture, Forestry and Fisheries (2015). Strategic Plan for the Department of Agriculture, Forestry and Fisheries 2015/16 to 2019/20, South Africa.

Department of Industrial Research and Promotion (2015) Make in India, India.

Department of Science and Technology (2015) National Biotechnology Development Strategy 2015-2020, India.

Ministry of Earth Sciences (2016) Vision for 2030, India.

**China**

Ministry of Science and Technology (2006) Implementation of the “National Medium and Long Term Science and Technology Development Plan (2006–2020)” a number of supporting policies, China.

Chinese Academy of Sciences (2009) Innovation 2050: Science and Technology and China’s Future “Chinese Academy of Sciences Strategic Research Series released, China.

State Council, CPC Central Committee (2010). Decision of the State Council on Accelerating the Cultivation and Development of Strategic Emerging Industries, China.

State Council, CPC Central Committee (2014). Energy Development Strategy Action Plan (2014–2020), China.

National Development and Reform Commission (2015). “Silk Road Economic Zone”, China, Kazakhstan.

State Council, CPC Central Committee (2016) THE 13TH FIVE-YEAR PLAN FOR ECONOMIC AND SOCIAL DEVELOPMENT OF THE PEOPLE’S REPUBLIC OF CHINA (2016–2020), China.

Science and Technology Department of the People’s Republic of China (2016) National Innovation-Driven Development Strategy Outline “Three-step to build the world’s science and technology innovation in 2050” China.

State Council, CPC Central Committee (2016) “Healthy China 2030” Plan, China.

**South Africa**

Department of Science and Technology (2008) The Ten-Year Innovation Plan for South Africa 2008–2018, South Africa.

South Africa Government (2010) The New Growth Path.

National Planning Commission. Republic of South Africa (2011) Our Future-make it work. National Development Plan 2030.

Department of Science and Technology (2016) SOUTH AFRICAN RESEARCH INFRASTRUCTURE ROADMAP: First Edition.

**Intergovernmental BRICS documents**

Moscow Declaration of BRICS countries’ Science, Technology, and Innovation Ministers of 26 October, 2015.

Working Plan on Science, Technology and Innovation for BRICS countries 2015–2018, (2015).

BRICS, 2014. First BRICS Science, Technology and Innovation Ministerial Meeting (2014) Cape Town Declaration. 10 February 2014. Cape Town, South Africa.

BRICS, 2015. BRICS Science, Technology and Innovation Ministerial Meeting (2015) Memorandum of Understanding on Cooperation in Science, Technology and Innovation between the Governments of The Federative Republic of Brazil, The Russia Federation, The republic of India. The People’s Republic of China and The Republic of South Africa. Brasilia. 18 March 2015, Brasilia, Brazil, 2015.

BRICS, 2016. BRICS STI Framework Programme Coordinated call for BRICS multilateral projects – Pilot call.

BRICS, 2017. BRICS STI Framework Programme Coordinated call for BRICS multilateral projects.

## Appendix 2. Conversion Kable from Scopus Subject Areas and Subject Categories to 14 Priority Areas

Priority areas	Scopus subject areas and subject categories
1. Information and communication technologies	All subject categories of subject area “Computer Science”
2. Nanotechnology and new materials	All subject categories of subject area “Material Science”
3. Advanced manufacturing and robotics	Subject categories “Control and Systems Engineering”; “Electrical and Electronic Engineering”; “Industrial and Manufacturing Engineering”; “Mechanical Engineering”; “Mechanics of Materials”
4. Space systems and astronomical observations	Subject categories “Space and Planetary Science”; “Aerospace Engineering”
5. Transport systems (including aero-space)	Subject categories “Automotive Engineering”; “Transportation”
6. Energy efficiency and energy saving	Subject categories “Energy Engineering and Power Technology”; “Fuel Technology”
7. Nuclear energy	Subject categories “Nuclear Energy and Engineering”
8. Renewable energy resources	Subject categories “Renewable Energy, Sustainability and the Environment”
9. Search, exploration, development and mining of minerals	Subject categories “Economic Geology”; “Geochemistry and Petrology”; “Geology” “Geophysics”; “Geotechnical Engineering and Engineering Geology”
10. Climate change, environmental protection and disaster management	Subject categories “Ecological Modelling”; “Ecology”; “Environmental Engineering”; “Global and Planetary Change”; “Management, Monitoring, Policy and Law”; “Nature and Landscape Conservation”; “Pollution” “Atmospheric Science”; “Earth-Surface Processes”
11. Water resources	Subject categories “Aquatic Science”; “Oceanography”; “Ocean Engineering”; “Water Science and Technology”
12. Food security and sustainable agriculture	Subject categories “Agronomy and Crop Science”; “Food Science”; “Plant Science”; “Veterinary”
13. Healthcare and medicine	«Medicine» и «Health Professions»
14. Biotechnology	Subject categories “Biochemistry”; “Biophysics”; “Biotechnology”; “Cell Biology”; “Molecular Biology”; “Molecular Medicine”; “Structural Biology”; “Applied Microbiology and Biotechnology”

Since no research areas and categories in the Scopus classification exactly match the identified 14 priority S&T cooperation areas, a conversion table was designed to provide an adequate basis for calculations. Each priority area for cooperation was treated as a set of Scopus areas (categories) reflected in the table. It was used to calculate indicator values for priority S&T cooperation areas.

# Определение приоритетов научно-технологического сотрудничества стран БРИКС<sup>1</sup>

А.В. Соколов, С.А. Шашнов, М.Н. Коцемир, А.Ю. Гребенюк

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**Соколов Александр Васильевич** — к.физ.-мат.н.; заместитель директора Института статистических исследований и экономики знаний (ИСИЭЗ) Национального исследовательского университета «Высшая школа экономики» (НИУ ВШЭ); Российская Федерация, 101000, Москва, ул. Мясницкая, д. 20; E-mail: sokolov@hse.ru

**Шашнов Сергей Анатольевич** — к.филос.н.; заведующий отделом стратегического прогнозирования ИСИЭЗ НИУ ВШЭ; Российская Федерация, 101000, Москва, ул. Мясницкая, д. 20; E-mail: shashnov@hse.ru

**Коцемир Максим Николаевич** — младший научный сотрудник отдела количественного моделирования ИСИЭЗ НИУ ВШЭ; Российская Федерация, 101000, Москва, ул. Мясницкая, д. 20; E-mail: mkotsemir@hse.ru

**Гребенюк Анна Юрьевна** — заместитель заведующего отделом стратегического прогнозирования ИСИЭЗ НИУ ВШЭ; Российская Федерация, 101000, Москва, ул. Мясницкая, д. 20; E-mail: grebenyuk@hse.ru

*В статье представлены методические подходы к выбору приоритетов научно-технологического сотрудничества стран БРИКС на основе анализа международных и национальных стратегических документов стран БРИКС и тематики наиболее значимых публикаций ученых из этих стран, отраженных в базе данных Scopus. Систематизированы национальные научно-технологические приоритеты стран БРИКС и произведена сравнительная оценка их ресурсов научно-технологического развития.*

*Проанализированы показатели публикационной активности стран БРИКС, существенно активизировавшейся с 2000 г. и расширяющейся в межнациональных масштабах при доминировании Китая. Показана особая значимость развития сотрудничества с Китаем, уверенно выдвигающимся на позиции одного из мировых научно-технических лидеров, выделены перспективные области исследований для кооперации с Индией, Бразилией и ЮАР.*

*Сформирован перечень из 14 тематических приоритетов научно-технологического сотрудничества стран БРИКС (на основе анализа их национальных, двусторонних и многосторонних стратегических и прогнозных документов). Выделенные приоритеты научно-технологического развития создают основу для взаимовыгодного и эффективного сотрудничества стран БРИКС, в рамках которого ученые разных стран могут расширять диапазон исследований, развивать существующие и внедрять новые инструменты научно-технологического сотрудничества и обмениваться лучшим опытом.*

**Ключевые слова:** научно-технологическое сотрудничество; международное партнерство; приоритеты сотрудничества; библиометрический анализ; страны БРИКС

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# Sustainable Economy: Do Not Use The Debt Widely<sup>1</sup>

V. Zuev, E. Ostrovskaya, E. Frolova

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**Vladimir Zuev** – PhD, Professor of Economic Sciences, National Research University Higher School of Economics; 20 Myasnitskaya St., 101000 Moscow, Russian Federation; E-mail: vzuev@hse.ru

**Elena Ostrovskaya** – PhD, Associate Professor, School of World Economy, National Research University Higher School of Economics; 20 Myasnitskaya St., 101000 Moscow, Russian Federation; E-mail: eostrovskaya@hse.ru

**Ekaterina Frolova** – Assistant at the World Economy Department School of World Economy, National Research University Higher School of Economics; 20 Myasnitskaya St., 101000 Moscow, Russian Federation; E-mail: esfrolova@icloud.com

*In this article we consider the issue of debt, which became a global concern, within another global concept – in the context of sustainable development and economic growth. More and more attention is paid to this concept due to urgent necessity for coordination of policies at both national and global levels. The predominant theoretical thinking tends to underestimate the risks. Although a lot have been made towards improving global financial stability after the recent crisis, the risks remain high as new threats and challenges emerge, and the global financial system is still unable to respond to them adequately. Having considered the banking regulation innovations from the perspective of financial security and inclusiveness, we come to conclusion that the global financial reforms are being conducted in the right direction, and the system became more secure, however, not yet sufficiently sustainable. The other idea we come up with is that implementation of financial transaction tax as a tool to discourage excessive speculation without impeding other economic activities, which is the argument opponents of the tax appeal to, seems to be socially responsible measure working for financial stability at the same time. Finally, we also assume that steadily increasing nonfinancial sector debt of the leading economies presents a serious challenge to global financial stability and to sustainable growth. Estimates of the threats to the world economy from unprecedented debt at all levels of economic system are largely inadequate. Effective and inclusive measures to reduce it have not been yet developed. Therefore, the issue of increasing indebtedness should be tackled accordingly. Otherwise, the world economic system appears to become very fragile and unsustainable under the burden of financial imbalances and emerging risks.*

**Key words:** nonfinancial debt; financial stability; sustainable and inclusive growth; debt governance; financial transaction tax

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Modified version of the article was placed on June 2017 on the G20 web site ‘Insights – literature from the Think tanks’ in the course of the preparation for the G 20 2017 Summit in Germany. Available at: [http://www.g20-insights.org/related\\_literature/vladimir-zuev-elena-ostrovskaya-ekaterina-frolova/](http://www.g20-insights.org/related_literature/vladimir-zuev-elena-ostrovskaya-ekaterina-frolova/) (accessed 17 October 2017).

## Introduction

On September 25, 2015, the leaders of the 193 UN Member States adopted a 15-year program, entitled “Transforming Our World: 2030 Agenda for Sustainable Development,” which contains 17 Sustainable Development Goals (SDGs) and 169 targets. The following year, the G20 met and adopted the G20 Action Plan on the SDGs, in which the G20 members committed to meeting these goals through “collective and individual efforts, at home and abroad” with a “focus on sectors and themes of the Agenda where the G20 has a comparative advantage and can add value as a global forum for economic cooperation.”

Since the start of the Agenda’s implementation, the G20 has placed global sustainable development at the center of its activities. However, so far, no country has achieved sustainable development from the standpoint of its economy, financial sector, social sphere or the environment. Over the next few years, decisive action in several specific areas will prove critical for the G20 countries if they hope to reach the SDGs. In this article, we want to treat the issue of financial stability as a key factor in implementing the Action Plan.

Waves of financial instability are rising in the global economy. Which segment of the market will be the next to confront a rogue wave, and to what extent are national and global regulators prepared for future shocks? Many new initiatives were launched recently to enforce global financial supervision and governance. However, risks remain high. New threats emerge and the world economy remains far from resilient enough to withstand the likely shocks arising from growing financial imbalances. To navigate this environment successfully, policymakers must prepare adequately or steer us towards safe waters.

Recently the IMF published a report on global non-financial sector debt (IMF, 2016). The figures demonstrate a sharp rise in both public and private sector debt, which the Fund expected to reach new heights by the year 2017. So far, regulators have done what they could to lessen financial risks arising from the banking sector, although the new parameters of the system still need a lot of improvement, especially if they hope to promote socio-economic inclusiveness, a key theme of the SDGs. The record levels of non-financial sector debt, in our view, represent a serious new challenge if the SDGs are to be implemented. Governments must stick to financial discipline in a more responsible way. A correct assessment of new risks is needed to secure the system and make it sustainable.

First, we will make an assessment of innovations in banking regulation from the perspective of financial security and inclusiveness.<sup>2</sup> Our conclusion is that the sector hasn’t proven that it’s sufficiently sustainable. Then we disclose the remaining deficits of the regulatory system, discovering emerging risks to stability and growth from the non-financial sector, and suggest more arguments for the introduction of an adequate regulatory response. Additionally, we’ll detail how the system appears to have become very fragile and unsustainable.

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## Dealing with Bank Debt

The global financial crisis revealed a systemic deficit of financial regulation at the global level among all financial institutions, especially with respect to banks. This came as the result of a long process of the “diffusion of power in favor of private actors” in the financial sector [Underhill, Zhang, 2008, p. 535–554]. Insufficient regulation at the global level made the system extremely unstable and risky. Uncontrolled, exponential growth within the financial sector and its rapid globalization have led to an equally rapid increase in endogenous challenges. Some of the key risks that we would like to outline to assess challenges to global economic governance were the following:

- Overleveraged banks provided too much credit, which lead to speculative bubbles in the US sub-prime mortgage sector and other countries’ real estate markets and a huge effect of ‘toxic waste’ derivatives;
- Bank’s risk management strategies proved ineffectual;
- Too much speculation activity. Bankers are losing interest in lending to real sector companies, faced with high incomes from speculation and modest incomes from real sector investments;
- Troubled lenders and other financial companies even after receiving emergency funding, rewarded executives generously and issued them exorbitant bonuses;

Looking at the list, we can see that most of the risks originated in the banking sector. Normally banks are supposed to stimulate growth, but many risks resulted from banking activities. In general, we can conclude that the financial sector became estranged from industry as banks ceased to play a beneficiary role in the financing of industrial activity.

The core element of financial governance is banking regulation. In theory, banking services should provide an important link between the financial and the real sector in securing economic growth. In reality, the banking sector has, in itself, become a source of risk multiplication, including active speculative activity, resulting in financial “bubbles,” and increasing the gap between the real and the financial sector. Unsecured banking operations have started to threaten growth instead of stimulating it. The inter-mediator link between the banks and the real sector is becoming less vital to the banks. The financial sector in itself becomes a focus of banking activities. This sector begins to live its own life. That has become a challenge for regulators; to bring banks closer to producers in order to stimulate economic growth again. As banks appear to be the key contributors to financial instability, the big question is how to diminish that risk.

Banks are expected to be the cornerstone of financial stability. If they are at risk or deemed “too big to fail,” the governments jumps in to save them using public funds in order to protect customers. In doing so, they help banks by redistributing money from these same customers, the taxpayers.

Speculative operations are the source of highest risk for banks; simultaneously, however, they offer the greatest profit margins. Thus, it seems unrealistic to separate speculative investment from lending activity. Banks will always be tempted to engage in risky operations in order to generate high returns. The measures which have been taken at the national and global level to increase capital requirements, extend monitoring and

perform stress tests are all vital, but they are not enough to guarantee that banks remain solvent. The most relevant measure to assure financial stability is to introduce a tax on financial institutions' speculative operations and to establish a rescue fund for banks at their own expense. Our argument is that this measure combines lower risks for the financial system with international commitments to promote inclusiveness and strong, balanced growth.

A tax in one country or in a small group of countries will be not sufficient. It will only bring a solid and visible effect if introduced at a global level. Thus, a global institution could and should provide an appropriate platform for such an initiative. The G20 is a strong contender for this role, as it has an adequate global format for the introduction of such a tax. It would benefit the G20, upgrade financial stability and provide needed public support to global governance institutions. Surprisingly, the idea is not among the top priorities of the global agenda, although the cost is low for the stakeholders, because of the low rate of the tax proposed. This paper strongly supports the idea of introducing such a financial transaction tax. The authors provide more analytical arguments in this regard and want to increase public and academic awareness of the necessity of such a measure.

When the G20 convened in China, it placed a high priority on several specific development goals: to “eradicate poverty, achieve sustainable development and build an inclusive and sustainable future for all,” and “continue to promote strong, sustainable and balanced growth.” If these Goals are to be achieved, the financial sector must undergo drastic changes. Another aspect of the issue is that most of the risks are global or regional in origin but are dealt with at the national level. The financial system lacks control at the global level. Some risks are supervised, but it is mostly done by informal institutions with no legally binding commitments. Financial markets became transnational many decades ago, but formal regulation and supervision have mostly remained national. Because of these gaps, the system has become either self-regulated or poorly regulated. This has been promoted by the liberalization of financial markets by states, and this same liberalization has been used as a tool to attract investment [Tsingou, 2003, p. 8]. For this reason, the need for global financial governance is more urgent than ever. Attempts to create an independent system of global supervision have encountered opposition from nation-states and from the banking community. They are interested in ‘carte blanche’, and are not supporting the establishment of a system of global financial governance.

Better global financial governance means setting up a coherent system of legitimate institutions, using adequate and effective regulation instruments, relying on efficient methods of monitoring and control over the financial networks, and ensuring that the interest of the people remains safeguarded with these measures in place. In this article, we try to analyze the most important of these aspects to provide the grounds for the assessment of the emerging system's inclusive function.

Many scholars support stronger international regulation [James, Patomak, 2006]. What kind of regulation do we need and what should be regulated?

Theoretical concepts of global governance are well developed by many scholars. The link between formal and informal institutions is represented by the concepts of ma-

for informal institutions (like the G8 and G20) governing either through multilateral formal organizations [Kokotsis, 1999] or against them [Kirton, 2004], or without them [Bayne, 2000]. The authors of this study advance another vision of this link, presuming that within the last decade an emerging system of interlinks among different institutions can be defined like members of an orchestra, each of whom has his own sheet of music but remains part of a coordinated effort to play the tune of financial stability. We assess the process of setting up new financial institutions and that of igniting new life into traditional ones, resulting in the emergence of an interlinked system of global financial governance institutions. During the post-crisis years, financial architecture has been reassessed and regulatory mechanisms have undergone radical change at the international level. Only a decade ago, authors who explored the financial regulatory system never mentioned a single global supervisory institution in their works [Chung-Hua, 2006].

In this study, we depart from the assumption<sup>3</sup> that a large part of the financial regulation has been initiated at the global level, strengthening global financial governance during the post-crisis decade and making it sound like an orchestra.

## Selecting Proper Instruments to Assure Inclusive and Sustainable Growth

The starting point in making the system of financial regulation more efficiently targeted to promote inclusive and sustainable growth is making banks more accountable. Regulations regarding capital requirements for banks came into effect in all 27 jurisdictions that are members of the Basel Committee on Banking Supervision. When the banks heed these provisions, it enhances the reliability of the system, but this is not enough. The Basel III prescriptions, even if applied in full, are insufficient to build an effective system of control over the banking sector [Gros, 2013]. Among the deficiencies in the existing mechanism is the fact that banks use internal models to calculate capital requirements, there's a lack of disclosure and the minimum leverage ratio is insufficient [KPMG, 2013]. Another difficulty is the growing discrepancy in national approaches to the Basel standards' implementation. The Basel IV framework could provide solutions to these issues. The Bank of International Settlements (BIS) is also trying to catch up with these deficits by advancing different solutions [Bank for International Settlements, 2015]. The Basel Committee does a lot to promote the adopting of new standards and recommend best practices in banking supervision. The Financial Stability Board encourages the adherence by all jurisdictions to regulatory and supervisory standards on information exchange [FSB, 2010]. The Economic Stability Council pushed forward the introduction of International Financial Reporting Standards (IFRS). This is particularly important, as states are reluctant to transfer their powers to global regulators [Baxter, 2011]. The ESC's tasks, to simplify and improve international standards of financial reporting, and harmonize financial listing standards, were

<sup>3</sup> Zuev V., Ostrovskaya E. Setting up a system of global financial supervision. Review of international organizations, 2016, no 4, pp. 106–126.

conducted in cooperation with the International Accounting Standards Board (IASB) as well as with national institutes.

The global institutions' process of creating new, globally applicable packages of regulations is systematic and consistent. For example, in January 2016 the next set of changes in requirements for banks regarding market risk revaluation was adopted; in February 2016, two more documents were published – the Guide to Anti-Money Laundering and Recommendations on Account Opening Procedures. And so it goes on; this regularity, continuity and consistency, generated at a global level within the last decade, provides for a solid base to avoid erratic and conflicting national legislative activity, which is where and how a sound new international financial order might be set up.

There are many other issues to be tackled in order to comply with the G20-backed UN SDGs, including concepts such as “too big to fail” as well as “shadow banking systems.”<sup>4</sup> They all lie within the competence of international institutions [Tobias, 2014]. ‘Too big to fail’ banks present a special case for social responsibility and inclusiveness. In this particular case, an international regulatory response to the issue is very important.

In the year 2013, a methodology to identify systemically important global insurance companies (G-SIICs) and an updated technique of revealing global systemically important banks (G-SIBs) were published. Using this basis, the list of G-SIBs was composed (it included 28 G-SIBs) and an initial list of G-SIICs has been compiled and is updated annually starting from November 2014. Financial institutions included in these two lists are obliged to meet higher requirements and are subject to more rigorous supervision. Plans for the settlement of insolvency were developed for them. The liquidity adequacy requirements for 28 G-SIBs were also developed and in most cases, the G-SIBs increased capital before the deadlines. Additional stringent requirements for liquidity adequacy have applied to G-SIBs since 2016 with their gradual full introduction by 2019.

Late in 2014, the FSB put forward an initiative increasing big banks' accountability in order to upgrade the risk absorption role of the global banking system [Bruno, Song Shin, 2014]. The proposal was to oblige the global, systemically important banks (G-SIBs) to have additional reserve assets so that the losses are not shifted onto taxpayers' shoulders in the event of an emergency. On November 11, 2015, following a quantitative impact assessment, the Financial Stability Board finalized total loss absorbing capacity (TLAC) and minimal requirements for G-SIBs. Although the initiative was endorsed by the G20 summit, the implementation mechanisms have yet to be detailed at a national level. Nevertheless, this is a move in the right direction – banks should bear most of the responsibility themselves and cover the cost of overcoming eventual risks.

On October 12, 2016, new standards for internationally-active banks (both G-SIBs and non-G-SIBs) regarding TLAC holdings was published by the FSB, according to which banks must deduct their TLAC holdings that do not otherwise qualify as regula-

<sup>4</sup> FSB includes in this category, among others, money market funds (MMFs), structured finance vehicles, broker-dealers, finance companies, financial holding companies, hedge funds and other investment funds. For more details, see A Policy Framework for Strengthening Oversight and Regulation of Shadow Banking Entities and a Policy Framework for Addressing Shadow Banking Risks in Security Lending and Repos. Financial Stability Board. Available at: [http://www.fsb.org/wp-content/uploads/c\\_130129y.pdf](http://www.fsb.org/wp-content/uploads/c_130129y.pdf)

tory capital from their own Tier 2 capital. This reduces a significant source of contagion in the banking system. The standard also reflects changes to Basel III specifying how G-SIBs must consider the TLAC requirement when calculating their regulatory capital buffers [FSB, 2016].

In 2015, the Financial Stability Board launched a peer review on the implementation of the policy framework for financial stability risks posed by non-bank financial entities (“other shadow banking entities”) [FSB, 2015]. The objective of the review was to evaluate the progress made by jurisdictions in implementing the principles, in order to reduce the prevalence of shadow banking and promote regulatory compliance. Peer review appears as another instrument to ensure the establishment of a more reliable system. In accordance with the provisions of the Charter of the FSB, the member countries are obliged to periodically implement the Financial Sector Assessment Program (FSAP) of the IMF and World Bank. They have to present country surveys, which contain an evaluation of the degree of implementation of international standards. The work to provide these reports enhances compliance.

One of the problems is that most of the global institutions’ decisions are recommendatory, although a relatively high level of compliance appears as an extraordinary feature of global financial governance [Brummer, 2012]. Expanding the controlling functions of the international institutions and obliging the national and international actors to make regular reports on their activities substantially helps increase the influence of internationally-acknowledged norms. The global institutions set up a certain standard for financial regulation. Moreover, they exert soft power to enforce this regulatory framework for financial institutions. For example, if the financial institutions concerned do not fully comply with the provisions of Basel III (liquidity coverage ratio or the net funding ratio) they may not be allowed access to the major stock exchange platforms. In this way, stimulus to respect the new international prescriptions is created. Some bankers claim they are not ready to fulfill these recommendations, describing them as too exacting. Nevertheless, the adopted global standards are eventually implemented by most countries, even if this is implemented by the banking sector somewhat grudgingly. Therefore, it is crucial that the chosen global standard should promote inclusive and sustainable growth.

Another instrument of financial governance is the introduction of sanctions based on stress tests. Conducting stress tests on a regular basis is an innovation in global governance. The terms of reference of the stress tests undertaken by the FSB stipulate the issuance of a warning, if non-compliance is revealed for the first time. The inclusion of a member-state or its banking institutions in “grey” and “black” lists, in the event of repeat non-compliance, entails the imposition of sanctions by the Financial Stability Board. Thus, FSB members are involved in the formulation of general rules, norms and procedures, selecting proper instruments of implementation and providing for supervisory and controlling functions, thus assuring compliance with the adopted recommendations. In November 2015, the FSB published the first report on the *Implementation and effects of the G20 financial regulatory reforms*. Implementation of the Basel III reforms for the bank capital and liquidity requirements took place ahead of schedule.

Summing up the overview of the adopted instruments, we can conclude that a vast number of new measures appear: monitoring procedures, checks and stress tests, new standards of reporting and accounting, new risk-management techniques and the exchange of best practices, new capital requirements, etc. What is missing?

There are two big problems which remain unresolved. Market speculations remain very attractive for the banks. Consequently, the risk of dangerous financial bubbles emerging remains high. If they occur, they could put banks at risk of insolvency, necessitating that governments earmark funds from national budgets to provide them with liquidity. As in the past, there is no fund financed by the bankers themselves that could rescue banks in the event of necessity, but a rational solution appears to be evident.

## Financial Transaction Tax – Inclusiveness, Social Responsibility and Financial Stability

Is the current contribution from the financial sector to the financial stability of the majority of their customers fair enough? The ongoing reforms since the outbreak of the global financial crisis do not solve one key problem, namely, the enormous cost of rescuing the financial sector in the event of a looming economic collapse brought about by speculative euphoria. These costs are taken on, to a large extent, by governments and the taxpayer; meanwhile, speculators and the institutions that facilitate their activity benefit almost exclusively from risky financial behavior when it proves successful.

Our study aims to outline the necessity for the regulators to undertake concrete policy measures to meet the challenge of maintaining global financial stability, in line with international social responsibility objectives. If we think about market instruments, taxation is the first thing to come to mind. It could serve two goals: discouraging speculation and providing a source of financing for a fund that would rescue banks in trouble at their own expense. Thus, it would reflect the UN and G20 objective of promoting an inclusive, sustainable society.

The discussion on the introduction of various forms of financial taxation has a long history. In 1936, John Maynard Keynes wrote: “The introduction of a substantial Government transfer tax on all transactions [on Stock Exchanges] might prove the most serviceable reform available with a view to mitigating the predominance of speculation over enterprise in the United States” [Keynes, 1961].

The regulatory system needs adequate mechanisms to discourage excessive speculating. Basel III provides for stronger capital requirements, assuring more responsibility by the banks, but does little to reduce speculation. Speculation continues to flourish in the financial sector amid inflated values, while financing is less available in the real sector economy.

In 2009, Paul Krugman published an article, “Let’s make banking boring again.” [Krugman, 2009] He argued that the banking industry which emerged from the US Great Depression was tightly regulated. Banks served as intermediators and banking was “boring.” After 1980, however, many of the regulations on banks were lifted, and banking became exciting again. That was the moment when speculative activity became great.



Debts began rising rapidly, and the financial industry exploded in size. Krugman suggested re-asserting the split between investment banking and retail banking. The ongoing structural measures to introduce limitations on banking such as the US Volcker rule, the UK's Vickers ring-fence, and the EU's Liikanen proposal, which envisage creating a functional separation of operations, were all advanced as a reaction to the inadequate management of excessively risky speculative investments by deposit-taking banks.

Though there are historical examples of a split between investment banking and retail banking, as in the USA since the early 30's, our assumption is that it is more difficult to undertake the separation of speculative operations from the deposit-credit activities of the banks with an appropriate control, than to introduce a proper taxation on speculative activities. It is even more so at times of spectacular intensification of speculative activities. Even if it seems to be feasible, those speculative activities will be switched to the shadow banking system, which in its turn is still harder to control.

The global institutions are trying to catch up. The Basel committee on Banking Supervision published a new standard revising the prudential treatment of banks' investments in the equity of funds within the Basel capital framework. This year, it is set to be applied to banks' equity investments in all funds (e.g. hedge funds, managed funds and investment funds) [Basel Committee, 2013]. Still, it is extremely difficult to make banks reduce their speculative activities and thus lessen risks posed to the financial system. Why not let the banks do the job themselves, creating a substantial buffer outside of their books which would be paid for by the banking community?

One of the most suitable tools for this role seems to be the Financial Transaction Tax (FTT), according to many analysts [Baker, 2016]. However, arguments for its implementation have yet to achieve critical mass. The FTT is a fee charged on financial institutions for certain financial operations they carry out. This may concern stocks, bonds, shares, derivatives or other investment vehicles. Proposed means of implementing such a tax vary – by the residence of the investor or of the issuer, or by the asset's origin, for example. It is essential that the place of the operation does not matter, which decreases the attractiveness of offshore jurisdictions with regard to this type of operations.

The common argument stopping countries from introducing a FTT is that it would risk reducing the turnover of the financial sector and a number of financial institutions would flee to non-taxed exchanges. However, the tax rate is too minimal to really divert businesses from being registered in a national market or to make a visible impact on their activities. The FTT mostly does not exceed a few tenths (or even hundredths) of a percent of the value of any given transaction. It is possible to split the tax between the seller and the buyer. Among other negative consequences, the introduction of a FTT – would likely lead to a reduction in investment. Some experts dispute the very idea of taxing such operations [PWC, 2012]. The use of the FTT can lead to a contraction not only in speculative trade, but also in transactions made by brokers with non-speculative purposes. An increased cost of operations may cause concern among governments as they assume investors might be less willing to buy state bonds due to a new taxation fee. Traders and investors may also move overseas if the tax is introduced in their country. Although, as mentioned above, the country of operation is not critical for the collection of the tax, bankers may find loopholes.

The additional funds from the FTT received by the state or by an international organization (if the Fund is governed globally, which, in our opinion, is the preferable option) are primarily considered an advantage of this regulation. Such a tax could have empowered the G-20 (or the IMF) with the necessary financial resources to move forward faster with global financial sector reforms. For example, the US Congress proposed the introduction of a FTT and estimated getting \$180 billion from US banks alone between 2015 and 2023 (Fig. 1). A global tax could yield far more.

*Table 1.* Budget revenues from a tax on financial transactions in the US

Billions of dollars	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2014–2018	2014–2023
Changes in Revenues	0	12	18	19	20	21	21	22	23	24	68	180

*Source:* congressional Budget Office. Staff of the Joint Committee of Taxation. November 2013. Available at: <https://www.cbo.gov/budget-options/2013/44855>

Another important theoretical point is that apart from money-raising arguments, the FTT serves as an appropriate market tool for reducing incentives for excessive speculation. It is unrealistic to expect that the use of the FTT will dramatically cut the number of short-term and highly-speculative securities trading, as the rate of the tax would be minimal at the initial stage of its introduction. However, the motivation for speculative activities might at least be a bit lower. That would be a very important sign for the bankers. The FTT has significant advantages over other taxes on financial activities, as it is relatively easy feasible and difficult to avoid. For the brokers specializing in high-frequency trade, for example, it is technically difficult to conduct operations from outside their respective countries because computer proximity to the Stock Exchange is critical.

Still another argument is that the FTT, by reducing systemic risks, contributes to sustainable economic growth. While there is growth, the volume of the rescue funds and thus their ability to safeguard financial stability will steadily increase. Justifying the introduction of the tax, J. Tobin pointed out another positive effect of the FTT on the economy. If a decrease in speculation activity occurs alongside a lowering of excessive profit margins, it makes careers in finance less attractive for active, intelligent and educated professionals. This could result in other sectors such as medicine, science or traditional industry attracting more and more talented people, redirecting the economy towards industrial growth.

Additionally, the FTT could be vital because of its special, deep-rooted effects, which are worth noting with regard to this study. This form of taxation could contribute (though modestly, but still) to a more equitable income distribution and a slowdown in the disproportional concentration of wealth. As described in the works of Thomas Piketty, the problem is high on the global agenda [Piketty, 2014]. Research shows that levying an FTT has a progressive effect. Roughly, 3/4 of the funds collected are ultimately paid by taxpayers in the highest income quintile and more than 40 percent falls

on the top 1 percent [Burman, Gale and others, 2015]. One major step to socialize the FTT's mechanism could be the introduction of smart accountability systems. Special conditions could be applied to pension funds, and small companies or firms engaged in socially responsible activities could receive exemptions.

Finally, the bankers themselves and not the taxpayers would bear the financial responsibility for bailing out troubled financial institutions during a crisis, shifting the burden of the emergency bailouts away from the taxpayers, thus bearing the costs associated with extreme financial risk which are often unjustly shifted to individual taxpayers.

While nations continue to debate the merits of an FTT, the issue of practical implementation remains a sticking point. In 2011, several EU member states, including Austria, Belgium, France, Germany, Italy and Spain, put forward the idea of a common FTT for the European Union. In December 2012, the European Parliament voted for the proposal, which had been supported by eleven EU members. In January 2013, the European Council approved the introduction of the FTT. That was a very significant first move to implement the FTT globally. The impact of the EU's soft power has played an important role with respect to many other initiatives. It could be the case this time as well. The bank support fund created with the FTT disbursements could become a clever instrument to assure financial stability. The EU Council considered the introduction of the FTT to avoid shifting the burden for bailouts to taxpayers, as happened during the global financial crisis of 2008, when the US financial sector bailout launched a string of protests. A FTT on the banking system appears to be a fair way to assure more just financial regulation. Once introduced in the EU, other countries might wish to follow and to have such an instrument as well.

Still, diverging opinions remain, even at the highest political levels, on how to make use of such a tax in a more effective way. This article further develops the arguments in favor of the FTT. [Zuev, Nevskaya, 2018] In May 2014, ten out of the initial eleven participating member states (Slovenia abstained) agreed to seek a tax on equities and derivatives by 2016. In December 2015, however, Estonia decided to opt out, considering that the cost of collecting the tax would surpass the revenues (according to our calculations, this is not the case). Nevertheless, on March 16, 2016, the Republic of Estonia completed the formalities required to leave the enhanced co-operation on FTT. The FTT issue came to a standstill in the EU Council. The EU Economic and Financial Affairs Council decided that work would continue during the second half of 2016 between the remaining ten participants. Concerns arose over the cost efficiency of FTT collection. In February 2017, German Finance Minister Wolfgang Schaeuble said that implementation of the proposed European financial transaction tax was hindered by increasing demands for exemptions [Bloomberg, 2017].

Setting up a common EU system for the taxation of financial transactions is a method of ensuring the banks make a fair contribution to compensate for the cost of overcoming financial crises, since these banks have received substantial amounts of government support. The deadline to implement the agreement was shifted several times. The United Kingdom, as in many other cases, makes it clear that special protective measures must be used if damage is done to its market [Maurice, 2015]. The UK

in general was not so much against the tax in principle. The country thought it would never work unless the tax was levied globally by the G20. The authors of this article share this view to a certain extent, without over-exaggerating the negative effect that London as financial center would experience if it lost out to New York or Singapore.

Taking into consideration the remaining lack of unity on the issue, the EU so far is undermining the introduction of the FTT in the rest of the world. However, the opposite could prove true as well: if the tax is implemented in the EU, the critical mass necessary for its transformation into a truly global instrument of regulation could be formed.

The idea of the introduction of the FTT at a global level was raised by the G20 in 2008 and received the support of the majority of member-states at that time. It was unfortunate that in 2010 at the summit in Toronto the proposal was shelved. It was a surprise, as currently 16 of the 20 members of the G20 use different types of taxes with similar effects to the FTT. The most widespread types of taxes resembling the FTT are a tax on trading in large companies' shares, the EU tax on short sales and sovereign credit default swaps (CDRs), and taxes aimed at high-frequency trading (for example, in France it is a tax on cancelled orders, in Italy – a tax on modified orders). Globally, more than 30 countries use different variations of the FTT, applying a rate of 0.1 to 0.5%. Companies which apply various financial taxes include the United Kingdom, France, Belgium, Greece, Hong Kong, Switzerland, Australia, and South Korea.

In Europe, social justice considerations were taken into account during the implementation of the FTT; the mechanism provides countries with the opportunity to make exemptions for different categories of persons and institutions. For example, in Italy the tax on transactions with shares of national companies and derivatives is not applied to companies operating in 'socially meaningful' and 'ethical' spheres [Hemmelgarn, Nicodeme et al., 2015]. The selective application of financial operations taxes should be an additional tool to consider when developing socially-oriented adjustments to financial regulation.

The current UK FTT system didn't prompt investors to flee the country because its application isn't related to the investor's residence, as was the case with the Swedish tax [Seely, 2014]. Thus, the unification of those taxes could have been convenient for everybody [Hemmelgarn, Nicodeme et al., 2015]. The implementation of a unified tax policy renders irrelevant the argument that the introduction of the FTT would present an additional burden for financial institutions. This argument seems to be irrelevant anyway, as the rate of taxation is very small. In all the states that have adopted variations of the FTT, as well as in most other countries (e.g. in the EU), popular support for the implementation of the tax is high.

The transposition of the FTT from the national level to a regional or global level is a prerequisite for the actors' acceptance of the tax. The cases of Estonia and Sweden demonstrate that the introduction of the tax on a unilateral basis by a small country alone may be not efficient. Most of the studies reveal that a FTT with a broad (global) tax base provides greater revenues [Schaefer, 2015]. The necessary synergies appear to materialize best when the tax is levied at the global level.

In order to efficiently socialize the impact of the FTT's introduction, it is critical to define exact patterns for how states must spend the funds they raise, in order to circumvent the necessity of future bail-outs. We do not have crises all the time. Thus, the Fund could be used for some other purposes if there is no financial crisis. The EU countries' experience demonstrates that it is possible to proclaim "far reaching" goals, such as using the new funds to grant aid to the poorest countries. One way of spending could be to finance growth-enhancing projects and create an international "safety cushion" for the banks, which could serve as an incentive for them to follow the initiative. In our view, it would be much easier to gain supporters for the idea of introducing the FTT within the banking community, had it been announced that the Basel 3 norms on capital requirements would be relaxed for countries which had created the fund for assisting banks in trouble. Creating the fund would mean giving banks more flexibility in their credit policies, as the fund, once operational, could provide the necessary assistance at the expense of the banks themselves. In this case, one could expect a positive effect on banking community leaders to stimulate them to accept the taxation.

Using a financial transaction tax as a tool to discourage excessive speculation without hampering any other activity seems to be socially responsible measure which would promote financial stability at the same time.

## Debt: Do Not Use it Widely

Financial globalization and fast growing debt levels mean that crises can spread far more quickly and widely, contributing to financial shocks. These are detrimental to global economic growth and resilience, presenting a major challenge for the implementation of the SDGs. According to the *IMF Fiscal Monitor*, published in October 2016, the global debt of the non-financial sector has reached an unprecedentedly high level of 225% of the world's GDP. According to the authors of the report, consensus on what level of debt could be considered high has not been achieved yet. However, one need only imagine that every producer of goods and services in every country must work and spend nothing on food for 2 years in a row to make possible the repayment of the principal, not even the interest, of this debt. Obviously, it is impossible. From our standpoint, the situation continues to spiral out of control. The most alarming is that the global debt to GDP ratio exceeds its historic highs despite the absence of financial crises, unlike in 2008–2009 and 2014. During times of crisis, a record increase in indebtedness could be explained by the urgent need to rescue national economies with massive liquidity injections. What basic explanation can we provide for the current record levels of debt? Is it out of a habit? Is it because of the easy availability of funding? The desire to solve problems (of economic growth, asset acquisition) not via the time- and effort-consuming activity of making money, but using quick and easy borrowing in exchange for the promise to repay later? Another underestimation of policy risks without adequate deleveraging?

Two-thirds of global debt consists of private sector liabilities, which is an additional cause for concern. As soon as the government makes the decision to help national corporations during times of financial trouble by launching bailouts, private debt

turns into public debt and adds substantially to the levels of governmental indebtedness, which was the case in the aftermath of the 2007–09 global crisis.

Emerging markets' nonfinancial corporate debt surpassed the \$26 trillion mark in the first half of 2016, according to the Institute for International Finance. In its turn, the corporate debt level of most nonfinancial companies in emerging economies rose from \$4 trillion in 2004 to \$18 trillion in 2014 [IMF, Global Financial Stability Report, 2016].

Demand for emerging market debt can be explained by higher yields and low and or even negative bond yields in developed economies. Brexit was another important factor in diverting investment flows from the developed economies. International investors have put more than \$18 billion into dollar-denominated emerging market bond funds since the United Kingdom voted to leave the EU. China and Saudi Arabia are the leading developing market sovereign debt issuers. That large volume of corporate debt could be seen as exerting additional pressure on government financing. In the event of low economic activity, if a government helps national corporations, its debt burden only increases further. Billionaire investor George Soros has expressed concern about China increasing its volume of debt. The rise in new borrowing suggests that the Chinese government is prioritizing growth instead of controlling debt. Stocks and bonds maintain a positive correlation, especially when investors are unsure about the prospects of stocks.

Thus, we have every reason to consider the levels of non-financial sector debt jointly, public and private. Excessive private debt is widely considered as a potential risk to economic stability and growth. On the other hand, there is another concern: that a private deleveraging process could stifle the delicate economic recovery.

Surprisingly enough, little attention is paid to government debt, which amounts to the remaining one third of global debt. While increasing control is exercised over private sector debt and the borrowing of banks (see part 1 and 2 of the article), there is virtually no regulation of government debt. Indeed, the regulation aimed at prevention of bankruptcy among individuals, firms and banks becomes more advanced and rigid. On the contrary, governments are almost free in their borrowing: no limits, no regulation, no control. With minor exceptions like in case of sovereign debt ratings procedure. Until recently, most experts, when assessing risks to global financial stability, took all types of debt into consideration except sovereign debt. Does it mean we don't have to worry about the ability of the states to repay their lenders?

The cases of small European countries such as Greece, Ireland, Portugal, and some bigger countries (Spain and Italy) during the recent global financial crisis demonstrated that the risks are high and real. Only the provision of financial help from the European Central Bank, IMF and the EU, such as the 240 billion euros lent to Greece in 2010 and 2012 allowed the EU to solve the problem, and the measure was only partially successful. Even extraordinary financial injections failed to help the country address its imbalanced finance, and seven years after the launching of massive external emergency lending, even bigger countries, like Italy, remain exposed to financial stability risks. We can generalize that in Europe, insufficient EU-level debt regulation can be identified as a common feature. The lack of rigid regulation led to a high level of indebtedness within certain individual countries, which was detrimental to the system as a whole. The com-

mon feature for the EU countries could be identified as insufficient supervision and a lack of regulation from the governing bodies of the Union. The high indebtedness of the member states was at least in part the result of the incoherent system.

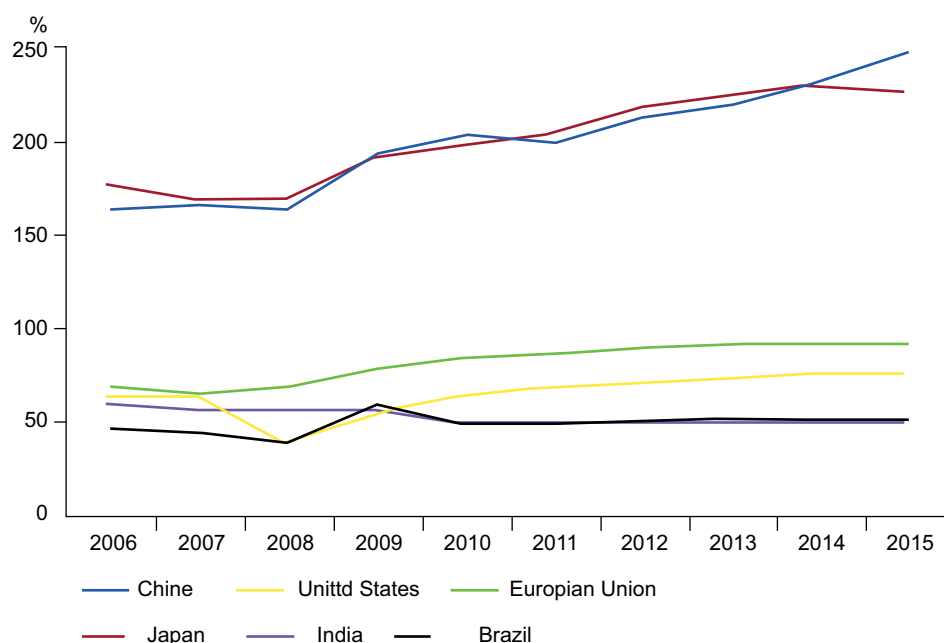


Fig. 1. Global Debt Sending a Warning to the Market

Source: IMF, OECD.

Let us look at it in another way. If a government is over-indebted, public budget cuts to vital services are inevitable, which constitutes a sacrifice in human well-being and long-term growth prospects. Moreover, in a globalized world, it's easy for one country's over-indebtedness to have spillover effects that affect regional or even global markets, as the recent Greek financial crisis demonstrated [Motoko Aizawa, 2016].

We'll try to summarize arguments in favor of the regulation of government debt:

1) Excessive levels of government debt often stifle economic growth.

The central banks of developed economies are putting more money into their respective economies in the form of quantitative easing (QE). Governments across the world are issuing more debt to fund their fiscal deficit. By issuing debt, they are aiming to increase their fiscal stimulus and accelerate economic activity in order to boost economic growth. When stimulating the economy by using fiscal policy, as countries did during the crisis and post-crisis period, governments overwhelmingly resort to debt financing. Some experts consider an increase in government debt to be an incentive for economic recovery and growth. Notably, the econometric models presented in the work of Jordà, Schularick, and Taylor suggest "that fiscal policy can significantly reduce the output cost of a financial crisis, provided that fiscal buffers are available prior to the crisis" [Jordà, Schularick, Taylor, 2016].

However, once it becomes excessive, government debt turns into an obstacle to economic growth. Three groups of economists have independently shown that high government debt negatively affects long-term economic growth. The general explanation for this correlation is the following: when government debt exceeds a certain threshold, private investment activity tends to ebb due to the lower value of government guarantees, as well as a lower level of trust in the government. This ultimately lowers future profits and leaves no space for future growth. According to empirical studies across advanced economies, the worst effects occur when the government debt to GDP ratio reaches a level of 90%. However, recent empirical evidence casts doubt on that level. Studies by Manmohan Kumar, Jaejoon Woo (IMF) [Kumar, Woo, 2010] and by Carmen Reinhart, Vincent Reinhart and Kenneth Rogoff (National Bureau of Economic Research) [Reinhart, Reinhart, Rogoff, 2012] have illustrated that once a country's government reaches higher-debt status, the economy tends to experience a slowdown in economic growth. Yet another study was carried out by Stephen Cecchetti, Madhusudan Mohanty, and Fabrizio Zampolli (the Bank for International Settlements), who found that high government debt had nearly the same negative effects on economic growth [Cecchetti, Mohanty, Zampolli, 2011].

Despite being challenged as questionable by some experts, such as Ugo Panizza and Andrea F. Presbitero (UNCTAD) [Panizza, Presbitero, 2014], the idea of potential harm to economic growth from an overleveraged government is gaining popularity among economists. Some have established that excessive debt levels lead to a slowdown in growth even in the absence of an economic crisis. The reason for this is that highly indebted borrowers will have to reduce investments sooner or later, and subsequently might even reduce consumption as they become less able to service their debt. Lenders will be less inclined to extend new loans to them.

One of the most popular ratios for sovereign debt, which compares it to GDP, has a certain defect. The use of the GDP seems unrelated, as such an approach ignores the asset side of the balance sheet, which matters when evaluating repayment capacity. Assets, like incomes, can be used to build up repayment flows. An alternative methodology is to use something akin to the sustainability criterion proposed by Arrow and others [Arrow, Dasgupta, Goulder et al., 2004] where private debt is assessed as sustainable whenever net asset worth follows a non-decreasing trend. The concept requires debt to evolve in line with the value of assets, corrected for valuation effects. A similar approach was shared later by Cuerpo and others [Cuerpo, Drumond, Lendvai, 2015].<sup>5</sup>

Some studies have identified the effect on growth of public debt.<sup>6</sup> Unfortunately, as already stated, there is no consensus on the threshold at which debt levels (private or government) begin to matter for growth or trigger deleveraging. Our assumption is that

<sup>5</sup> Cuerpo, C., I. Drumond, J. Lendvai, P. Pontuch, and R. Raciborski. 2015. "Private Sector Deleverage in Europe." *Economic Modelling* 44: 372–83.

<sup>6</sup> See, for example, Krugman, P. 1988. "Financing vs. Forgiving a Debt Overhang." *Journal of Development Economics* 29 (3): 253–68.; Reinhart, C. M., and K. S. Rogoff. 2010. "Growth in a Time of Debt." NBER Working Paper 15639, National Bureau of Economic Research, Cambridge; Baum, A., C. Checherita-Westphal, and P. Rother. 2013. "Debt and Growth: New Evidence for the Euro Area." *Journal of International Money and Finance* 32: 809–21.



the levels of debt currently revealed should start to be considered excessive, potentially endangering global financial stability.

2) Excessive levels of government debt might cause potential harm to global financial stability.

Numbers speak volumes. If we look at the scale of government debt compared to GDP, the rapid increase is striking (see the Graph 1 below).

However, a comparison with GDP doesn't provide the complete picture, simply because the whole value of GDP couldn't be spent on repaying the debt. In principle, one could use government debt to GDP ratios to reach certain judgments about the situation, but this approach ignores the asset side of the balance sheet, which is crucial for the adequate evaluation of repayment capacity. The capacity to pay back debt is most important in terms of sustainable growth. An alternative would be to compare government debt to some other indicators, such as gross national savings, or the total revenues of the central government. As we can see from Graph 3, government debt in G20 dramatically exceeds government revenues and national savings, and the trend is still upward. The government debt to official reserves ratio is quite similar: it decreased during the economically prosperous period of 2000–2006, but started to grow again after the recent financial crisis, and in the year 2015 reached the level of 715.88, which means that we could not rely on official reserves in the event of an emergency.

It can easily be asserted that the extremely high level of government debt among major economies poses a threat global financial stability. Governments, as lenders of last resort, are expected not just to provide public goods and confront the economic cycle, but also to provide financial assistance in the form of loans to banks and the non-financial sector in the aftermath of financial shocks. If systematically important banks and companies face the risk of bankruptcy again, governments will be expected to help them. But who will help these governments as they too, one by one, face the risk of default?

Obviously, international financial institutions such as the World Bank and IMF form a kind of a financial buffer that plays a crucial role in the event of such emergencies. Despite being criticized for its insufficient efficiency and agility, the IMF managed to help countries in need during the recent financial crisis. Nevertheless, it is obvious that the Fund's resources, measuring in the billions of US dollars, are no match for global government debt, which measures in the trillions (see the Table below), and in the event of a global government debt crisis, the IMF can't be expected to assure the financial stability of the world. After the financial crisis of 2007–2008, the global financial system has undergone several reforms aimed at improving its stability and enhancing its effectiveness. But even though established institutions are accumulating financial resources and new institutions are being developed, the capacity of the global financial system still hasn't responded adequately and proportionally to the exponentially increasing risks.

3) Excessive levels of government debt clash with the idea of sustainable and inclusive economic growth.

According to the 2030 Agenda for Sustainable Development, the G20 countries are committed to *“ensure that no one is left behind in our efforts to eradicate poverty,*

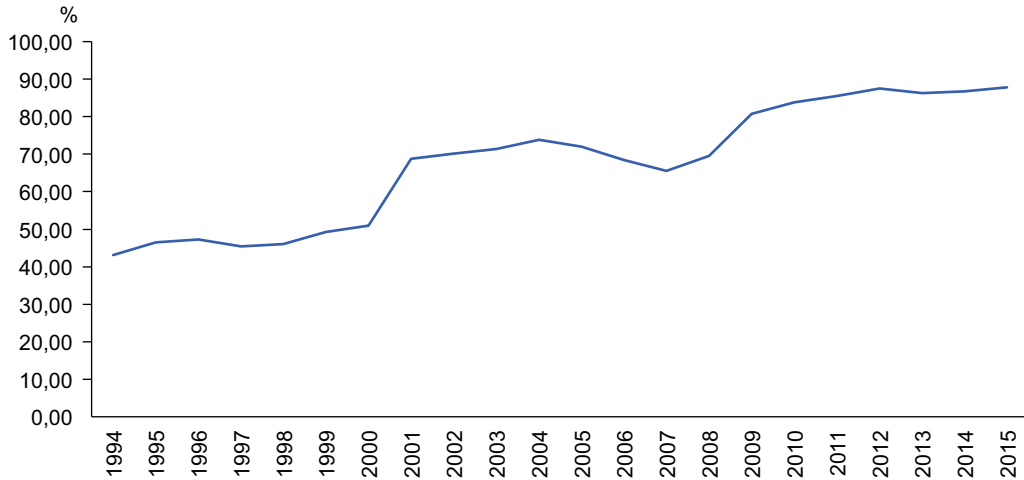


Fig. 2. Gross Government Debt to GDP Ratio for G20 countries

Source: calculated by authors according to IMF Data.

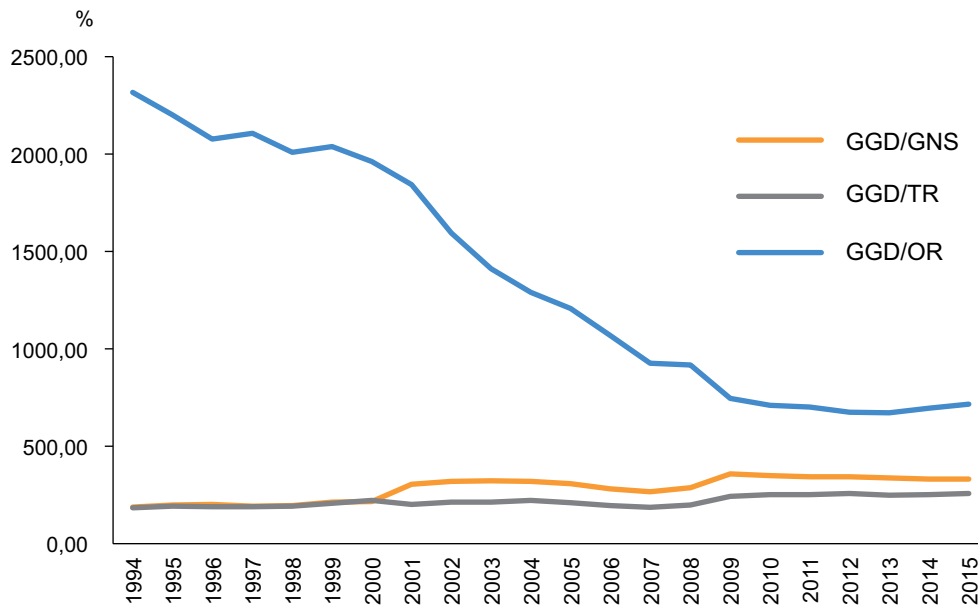


Fig. 3. Public Debt as a % of Gross National Savings and Government Total Revenues

Source: calculated by authors according to IMF Data.

*achieve sustainable development and build an inclusive and sustainable future for all.*” Nevertheless, continuously increasing government borrowing at the expense of future development does not conform to the goal of sustainable growth declared by G20. Additionally, it contradicts with the idea of inclusiveness that implies considering the interests of all social groups, because, ultimately, citizens must pay for government debt

*Table 2.* Government debt to IMF resources ratio (total value of SDRs)

Year	Ratio	Year	Ratio	Year	Ratio
1994	4746	2004	8711	2010	7181
1996	5882	2005	9141	2011	8068
1998	3860	2006	9338	2012	8383
2000	4582	2007	10020	2013	8465
2001	6162	2008	11541	2014	8734
2003	7511	2009	12747	2015	8366

*Source:* calculated by authors according to IMF and World Bank Data.

restructuring. Indeed, if governments are bankrupt, citizens would suffer most again, as in the case of the 2008 financial crisis and bank bailout. Socially responsible global financial governance should take into consideration the seriousness of the governmental debt issue in a similar manner to how it treated the bank's resilience issue.

That being said, a need for reigning in government borrowing must be acknowledged as an important objective. Some experts and some institutions have started to acknowledge the relevance of the issue. The talk is about the global governance gap in the key area. Motoko Aizawa made a point we fully share, stating in his study on global debt that we currently lack an effective insolvency apparatus that could resolve sovereign debt crises in a fair, speedy and sustainable manner [Motoko Aizawa, 2016]. The pioneer in dealing with the issue is the European Union, which has already taken some steps to establish government debt regulation. These are the introduction of the Maastricht criteria, the implementation of the budget coordination mechanism, and the development of stability and convergence programs. We believe such practices should be taken by the G20 countries, which account for approximately 86% of global GDP and 87% of global government debt.<sup>7</sup> We advance the idea that the meaningful solution to the global public debt governance issue might be the introduction of an agreement akin to the Basel Agreements in banking that have already proved their effectiveness.

Today international institutions and experts explore ways to ensure responsible lending and borrowing by G20 governments. As suggested, responsible lending, in accordance with 2012 UNCTAD Principles on Promoting Responsible Sovereign Lending and Borrowing and the 2011 EURODAD Responsible Finance Charter, could protect both debtor and creditor nations.

However, in our view, it's unrealistic to expect individual governments to engage in and promote responsible lending and borrowing policy. Imagine a government in desperate need of funds that refuses a gracious offer from an outside lender to provide the necessary financing... The notion of convincing lenders that they have to be more responsible is also illusory. Given the nature of the activity, they are willing to get back their money and profits anyway. You do not have to convince them or guide them according to any type of codex. The only thing that matters is that a high level of risk

<sup>7</sup> Calculated by authors according to IMF Data.

awareness is required. The more the lenders realize that global debt levels have reached an untenable point, the more prudent they will be in their lending policies.

Additionally, in terms of the Sustainable Development Goals, it is reasonable to assess whether a country's debt payments are preventing the financing of human and environmental needs. The existing IMF-World Bank Debt Sustainability Framework should be broadened and applied to advanced and emerging economies, rather than just to low-income states as it is now. Their extremely high levels of debt endanger global financial stability.

We believe the G20 should make a significant contribution to increasing public awareness of risks that come from high debt levels for both developed and developing countries. The most critical indicator for investors is trust. Once investors lose their trust, they stop giving money. Consequently, the more people are aware of risks thanks to the G20's effort, the more rational and efficient their investment activity will become. Lack of monitoring is another issue the G20 could try to tackle. Who will reign in countries which opt to pursue insane borrowing policies? The need is there for the introduction of comprehensive public debt mechanism, based upon the early warning system of global financial supervision.

## Conclusion

Rapidly growing debt levels, both private and public, and both in the banking and non-financial sector, present a real threat to global financial stability. In the age of financial globalization, every crisis can be expected to spread far more quickly and widely than ever before, contributing to financial shocks around the world. This untenable level of borrowing is detrimental to global economic growth and resilience, and must be addressed if the international community hopes to accomplish the development goals shared by the world's largest economies and the United Nations.

It would be incorrect to say that the issue is not being considered. It is. But the way it is being addressed is far too "narrow" in scope, given the potential consequences. The problem requires much broader consideration: at the global level; with enough attention paid to both private and public debt. International efforts have been made to address and upgrade bank capital requirements, but no major sector-financed fund exists to help them; this could be achieved with the introduction of the FTT at the G20 level. While such a fund exists for governments in the form of the IMF, the monetary resources available lag far behind rapidly-growing public and non-financial sector debt levels.

After the start of the global financial crisis, the amount of public debt in advanced economies and some systematically important emerging economies rose rapidly, presenting a real threat to the global financial stability and economic development. Governments tend to borrow without limits, but this can't continue endlessly. Economists and policy makers must tend to this issue in earnest due to its high relevance. In a globalized world, if major economies fail under the burden of public debt, there will be no adequate response and assistance from the international financial institutions. Then real economic chaos will ensue, compared to which the global financial crisis will be regarded as a kind of "slight instability."

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# Глобальная долговая проблема и проблема устойчивости мировой экономики<sup>1</sup>

*В.Н. Зуев, Е.Я. Островская, Е.С. Фролова*

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**Зуев Владимир Николаевич** — д.э.н., профессор кафедры торговой политики Национального исследовательского университета «Высшая школа экономики»; Российская Федерация, 101000, Москва, ул. Мясницкая, д. 20; E-mail: vzuev@hse.ru

**Островская Елена Яковлевна** — к.э.н., доцент департамента мировой экономики Национального исследовательского университета «Высшая школа экономики»; Российская Федерация, 101000, Москва, ул. Мясницкая, д. 20; E-mail: eostrovskaya@hse.ru

**Фролова Екатерина Сергеевна** — ассистент департамента мировой экономики Национального исследовательского университета «Высшая школа экономики»; Российская Федерация, 101000, Москва, ул. Мясницкая, д. 20; E-mail: esfrolova@icloud.com

*Статья посвящена рассмотрению проблем растущей задолженности и финансовых рисков сквозь призму концепции устойчивого развития и экономического роста. Данной концепции уделяется все больше внимания в связи с острой необходимостью координации действий на национальном и международном уровнях. Господствующие экономические теории недооценивают возможные риски. Несмотря на большое количество мер, принятых для обеспечения финансовой стабильности в мире после глобального финансового кризиса, риски остаются высокими. Это связано в первую очередь с появлением новых угроз и вызовов для устойчивости глобальной финансовой системы. Рассмотрев нововведения в области банковского регулирования с точки зрения финансовой устойчивости и социальной справедливости, авторы приходят к выводу, что направление вектора реформ задано верно, но глобальная финансовая система остается пока недостаточно резистентной к новым вызовам. Предложенная авторами идея заключается в том, что введение ведущими экономиками мира налога на финансовые операции в качестве инструмента понижения избыточной спекулятивной активности не приведет к замедлению развития экономики, чем аргументируют свою позицию противники данного налога. Наоборот, введение налога на финансовые операции будет выполнять две важные функции: станет социально ответственной мерой и снизит уровень угроз финансовой стабильности. Авторами также выдвинуто предположение относительно того, что все более серьезный вызов мировой финансовой стабильности и устойчивому росту представляет постоянно растущая задолженность нефинансового сектора. Доминирующие оценки степени угроз беспрецедентной задолженности для мировой экономики в своем большинстве неадекватны, а эффективных и социально справедливых мер по ее сокращению не выработано. Если в условиях глобализации крупные экономики не выдержат долговой нагрузки, международные финансовые институты будут не в состоянии предложить адекватную поддержку. Нарастающие финансовые дисбалансы создают риски обеспечения экономической стабильности, рассматриваемой авторами в качестве ключевого фактора для реализации Целей устойчивого развития, сформулированных ООН в 2015 г. в Программе устойчивого развития 2030.*

**Ключевые слова:** долги нефинансового сектора; финансовая стабильность; устойчивый и инклюзивный рост; урегулирование долговой проблемы; налог на финансовые операции

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# Problems of Development and Integration of the Securities Market in the Countries of the EAEU<sup>1</sup>

A. Bayadyan, A. Baghdasaryan

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**Ashot Bayadyan** – Doctor, Professor, Head of the Chair of Finance and Credit, Economic Department, National Agrarian University of Armenia; 74, Teryan St., Yerevan 0009, Republic of Armenia; E-mail: info@anau.am

**Areg Baghdasaryan** – PhD, Associate Professor, Chair of Finance and Credit, Economic Department, National Agrarian University of Armenia; 74, Teryan St., Yerevan 0009, Republic of Armenia; E-mail: aregbag@gmail.com

*The article is devoted to studying problems associated with the development and integration of the securities market in the countries of the Eurasian Economic Union. The article examines the present state, possibilities and problems pertaining to the development of the securities market and, in particular, the regulated market. The development and integration of the securities market is an important factor affecting the potential for economic development and sustainable economic growth in the countries of the Eurasian Economic Union. The subject of this study is the development and integration problems affecting the securities market in the countries of the Eurasian Economic Union.*

*The securities market in the countries of the Eurasian Economic Union has sufficient integration opportunities. Potential exists in all segments of the securities market, but more opportunities exist in the debt securities market. The deepening of the integration processes in the securities market of the countries of the Eurasian Economic Union could have a positive impact on increasing the investment opportunities of the economies of these countries. This, in turn, can have a positive impact on the growth of the gross domestic product, reducing unemployment and improving the social status of the population. However, the creation of a single or integrated exchange market should be accompanied by the integration of depository processes as well as the settlement and clearing systems, and the synchronizing of the regulatory and legal framework governing the securities market. Particular attention is required to study the problems associated with fixing and transferring property rights to the securities and protecting the interests of investors. The integration processes of depository, settlement and clearing systems may include the introduction of a nominee holder for central depositories and the establishment of correspondent relations between the central depositories of the securities of the countries of the Eurasian Economic Union. For the development of integration processes both in the regulated market and between depository, settlement and clearing systems, the most important prerequisite is synchronization and, in the future, will be the unification of the regulatory and legal framework governing the securities market.*

**Key words:** the securities market; regulated market; infrastructures of the securities market

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<sup>1</sup> The editorial board received the article in September 2017.



The development of the securities market is an important factor affecting the potential for economic development and sustainable economic growth in the EAEU countries. After the collapse of the Soviet Union and the transition to a market economy in the post-Soviet space, disparate financial markets were formed. This disparity is especially evident in the securities market. The problems of the disparity of the securities market are also exacerbated by the presence of significant differences in the regulation of the securities market among countries in the region, the principles of building a depository, settlement and clearing systems, as well as fixing and transferring proprietary rights and other property rights to the securities.

A rather large number of studies have been devoted to the analysis of the problems affecting the development of the securities market in the EAEU countries over the past twenty-five years. In most studies, the problems associated with the development of the securities markets are addressed by individual countries within the EAEU. Some studies help address the development of individual segments or functions of the securities market.

The investment functions of the securities market have been studied in detail. They address the peculiarities and problems facing the financing of investments through securities market instruments [Salnazaryan, 2003; Karev, 2012; Semernina, 2012], the development trends of individual and institutional investment in the securities market [Korneev, 2007; Statsenko, 2012], issues related to the issuance and placement of securities [Glushetsky, 2012; Gevorgyan, 2013], organizational and methodological issues surrounding the securitization process and its role in financing investment projects [Tereshchenko, 2011; Pavelieva, 2013], as well as problems of increasing the effectiveness of corporate governance [Margaryan, 2013]. Issues concerning the formation and development of trading, depository and settlement systems in the securities market [Mirkin, 1995; Zakharov et al, 2002; Puchkov, 2003], as well as questions about the modernization of the securities market's infrastructure [Shalisco, 2013] were studied intensively. The problems affecting the formation of the securities market in post-socialist countries [Kozlov, 2002], and problems stemming from crises on the securities market [Stanik, 2013] are considered. The problems associated with the development of the securities market were mainly considered in the context of accelerating economic growth [Mirkin, 2002; Dementyev, 2009; Bessarabova, 2013], as well as from the point of view of the development of certain segments of the securities market [Kiselev, 2010], regional markets [Miller, 2013] or market development in foreign countries [Kudinova, 2005; Vakhrushin, 2009]. The problems associated with the regulation of the securities market were considered mainly in the context of the regulation of the entire financial system [Tsarikhin, 2008; Fabozzi et al., 2009; Bolonin, 2010; Rzhetskaya, 2012], as well as from the point of view of self-regulation mechanisms in financial markets [Ilyin, 2012] and the regulation of the services of professional securities market entities [Vilkova, 2007; Gorlovskaya, 2010]. In recent years, intense research has been carried out in the field of development of integration processes in the securities market [Rubtsov, 2000; Fedorova, 2011], particularly from the point of view of formation of the Com-

mon Economic Space of the Russian Federation, Belarus and Kazakhstan [Ilyas, 2012; Niyazbekova, 2014].

However, the study of the problems affecting the development and integration of the securities market cannot be limited to the study of only one or several market segments. It is also important to study the problems associated with development and the integration of settlement, clearing and depository systems in comparison with problems related to development and integration in the exchange market. In light of the possibilities associated with creating a common economic space, a comprehensive study of the prospects for the integration of the securities market of the EAEU countries becomes particularly important.

The purpose of this study is to develop recommendations for the development and integration of the stock markets of the EAEU countries. Based on the research objectives, the article examines the present state and peculiarities of the development of the securities market in the EAEU countries, as well as the opportunities and prospects for the integration of the securities market in the EAEU countries.

After the collapse of the USSR, the development and integration of the securities market in the post-Soviet space was primarily attempted at the national level. This stage, in most of the EAEU countries, can be considered already completed. Thus, if at the end of the last millennium there were four stock exchanges on the territory of the Republic of Armenia, at present there is only one stock exchange – NASDAQ OMX Armenia.<sup>2</sup> Integration processes were also initiated in the field of depository and settlement-clearing systems. Currently, the introduction of a single depository and settlement and clearing system is in its final stage, which is also the structural division of NASDAQ OMX [Baghdasaryan, 2013, pp. 167–177]. Similar trends have been observed in the Russian market. Thus, at the end of 2011 there was the merger of two main trading systems in the Russian securities market – RTS and MICEX.<sup>3</sup> As a result of the merger, the Moscow Exchange was formed – the largest securities market trading system in the post-Soviet space. Integration processes also took place in the sphere of depository, settlement and clearing systems operating on the territory of the Russian Federation. As part of the Moscow Exchange group, a company was formed that provides all types of depository and settlement services on the securities market. This company – the National Settlement Depository, was given the status of a central depository in 2012.<sup>4</sup> In accordance with the legislation of the Russian Federation, the status of a central depository can be assigned to only one legal entity. Thus, both in the Republic of Armenia and in the Russian Federation, integrated trading, depository and settlement-clearing systems have been formed in the securities market [Baghdasaryan, 2012, p. 10]. Similar trends have been observed in other EAEU countries.

The processes leading to the further integration of the securities market are related to the integration of national trading, depository, settlement and clearing systems operating in different countries. Such integration processes can include the creation and strengthening of links between national systems, the synchronization of the regulatory

<sup>2</sup> NASDAQ OMX Armenia. Available at: <http://www.nasdaqomx.am>.

<sup>3</sup> Moscow Exchange (MICEX-RTS). Available at: <http://www.moex.com>.

<sup>4</sup> National Settlement Depository. Available at: <http://www.nsd.ru>.

framework, regulating the securities market, and the formation of supranational systems. In the sphere of international integration, different countries in the post-Soviet space began to adhere to different priorities. In the Baltic region, for example, the integration processes were mainly aimed at synchronizing national legislation with the legislation of the European Union. In these countries, both regulated securities market operators and settlement system operators (central securities depositories) are part of the Nasdaq group [Baghdasaryan, 2013, p. 189]. A unified trading system has been established in the Baltic region. The central depositories of securities of Lithuania, Latvia and Estonia have links between themselves, through which ownership and other property rights are recorded; these also perform the function of a settlement system. There is also the integration of the Nasdaq Baltic securities market with other Nasdaq markets, particularly with the Nordic market. Correspondent relations with depository, settlement and clearing systems operating in the territory of the European Union, such as Clearstream or Euroclear, have been formed. International integration processes are also deepening in the territory of the EEA countries. Significant integration opportunities exist in the securities market of the Russian Federation, Belarus and Kazakhstan.

One of the aspects of the integration processes of the securities market occurring within the EAEU is the unification of stock exchanges, as well as depository, settlement and clearing systems, through the acquisition of participation (shares) and (or) reorganization. In this vein, integration processes take place on the exchange market of the Moscow Exchange.

Another goal of the integration processes of the securities market within the EAEU countries is to develop cooperation between the operators of the aforementioned exchanges and related depository, settlement and clearing systems. This aspect of the integration processes is observed in the relations between the Moscow Exchange, the Belarusian Currency and Stock Exchange and the Kazakhstan Stock Exchange.<sup>5, 6, 7</sup>

Especially important is the development of integration processes between the Russian and Armenian stock markets. The importance of such integration is due to the fact that on the one hand, the main securities exchange operating on the territory of the Russian Federation, the Moscow Exchange, is the initiator of integration processes with securities exchanges operating on the territory of the Republic of Belarus and the Republic of Kazakhstan, the Belarusian Currency and Stock Exchange and the Kazakhstan Stock Exchange; while on the other hand, the only stock exchange operating on the territory of the Republic of Armenia, NASDAQ OMX Armenia, is already tied to one of the leading operators of exchange market, depository, settlement and clearing systems in the world; one it shares with the three Baltic countries – the Nasdaq group [Baghdasaryan, 2013, p. 189]. Thus, the development of such integration processes can become the starting point for the development of integration processes between the systems operating in the territory of the European Union and the Eurasian Economic Union. However, the creation of unified and integrated systems in the exchange market also implies the integration of depository, settlement and clearing systems, as well

<sup>5</sup> Belarusian Currency and Stock Exchange. Available at: <http://www.bcse.by>.

<sup>6</sup> Kazakhstan Stock Exchange. Available at: <http://www.kase.kz>.

<sup>7</sup> Moscow Exchange (MICEX-RTS). Available at: <http://www.moex.com>.

as the synchronization of the regulatory and legal framework governing the securities market. In particular, special attention needs to be given to the study of problems related to fixing and transferring property rights to securities and protecting the interests of investors.

In order to disclose the integration opportunities of the securities market, it is also important to study the basic indicators of the exchange market, taking into account the peculiarities of the development of the securities market in the territory of the EAEU. We've selected the number of issuers whose shares are admitted to trading on the exchange market, the market capitalization of shares admitted to trading on the exchange market, the volume of trading in shares and debt securities, as well as the volume of trade in currency and credit resources on the exchange market.

The number of issuers whose shares are admitted to trading on the exchange market in the EAEU countries is shown in Table 1.

*Table 1.* The number of issuers whose shares are admitted to trading on the exchange market in the EAEU countries, 2011–2015

Country	Number of issuers whose shares are admitted to trading on the exchange market				
	2011	2012	2013	2014	2015
Armenia	11	11	11	11	10
Belarus	2,335	2,359	67	67	62
Kazakhstan	71	81	80	77	85
Kyrgyzstan	13	18	20	21	23
Russian Federation	341	271	284	281	254

*Source:* compiled by the authors on the basis of exchange statistics of the countries of the EAEU.<sup>8, 9, 10</sup>

Table 1 shows that the Russian Federation is in first place among the countries of the EAEU in terms of the number of companies listing shares on the local exchange market. In 2015, the shares of 254 issuers were traded via Russia's Moscow Exchange. The Republic of Kazakhstan and the Republic of Belarus are in second and third place among the EAEU countries in terms of the number of issuers whose shares are traded on the local exchange market. The number of listed shares in these countries, however, is much less than in the Russian Federation. In 2015, the shares of 85 and 62 issuers were listed, respectively, in the Republic of Kazakhstan and the Republic of Belarus. The smallest number of issuers whose shares are traded on the local exchange market are registered in the Kyrgyz Republic and the Republic of Armenia – 23 and 10, respectively.

<sup>8</sup> Bulletins of stock exchange statistics: 2006–2014, International Association of Exchanges of the CIS Countries. Available at: <http://mab.micex.ru>.

<sup>9</sup> Directories of stock exchanges and depositaries – members of the IAE CIS. 2006–2015, International Association of Exchanges of the CIS Countries. Available at: <http://mab.micex.ru>.

<sup>10</sup> FEAS Books: 2009–2015, Federation of Euro-Asian Stock Exchanges. Available at: <http://www.feas.org>.

The market capitalization of shares traded on the local exchange markets in the EAEU countries is presented in Table 2.

*Table 2.* Exchange capitalization of the stock market in EAEU countries, 2011–2015

Country	Exchange capitalization of the stock market, billion US dollars				
	2011	2012	2013	2014	2015
Armenia	0.1	0.1	0.2	0.2	0.2
Belarus	1.1	0.4	3.7	0.6	0.5
Kazakhstan	22.6	23.5	26.3	23.0	34.9
Kyrgyzstan	0.2	0.2	0.2	0.2	0.2
Russian Federation	771.2	827.3	776.3	409.2	393.2

*Source:* compiled by the authors on the basis of exchange statistics of the countries of the EAEU.<sup>11, 12, 13</sup>

As can be seen from Table 2, the Russian Federation is in first place among the EAEU countries in terms of stock market capitalization. In the Russian Federation, stock market capitalization amounted to 393.2 billion US dollars in 2015. Second place in terms of stock market capitalization is held by the Republic of Kazakhstan. In the other EAEU countries, stock market capitalization is significantly less than in the Russian Federation or the Republic of Kazakhstan. Exchange capitalization of the equity market in 2015 in the Republic of Kazakhstan was 34.9 billion US dollars, in the Republic of Belarus it was 0.5 billion US dollars, and in the Republic of Armenia and the Kyrgyz Republic it was 0.2 billion US dollars.

The significant difference between the number of issuers whose shares are admitted to trading on the exchange market and the stock market capitalization in the EAEU countries is due to the specifics of regulation of the securities market and the volume of the economy in the respective EAEU countries. Thus, if the Russian Federation has 25 times as many issuers as Armenia whose shares are listed on the country's exchange market, then its volume of exchange capitalization totals almost 2,000 times.

Volumes of stock trading on the exchange market in the EAEC countries are presented in Table 3.

Table 3 shows that the Russian Federation is first among the EAEU countries in terms of equity market trading volume. In the Russian Federation, equity trading volume amounted to about 139.2 billion US dollars in 2015. The Republic of Kazakhstan demonstrated the second highest volume of equity market trading. In the rest of the EAEU countries, the volume of equity market trading is significantly less than in the Russian Federation and the Republic of Kazakhstan. The volume of equity market trading in 2015 in the Republic of Kazakhstan amounted to almost 4 billion dollars, whereas

<sup>11</sup> Bulletins of stock exchange statistics: 2006–2014, International Association of Exchanges of the CIS Countries. Available at: <http://mab.micex.ru>.

<sup>12</sup> Directories of stock exchanges and depositaries – members of the IAE CIS. 2006–2015, International Association of Exchanges of the CIS Countries. Available at: <http://mab.micex.ru>.

<sup>13</sup> FEAS Books: 2009 – 2015, Federation of Euro-Asian Stock Exchanges. Available at: <http://www.feas.org>.

in the Republic of Armenia this figure was 9.1 million dollars; in the Republic of Belarus it was 8.3 million dollars and in the Kyrgyz Republic it was 17.5 million dollars.

*Table 3.* The volume of stock trading on the exchange market in the EAEU countries, 2011–2015

Country	Volume of trade in shares, mln. USD				
	2011	2012	2013	2014	2015
Armenia	0.5	1.0	3.7	60.6	9.1
Belarus	50.4	90.0	57.3	46.6	8.3
Kazakhstan	1,089.2	1,377.6	783.6	961.1	3,956.2
Kyrgyzstan	28.0	22.5	24.7	21.6	17.5
Russian Federation	554,067.3	372,619.7	266,894.9	263,180.9	139,167.2

*Source:* compiled by the authors on the basis of exchange statistics of the countries of the EAEU.<sup>14, 15, 16</sup>

The volumes of trade in debt securities on the exchange market in the EAEU countries are presented in Table 4.

As Table 4 illustrates, the Russian Federation holds first place among the EAEU countries in terms of the volume of trade in debt securities on the exchange market. In the Russian Federation, the volume of debt market trading in 2015 amounted to about 116.6 billion US dollars. The Republic of Kazakhstan and the Republic of Belarus witnessed the second and third largest annual volumes of debt market trading in that year (4.9 and 4.5 billion US dollars, respectively). The volume of debt market trading is significantly less in the Republic of Armenia (29.8 million US dollars). The smallest amount of market trading in debt securities was in the Kyrgyz Republic (5.1 million US dollars).

The disproportionate development of the securities market and, especially, the stock market in the EAEU countries is due to various factors, both objective and subjective in nature. The objective factors include the differences in the size of the countries' respective economies and the market volumes in the different countries of the EAEU. These differences, in turn, affect a number of other differences, such as differences in market competition, market liquidity and pricing in the market. In addition, there are a number of factors of a subjective nature that affect the securities market, primarily the stock market. Such factors include differences in the culture of corporate governance and public administration, the degree of protection of investors' rights and interests and the stability of the political situation in the country.

One of the main prerequisites for the development of integration processes in the market is the "existence" of this market. The stock market in some EAEU countries

<sup>14</sup> Bulletins of stock exchange statistics: 2006–2014, International Association of Exchanges of the CIS Countries. Available at: <http://mab.micex.ru>.

<sup>15</sup> Directories of stock exchanges and depositaries – members of the IAE CIS. 2006–2015, International Association of Exchanges of the CIS Countries. Available at: <http://mab.micex.ru>.

<sup>16</sup> FEAS Books: 2009–2015, Federation of Euro-Asian Stock Exchanges. Available at: <http://www.feas.org>.

*Table 4.* The volume of trade in debt securities on the exchange market in the EAEU countries, 2011–2015

Country	Volume of trade in debt securities, mln. USD				
	2011	2012	2013	2014	2015
Armenia	15.7	11.4	44.3	82.7	29.8
Belarus	2,280.5	4,707.5	3,928.4	5,541.7	4,520.1
Kazakhstan	9,762.5	3,712.9	4,044.9	8,421.8	4,910.2
Kyrgyzstan	1.3	2.1	5.4	5.3	5.1
Russian Federation	1,627,303.9	2,246,430.0	396,993.3	225,841.2	116,564.7

*Source:* compiled by the authors on the basis of exchange statistics of the countries of the EAEU.<sup>17, 18, 19</sup>

is almost non-existent, there are no liquid market instruments, there are no pricing mechanisms, there is no quotation, there is no interest in the market among potential issuers and investors, and there are no effective mechanisms for protecting the rights and interests of shareholders. From the data shown in Tables 3–4, it can be seen that the debt securities market, unlike the equity market, is developed to a certain extent in almost all EAEU countries. This circumstance indicates that the integration opportunities of the debt securities market are largely higher than the integration opportunities of the stock market. In addition, the development of integration processes in the debt securities market is less dependent on the differences in the culture of corporate governance. Therefore, special attention should be given to the development of integration processes in this market. To identify the integration opportunities of certain segments of the debt securities market, it is important to study the indicators of the volume of trade in corporate debt securities and government securities. The market for government securities is the most promising segment of the market from the point of view of the development of integration processes. This is due to the fact that sovereign debt is among the most reliable financial instruments in the EAEU countries. Equally important is the fact that EAEU countries have similar principles with respect to public administration and the servicing of public debt.

The volume of trade in corporate debt securities on the exchange market in the EAEU countries is presented in Table 5.

Table 5 shows that the Russian Federation occupies the first place among the EAEU countries by the volume of trade in corporate debt securities on the exchange market. The volume of trade in corporate debt securities on the exchange market in 2015 amounted to about 60.7 billion US dollars in the Russian Federation. Second and third places in terms of the volume of exchange-based corporate debt trading were held by Kazakhstan and Belarus (3.5 and 2 billion dollars, respectively). The volume of

<sup>17</sup> Bulletins of stock exchange statistics: 2006–2014. International Association of Exchanges of the CIS Countries. Available at: <http://mab.micex.ru>.

<sup>18</sup> Directories of stock exchanges and depositaries – members of the IAE CIS. 2006–2015. International Association of Exchanges of the CIS Countries. Available at: <http://mab.micex.ru>.

<sup>19</sup> FEAS Books: 2009–2015. Federation of Euro-Asian Stock Exchanges. Available at: <http://www.feas.org>.

exchange-based corporate debt trading in 2015 was significantly smaller in Kyrgyzstan (5.1 million dollars). The smallest volume of debt securities trading on the exchange market was recorded in Armenia (4.4 million dollars).

*Table 5.* The volume of trade in corporate debt securities on the exchange market in the EEA countries, 2011–2015

Country	Volume of trade in corporate debt securities, mln. USD				
	2011	2012	2013	2014	2015
Armenia	1.8	1.0	7.1	11.2	4.4
Belarus	1,150.8	1,138.6	1,930.4	2,392.7	2,020.1
Kazakhstan	2,010.8	2,165.3	2,789.9	2,708.8	3,532.8
Kyrgyzstan	1.3	2.1	5.4	5.3	5.1
Russian Federation	1,225,153.2	1,848,335.6	193,921.9	112,782.5	60,742.7

*Source:* compiled by the authors on the basis of exchange statistics of the countries of the EAEU.<sup>20, 21, 22</sup>

The volume of exchange-based sovereign debt trading in the EAEU countries is presented in Table 6.

As can be seen from Table 6, the Russian Federation far outpaces its EAEU peers in terms of the volume of sovereign debt traded locally on the exchange market. The volume of sovereign debt traded on the national securities exchange in 2015 amounted to about 54.3 billion US dollars. Belarus and Kazakhstan place second and third in terms of the volume of trade in government securities on the exchange market (2.5 and 1.3 billion dollars, respectively). The volume of sovereign debt trading is significantly smaller in Armenia (25.4 million dollars). In Kyrgyzstan, government securities are not traded on the exchange market at all.

From the data shown in Tables 5 and 6, it can be seen that the corporate securities market is the most developed in the Russian Federation and at its least developed in Armenia and Kyrgyzstan. In Armenia, the majority of instruments traded in the securities market are government securities. This is due to both the low level of corporate governance development and the structure of investors in the securities market. One of the main groups of investors in the securities market are banks that require reliable, highly liquid instruments with low credit risk for repo transactions with the Central Bank of the Republic of Armenia. A similar situation is also observed in other countries of the EAEU. However, in these countries, along with the development of the government securities market, we can see also some development of the corporate securities market. The development of integration processes in the securities market can help spread the positive experience between the EAEU countries.

<sup>20</sup> Bulletins of stock exchange statistics: 2006–2014, International Association of Exchanges of the CIS Countries. Available at: <http://mab.micex.ru>.

<sup>21</sup> Directories of stock exchanges and depositaries – members of the IAE CIS. 2006–2015, International Association of Exchanges of the CIS Countries. Available at: <http://mab.micex.ru>.

<sup>22</sup> FEAS Books: 2009–2015, Federation of Euro-Asian Stock Exchanges. Available at: <http://www.feas.org>.



*Table 6.* The volume of exchange-based sovereign debt trading in the EAEU countries, 2011–2015

Country	Volume of trade in government securities, mln. USD				
	2011	2012	2013	2014	2015
Armenia	13.9	10.4	37.2	71.5	25.4
Belarus	1,129.7	3,516.0	1,918.8	3,141.2	2,500.0
Kazakhstan	7,751.7	1,547.6	1,255.0	5,711.1	126.4
Kyrgyzstan	0	0	0	0	0
Russian Federation	402,149.8	398,094.7	188,611.1	103,233.8	54,272.9

*Source:* compiled by the authors on the basis of exchange statistics of the countries of the EAEU.<sup>23, 24, 25</sup>

The volume of foreign currency trading on the exchange market in the EAEU countries is presented in Table 7.

*Table 7.* The volume of foreign currency trading on the exchange market in the EAEU countries, 2011–2015

Country	Foreign currency trading volume, mln. USD				
	2011	2012	2013	2014	2015
Armenia	760.4	753.7	714.5	744.5	313.7
Belarus	17,002.5	30,047.8	31,771.3	30,044.3	30,012.1
Kazakhstan	106,179.9	96,063.7	120,583.0	188,295.8	190,034.1
Kyrgyzstan	0	0	0	0	0
Russian Federation	2,938,156.7	3,760,597.0	4,878,451.6	5,979,928.8	5,980,024.1

*Source:* compiled by the authors on the basis of exchange statistics of the countries of the EAEU.<sup>26, 27, 28</sup>

Table 7 shows that the Russian Federation holds first place among the EAEU countries in terms of foreign currency trading on its local exchange market. The volume of foreign currency trading on Russia's exchange market in 2015 amounted to about 6 trillion US dollars. Kazakhstan holds second place in terms of the volume of foreign currency trading on its exchange market; in 2015 it amounted to 190 billion USD. In the rest of the EAEU countries, the volume of foreign currency trading on the local exchange market is significantly less than in the Russian Federation and the Republic

<sup>23</sup> Bulletins of stock exchange statistics: 2006–2014, International Association of Exchanges of the CIS Countries. Available at: <http://mab.micex.ru>.

<sup>24</sup> Directories of stock exchanges and depositaries – members of the IAE CIS. 2006–2015, International Association of Exchanges of the CIS Countries. Available at: <http://mab.micex.ru>.

<sup>25</sup> FEAS Books: 2009–2015, Federation of Euro-Asian Stock Exchanges. Available at: <http://www.feas.org>.

<sup>26</sup> Bulletins of stock exchange statistics: 2006–2014, International Association of Exchanges of the CIS Countries. Available at: <http://mab.micex.ru>.

<sup>27</sup> Directories of stock exchanges and depositaries – members of the IAE CIS. 2006–2015, International Association of Exchanges of the CIS Countries. Available at: <http://mab.micex.ru>.

<sup>28</sup> FEAS Books: 2009–2015, Federation of Euro-Asian Stock Exchanges. Available at: <http://www.feas.org>.

of Kazakhstan. The volume of foreign currency trading on the exchange market in 2015 in the Republic of Belarus totaled 30 billion US, and in the Republic of Armenia this figure was only 313.7 million USD. Foreign currency trading is not conducted at all on the local exchange market in Kyrgyzstan.

The volume of trade in credit resources on the exchange market in the EAEU countries is presented in Table 8.

As can be seen from Table 8, trade in credit resources on the exchange market in the EAEU countries has been conducted only in the Russian Federation and the Republic of Armenia. However, the volume of trade in credit resources in these countries is not remotely comparable. In 2015, the volume of trade in credit resources on the exchange market amounted to about 559 billion US dollars in the Russian Federation, while in the Republic of Armenia this figure was only to 92 million US dollars. It should also be noted that as a result of changes in the terms of trade in credit resources on the exchange market in the Republic of Armenia, trade in credit resources has not actually been conducted since September 2015.

*Table 8.* The volume of trade in credit resources on the exchange market in the EAEU countries, 2011–2015

Country	Volume of trade in credit resources, mln. USD				
	2011	2012	2013	2014	2015
Armenia	7,087.7	15,084.3	16,444.1	657.1	92.1
Belarus	0	0	0	0	0
Kazakhstan	0	0	0	0	0
Kyrgyzstan	0	0	0	0	0
Russian Federation	339,180.5	349,846.6	478,106.2	558,646.1	559,100.3

*Source:* compiled by the authors on the basis of exchange statistics of the countries of the EAEU.<sup>29, 30, 31</sup>

From the data presented above, it can be seen that the development of the exchange market in a particular region largely depends on the size of the market and the extent of integration in the market. Thus, the Russian Federation, which has the largest and most sufficiently integrated exchange market among the EAEU countries, is the leader in all key indicators. From the point of view of the development of small markets, such as the Armenian securities market, integration with other domestic markets, for example, with the foreign exchange market and the market for credit resources, is of great importance. Such integration can yield a synergistic effect. In countries with small markets, the creation of integrated systems increases the efficiency of their activities, which, in turn, allows stock exchanges to invest additional funds in the development of trading, depository, clearing and settlement systems. The creation of integrated

<sup>29</sup> Bulletins of stock exchange statistics: 2006–2014, International Association of Exchanges of the CIS Countries. Available at: <http://mab.micex.ru>.

<sup>30</sup> Directories of stock exchanges and depositories – members of the IAE CIS. 2006–2015, International Association of Exchanges of the CIS Countries. Available at: <http://mab.micex.ru>.

<sup>31</sup> FEAS Books: 2009–2015, Federation of Euro-Asian Stock Exchanges. Available at: <http://www.feas.org>.

financial market systems allows for the creation of new financial products, increasing competition in the market and creating new investment opportunities. As a result, integration can lead to faster growth in the total volume of integrated markets compared to the growth of the total volume of individual markets. However, the integration capabilities of domestic markets are limited. At the current stage of market development, the process of integration with external markets is also of high importance. Integration of the exchange market in the EAEU countries can occur in almost all market segments. Integration opportunities exist both in the primary market and in the secondary market, both in the government and corporate securities markets.

Integration processes in the primary market can include the creation of integrated platforms for the initial placement of securities, access to which may be available to professional participants in the securities market of other countries of the EAEU. Additionally, it can include the creation of mechanisms for redirecting the applications of professional participants in the securities market of one country to professional market participants in the securities market of another country, and to their nation's local exchange market. In the first case, much more changes will be needed in national laws and other regulations governing the securities market. In the second case, the transaction costs associated with the execution of applications will increase. The introduction of integrated systems and mechanisms for redirecting applications in the primary market of government securities will provide an opportunity to ensure stable financing of the budget deficit with a parallel reduction in the costs of servicing the public debt. Despite the similarity and interconnectedness of the economies of the countries of the post-Soviet space, the economies of the EAEU countries have significant differences that lead to time lags (or even shifts) in economic cycles, the need for budget expenditures and changes in the size of budget revenues and budget deficits. Differences are mainly related to the structure of the economies of individual countries, as well as foreign economic relations. From the point of view of the dependence of the country's economy on energy prices, the countries of the EAEU may be divided into two groups: in Russia and Kazakhstan, revenues from energy carriers constitute a significant share of GDP, whereas in Armenia, Belarus and Kyrgyzstan, energy carriers do not play a significant role in the formation of the state budget. From the point of view of foreign economic relations, the countries of the EAEU can be divided into countries more integrated with (and dependent on) European markets (Armenia, Belarus) and countries more integrated with (and dependent on) Asian markets (the Russian Federation and Kazakhstan); these in turn also affects their exposure to different risks. Given the existence of such economic lags (shifts), the integration of the government securities market in the EAEU countries can help to increase the diversification of sources of financing the budget deficit, which in turn can contribute to ensuring the stability of budget deficit financing and the reduction of public debt servicing costs.

The introduction of integrated systems and mechanisms for redirecting applications in the primary market for corporate securities can increase the investment opportunities of the market, the mobility of capital and also the role of the securities market in financing investment projects.

Integration processes in the secondary market can also include the creation of integrated trading platforms, access to which can be granted to the professional participants in the securities market from other countries of the EAEU and the creation of mechanisms for redirecting applications. The introduction of integrated systems and mechanisms for redirecting applications in the secondary securities market can help increase the liquidity of the securities market, increase competition and create a market value for securities.

## Conclusions

The conducted studies show that the securities market in the EAEU countries has sufficient integration capabilities. As the above data show, the potential exists in all segments of the securities market, but more opportunities exist in the debt securities market. This is due to the fact that this segment of the market, unlike the equity market, is to some extent developed in almost all the countries of the EAEU. Deepening the integration processes in the securities market of the EAEU countries can have a positive impact on increasing the investment opportunities of the economy of the EAEU countries, which in turn can have a positive impact on GDP growth, reducing unemployment and improving the social status of the population. However, the creation of a single or integrated exchange market should be accompanied by the integration of the member states' depository, settlement and clearing systems and the synchronization of the regulatory and legal framework governing the securities market. Particular attention is required to study the problems associated with fixing and transferring property rights to the securities and protecting the interests of investors. Integrating the countries' depository, settlement and clearing systems may include the introduction of a nominal holding institution for central securities depositories and the establishment of correspondent relations between the central securities depositories in the EAEU countries. Thanks to the establishment of correspondent relations between the central securities depositories, it will be possible to ensure the recording and transfer of proprietary rights and other property rights to the securities, and to ensure the maximum protection of the interests of investors. For the development of integration processes both on the exchange market and between depository, settlement and clearing systems, the most important prerequisite is synchronization and, in the future, unification of the regulatory and legal framework governing the securities market. The main problems are connected with the fact that after the collapse of the Soviet Union, the development of the regulatory and legal framework in the territory of the former union republics took place in different ways. In this context, it is important to synchronize the regulatory framework governing the Russian and Armenian securities markets, despite the differences in the volumes of these markets. The importance of this process is conditioned by the fact that the regulatory framework governing the securities market of the Republic of Armenia is most synchronized with the legislation of the countries of the European Union and, in particular, with the regulatory and legal framework of the countries of the Baltic region. The creation of a synchronized regulatory and legal framework regulating the

securities market can lay the foundation for the formation of a single integrated Eurasian securities market.

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# Проблемы развития и интеграции рынка ценных бумаг в странах ЕАЭС<sup>1</sup>

А.А. Баядян, А.М. Багдасарян

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**Баядян Ашот Акопович** — д.э.н., профессор, заведующий кафедрой финансов и кредита экономического факультета Национального аграрного университета Армении; Республика Армения, Ереван, 0009, ул. Терьяна, д. 74; E-mail: info@anau.am

**Багдасарян Арег Меружанович** — к.э.н., доцент кафедры финансов и кредита экономического факультета Национального аграрного университета Армении; Республика Армения, Ереван, 0009, ул. Терьяна, д. 74; E-mail: aregbag@gmail.com

*Статья посвящена изучению проблем развития и интеграции рынка ценных бумаг в государствах — членах Евразийского экономического союза (ЕАЭС). Рассматриваются настоящее состояние, возможности и проблемы развития рынка ценных бумаг, и в частности биржевого рынка. Развитие и интеграция рынка ценных бумаг — важные факторы, влияющие на потенциал развития экономики и устойчивого экономического роста в странах ЕАЭС.*

*Предметом анализа настоящего исследования являются проблемы развития и интеграции рынка ценных бумаг в странах ЕАЭС.*

*Авторы приходят к выводу, что рынок ценных бумаг в странах ЕАЭС обладает достаточными интеграционными возможностями. Потенциал существует во всех сегментах рынка ценных бумаг, однако более широкие возможности — на рынке долговых ценных бумаг. Углубление интеграционных процессов на рынке ценных бумаг ЕАЭС может оказать положительное воздействие на увеличение инвестиционных возможностей экономики этих стран, что в свою очередь может содействовать увеличению темпов роста валового внутреннего продукта, сокращению безработицы и улучшению социального положения населения. Однако создание единого или интегрированного биржевого рынка должно сопровождаться интеграционными процессами депозитарных и расчетно-клиринговых систем и синхронизацией нормативно-правовой базы, регулирующей рынок ценных бумаг. Особого внимания требует исследование проблем, связанных с фиксированием и передачей имущественных прав на ценные бумаги и защитой интересов инвесторов. Интеграционные процессы депозитарных и расчетно-клиринговых систем могут включать внедрение института номинального держателя для центральных депозитариев и установление корреспондентских отношений между центральными депозитариями ценных бумаг стран ЕАЭС. Для развития интеграционных процессов как на биржевом рынке, так и между депозитарными и расчетно-клиринговыми системами важнейшей предпосылкой является синхронизация, а в дальнейшем — унификация нормативно-правовой базы, регулирующей рынок ценных бумаг.*

Ключевые слова: рынок ценных бумаг; биржевой рынок; инфраструктура рынка ценных бумаг

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# Occupational Structure in European Countries: What do Forecasts Predict?<sup>1, 2</sup>

N. Vishnevskaya, A. Zudina

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**Nina Vishnevskaya** — PhD, Deputy Director, Centre for Labour Market Studies, National Research University Higher School of Economics; 20 Myasnitskaya St., 101000 Moscow, Russian Federation; E-mail: vishnev@hse.ru

**Anna Zudina** — PhD, Research Fellow, Centre for Labour Market Studies, National Research University Higher School of Economics; 20 Myasnitskaya St., 101000 Moscow, Russian Federation; E-mail: azudina@hse.ru

*This paper analyzes the future occupational structure of the labour force in European members of the Organisation for Co-operation and Development (OECD). Occupational structure forecasts allow researchers to evaluate the quality of job openings and, consequently, overall future labour market performance. Identification of demand for certain occupations in Europe can facilitate assessment of whether processes occurring in the Russian labour market are consistent with global trends.*

*The paper discusses the methodology of labour force forecasting and basic research approaches to the prediction of occupational structure changes. It emphasizes the dynamics of demand for representatives of certain occupations in Europe by identifying the fastest growing and declining occupations and suggests possible reasons for changing demand. The paper demonstrates that the main occupational trend over the next decade will consist in the increasing importance of professionals, as well as technicians and associate professionals. The increase in demand for health professionals and representatives of occupations providing scientific and technological innovation will be most significant. At the same time, it is expected that demand for elementary occupations will also rise. This process will evolve simultaneously with the decrease in the total number of skilled and semi-skilled blue-collar occupations due to globalization and the reduction of industrial production in developed economies. The ongoing “mechanization” of many job functions will not eliminate the need for occupations such as cleaners, labourers, domestic servants or personal workers. The need for these jobs allow employees with low levels of education to enter the labour market rather than depending on the social benefit system. Another tendency for all countries with developed economies will be reduced demand for many white-collar occupations as modern computer technologies and the automation of many routine functions previously performed by office workers becomes more prevalent.*

**Key words:** occupational structure; forecasting; labour market, Europe; OECD; labour demand; job quality

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## Introduction.

### Relevance and Motivation of the Study

In any country, the labour market is in a constant state of flux, with changes in the occupational structure of the workforce reflecting key trends in economic development. The growing demand for certain occupations and the difficulties in finding employment for people with outdated professional knowledge and skills is influenced by several parallel processes, the most important of which are sectoral shifts in the economy, competition in commodities markets, globalization and technological progress.

Forecasting society's occupational structure is important for many economic agents. The expected changes in the structure of labour demand are important for the education system, whose main task is to provide training for professions that are in demand. Forecasts of the occupational structure are the basis for making decisions on hiring and retraining employees, thereby determining opportunities for further growth in labour productivity. Without a clear idea of the major changes in the structure of employment, it is impossible to formulate effective policies in the labour market. Additionally, assumptions about a possible deficit within certain occupations help to foster a competent migration policy. Consumers of information about the forthcoming changes in the labour market also include young people who are choosing a career path. Such knowledge is also important for older workers, who may seek a different career path or want to obtain training in order to remain competitive.

This article aims to analyze the future occupational structure of European OECD countries, which include the developed states as well as a number of transitional economies. Existing occupational forecasting studies for European countries tend to narrowly focus on forthcoming changes in demand for large occupational groups. In our opinion, it is necessary to study in detail which specific occupations will grow, as well as which will decline. The discussion of the dynamics of demand for different occupations is traditional for the US labour market, but such publications have no readily-available analogue in Europe.

Analyzing the future structure of the relevance of various occupational categories allows one to determine the quality of newly-created jobs: if they will be predominantly "good" jobs which command a high salary and require a high level of skills, or if the demand for labour is distributed more evenly between different occupational categories, or if demand for employees will reflect a U-shaped scenario. In the latter case, the most and least qualified employees will be in demand, while employment opportunities for those with an average level of qualification will be sharply narrowed. The effectiveness of the labour market won't just depend on where the new jobs will be concentrated. Under a U-shaped scenario, work available to those with mid-level qualifications will dry up. In developed countries, these employees constitute the largest segment of society; if their numbers dwindle, it can result in more socio-economic inequality.

It is important not only to draw the expected “picture” of the occupational structure, but also try to explain what causes contribute to the fact that the demand for certain occupations is growing rapidly, while others are also rapidly declining. The predictions of the occupational structure in European countries, which are Russia’s neighbors and partners, are of interest not only from the point of view of understanding the future state of their labour markets. Identifying the specifics of demand for individual professional groups in other countries seems to be useful for understanding how events in Russia correspond to world trends.

## Forecasts of the Occupational Structure: Causes, Main Tasks and Classifications

Forecasting an occupational structure is a relatively new field of economic research. The USA and Canada were pioneers in this field; they first started predicting how the structure of the workforce would change in the late 1950s. These two countries have made significant progress in developing the methodology for forecasting and preparing the appropriate statistical base. The US still holds leading positions in this field, developing the most detailed forecasts. In European countries, occupational structure forecasts were first organized later, in the mid-1960s. Since the 1990s, countries with transitioning economies have also been actively involved in the process of “anticipating” the future.

In European countries, the intensification of occupational structure forecasts was due to two main reasons. First, the increased understanding of the importance of workforce quality in promoting economic growth, which has been established among researchers of various theoretical schools and government officials. This problem gained more recognition following a study published by E. Denison in 1962, which was devoted to exploring sources of further economic growth [Denison, 1962]. The second reason was related to the fear that there would be a shortage of various categories of workers, especially skilled workers, amid the economic recovery of the 1960s.

The history of forecasting shows not only the improvement of technical forecasting tools; significant changes have been made to their goals and main tasks. During the first period, which lasted until the mid-1970s, it was believed that by identifying future trends in the occupational structure, the education system would receive the most accurate guidelines for training workers needed by the economy. In those years, it was widely held that such forecasts can play a decisive role in balancing demand and supply in the labour market, which in turn would solve the problem of labour shortages in many occupations, especially ones that required specialized qualifications.

However, the initial experience of countries that actively joined in the work of drafting occupational structures showed that such expectations are overestimated. Detailed, reliable forecasts for individual occupations have proved extremely difficult. In addition, the education system and business could not make full use of the available

forecasts, not only due to remaining doubts about their accuracy, but also because the necessary knowledge and skills for a particular occupation can be obtained in different ways [Hughes, 1993].

The tasks of present-day occupational structure forecasts can be considered less ambitious, but much more realistic. Now, forecasts are expected to determine the trajectory of changes in the occupational structure of the workforce that may occur in any given scenario of economic development. Users of these forecasts, including state officials, employers, educational institutions and those choosing a career, have material for reflection rather than a direct guide. The change in priorities had one more consequence. Although in most countries the number of professional categories for which forecast estimates are made has increased significantly, detailed forecasts for individual specialties don't exist. In addition, forecasts are not made for individual years, but only for a certain, usually ten-year period.

When forecasting the occupational structure of the economy, the main sources of information are labour market surveys and national accounts data. Each of the sources has its pros and cons. The advantage of surveys is their regularity (in developed countries – at least once a quarter, and in many countries – on a monthly basis). Moreover, in the EU countries, a precise methodology is used. The national accounts data contain indicators such as output and labour costs, and therefore they are often used in the construction of forecast models. As supporting data, various surveys are used, particularly employers' surveys, but these data are mainly needed for short-term forecasting.

In the developed countries, the forecasting, as a rule, enjoys massive state support. However, the direct producers of this work are not always state entities. Perhaps paradoxically, state institutions are responsible for this work in two countries that are thought of as being free-market-oriented – the USA and Canada. In Europe, this work is done by non-profit organizations, such as the English Institute for Employment Studies of the University of Warwick or the German Institute for Employment and Occupational Research at the Federal Institute of Labour in Nuremberg. Some researchers attribute this “detachment” of the state in European countries from the organization of forecasting to the fact that in these countries the authorities, which are to a large extent tasked with “responding” to the economic situation, are afraid to take responsibility for the quality of the forecast estimates [Zukersteinova, 2007].

In addition to forecasts that are developed by specialists in individual countries, there are forecasts for groups of countries, and particularly for the countries of the European Union. This is the work of the European Centre for the Development of Vocational Training (CEDEFOP), which we have used to analyze the future trends of the occupational structure of European countries at the level of disparate professional categories.

Inter-country comparisons of occupational structure forecasts are impossible without the use of an identical or at least similar classification of occupations. The definition of professional affiliation must be scientifically justified, stable over time

and universally recognized. These requirements are met by the International Standard Classification of Occupations (ISCO). The first version of the ISCO was adopted in 1988, and the second, modernized version, was introduced in 2008. It is this classification that is used in continental Europe (in contrast to the United States and Great Britain, where other classifiers are used).

The ISCO-08 is a hierarchical structure of classes, consisting of four levels. At the fourth, most detailed level, all occupations are classified into 436 groups, which in the third level are grouped into 130 categories, and at the second level are split into 43 groups. The first level presents occupations in their most generalized form, which includes 10 groups of classes [ILO, 2012].

The International Classification of Occupations 2008 is based on two basic concepts: the type of work performed and the necessary qualifications. The latter in turn has two dimensions: the level of qualification (which is a function of the complexity and variety of tasks and duties of the employee) and specialization, which is determined by the amount of necessary knowledge, as well as the tools and equipment used. One feature of the latest version of the classifier is the priority value of the required level of knowledge and qualifications for determining the professional affiliation of the employee [ILO, 2012]. The new classification was intended to become a definite standard for the statistical offices of European countries, in order to promote the further unification of statistics for determining the professional affiliation of workers. The transition of European countries from ISCO-88 to the modernized version of the ISCO, the ISCO-08 (which actually happened only in 2011) led to a certain “shake-up” of the occupational structure, especially of individual professional group [Stehrer, 2013]. This, in turn, made it difficult to build long historical series, and, therefore, complicated the forecast work. The overwhelming majority of countries did not recalculate data for the past years based on the new classification, so the data on the occupational structure of the labour force before and after 2011 are not fully comparable. It is for this reason that currently available forecasts for the EU countries until 2020 are based on the ISCO-88 classification, and some attempts to recalculate data on the occupational structure from the new classification are still of an experimental nature [Coping with changes, 2014].

## The Main Approaches to Forecasting the Occupational Structure of the Labour Force

The empirical data, the analysis of which is presented in this paper, are based on the European forecast of the occupational structure of the labour force, prepared by Cedefop [Future skills supply and demand in Europe, 2012]. We emphasize that the main feature of this data is that, firstly, they allow us to look at the European labour market as a whole, and secondly, the forecast of the occupational structure is an integral part of the forecast of supply and demand in the labour market.

The future demand for labour can be schematically represented in the form of a matrix in which all professional groups are represented horizontally, depending on the industry in which they are concentrated, and vertically, based on the branches of the economy. The size of a particular professional group can vary depending on two factors: (a) the dynamics of production in a particular industry, which implies the same rate of change in the numbers in all professional categories in the industry, and (b) the influence of factors such as technical progress, according to which the change in individual professional category numbers will occur at different rates. Therefore, the forecast of changes in the occupational structure of the workforce is based on an assessment of future changes in the sectoral structure of the economy.

The professional breakdown of the future structure of the workforce depends not only on the level and dynamics of the possible demand, but also on how fully and quickly the education system can meet changing demand, i.e. on the structure of the labour supply. In the supply matrix of the workforce, professional categories are represented horizontally and levels of education vertically. In this case, the main difficulty lies in the fact that there are different opportunities to obtain the same profession, and workers with a certain level of education can find jobs with higher or lower requirements for the educational level. Another limitation is demographic indicators, in particular, the age structure of the economically active population. The principle of the matrix is laid out in such models as the RAS Model, which is used in the Cambridge Growth Project, the Markov Model and many others.

As can be seen in Fig. 1 (right side), the prognosis of the occupational structure consists of interconnected modules, each of which solves a specific problem.

For calculations of each of the modules, a corresponding database is used. For occupational structure forecasts, the main sources of information are labour market surveys.

The forecasting begins with Module 1, within which the number of employees broken down by economic sectors is forecasted. The basis of this module is the intersectoral macroeconomic model (E3ME) used by Eurostat. In the occupational structure forecasting module (module 2 – EDMOD), using the extrapolation method and other more complex econometric methods, estimates of the net change in the number employed in the occupational context for individual sectors of the economy at the end of the forecast period are calculated. Module 3 (QUALMOD) broadcasts expected changes in the number of people employed in three main skill levels, which in turn are consistent with the three levels of formal education in the International Standard Classification of Education (ISCED). The ISCED 1 and ISCED 2 groups represent the lowest level of qualifications; group ISCED 3 and ISCED 4 – medium, and finally, the groups ISCED 5 and ISCED 6 represent the highest educational levels.

Since it is important for the forecast to determine not only the number of newly-created jobs for different occupations, but also to estimate how many jobs will be made available as a result of retirement, a transition to economic inactivity, emigration and professional mobility, a special module is added. In this case, this is module 4: “Replacement demand module.”

When constructing a forecast of replacement demand, the expected levels of employment by occupation and skill level obtained in modules 2 and 3 along with data on the possible mobility of workers are used. The occupational structure of individual age groups can vary significantly; in order to estimate the scale of “substitution,” data on the age and gender structure of the workforce and age of retirement are needed. The mobility of certain age groups is attributable to various factors. If, for example, older workers are more likely to leave the workplace due to retirement, young people do this mainly for reasons such as job mobility, maternity leave (and related family concerns), and immigration. Labour market surveys make it possible to analyze the demographic composition of each professional group and, consequently, determine the retirement age of workers in the profession.

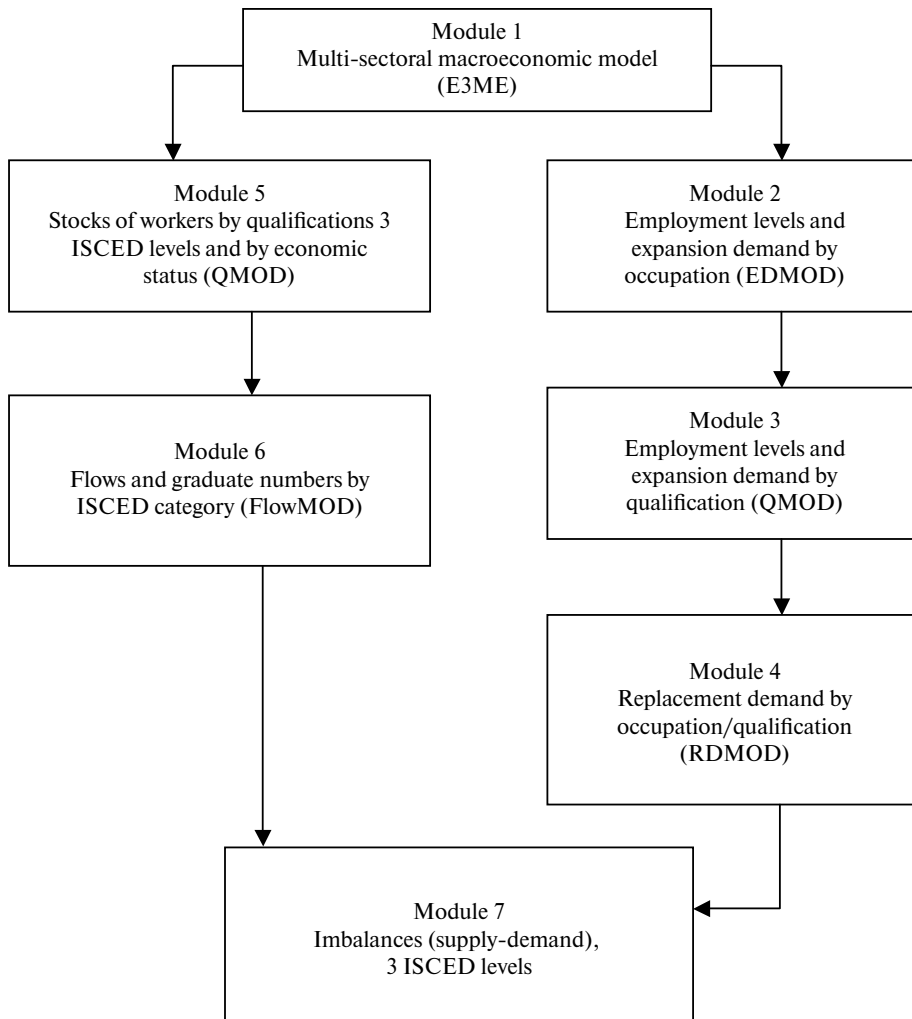


Fig. 1. Conceptual framework of modelling skills supply and demand

Source: coping with Changes, 2014, p. 63



The left side of Fig. 1 schematically shows the methodology for forecasting the supply of labour in terms of occupations and skill level, broken down by age and sex for the whole population and for its economically active segment.<sup>3</sup>

Summing up everything is module 7, which reflects possible imbalances between the supply and demand of labour for the forecast period. However, this apparent imbalance does not consider individual occupations, but only three basic levels of qualifications. Forecasting the imbalance from the standpoint of individual occupations is not yet possible, since such an operation should take into account the many factors that cannot yet be reflected in the applied model.

In the next section, we proceed to assess the future structure of the European labour force, performed on the basis of the Cedefop forecast data, published in absolute numbers. The peculiarity of our analysis is that we focus on separate professional groups and, particularly interestingly, we determine future demand for new and replaced professions.

## European Labour Market – Occupational Structure Forecast

### ***Occupational Groups – Forecast of Net Change***

The employment structure in European countries by occupation is presented in Table 1 (in addition to the 27 EU countries, the forecast includes data on Norway and Switzerland). An analysis of the occupational structure forecast provides the answer to several questions. Will employment increase, or should the situation on the European labour market be described as stagnation? Will trends in the dynamics and the occupational composition of employment that have characterized it in the past continue, or should education policy-makers be prepared for significant changes in the structure of labour demand? Finally, one of the main questions is: will there be a gradual increase in the share of skilled labour and, simultaneously, a washout of those with a low level of qualification from the labour market, or will labour market demand be characterized by a U-shaped scenario? The latter suggests that the growth of jobs for skilled and unskilled labour will be accompanied by subsiding demand for mid-level occupations.

As can be concluded from the figures presented, at the beginning of the current decade, white-collar occupations dominated in the structure of European employment (Occupational groups No 1, 2, 3 of ISCO-88). The largest occupational group was represented by technicians and associate professionals (group 3), whose share in total employment reached 17%. The second largest occupational group consisted of professionals (group 2), the specific weight of which exceeded 15%. Legislators, senior officials and managers (group 1) account for about 9% of the total number of employees. Thus, professionals from the first three one-digit ISCO-88 groups were engaged in

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<sup>3</sup> A more detailed analysis of the methodology for forecasting the supply of specialists of various qualifications, based on an assessment of the prospects for the development of education and training systems, is beyond the scope of this paper.

skilled work and had, as a rule, a type A or B tertiary education, accounting for more than 40% of all employed. Clerks (group 4) and service workers and shop and market sales workers (group 5), who can be classified as “white-collar workers” with mid-level qualifications, accounted for almost a quarter of all employed.

The remaining 35% of the European workforce was engaged in blue-collar occupations (groups 6–9): craft and related trades workers (13%), plant and machine operators and assemblers (8%), and elementary occupations (10%). Skilled agricultural and fishery workers (group 6) belonged to the smallest cohort – their share did not exceed 4%.

By 2020, according to the forecast, the aggregate employment in European countries, i.e. the ratio of the projected increase in the number of workers in a certain occupation in 2020 related to the number of workers in this occupation as of 2010, will grow, although this increase will be small (only 3.6%). However, the expansion of labour demand will affect various occupational groups differently.

The fastest-growing occupational group will be technicians and associate professionals, whose number will grow by 13% by 2020, which will allow them to remain the most numerous cohort in the European labour market (see the third column of Table 1). By the beginning of the next decade, this group will occupy 18.3% of Europe’s total workforce, compared with 16.8% in 2010. Such growth will be achieved, first of all, by an increase in the number of jobs for teaching associate professionals, whose number by 2020 will increase by one third. Also the need for life science and health associate professionals will increase by more than 11%. The high growth rates of jobs that require tertiary-type B education in these two industries that traditionally demand the most qualified workers not only testify to the increased demand for educational and medical services, but also point to the redistribution of functions between the two groups of specialists. Professionals with a tertiary-type B education are increasingly taking on certain functions that were previously performed by only the most qualified personnel, thus ensuring a more efficient distribution of labour within a skilled workforce segment.

A significant increase will also be observed among occupations which collectively fall in the so-called “Others” group (by 15%); group 34 of ISCO-88. These include associate professionals with a tertiary-type B education as legal associate professionals, certain categories of government officials, accountants, real estate agents and sales representatives. Finally, employment among physical and engineering science associate professionals will increase by 6% (group 31).

By 2020, the number of professionals will also grow, but at a slightly slower pace than those with mid-level qualifications. Over the ten-year period, this group will grow by 8%, and their share in total employment will rise from 14.9 to 15.5%. The expansion of this occupational category in the structure of employment will be achieved mainly due to the increase in demand for physics, mathematics and engineering science professionals (by about 14% compared to 2010), as well as professionals who fall into the “Others” category. It includes such occupations as qualified accountants, market analysts, judges and lawyers, as well as writers, translators and composers (growth of this group will be about 19%).

*Table 1.* Dynamics of employment structure by occupation, European countries, 2010–2020

Occupational groups according to ISCO-88	Share, %		Dynamics of the size of the group in 2010–2020 related to the 2010 size, %
	2010	2020	
<b>1 Legislators, senior officials and managers</b>	<b>8.4</b>	<b>8.8</b>	<b>8.0</b>
11 Legislators and senior officials	0.2	0.2	6.6
12 Corporate managers	4.8	5.0	9.2
13 Managers of small enterprises	3.5	3.6	6.4
<b>2 Professionals</b>	<b>14.9</b>	<b>15.5</b>	<b>8.2</b>
21 Physical, mathematical and engineering science professionals	3.9	4.2	13.9
22 Life science and health professionals	1.8	1.8	–1.1
23 Teaching professionals	4.0	3.5	–7.2
24 Other professionals	5.3	6.1	18.8
<b>3 Technicians and associate professionals</b>	<b>16.8</b>	<b>18.3</b>	<b>13.0</b>
31 Physical and engineering science associate professionals	3.8	3.9	6.4
32 Life science and health associate professionals	2.8	3.0	11.3
33 Teaching associate professionals	1.3	1.6	30.4
34 Other associate professionals	8.9	9.9	14.7
<b>4 Clerks</b>	<b>10.6</b>	<b>9.5</b>	<b>–7.3</b>
41 Office clerks	8.5	7.9	–14.5
42 Customer services clerks	2.0	2.4	22.5
<b>5 Service workers and shop and market sales workers</b>	<b>14.0</b>	<b>14.0</b>	<b>3.6</b>
51 Personal and protective services workers	9.1	9.0	2.6
52 Models, salespersons and demonstrators	4.9	5.0	5.4
<b>6 Skilled agricultural and fishery workers</b>	<b>4.2</b>	<b>3.7</b>	<b>–9.4</b>
<b>7 Craft and related trades workers</b>	<b>12.7</b>	<b>11.5</b>	<b>–6.0</b>
71 Extraction and building trades workers	5.6	5.8	5.0
72 Metal, machinery and related trades workers	4.7	3.9	–14.5
73 Precision, handicraft, printing and related trades workers	0.5	0.4	–15.9
74 Other craft and related trades workers	1.8	1.5	–15.0
<b>8 Plant and machine operators and assemblers</b>	<b>7.7</b>	<b>7.5</b>	<b>–0.1</b>
81 Stationary plant and related operators	0.9	0.9	6.7
82 Machine operators and assemblers	3.6	3.5	0.8
83 Drivers and mobile plant operators	4.1	3.9	–2.4

Occupational groups according to ISCO-88	Share, %		Dynamics of the size of the group in 2010–2020 related to the 2010 size, %
	2010	2020	
<b>9 Elementary occupations</b>	<b>10.1</b>	<b>10.8</b>	<b>10.7</b>
91 Sales and services elementary occupations	6.6	6.8	6.7
92 Agricultural, fishery and related labourers	0.8	0.9	15.6
93 Labourers in mining, construction, manufacturing and transport	2.8	3.2	19.1
Total employment*	100.0	100.0	3.6

\* Total employment also includes the category of armed forces, however Cedefop doesn't publish data on the forecasts of the dynamics of its size.

*Source:* Own calculations on the basis of Cedefop Forecasts Data.<sup>4</sup>

The forecast for the European countries confirms the tendency toward a gradual compression of demand for workers in the 4th ISCO-88 group, which includes office clerks and customer service representatives. Jobs in this group are the least qualified of all “white-collar” occupations. By 2020, the number of office clerks, who until quite recently were in one of the most in-demand occupational groups, will decrease by 15%. The decline in demand for this category of work is directly related to the widespread use of computer technology and the automation of many routine functions previously performed by office workers. However, the reduction in the need for office workers will be compensated to a certain extent by the expansion of the neighboring occupational group, which also belongs to group 4 of ISCO-88. The number of customer services clerks (such as cashiers and client information clerks) compared to 2010 will increase by almost 23%. Overall employment in Group 5 of ISCO-88 will increase by 7% as a result of the growth of this category of clerks, but this will not save the share of this group in the labour market: it will decrease from 10.6 to 9.5 % during 2010–2020.

The role of another occupational group, service workers and shop and market sales workers, will increase insignificantly. By 2020 their total number will increase at a rate similar to the general increase in employment, that is, by 3.6%. At the same time, they will remain the third largest occupational group, with a share of 15% of total employment (their share of the labour market will remain unchanged in 2010–2020).

Groups that suffer significant “losses” in the labour market include the majority of “blue-collar” occupations. The number of skilled agricultural and fishery workers will drop by almost ten percent. However, taking into account the size of this group – this occupation in 2010 was among the least common – this will have little effect on overall employment. In addition to this group, the number of craft and related trades workers also will decrease by 6% according to forecasts. This decline will be mainly

<sup>4</sup> Forecasting skill demand and supply. Available at: <http://www.cedefop.europa.eu/en/events-and-projects/projects/forecasting-skill-demand-and-supply> (accessed: 17 October 2017).

caused by a reduction in the number of metal, machinery and related trades workers, as well as precision, handicraft, printing and related trades workers. The number of plant and machine operators and assemblers will remain practically unchanged, therefore the share of this group will decrease by only 0.2%, to 7.5%. The only subgroup of craft and related trades workers that will show a positive employment trend will be extraction and building trades workers. The growth in the number of such workers will still be small and amount only to 5% by 2020. In the “blue-collar” occupations in general, the number of those employed by 2020 will decrease by 15% compared to 2010.

In the segment of blue collar workers’ occupations, the only occupational group which will grow in 2010–2020 (by 7%) will be elementary occupations (group 9); its share in total employment will grow from 10.1% to 10.8%. The number of jobs among different subgroups will increase more significantly. Thus, employment among agricultural, fishery and related labourers will be 16% higher than in 2010, and almost one-fifth higher among labourers in mining, construction, manufacturing and transport. The expansion of demand for the most unskilled labourers is considered by a number of researchers as a confirmation of the U-shaped scenario of occupational structure dynamics, when not only qualified specialists but also workers with a low level of education and vocational training are in demand, while the “middle” occupational groups are compressed in their size [Crouch, 2010].

### ***Disaggregated Occupations: Leaders of Growth and Decline***

The transition to reviewing the structure of the workforce using a larger, more detailed set of occupational categories (the three-digit level of ISCO-88 classification) allows us to identify the top-20 occupations that will expand most dynamically in the next decade and the top-20 occupations that will most actively reduce their presence in the European labour market (see Table 2 below).

What do the figures presented in Table 2 tell us?

First, it should be emphasized that the occupations that are included among the top 20 most dynamically expanding can be found in almost all major occupational groups (except Group 1). Secondly, the dynamics of demand for these occupations significantly outperforms the average level and ranges from 15 to 38%. Third, attention should be drawn to the fact that many of the rapidly growing occupations suggest direct personal contact between the employee and the consumer of his service. The top 20 includes sales consultants, street vendors, employees working with clients from different areas, instructors and teachers’ assistants. As D. Autor and D. Dorn noted, occupations that presuppose compulsory interpersonal communication, that are often concentrated in the service sector are unlikely to be replaced by technology someday [Autor, Dorn, 2013]. The high demand for occupations that have fallen into the top-list is largely explained by the fact that these occupations refer to those types of activities that cannot be broken down into many routine operations and thus automated. Fourthly, the most sought-after professionals in the labour market will be those with a tertiary education

of type A or B, engaged in actively developing scientific fields (including not only exact and natural sciences but also social sciences) and physical labourers (transport labourers and metal-processing-plant operators, painters and cleaners).

Table 2 also demonstrates 20 occupations (the tree-digit level of ISCO-88 classification), which are increasingly “rejected” by the labour market. More than the half of the occupations that were included in this list relate to Group 7 in the ISCO-88 classification (craft and related trades workers). Their employment becomes more and more vulnerable to such factors as the globalization of the modern economy, technological progress and changes in consumers’ behavior. Thus, the reduction in the employment of workers involved in food processing and textile, garment, pelt, leather and shoe-making trades workers is explained by the transfer of production in the corresponding industries to less developed countries, primarily, the countries of South-East Asia.

The same can explain the decline in forecasted employment indicators for workers in agriculture and forestry, as well as fishery workers, hunters and trappers. Another important factor which will continue to result in a decline in demand for labour in occupations from Group 7 is mass production, which is displacing handicraft work in Europe. So the share of blacksmiths, glass-makers and potters by 2020 is projected to decrease by 16–17% compared to 2010. Printers will suffer the greatest reduction as a group – the corresponding indicator for 2020 will be 27% less than those employed in that professional category in 2010. This forecast can be explained by reduction of printing production because of the development of electronic mass media and electronic book-publishing. Finally, mechanization and computerization will lead to a reduction in the employment of various categories of clerks, such as library and mail clerks, as well as secretaries and keyboard-operating clerks.

*Table 2.* Top-20 most dynamically expanding and Top-20 most dynamically decreasing occupations in the European labour market, 2010–2020

№	Occupational groups according to ISCO-88	Dynamics of the size of the group in 2010–2020 related to the size of the group in 2010, %	№	Occupational groups according to ISCO-88	Dynamics of the size of the group in 2010–2020 related to the size of the group in 2010, %
1	521 Fashion and other models	37.9	1	734 Printing and related trades workers	–26.9
2	333 Special education teaching associate professionals	34.0	2	744 Pelt, leather and shoemaking trades workers	–24.8
3	346 Social work associate professionals	32.5	3	741 Food processing and related trades workers	–22.1
4	422 Client information clerks	30.3	4	743 Textile, garment and related trades workers	–18.0
5	321 Life science technicians and related associate professionals	28.5	5	412 Numerical clerks	–17.9

№	Occupational groups according to ISCO-88	Dynamics of the size of the group in 2010-2020 related to the size of the group in 2010, %	№	Occupational groups according to ISCO-88	Dynamics of the size of the group in 2010-2020 related to the size of the group in 2010, %
6	812 Metal-processing-plant operators	27.4	6	711 Miners, shotfirers, stone cutters and carvers	–17.6
7	911 Street vendors and related workers	25.6	7	414 Library, mail and related clerks	–17.2
8	933 Transport labourers and freight handlers	25.4	8	732 Potters, glass-makers and related trades workers	–17.2
9	244 Social science and related professionals	24.3	9	411 Secretaries and keyboard-operating clerks	–16.8
10	322 Modern health associate professionals (except nursing)	24.0	10	722 Blacksmiths, tool-makers and related trades workers	–16.2
11	332 Pre-primary education teaching associate professionals	23.8	11	724 Electrical and electronic equipment mechanics and fitters	–15.7
12	241 Business professionals	23.4	12	721 Metal molders, welders; sheet-metal workers, structural-metal preparers	–14.9
13	212 Mathematicians, statisticians and related professionals	22.6	13	419 Other office clerks	–14.5
14	714 Painters, building structure cleaners and related trades workers	20.6	14	723 Machinery mechanics and fitters	–13.1
15	334 Other teaching associate professionals	20.3	15	614 Forestry and related workers	–12.0
16	932 Manufacturing labourers	18.7	16	833 Agricultural and other mobile-plant operators	–11.7
17	211 Physicists, chemists and related professionals	17.3	17	615 Fishery workers, hunters and trappers	–11.7
18	915 Messengers, porters, door-keepers and related workers	15.9	18	610 Other: skilled agricultural and fishery workers	–10.8
19	341 Finance and sales associate professionals	15.2	19	731 Precision workers in metal and related materials	–10.4
20	348 Religious associate professionals	14.7	20	834 Ships' deck crews and related workers	–10.0
	421 Cashiers, tellers and related clerks	14.7			

Source: own calculations on the basis of Cedefop Forecasts Data.

### **Occupational Structure: Forecasting Total Demand**

In the previous section, we considered the forecasted estimates of the net increase in employment by occupational group for Europe in 2020. However, in addition to net growth, forecasts should also evaluate the number of jobs that will become available as a result of retirement, death, and workers changing their professions. At the same time, the replacement demand may differ significantly from the trends of net employment growth. One of the reasons here is the differences in age structure of various occupational groups. For example, the need for the replacement will be especially high among certain categories of unskilled labour, legislators and major officials, the proportion of older age groups among which is much higher than average.

Table 3 shows the changes in the forecasted labour demand, broken down by net and replacement demand for different occupational groups (two-digit level of ISCO 88 classification) in the European labour market between 2010 and 2020. A review of the two components of demand for labour leads to one important conclusion: in all occupations, the need for labour replacement will significantly exceed the need for a new workforce. The dynamics of the total number of jobs that will become vacant in the future will be positive for all occupational groups, although the rate of this increase will be different.

*Table 3.* Total labour demand by occupational group, European countries, 2010–2020

Occupational groups according to ISCO-88	Total labour demand 2010–2020 (,000)			Dynamics of labour demand 2010–2020 (related to 2010 level, %)		
	Expansion demand	Replacement demand	Total requirement	Expansion demand	Replacement demand	Total requirement
<b>1 Legislators, senior officials and managers</b>	<b>1556.0</b>	<b>8659.0</b>	<b>10215.0</b>	<b>8.0</b>	<b>44.5</b>	<b>52.5</b>
11 Legislators and senior officials	27.0	275.0	302.0	6.5	67.5	74.0
12 Corporate managers	1016.0	4184.0	5200.0	9.2	38.0	47.2
13 Managers of small enterprises	513.0	4200.0	4713.0	6.4	52.4	58.8
<b>2 Professionals</b>	<b>2819.0</b>	<b>12138.0</b>	<b>14957.0</b>	<b>8.2</b>	<b>35.4</b>	<b>43.7</b>
21 Physical, mathematical and engineering science professionals	1237.0	2517.0	3754.0	142.0	29.0	43.2
22 Life science and health professionals	–45.0	1734.0	1688.0	–1.1	40.9	39.8
23 Teaching professionals	–659.0	3633.0	2973.0	–7.2	39.8	32.6
24 Other professionals	2286.0	4255.0	6541.0	18.8	34.9	53.7
<b>3 Technicians and associate professionals</b>	<b>5012.0</b>	<b>11258.0</b>	<b>16269.0</b>	<b>13.0</b>	<b>29.1</b>	<b>42.1</b>
31 Physical and engineering science associate professionals	555.0	2393.0	2948.0	6.4	27.5	33.9



Occupational groups according to ISCO-88	Total labour demand 2010–2020 (,000)			Dynamics of labour demand 2010–2020 (related to 2010 level, %)		
	Expansion demand	Replacement demand	Total requirement	Expansion demand	Replacement demand	Total requirement
32 Life science and health associate professionals	727.0	1816.0	2543.0	11.3	28.3	39.7
33 Teaching associate professionals	697.0	939.0	1636.0	23.6	31.8	55.5
34 Other associate professionals	3032.0	6110.0	9142.0	14.7	29.7	44.4
<b>4 Clerks</b>	<b>–1786.0</b>	<b>7369.0</b>	<b>5583.0</b>	<b>–7.3</b>	<b>30.2</b>	<b>22.9</b>
41 Office clerks	–2847.0	6107.0	3260.0	–14.5	31.1	16.6
42 Customer services clerks	1061.0	1262.0	2323.0	22.5	26.8	49.3
<b>5 Service workers and shop and market sales workers</b>	<b>1170.0</b>	<b>8676.0</b>	<b>9845.0</b>	<b>3.6</b>	<b>26.8</b>	<b>30.4</b>
51 Personal and protective services workers	554.0	5908.0	6461.0	2.6	28.2	30.8
52 Models, salespersons and demonstrators	616.0	2768.0	3384.0	5.4	24.3	29.7
<b>6 Skilled agricultural and fishery workers</b>	<b>–905.0</b>	<b>5445.0</b>	<b>4540.0</b>	<b>–9.4</b>	<b>56.4</b>	<b>47.0</b>
<b>7 Craft and related trades workers</b>	<b>–1744.0</b>	<b>7646.0</b>	<b>5901.0</b>	<b>–6.0</b>	<b>26.2</b>	<b>20.2</b>
71 Extraction and building trades workers	650.0	3367.0	4017.0	5.0	26.0	31.0
72 Metal, machinery and related trades workers	–1575.0	2830.0	1255.0	–14.5	26.1	11.6
73 Precision, handicraft, craft printing and related trades workers	–190.0	389.0	199.0	–15.9	32.6	16.7
74 Other craft and related trades workers	–630.0	1059.0	429.0	–15.0	25.2	102.0
<b>8 Plant and machine operators and assemblers</b>	<b>–22.0</b>	<b>5263.0</b>	<b>5241.0</b>	<b>–0.1</b>	<b>29.5</b>	<b>29.4</b>
81 Stationary plant and related operators	137.0	490.0	627.0	6.7	24.0	30.8
82 Machine operators and assemblers	70.0	1534.0	1605.0	1.1	24.0	25.1
83 Drivers and mobile plant operators	–229.0	3239.0	3010.0	–2.4	34.4	31.9
<b>9 Elementary occupations</b>	<b>2500.0</b>	<b>8716.0</b>	<b>11216.0</b>	<b>10.7</b>	<b>37.3</b>	<b>48.0</b>
91 Sales and services elementary occupations	1020.0	6392.0	7412.0	6.7	42.1	48.9
92 Agricultural, fishery and related labourers	267.0	792.0	1060.0	14.5	43.1	57.6

Occupational groups according to ISCO-88	Total labour demand 2010–2020 (,000)			Dynamics of labour demand 2010–2020 (related to 2010 level, %)		
	Expansion demand	Replacement demand	Total requirement	Expansion demand	Replacement demand	Total requirement
93 Labourers in mining, construction, manufacturing and transport	1213.0	1532.0	2744.0	19.1	24.1	43.2
All occupations	8376.6	75309.1	83685.7	3.6	32.7	36.3

*Source:* Cedefop Forecasts Data.

As can be seen from Table 3, the demand for replacement workers as a whole in the European countries will increase by 33% during 2010–2020. At the same time, the most pronounced increase in the need for labour replacement will take place among such occupations as legislators and senior officials, managers of small enterprises and skilled agricultural and fishery workers. The increase in replacement demand for the labour force in these occupations in comparison with 2010 will amount to more than 50%. As a rule, many professionals engaged in these occupations are middle-aged or seniors. Therefore, the need for the replacement of the labour force in connection with the retirement of workers will be particularly acute here. In all other occupations the forecasted increase in the demand for the replacement of the labour force will be less apparent, but nowhere will this figure fall below 24%.

Summing up the indicators of net and replacement demand for various occupational groups, we can conclude that the greatest increase in total labour demand by 2020 will occur among managers of small enterprises, corporate managers, “other” professionals, teaching associate professionals, customer services clerks, skilled agricultural and fishery workers, sales and services-related elementary occupations, as well as agricultural, fishery and related labourers. In all these occupations, the increase in the total labour force requirement in 2020 compared to 2010 will be approximately 50% or even more.

The growth in demand for labour will be significantly less for craft and related trades workers and plant and machine operators and assemblers. The corresponding figure for metal, machinery and related trades workers, as well as other craft and related trades workers will only be about 10%. It is noteworthy that this low level will be the result of a combination of a simultaneous fall in the demand for a new labour force and an increase in the need for labour replacement that will characterize these occupations.

## Conclusion

In this paper, we analyzed the projected changes in labour demand in the European labour market in the context of an array of professional categories, which made it possible to clarify future trends.

Forecasts of the occupational and skill structure of the workforce are an important component of nationwide forecasts in developed European countries. The Cedefop prepares forecasts for the European Union as a whole, in which some transition economies have recently been included. Although such forecasts are no longer considered direct “guidance,” particularly with respect to education or business, they continue to play an important role, outlining possible changes in the future demand for certain categories of workers.

Summing up, we can say that the main trend for the next decade will be an increasing demand for both mid-level and highly qualified specialists. The need for health workers and other occupations that provide a scientific and technical breakthrough will grow especially rapidly. The increased demand for mid-level employees is due to the fact that those employed in such occupations are increasingly taking on certain functions that were previously performed by more qualified personnel, thus ensuring a more efficient distribution of labour within a skilled workforce segment.

At the same time, demand for the least skilled workers is also expected to increase. This will happen despite the fact that the forecasts indicate a forthcoming decrease in the number of qualified and semi-skilled workers’ occupations, which is directly related to the fall in the share of industrial production in developed countries. However, the fact is that the ongoing “mechanization” of many labour functions can’t eliminate the need for many “elementary” occupations. It should be borne in mind that the preservation of such jobs allows workers with low, often only initial education to remain in the labour market and not depend on social assistance.

In developed market economies, there is a clear tendency towards a reduction in the demand for labour among many “white-collar” occupations, which require a lower skill level. The forthcoming decrease in demand in many categories of employees in this group is associated with the further spread of modern computer technology and the automation of many routine functions previously performed by office workers. At the same time, the demand for employees engaged in services is expected to “take off,” that is, employees who have direct contact with consumers of goods or services produced. The number of jobs in trade will grow at an average level for the economy, but we should not forget that trade workers will remain one of the largest groups in the workforce.

As the forecasts of the occupational structure of the economy show, the overall demand for labour will depend not only on the dynamics of the newly created jobs, but also on the need to replace labour in connection with an aging population, withdrawal from the labour market and labour mobility. That is why the total demand for labour in all professional groups will be positive, although in some of them it will arise mainly due to the need to fill existing jobs.

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# Профессиональная структура рабочей силы в странах Европы: о чем свидетельствуют прогнозы?<sup>1</sup>

Н.Т. Вишневская, А.А. Зудина

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**Вишневская Нина Тимофеевна** — к.э.н., заместитель директора Центра трудовых исследований Национального исследовательского университета «Высшая школа экономики»; Российская Федерация, 101000, Москва, ул. Мясницкая, д. 20; E-mail: vishnev@hse.ru

**Зудина Анна Алексеевна** — к.соц.н., научный сотрудник Центра трудовых исследований Национального исследовательского университета «Высшая школа экономики»; Российская Федерация, 101000, Москва, ул. Мясницкая, д. 20; E-mail: azudina@hse.ru

*В работе анализируется будущее состояние профессиональной структуры рабочей силы в европейских странах ОЭСР. Анализ прогнозных оценок структуры рабочей силы в профессиональном разрезе позволяет ответить на вопрос о качестве вновь создаваемых рабочих мест, а следовательно, о будущей эффективности функционирования рынка труда. Выявление особенностей спроса на отдельные профессиональные группы в странах Европы представляется полезным для понимания того, насколько процессы, происходящие на российском рынке труда, соответствуют мировым трендам. В работе рассматриваются особенности методологии составления прогнозов и основные подходы к прогнозированию изменения профессиональной структуры, характеристики динамики спроса на труд представителей отдельных профессий, а также причины увеличения и падения спроса на те или иные профессии. Как показал проведенный анализ, основной тенденцией на рынке труда на ближайшее десятилетие станет увеличение значимости специалистов средней и высшей квалификации. Особенно активно возрастет потребность в работниках здравоохранения, а также профессиях, обеспечивающих научно-технический прорыв. Одновременно с этим ожидается повышение спроса на труд самых неквалифицированных работников, которое будет наблюдаться на фоне снижения численности квалифицированных и полуквалифицированных рабочих профессий, вызванное падением доли промышленного производства в экономике развитых стран и процессами глобализации. Происходящая «машинизация» многих трудовых функций пока еще не может свести на нет потребность во многих профессиях низкой квалификации. Сохранение подобных рабочих мест позволяет работникам с низким образованием оставаться на рынке труда и не зависеть от системы социальной помощи. Для всех стран с развитой рыночной экономикой достаточно четко проявляется тенденция к сокращению спроса на труд таких «беловоротничковых» профессий, как офисные служащие. Предстоящее снижение потребности в этой категории занятых связано с дальнейшим распространением современных компьютерных технологий и автоматизацией многих рутинных функций, ранее выполняемых работниками офисов.*

Ключевые слова: профессиональная структура; прогнозирование; рынок труда; Европа; ОЭСР; спрос на труд; качество рабочих мест

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# The Phenomenon of Private Military Companies in the Military and Power Policies of States in the 21st Century<sup>1</sup>

K. Kurilev, N. Parkhitko, D. Stanis, E. Martynenko

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**Konstantin Kurilev** – PhD, Assistant Professor, Peoples Friendship University of Russia; 6 Miklukho-Maklaya St., 117198 Moscow, Russian Federation; E-mail: kurylev\_kp@rudn.university.ru

**Nickolay Parkhitko** – PhD, Senior Lecturer, Peoples Friendship University of Russia; 6 Miklukho-Maklaya St., 117198 Moscow, Russian Federation; E-mail: parkhitko\_np@rudn.university.ru

**Daria Stani** – PhD, Assistant Professor, Peoples Friendship University of Russia; 6 Miklukho-Maklaya St., 117198 Moscow, Russian Federation; E-mail: stanis\_dv@rudn.university.ru

**Martynenko Elena** – Vice-rector of RUDN University; Professor, Head of the Chair of Theory and History of journalism; 6 Miklukho-Maklaya St., 117198 Moscow, Russian Federation; E-mail: martynenko\_ev@pfur.ru

*Two main issues are considered in this article. The first is the changing historical and legal status of private military companies (PMCs). Emerging after the end of World War II, the PMC phenomenon became well-established by the mid-1990s. In the first decade of the 21st century, PMCs not only engaged in military activity in different regions of the world but also participated as independent economic actors capable of occupying a certain niche in the military segment of the world economy. Following this review, the article examines the practical activities of PMCs drawing on the example of the conflict in Ukraine during the civil war that began there after the coup d'état of February 2014 and which saw the removal of the legally elected president V. Yanukovich and the rise of nationalist radicals to power. It should be noted that the Ukrainian crisis is only one of many examples of the use of PMCs. Moreover, as demonstrated in this study, the most powerful PMCs in the world are represented in the territory of Ukraine, pointing to the extreme importance of the processes occurring in Ukraine from the view point of the interests of the dominant actors in the modern international system involved in Ukrainian affairs.*

**Key words:** Private military company (PMC); mercenarie; Montreux document; Ukraine; armed conflict; civil war

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## Introduction

States have lost their monopoly on the use of military force. This erosion of direct state control constitutes one of the principle modern challenges facing international

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security. A few decades ago, most countries relied on their own armed forces to implement military policy; armies were staffed with professional soldiers as well as draft-conscriptees. However, in the wars and military conflicts of the 21st century, the role of the units of non-governmental structures has been growing. Today, PMCs are an equivalent legal entity alongside the armed forces of various states, and are widely used in international conflicts. PMCs are structures authorized by states to solve special tasks. Currently, PMCs are on equal footing with regular armies. Moreover, based on expert opinions, such structures will play an increasingly important role in armed conflicts and wars in the future. PMCs are the object of the study in this article. The subject of the study is the policy of states using PMCs in certain conflicts occurring in places around the world, exclusively in accordance with their own foreign policy interests. Given the “national” origin of each individual PMC (in this context, it is appropriate to use the English word “nation” in the sense of “state, country”), despite their apparent commercial autonomy, their actions are still directly politically dependent on the interests of the state in the world arena.

As for the methodology used in the study, the authors relied on the typological method, classifying each PMC reviewed based on its regional (zone of activity and interests), national (country of origin and preferential nationality of staff) and financial (large PMC affiliated with the oil business or small PMC performing private orders) principles. It also used the comparative method, which allows us to compare the studied PMCs with each other, and the modeling method, identifying the causal relationship between certain political events preceding the emergence of a certain conflict in a particular country (region) and the inclusion of PMCs in a conflict on the side of the government/insurgent forces, depending on the political environment.

The main conclusions regarding both aspects of the study are formulated in the final section. General conclusions are drawn about the new role of PMCs in contemporary international relations, taking into account their adaptation to the changed realities of the 21st century.

## Private Military Companies: The Problems of Terminology and Definition

One of the main modern challenges facing international security is the erosion of the state’s monopoly on the use of military force. Even a few decades ago, most of the world’s states, when implementing their military policy, relied on their armed forces, which were either professional fighters or conscripts. However, in the wars and military conflicts of the 21st century, the role of units of non-governmental structures has been growing. Today, PMCs are an equivalent legal entity alongside the armed forces of various states, which are in wide use, in practice, throughout the world. PMCs are structures authorized by states to solve special tasks. These days, PMCs occupy an equal position with regular armies. Moreover, based on expert opinions, such structures will play an increasingly important role in armed conflicts and wars in the future.



At present, both in Russian and foreign historiography, there is no uniform definition of the concept of “private military company” and therefore very often there is confusion regarding the definition of what a PMC is. There are numerous names for those who for one reason or another start working for a PMC: soldiers of fortune, wild geese, etc. However, the term “mercenary” is used most often.

According to one of the definitions, “A PMC is a registered private high-profit commercial structure staffed with high-class technical specialists, controlled by the state and acting in the interests of the state ...”<sup>2</sup>

According to another definition, a PMC is “a highly organized structure whose main task is to ensure combat operations (logistics, collection and destruction of unexploded ordnance and mines, removal from the battlefield and repair of damaged equipment, supplying food for soldiers, sustainment, protection of military facilities and warehouses, prisons, etc.).” PMCs are created and used in the interests of the state.<sup>3</sup>

There is another definition of PMC, which goes as follows: “PMCs are non-governmental organizations rendering military services on a fee-for-service basis to individuals and legal entities, as well as to states; military services are understood to include specialized services related to military activities, including military operations, strategic planning, intelligence, operational or logistical support, the training of military personnel, logistics, etc.”<sup>4</sup>

There is also a more detailed approach that refers to PMCs as “commercial organizations created to profit through the provision of contract-based military and paramilitary services operating primarily outside the country of origin whose employees are not government employees.”<sup>5</sup>

Thus, it is clear that, indeed, there is no unambiguous definition of the term “private military company.” From the above definitions, it is clear that the existing definitions are not even accurate, since states comprise the main customers of their activity, and PMCs are most often registered within that state. Accordingly, in essence, they are not a private military force but one resulting from the outsourcing of state structures, and they are an instrument of the state’s foreign policy.

## The History of the PMCs’ Development, from Hired Militia of the Middle Ages to the Private Armies of the 21st Century

The historical stages of modern PMC development can be nominally divided into three periods: 1940–1970s, 1980–1990s, and from the 1990s until now. Naturally, the division is rather relative because it is very difficult to identify rigid periods for the transi-

<sup>2</sup> N. Tsepkov. Private Military Companies: A Brief Overview of International and Russian Regulation. Available at: [https://zakon.ru/blog/2015/12/14/chastnye\\_voennye\\_kompanii\\_kratkij\\_obzor\\_mirovogo\\_i\\_rossijskogo\\_regulirovaniya](https://zakon.ru/blog/2015/12/14/chastnye_voennye_kompanii_kratkij_obzor_mirovogo_i_rossijskogo_regulirovaniya) (accessed 10 April 2016).

<sup>3</sup> A. Alikin. PMCs Are a Very Effective Tool of Influence. Available at: <http://rusplt.ru/society/voennie-chastniki-8795.html> (accessed 10 April 2016).

<sup>4</sup> A. Volevodz (2009) On International Initiatives in Legal Regulation of the Activities of Private Military and Security Companies. *International Criminal Law and International Justice*, no 1, p. 14.

<sup>5</sup> Y. Apukhtin (2009) Private Military Companies: a New Goal of Political Criminology. *Criminology: Yesterday, Today, Tomorrow*, no 2 (17).

tion from one period to another. At the same time, a deep historical digression leads us to very interesting conclusions.

There is the opinion that “even the conquering of America by the conquistadors was their own private endeavor, as the Spanish kings granted them the right to get a buyback on the lands they conquered, as well as the right to own the lands themselves. A similar private endeavor precipitated the seizure of colonies in India and Southeast Asia by the British East India Company, and, for that matter, the French and Dutch East India companies.”<sup>6</sup> As researchers note, “The militia of Minin and Pozharsky was, in fact, a private army for state purposes. Tsar Ivan IV the Terrible hired a privateer flotilla under the leadership of Karsten Rhode, a Dane, for operations in the Baltic, while the Stroganov merchants hired an Ermak squad for solving their own economic task – the conquest of Siberia. Cossacks, in fact, were private armies, albeit in the civil service. The Imperial Russian Army was often aided by private hordes, e.g. Nogais.”<sup>7</sup>

The emergence of mercenaries in the modern sense of the word received a powerful boost immediately after the end of World War II, when thousands of people who’d been professionally trained to kill remained unclaimed. As demand always generates supply, there became a market for these professionals, too. Commercial battle units demonstrated themselves as a single and formidable force for the first time during the suppression of the wave of national liberation movements in Africa. The result was a UN ban on mercenary activities. This ban was entered into the 1949 Supplementary Protocol I to the Geneva Convention for the Protection of War Victims. However, some countries did not ratify it, the United States in particular.

The remaining mercenaries were retrained into security structures. They dealt with the protection of both individual companies and entire governments. Private security companies gradually became a serious force for “dirty work” done at the behest of government agencies and terrorist organizations.

From the early 1990s, the role of already-mature PMC structures in local and regional conflicts increased sharply. This was facilitated by mass cuts of military servicemen both in Western countries in the 1990s and in the post-Soviet space after the collapse of the USSR. Since then, PMCs have only increased their influence and combat power by participating in military and peacekeeping operations along with different branches and types of armed forces.

In the early 1990’s, for every 50 regular US military personnel there was only one PMC, but by 2012 this ratio had decreased to 10:1 and the proportion of PMCs is growing. There are several hundred private military and security companies operating in Afghanistan and Iraq alone, which employ more than 265,000 private contractors.<sup>8</sup>

<sup>6</sup> O. Valetsky. Private Military Companies, Their Creation and Development – Experience in Iraq, Afghanistan, Africa and Other Regions of the World. Available at: [http://artofwar.ru/w/waleckij\\_o\\_w/chvk.shtml](http://artofwar.ru/w/waleckij_o_w/chvk.shtml) (accessed 10 April 2016).

<sup>7</sup> S. Kanchukov. Private Military Companies – Help or Burden for Russia? Available at: <http://www.iarex.ru/articles/28444.html> (accessed 10 April 2016).

<sup>8</sup> Private Military Companies – Mercenaries of the XXI Century. Available at: <http://politrussia.com/vooruzhennye-sily/chastnye-voennye-kompanii-469/> (accessed 10 April 2016).

## Legal Characteristics of Mercenary Activities

How well does the term mercenary describe those who work in PMCs? Let us turn to international legislation and see how it interprets the concepts. It should be noted at once that there is no such thing as a PMC in international law, although mercenaries are mentioned. Firstly, we are talking about the 1977 Additional Protocol I to the Geneva Conventions of 1949. In accordance with its Article 47, “a mercenary is a person who

- 1) is specially recruited locally or abroad in order to fight in an armed conflict;
- 2) actually takes direct part in armed hostilities;
- 3) is motivated to take part in the hostilities essentially by the desire for private gain and, in fact, is promised, by or on behalf of a party to the conflict, material compensation substantially in excess of that promised or paid to combatants of similar rank and function in the armed forces of that party;
- 4) is neither a national of a party to the conflict nor a resident of the territory controlled by a party to the conflict;
- 5) is not a member of the armed forces of a party to the conflict;
- 6) has not been sent by a State which is not a party to the conflict on official duty as a member of its armed forces.”<sup>9</sup>

As can be seen, along with financial criteria, mercenaries must also meet a number of other criteria. In particular, they cannot be a part of the armed forces of any of the parties to the conflict. In addition, they cannot be sent by a state that is not a conflict-party to perform official duties as a member of its armed forces.

In December 1989, the UN adopted the International Convention against the Recruitment, Use, Financing and Training of Mercenaries. This document, unlike the 1977 Additional Protocol I to the Geneva Conventions of 1949, defines mercenaries as not only persons directly involved in armed conflicts, but also any person who:

- 1) “is specially recruited locally or abroad for the purpose of participating in a concerted act of violence aimed at:
  - 2) a) overthrowing a Government or otherwise undermining the constitutional order of a State; or
  - b) undermining the territorial integrity of a State;
- 4) is motivated to take part therein essentially by the desire to for significant private gain and is prompted by the promise or payment of material compensation;
- 5) is neither a national nor a resident of the State against which such an act is directed;
- 6) has not been sent by a State on official duty; and
- 7) is not a member of the armed forces of the State on whose territory the act is undertaken.”<sup>10</sup>

<sup>9</sup> Additional Protocol to the Geneva Conventions dated 12 August 1949 concerning the Protection of Victims of International Armed Conflicts. Available at: [https://www.icrc.org/rus/assets/files/2013/ap\\_i\\_rus.pdf](https://www.icrc.org/rus/assets/files/2013/ap_i_rus.pdf) (accessed 10 April 2016).

<sup>10</sup> International Convention against the Recruitment, Use, Financing and Training of Mercenaries. Adopted by General Assembly resolution 44/34 on December 4, 1989. Official Records of the General Assembly, 44th Session, Supplement No. 49 (A/44/49), pp. 425–428.

It should be noted that the Convention against the Recruitment, Use, Financing and Training of Mercenaries was signed by 40<sup>11</sup> countries and ratified by 30.<sup>12</sup>

A similar definition of a mercenary is found in the Convention of the Organization of African Unity (now the African Union) for the elimination of mercenary activities in Africa.<sup>13</sup>

As can be seen, in order for a PMC worker to qualify as mercenary, they must meet all of the above criteria. Therefore, these definitions are regarded by many as ineffective. Accordingly, only some of the PMC staff participating in international military conflicts can be recognized as mercenaries. This is actually not something they desire, given that one of the features of the legal mercenary status is that the person participating in an international armed conflict will not have the status of a prisoner of war. This is indicated by the Geneva Convention on the Treatment of Prisoners of War of 1949, which lists persons who are eligible to the status of a prisoner of war.

In other words, international law defines mercenaries as war criminals and, if a mercenary is captured, theoretically he can be shot without a trial or record.

## Legal Aspects of the Regulation of PMCs. Major International Documents

It should be noted that currently there is no international legal instrument which would reflect and regulate the activities of PMCs. The documents that we discussed above do not mention this whatsoever. Thus, if we recognize that mercenary activities and the activities of PMCs are different phenomena, it turns out that the legal status of PMCs is not defined and not established due to gaps in the current legislation.<sup>14</sup> In other words, PMCs are not subjects of international law or bearers of the obligation not to use force in international relations set forth in the UN Charter.

At the same time, there are certain legal norms regulating the activities of PMCs. “In the early 21st century, legal initiatives appeared that were aimed at strengthening the control over the activities of PMCs on the part of the government of Great Britain (Green Rareg-2002) and Switzerland, in conjunction with the International Red Cross (the so-called Swiss Initiative of 20026). Upon adoption, the initiative was endorsed by Australia, Austria, Angola, Afghanistan, Britain, Germany, Iraq, Canada, China, Poland, Sierra Leone, the USA, France, Sweden, Ukraine, and South Africa. These initiatives were aimed at:

<sup>11</sup> Angola, Azerbaijan, Barbados, Belarus, Belgium, Cameroon, Congo, Costa Rica, Croatia, Cuba, Cyprus, Democratic Republic of the Congo, Georgia, Germany, Guinea, Italy, Liberia, Libyan Arab Jamahiriya, Maldives, Mali, Mauritania, Moldova, Montenegro, Morocco, New Zealand, Nigeria, Peru, Poland, Qatar, Romania, Saudi Arabia, Senegal, Serbia, Seychelles, Suriname, Togo, Turkmenistan, Ukraine, Uruguay, Uzbekistan.

<sup>12</sup> The Convention was not ratified by Angola, Germany, Democratic Republic of the Congo, Congo, Morocco, Nigeria, Poland, Romania, Serbia, and Montenegro.

<sup>13</sup> Convention for the Elimination of Mercenarism in Africa, Organization of African Unity, Libreville, 3 July 1977, CM/817 (XXXIX), Annex II, Rev. 3 (entered into force 22 April 1985).

<sup>14</sup> Singer P. (2005) Outsourcing War. *Foreign Affairs*. 1 March. Available at: <http://www.brookings.edu/views/articles/fellows/singer20050301.htm> (accessed 10 April 2016).

A) Creating a single international body (secretariat) to monitor the activities of PMCs that has the right to prohibit their activities in “aggressor countries” and other states and has the ability to revoke their operating license as a punishment;

B) Instituting international control over the licensing system for PMCs;

C) Monitoring international bodies for the activities of PMCs with the development of agreements between countries that have such companies.

It was assumed that the functions of the international body (secretariat) for monitoring the activities of PMCs could include considering complaints about the companies in the event of incidents, keeping records of PMC staff, carrying out inspections of signed contracts, as well as enforcing possible financial penalties. According to the position of the United States and Great Britain, within the Swiss Initiative, there was a plan to create three working groups including British diplomats and employees of the US Department of Defense, who would designate the structure, sources of financing and the directors of the future international secretariat. Representatives of the US State Department, the Pentagon, as well as leading American and British PMCs were to participate in the work of the international body. The international body would be empowered to conduct international inspections and have the right to withdraw companies' permission for the implementation of professional activities. It is assumed that the headquarters would be located in Geneva.<sup>15</sup> As of today, these initiatives have been completed with the adoption of the Montreux Document in 2008<sup>16</sup> and the International Code of Conduct for Private Security Service Providers in 2010.<sup>17</sup>

The Montreux Document contains rules and regulations for private military and security companies operating in armed conflict zones. In total, it contains some 70 recommendations on regulating the activities of private contractors in the zones of military conflicts and monitoring compliance with the standards of international law. The document was the result of an international process initiated in 2006 by the Government of Switzerland and the International Committee of the Red Cross. Along with the cover letter of the Permanent Representative of Switzerland to the United Nations, the document was sent to its Secretary General.

The Montreux Document consists of two parts. The first part defines the notion of a private military company. According to the document, PMCs “*are private business entities that provide military and/or security services, irrespective of how they describe themselves. Military and security services include, in particular, armed guarding and the protection of persons and objects, such as convoys, buildings and other places; the maintenance and operation of weapons systems; prisoner detention; and advice to or training of local forces and security personnel.*”<sup>18</sup> The document also mentions three groups of states:

<sup>15</sup> International legal aspects of the use of PMCs. Available at: <http://www.modernarmy.ru/article/360/mejdunarodno-pravovie-aspekty-ispolzovaniya-chvk> (accessed 10 April 2016).

<sup>16</sup> Montreux document on relevant international legal obligations and best practices of states concerning the operation of private military and security companies during armed conflicts. Available at: <https://www.icrc.org/rus/resources/documents/misc/ihl-montreau.htm> (accessed 10 April 2016).

<sup>17</sup> International Code of Conduct for Private Security Service Providers. Available at: [http://www.icoca.ch/sites/all/themes/icoca/assets/icoc\\_russian3.pdf](http://www.icoca.ch/sites/all/themes/icoca/assets/icoc_russian3.pdf) (accessed 10 April 2016).

<sup>18</sup> Montreux document on relevant international legal obligations and best practices of States concerning the operation of private military and security companies in the period of armed conflicts. Available at: [https://www.icoca.ch/sites/all/themes/icoca/assets/icoc\\_russian3.pdf](https://www.icoca.ch/sites/all/themes/icoca/assets/icoc_russian3.pdf)

### Contracting States;

- Territorial States (States on whose territory PMCs operate);
- Home States (of incorporation, registration, principal place of management).<sup>19</sup>

The main drawback of the Montreux Document is its declarative nature. Since it is only a sketch for a possible international regulatory framework, its provisions are not mandatory and are of a recommendatory nature.

According to the International Code of Conduct for Private Security Service Providers, “private security companies (PSCs) and private security service providers are any company whose commercial activities include the provision of security services either on its own behalf or on behalf of another, irrespective of how the company describes itself.”<sup>20</sup> When signing the Code, the PSC assumes the obligation to “establish within 18 months external independent mechanisms for effective governance and oversight, which will include the Certification of Signatory Companies’ compliance with the Code’s principles and the standards derived from the Code, beginning with adequate policies and procedures, the Auditing and Monitoring of their work in the field, including Reporting, and execution of a mechanism to address alleged violations of the Code’s principles or the standards derived from the Code.” In addition, companies that have signed the Code are required to “establish and/or demonstrate internal processes to meet the requirements of the Code’s principles and the standards derived from the Code,” and “... once the governance and oversight mechanism is established,” private security companies and service providers “become certified by and submit to ongoing independent Auditing and verification by that mechanism.” They also “make compliance with this Code an integral part of contractual agreements with Personnel and subcontractors or other parties carrying out Security Services under their contracts,” and “adhere to this Code, even when the Code is not included in a contractual agreement with a Client.”<sup>21</sup>

To date, the International Code of Conduct for Private Security Service Providers has been signed by 708 companies.

Compliance with the standards of this International Code of Conduct for Private Security Service Providers is a prerequisite for the signing of any contracts for the provision of private military services at the international level. However, as with the Montreux Document, the International Code of Conduct for Private Security Service Providers does not have mandatory legal force and is recommendatory in nature.

Thus, the Montreux Document and the International Code of Conduct for Private Security Service Providers do not impose restrictions that infringe or, alternately, expand the rules of current international law or national legislations.

Separately, we should mention the legal framework for regulating the phenomenon under study. An important link in this chain is the use of PMCs in Russia. To date,

[www.icrc.org/rus/resources/documents/misc/ihl-montreux.htm](http://www.icrc.org/rus/resources/documents/misc/ihl-montreux.htm) (accessed 10 April 2016).

<sup>19</sup> Montreux document on relevant international legal obligations and best practices of States concerning the operation of private military and security companies in the period of armed conflicts. Available at: <https://www.icrc.org/rus/resources/documents/misc/ihl-montreux.htm> (accessed 10 April 2016).

<sup>20</sup> International Code of Conduct for Private Security Service Providers. Available at: [http://www.icoca.ch/sites/all/themes/icoca/assets/icoc\\_russian3.pdf](http://www.icoca.ch/sites/all/themes/icoca/assets/icoc_russian3.pdf) (accessed 10 April 2016).

<sup>21</sup> International legal aspects of the use of PMCs. Available at: <http://www.modernarmy.ru/article/360/mejdunarodno-pravovie-aspekty-ispolzovaniya-chvk> (accessed 10 April 2016).

there is no provision in Russian legislation that would directly regulate the activities of PMCs as legal entities.

As a rule, when such pilot projects appear, legislators tend to avoid the specifics and speak in generalities, giving loose, vacuous descriptions of the provisions of the bill.

When the law is created, it may contain two types of services – security and military. From the viewpoint of organizing the activities of the private military sector, the first major question is who the employer of these companies is. Orders for such services can come from various sources:

- government;
- relevant ministries and departments;
- businesses;
- private persons;
- non-governmental organizations, etc.

Naturally, the adoption of such a bill will entail the adoption of changes to other legislative acts of the Russian Federation (the Criminal Code of the Russian Federation, the Tax Code of the Russian Federation, and the Labor Code of the Russian Federation by supplementing them with items associated with international and military law).<sup>22</sup>

Private military companies and related businesses still cannot operate in Russia, first of all due to the lack of a legislative framework. According to the existing Russian legislature, this difficult, challenging and sometimes dangerous occupation has the same status as mercenary activity (Criminal Code of the Russian Federation, chapter 34, article 359. Mercenaries).<sup>23</sup> Article 208 of the Criminal Code of the Russian Federation is an additional restraining factor in the development of Russian PMCs. It says that the creation of an armed formation is not provided for by federal law, and that the leadership of such a group or financing one is a crime.

The development of the private military business in Russia would necessitate the urgent adoption of a special law on private military activities, or the refinement of the existing Federal Law “On Private Detective and Security Activities in the Russian Federation,” with appropriate amendments to the Criminal Code of the Russian Federation. The former option appears preferable.

An interim step has already been taken.

In July 2007, the State Duma and the Federation Council approved the law “On Procurement of Goods for Federal State Needs,” which empowered special units of Transneft JSC and Gazprom OJSC “to use official weapons and special equipment to ensure the protection of goods supplied for federal state needs and facilities for the goods’ production, processing, storage and transportation, as well as to protect other property necessary for the performance of state contracts, including during transportation.” After Russian President Vladimir Putin signed the bill on August 1, 2007, the security units of Gazprom and Transneft received the right to engage in departmental security services, i.e. in essence the same activity employees of the Ministry of Internal

<sup>22</sup> I. Rakitskaya (2014) Russian Constitutional Law: textbook. Moscow State Institute of International Relations of the Ministry of Foreign Affairs of Russia, Department of Constitutional Law.

<sup>23</sup> Russian Constitutional Law (eds Elena A. Kremyanskaya, Tamara O. Kuznetsova, Inna A. Rakitskaya). Cambridge Scholars Publishing.

Affairs have. However, since that moment, the institutionalization of PMCs in Russia has stagnated legally and remains totally unclear. So far, only a few Russian PSCs have been able to gain some experience as PMCs in Iraq – Oryol-Antiterror, Tigr Top-Rent Security, Redut Antiterror, and Feraks.<sup>24</sup>

As of today, Russian PMCs are practically prohibited from competing in the world market for military services, and without state support, it will not be easy to enter.

## Largest PMCs as of 2016

We will list a number of PMCs that currently take the most active part in international conflicts. It should be noted that out of over 400 private currently existing companies that earn on war, only a few are widely known. Therefore, we list the most famous of them:

- **Blackwater<sup>25</sup>/Academi (USA)**

The company was founded by retired US Navy Special Forces officer Eric Prince. It has at its disposal a modern testing ground, helicopters, boats, and patrol ships which are used by the US Coast Guard. It builds complexes for training its own employees, and also works under contract with the US Armed Forces and special services, and trains their personnel.

The company formerly known as **Blackwater** became widely known after an incident in the Iraqi city of Fallujah in April 2003, when its employees came into opposition with the local population, resulting in gunfire. As a result of the fighting, four employees of the company were captured by extremists and brutally killed. In response, the troops of the united coalition took the city by storm, which resulted in numerous casualties among civilians. Only in 2007, it received more than \$1 billion from the US government for carrying out special assignments in Iraqi territory. The company has a branch office in Tashkent, Uzbekistan. It was renamed Xe Services in 2009 and Academi in 2011. The activities of this company in the territory of Ukraine will be discussed in the second part of this work.

- **Kellog, Brown and Root (USA)**

KBR is a structural unit of Halliburton, the company once led by former US Vice President Dick Cheney. It actively participated in the Yugoslav conflict as a logistics company and as the main structure for training personnel for the local police. It also engaged in the protection of oil fields and industrial facilities in Iraq.

- **Groupe-EHC (France)**

This PMC was established in 1999 by former French army personnel. This is the first French military company to be represented in the United States. The company operates in high-risk regions, primarily in the former French colonies and African countries. It has experience in Iraq, Pakistan, Afghanistan, Indonesia, and Poland.

- **MPRI International (Military Professional Resources) Inc. (USA)**

The company provides a wide range of integrated services for the US and foreign armed forces in more than 40 countries. It provides training and support programs for

<sup>24</sup> I. Kononov, O. Valetsky (2013) Evolution of Private Military Companies. Pushkino: Center for Strategic Situations.

<sup>25</sup> Foreign sources often use a divided version of the name of the company – Black Water. Author's note.



employees of special forces, programs to stabilize conflict situations in various regions, training on the management of state military personnel, analytical support for special operations, and other services. It conducts security programs in Afghanistan, Kuwait, Bosnia, and Equatorial Guinea.

In addition to its main functions, MPRI International assists public authorities in developing strategies for effective information analysis, and provides support for research and public opinion assessment. It also has a program to combat corruption, which includes the creation and functioning of a special institute of inspectors general in each ministry and department to identify manifestations of corruption both in stable and unstable conditions.

To date, the company is managed by General **Carl Vuono**, former Chief of Staff of the Expeditionary Force of the US Armed Forces during operations in Panama and Desert Storm, and General Ed Soyster, former head of the US Military Intelligence Agency.<sup>26</sup>

## Participation of PMCs in the Civil War in Ukraine

The Ukrainian conflict continues to attract the attention of the public and will have a long-term destabilizing effect on the region's security. One of the most discussed issues both in the media and in the scientific and political discourse is the participation of PMCs in the civil war in Ukraine.

We should warn that it does not appear possible to cover the issue of the activities of PMCs (especially foreign ones) in Ukraine in full. Their activities are discussed based mainly on open sources of data, as well as by comparing information and inferencing.

PMCs appeared in Ukraine long before the start of the civil war in the country. However, it is during the development of this crisis that interest in them appeared. Let us emphasize that Ukraine was one of the first countries to ratify the Montreux Document considered above. The PMCs operating in Ukraine should be divided into two groups. The first includes those PMCs that can be called local, because they are registered in Ukraine, and their employees are mostly Ukrainians. The second group of PMCs includes companies that work in Ukraine but are registered abroad, owned by foreigners and serve their interests.

We will not dwell on the activities of PMCs in Ukraine during the pre-crisis period; we will give only a general overview of their activities.

Back in the 1990s, private security companies began to appear in Ukraine as well as in other former Soviet republics. They constituted the power core of the most powerful criminal structure that had become legitimate — that comprised of former state administrative officials. Private security eventually defeated the less organized and economically weaker forces of the simple gangster world. The natural victory was on the side of the private security companies controlled by national-level oligarchs and bureaucrats, which conquered “lawlessness” in a few years.<sup>27</sup>

<sup>26</sup> Private Military Companies — Mercenaries of the XXI Century. Available at: <http://politrussia.com/vooruzhennyye-sily/chastnye-voennye-kompanii-469/> (accessed 10 April 2016).

<sup>27</sup> Conflict in Ukraine and Private Military Companies. Available at: <http://road2life.in.ua/publ/3> (accessed 10 April 2016).

The PMCs as we know them began to appear in Ukraine around 2010. The largest Ukrainian companies include Omega Consulting Group, Artan Group, Albatros, Vega, and others. The Odessa company Albatros and the Nikolayev company Vega specialize in protecting ships from piracy. In relation to the latter, there was information regarding the participation of its employees in the antiterrorist operation (ATO) in Donbass. According to the available data, both PMCs work abroad ensuring the safety of the maritime transport of foreign ship owners. Official information is very scarce. PMC Omega Consulting's headquarters are located not far from Kiev, in Slavutich. On its website, the Ministry of Defense of Ukraine is listed among its customers. Officially, the company is engaged in the security business and training of bodyguards.

Artan Group, another PMC, is a very powerful outfit that is engaged in the protection of numerous facilities, military operations, the training of bodyguards, and guarding of ships. Among the facilities guarded by Artan employees are many that once belonged to the closest associates of former President V. Yanukovich. Artan Group even received a letter of recommendation from the post-coup Ukrainian Minister of Education and Science S. Kvit, a former member of the paramilitary organization Stepan Bandera Tryzub. This PMC supported the launch of the outright nationalist PMC Tamplier, whose employees were seen in the retaliatory battalion Aidar. Tamplier cooperates with Ukrainian nationalists and various right-wing radical volunteer organizations (such as Lvivska Brama). Media support is provided to Tamplier by Ukrainian nationalist Internet resources.<sup>28</sup>

As of today, there is no accurate data on whether Ukrainian PMCs directly participate in the so-called 'anti-terrorist operation' (ATO) in the eastern regions of Ukraine, or whether they advise the government on certain issues. To date, we know for certain about the participation of Omega Consulting, headed by A. Kebkalo, in the armed conflict in Donbass. In the spring of 2014, the company had open vacancies for advisor jobs, which were scheduled to be filled by May 1, 2014. One of the eligibility requirements was that applicants be registered as living in Ukraine's eastern Kharkiv, Donetsk, or Luhansk regions. Officially, the company recognized its participation in operations for the "emergency withdrawal of the Customer's personnel from the Autonomous Republic of Crimea and Donbass."<sup>29</sup> At the moment, the PMC's public relations department recognizes the existence of a contract relating to activities in the Donetsk and Lugansk regions (which seek independence from Ukraine), though it claims that it has no state orders — all contracts were signed with private individuals or enterprises.<sup>30</sup>

Let us turn to the activities of foreign PMCs in Ukraine. Since 1992, a branch of G4S, one of the largest PMCs in terms of staff size, has been operational in the country. The multinational company has Danish roots and is headquartered in the UK and trades on the British and Danish stock exchanges. It recruits experts in intelligence and military affairs, operating in over 100 countries with a staff of 675 thousand people,

<sup>28</sup> Morgenstern A. What Are Private Military Companies And What Are They Doing in Ukraine. Available at: <http://spinoza.in/analytics/chto-takoe-chastnye-voennye-kompanii-i-chto-oni-delayut-na-ukraine.html> (accessed 10 April 2016).

<sup>29</sup> Dobrovolsky A. Private Military Companies — Mercenaries of the XXI Century. Available at: <http://politrussia.com/vooruzhennye-sily/chastnye-voennye-kompanii-469/> (accessed 10 April 2016).

<sup>30</sup> Neelov V. Private Military Companies and the War in the South-East of Ukraine. Available at: <http://www.conjuncture.ru/category/pmc/> (accessed 10 April 2016).

dwarfing most of the national armies of European powers. (you can add <http://www.bbc.com/news/uk-39968776>) G4S owns armored vehicles, aircraft, maritime transport, unmanned vehicles, various means of electronic warfare, and reconnaissance technology. This company deals with a wide range of military and security services, which makes it independent, even in solving military and political problems. Another giant in the military business is L3, which is engaged in the security of mobile and information communications in Ukraine. Leidos, one of the oldest and most influential private military corporations, also works in Ukraine and maintains connections with activists from the EuroMaidan movement (which launched the February 2014 coup) both in the diaspora and in Ukraine itself.<sup>31</sup>

After the coup d'état, Ukraine's proxy confrontation between the West on one side and Russia on the other descended into civil war. One of the most important tools used in this conflict by Western countries, primarily the US, is the PMCs. An analysis of open sourced data suggests that since February–March 2014, there have been PMCs in Ukraine from a number of countries, primarily the United States, Poland, and the UK, under contracts with the Kiev central government as well as individuals and institutions. They have performed a number of functions: operational and strategic planning, the training of command and personnel, as well as the protection of individuals and individual objects. Ukraine has traditionally been attractive to PMCs. Thanks to an advantageous geographical location and due to regional peculiarities, Odessa has become one of the largest trans-shipment points for people wishing to go to war. In this regard, foreign PMCs were active here until their own representative offices were opened. However, if before the events of 2013–2014 Ukraine was attractive for foreign military contractors mainly as a source of inexpensive, highly-trained staff, the coup and the events that followed allowed them to enter the market in a new way: as contractors carrying out specific orders on the part of a number of Ukrainian entrepreneurs and oligarchs, as well as the central government in Kiev.<sup>32</sup>

Do these or other PMCs participate in the hostilities in the South-East of Ukraine? There are serious differences in opinions concerning their role. It was primarily pro-Russian media outlets that claimed the participation of American PMCs in the Ukrainian crisis. They mentioned the American PMCs Blackwater and Greystone. A video was published online in which several people wearing weird military uniforms were walking down the street in Donetsk in March 2014.<sup>33</sup> Pro-Russian websites were quick to identify the people in the video as Blackwater employees, although at that time the company had already ceased to exist and had been transformed into several other private military and security companies. This case of mistaken identity is best explained by the fact that the Blackwater is the most famous brand; the company carried out a number of high-profile military operations against civilians and rebel forces in Iraq. The actions of Blackwater in Iraq were well-known to the Russian audience, so drop-

<sup>31</sup> V. Neelov. Private Military Companies and the War in the South-East of Ukraine. Available at: <http://www.conjuncture.ru/category/pmc/> (accessed 10 April 2016).

<sup>32</sup> Ibid.

<sup>33</sup> See: <https://www.youtube.com/watch?v=1VFMAIv8yvA> и [https://www.youtube.com/watch?v=UD\\_xgxj\\_6Qo](https://www.youtube.com/watch?v=UD_xgxj_6Qo)

ping the name of this odious force in the conflict in Ukraine was extremely tempting for Russian propaganda outlets. Additionally, pro-Russian information websites and services, as well as online resources supporting the unrecognized Donetsk People's Republic and Lugansk People's Republic, provided information about the participation in the armed conflict of the employees of Greystone, a subsidiary of Academi LLC (formerly known as Blackwater). For a short time, the company's website posted an announcement about a good job in Russia, but in the spring of 2014, this announcement disappeared. No convincing data supporting the participation of this PMC in the conflict has been found so far, although the rebel forces reported losses in this military company. A little later, unofficial sources provided information that 20 mercenaries had been captured by the militia in the Slavyansk region. According to some reports, the captive mercenaries were from Graystone, others claim they were from another American PMC – Academi. Also, websites supporting the Donetsk People's Republic and Lugansk People's Republic reported on the participation of the Polish PMC ASBS Othago (Analizy Systemowe Bartłomiej Sienkiewicz) in the military operations on the side of the ATO forces. This information was not confirmed either.<sup>34</sup>

Let us emphasize that there is no reliable information about the direct participation of the personnel of foreign PMCs in combat operations. There are assumptions, hypotheses, and suspicions. None of the foreign PMCs has confirmed the participation of their employees in the hostilities in Donbass. This is understandable, as no party to the conflict is likely to condone their participation in it. The US government stated that there is no US military involvement in Ukraine, followed by a similar statement from the Polish authorities. Moreover, the management of Greystone stated that its employees were not and had never been in Ukraine.

So far, the information on the participation of PMCs in hostilities in the east of the country has come only from unofficial sources referring to the leaders of the self-proclaimed republics. First of all, we are talking about the data of the officials of the Donetsk People's Republic and Lugansk People's Republic, who reported on the participation of foreign PMCs in the hostilities in Donbass. The peak of information activity on the subject of the presence of PMCs in Ukraine was during March–June 2014, immediately after the coup d'état and the beginning of pro-Russian independence stirrings in the South-East of the country. At the first stage, the geography of the PMCs' presence basically coincided with the geography of protest activity: the Kharkiv, Donetsk, Luhansk, and Dnipropetrovsk regions. In addition, PMC staff were spotted in Kiev.

Let us repeat once again that at the moment there is no reliable information on the direct participation of PMC employees in the Ukrainian conflict as combatants. Actually, there is nothing weird about this. On the contrary, this is one of the important advantages of PMCs compared to state armies. PMCs can act as covertly as they see fit.

Nevertheless, according to some experts, the foreign private military company specialists can still legally take part in the military operations on the side of the Ukrainian army, but as advisers. This, however, is not a secret.

<sup>34</sup> Neelov V. Private Military Companies and the War in the South-East of Ukraine. Available at: <http://www.conjuncture.ru/category/pmc/> (accessed 10 April 2016).

The main tasks for the PMCs hired at this stage in the above-mentioned regions include the training and coordination of local law enforcement officers, as well as special units. Their objective is the elimination of protest activities in these regions, as well as the evacuation and escort of individuals and personnel from the territories covered by the uprising. Similar tasks were previously performed in Iraq, Afghanistan, Bosnia and Herzegovina, Kosovo and some other regions by the following foreign companies: DynCorp (USA), Academi (USA), Greystone Limited (USA), and Erinyes (Great Britain). We cannot state unequivocally that the employees of these companies were involved in the implementation of these missions, but the participation in previous similar conflicts and the nature of incoming information allows us to speak of a high probability of the presence of these companies.

The next period that witnessed foreign PMC activity in Ukraine is May-August 2014. This period was marked by the most active phase of military operations in Donbass, in 2014. It is very likely that the employees of foreign companies prepared and coordinated activity during a number of AFU military operations (Armed Forces of Ukraine) during that year's summer campaign.

Nevertheless, open sources of information provide data on losses of foreign PMCs in Ukraine: ASBS Othago (Poland) lost 144 people; Graystone (USA) lost 60 people; and Academi (USA) lost 130 people.<sup>35</sup> Information about foreign combatants who have been killed is regularly received from the militia of the Donetsk People's Republic and Lugansk People's Republic. Although it does not appear possible to establish their status, the probability that these are PMC employees is not high: the nature of the functions performed by these companies most often does not involve direct participation in combat.

The next stage of the conflict was September 2014 – January 2015, the period after the conclusion of the first Minsk agreements. At this time there was a decline in information activity related to PMCs in Ukraine. At the same time, the nature of the Ukraine Freedom Support Act dated December 12, 2014, suggested that, if implemented, US PMCs will be actively involved for training and strategic planning, as well as the supply and servicing of military equipment. Such functions can be performed by both MPRI (operations and strategic planning) and Kellogg Brown & Root (combat service and technical support, training in servicing the supplied equipment).

## Conclusion

Theoretically, the use of PMCs gives the state immunity from international law and even local laws when pursuing counter-insurgency and militaristic foreign policy objectives. It is easy to imagine the normative conduct of military operations by PMCs not in terms of a political conflict or the rules of war, but as a matter of contract compliance between two consenting parties. Accordingly, where corporate law is in force, no one, not even the UN, can demand full publicity and legal transparency. A possible answer to any reproaches in this situation is that the state does not interfere in the internal

<sup>35</sup> How and whom are foreign private military companies fighting in Ukraine? Available at: <http://chvkmar.ru/category/novosti> (accessed 10 April 2016).

affairs of PMCs. Thus, from a legal and diplomatic point of view, even the decision to “billet” the army to private military companies may appear efficient. Evidence of this can be found in the policies of the United States and some European countries.

Involving private military contractors in an internal political conflict certainly creates additional complications for its government, if it hopes to restore domestic harmony. One shouldn’t be fooled about the true purposes of using foreign contractors and their support by Western countries: any activity in any country is primarily dictated by the interests of its internal elites, rather than by the interests of democratic reforms, especially outside the developed world. Heads of state undoubtedly have a long dirty tradition of using mercenaries, including for suppressing popular uprisings. This tradition was developed by the United States as well, and Washington pursued different goals in each specific situation.<sup>36</sup>

First, US efforts in the 1990s and early 2000s, including in the information sphere, created an image of soldiers for hire that was neutral, if not positive. Now that the United States has used hundreds of thousands of military contractors in high-profile armed conflicts over the past decade, there is little reason for the US itself to condemn the use of similar structures by other sovereign states.

The US continues to use private military forces despite repeated instances of contractors’ involvement in abuses, senseless murders of civilians, and even the work of hired assassins for the CIA. Given the widest interpenetration of business in the US power and a legal system that condones corporate political lobbying, the US government has no legal or moral grounds to demand the restriction of the use of military contractors by the governments of other countries, even though those other governments mainly use foreign military contractors to prevent or suppress internal democratic movements.

Secondly, it was the US that created and subsidized the private military industry. By hiring contractors and paying them billions of dollars under contracts, the US breathed life and developed a private military industry, which enabled it to gain experience and professional contacts. It should be noted that the US also allowed allegedly authoritative corporate contractors to conclude subcontract agreements with local security organizations, including ones with dubious staffing policies, thus bringing cheaper and less professional military services to the market.

After the state paid in full for the costs of keeping PMCs in Afghanistan and Iraq, and after the latter gained huge profits from their activities, neither large private military corporations nor their smaller subcontractors will disappear from the world economy. Moreover, they will also occupy a stable niche in it. This is confirmed by the dynamically developing security and private military industries, which have already gone beyond purely governmental contracts and are opening up new business opportunities. It is most likely that given the successful US example, other countries will develop the practice of using private military contractors as well. Thus, a fundamentally new tool is being shaped for protecting nations’ interests and projecting them abroad.

<sup>36</sup> Use of private military companies in international conflicts. Available at: <http://speccom.livejournal.com/1241.html> (accessed 10 April 2016).

The most obvious example of such positioning is our analysis of the use of PMCs in the armed conflict in Ukraine, where the government of Kyiv and private individuals (mainly oligarchs) concluded contracts with PMCs, primarily from the USA and Poland. As the armed confrontation developed, the PMCs performed a number of functions: the protection of facilities and persons, operational and strategic planning, the training of personnel at all levels, and the evacuation and escort of persons and personnel. The active participation of PMC personnel directly in the hostilities in the Donbas was not recorded due to a number of reasons, principally because there were a sufficient number of motivated nationalist volunteers in the ranks of the National Guard and volunteer battalions, which also required training.

Due to the lack of legal grounds for the United States to render direct assistance to Ukraine, as well as supply lethal weapons, Washington resorted to the active use of a non-state instrument – PMCs. As the analysis demonstrates, these organizations provided the widest range of services to improve the Armed Forces of Ukraine, the National Guard and other law enforcement agencies in Ukraine.

Foreign PMCs have sufficient physical resources on the territory of Ukraine, as well as significant connections and work experience. Over the course of its 21 years of existence, the Ukrainian Armed Forces had experienced a lightning-fast process of degradation, as did other power structures. Amid the civil war, which began from approximately May 2014, it became obvious that the power structures of Ukraine had lost the ability to organize and conduct military activities. The assistance of the Western PMCs was therefore reduced mainly to advising the military and political leadership of Ukraine.

It should be recognized that in the short and medium term, the use of PMCs by government and private entities is bound to increase due to the lack of serious intentions to resolve the conflict peacefully. The companies that already have substantial physical resources and connections in the country (besides those mentioned above) have a solid chance to enter the Ukrainian market in a new capacity. At the same time, PMCs registered in Ukraine have so far shown themselves to be relatively inactive. There is only official information about one Ukrainian PMC that has performed tasks related to participation in this conflict. However, in the medium term, we can expect the development of Ukraine's local PMC market.

We can probably conclude that apparently there are foreign PMCs in Ukraine after all. However, we can neither confirm nor refute this. According to some experts, the participation of the employees of these companies is limited to the role of advisers. In the opinion of others, mercenaries have taken direct part in hostilities.

Such discrepancies in the expert environment are the result of a number of methodological difficulties encountered by those studying the activities of PMCs. We would like to draw attention to these problems. First, studying PMCs is very difficult due to a narrow range of sources and their questionable origin. Basically, we have to be satisfied with secondary sources. Second, we should note the high politicization of this problem, which also leaves an imprint on the quality of information that the researcher has to deal with. A vast array of available information is propaganda and should be considered part of an information war. This necessitates great care when studying related literature. Third, the categorical and terminological apparatus of the research problem

has not settled yet; private military companies are commonly incorrectly equated with mercenaries. Discrepancies related to this issue lead to errors in verifying that PMC personnel are engaged in military operations in various countries, including Ukraine. This can be quite acceptable in relation to PMC personnel, who, for example, went on vacation and went to fight in a certain flash point in personal capacity. In such cases, they cannot be considered employees of PMCs, but rather mercenaries.

To summarize, we will note that the main advantages of PMCs are their promptness, responsibility, efficiency, professionalism and undeniable financial advantage. PMCs are an alternative to the use of state military structures and criminal organizations. They provide guarantees and insurance in unstable areas, quick problem solving, and efficient risk management. It is often more advantageous to sign a contract with a PMC for a specific task than to send a security company associated with an oil or gas giant, or send troops and maintain garrisons. On the other hand, if the state does not want to advertise its participation in a given conflict or project, or wants to shift the dirty work to somebody else, which happens often enough during war, PMCs are excellent for these purposes as well.

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# Феномен частных военных компаний в военно-силовой политике государств в XXI в.<sup>1</sup>

К.П. Курылев, Е.В. Мартыненко, Н.П. Пархитко, Д.В. Станис

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**Курылев Константин Петрович** — д.и.н., доцент кафедры теории и истории международных отношений Российского университета дружбы народов (РУДН); Российская Федерация, 117198, Москва, ул. Миклухо-Маклая, д. 6; E-mail: kurylev\_kp@rudn.university.ru

**Мартыненко Елена Викторовна** — д.п.н., профессор, проректор Российского университета дружбы народов (РУДН); заведующая кафедрой теории и истории журналистики РУДН; РФ, 117198, Москва, ул. Миклухо-Маклая, д. 6; E-mail: martynenko\_ev@pfur.ru

**Пархитко Николай Петрович** — к.и.н., доцент кафедры теории и истории журналистики Российского университета дружбы народов (РУДН); Российская Федерация, 117198, Москва, ул. Миклухо-Маклая, д. 6; E-mail: parkhitko\_np@rudn.university.ru

**Станис Дарья Владимировна** — к.э.н., доцент кафедры государственного и муниципального управления Российского университета дружбы народов (РУДН); Российская Федерация, 117198, Москва, ул. Миклухо-Маклая, д. 6; E-mail: stanis\_dv@rudn.university.ru

*В статье рассматриваются два основных аспекта феномена частных военных компаний. Первый — это историко-правовой статус частных военных компаний (private military companies) (ЧВК — РМС), изменяющийся с течением времени. Зародившись после окончания Второй мировой войны, данное явление окончательно оформилось к середине 1990-х годов. В первое же десятилетие XXI в. ЧВК стали демонстрировать не только военную активность в разных регионах мира, но и проявлять черты самостоятельных экономических акторов, способных занять определенную нишу в военном сегменте мировой экономики. Во второй части статьи рассматривается практическая деятельность ЧВК на примере их участия в конфликте на Украине в ходе начавшейся там гражданской войны после совершенного в феврале 2014 г. государственного переворота, отстранения от власти законно избранного президента В.Ф. Януковича и прихода к власти националистов-радикалов. Отмечается, что украинский кризис выступает в качестве одного из многих примеров использования ЧВК. При этом, как показано в исследовании, на территории Украины представлены наиболее могущественные ЧВК мира, что является свидетельством крайней важности тех процессов, которые происходят на Украине, с точки зрения интересов доминантных акторов современной международной системы, вовлеченных в украинские дела.*

Ключевые слова: частная военная компания (ЧВК); наемники; Документ Монтрё, Украина; вооруженный конфликт; гражданская война

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# Digital Economy for Sustainable Economic Growth

## The Role of the G20 and Global Governance in the Emerging Digital Economy<sup>1</sup>

S. Guo, W. Ding, T. Lanshina

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**Shuyong Guo** – Professor, Dean of the School of International Relations and Public Affairs (SIRPA) of Shanghai International Studies University (SISU); 550 Dalian Road (W), Shanghai 200083, China; E-mail: syguo@shisu.edu.cn

**Weihang Ding** – Ph.D. Candidate at the School of International Relations and Public Affairs (SIRPA) of Shanghai International Studies University (SISU); 550 Dalian Road (W), Shanghai 200083, China.

**Tatiana Lanshina** – Research Associate, Center for Economic Modeling of Energy and the Environment, Russian Presidential Academy of National Economy and Public Administration; Research Associate, Center for Industrial Studies, Institute for US and Canadian Studies; 82 Prospect Vernadskogo bldg. 1, 119571 Moscow, Russian Federation; E-mail: lanshina.ta@gmail.com

*Recent decades have seen a rapid digital transformation resulting in important and sometimes even crucial changes in business, society and the global economy. After the global crisis of 2008–2009, digital industries have been among the most dynamic and promising in the global economy. Nevertheless, the world lacks equilibrium between benefits and risks in the digital economy, which explains the need for global governance in this sphere.*

*This article analyzes the role and characteristics of the G20 in the introduction of global governance in the digital economy. The authors review what's meant by the digital economy and define the key characteristics of this sector, as well as highlight the challenges to international cooperation, analyze the digital strategies of G20 countries, study the G20's participation in the global governance of the digital economy, analyze the potential for the leaders of China and Russia, and make recommendations concerning the participation of the G20 in the global governance of the digital economy.*

*The authors arrive at the following conclusions. First, society has to govern the digital economy properly in order to eliminate disparities between developed and developing countries, as well as address cyber security and other threats, and promote a higher quality of life for all. Second, the G20 has very limited experience in the governing of the digital economy, but as a leader in terms of soft power, and as an organization with limited membership that includes both countries with a developed digital sector and countries that lag behind, it may play a great role in the digital economy's global governance. Third, the US has historically been a leader in the IT sector and the digital economy. In recent years, China has sufficiently improved its positions, which allows it to aspire to a higher role in global governance. Russia may also play a greater (though not a leading) role, taking into account its experience and potential.*

*The authors also conclude that the G20 should: (1) pay more attention to cooperation with African countries; (2) promote tools of voluntary cooperation, first and foremost with developing countries; (3) work to improve international cyber security and (4) involve the private sector in the process of global Internet*

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<sup>1</sup> The editorial board received the article in November 2017.

*governance more often. Also, the G20 should position itself properly and actively in the sphere of digital governance, so as to optimize its functions as the hub of global governance.*

**Key words:** digital economy; global governance; G20; BRICS

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## Introduction

In recent decades, and following the agricultural and industrial revolutions, the world has been undergoing an information revolution, which has brought about essential improvements in productivity, caused critical changes in productive relations and created new activities, products and services. The increasing mobility and thus interdependence between nations has strengthened globalization. Globalization, on the one hand, has enhanced the development of international society, while on the other hand it has proliferated issues of global concern (e.g. cyber security).

Following the sub-prime mortgage crisis in the United States and the European sovereign debt crisis, the world economy entered a post-crisis era of stagnation and adjustment. Every country in the world is exploring approaches for economic revitalization, but tends to confront enormous difficulties. Apart from many other industries, the Internet and broader ICT sector have been quite resilient during the recent turbulent times since more and more individuals, companies and countries have been shifting their focus to the digital economy due to its benefits (e.g. high speed of transactions, low costs, international coverage, etc.). In terms of new businesses creation, survival rates and share appreciation, high- and medium-growth firms have outperformed other sectors of the economy [OECD, 2014]. The share of the digital economy involving digital skills and digital capital now accounts for about 22.5% of the world economy, and it still has a huge potential to further intertwine with the traditional economy and expand. By applying digital skills and technology, the world economy is expected to generate \$2 trillion of additional economic output by the year 2020 [Knickrehm, Berthon, Daugherty, 2016].

So far, researchers have paid attention to the global decline of the labor share due to the advances in information technology and the computer age [Karabarounis, Neiman, 2013], to e-fraud, digital piracy and other forms of digital shadow consumption [Gaspardeniene et al., 2016], etc. The concept of global governance in the digital economy and the role of the G20 in the digital transformation of the economy and society have hardly been analyzed. Meanwhile, the advantages of international cooperation in the digital sphere and necessity to build an inclusive global digital economy are becoming more and more obvious.

The aim of this article is to research the expanding role of the G20 in the global governance of the digital economy and formulate major advantages, as well as to find the potential role of China and Russia in digital G20 cooperation. To achieve this task, the authors use qualitative research methods, including the content analysis of G20 documents and empirical generalization.

## The G20 in Global Governance

Global governance is usually defined as the cooperation of transnational actors aimed at finding solutions to common problems that go beyond the scope of individual states. Transnational actors may include agreements, organizations, networks, etc. [Ozkan, 2011]. In other words, global governance is the management of global processes in the absence of global government. In the post-1945 world order, global governance was long understood to mean intergovernmental relationships. Modern global governance is a complex system of formal and informal institutions, both governmental and non-governmental, and relationships that coordinate policies in some specific spheres with mixed results [Aras, Crowther, 2016]. Thus, as noted in [Florini, Sovacool, 2009], it is not only governments that can achieve governance in the modern world.

The G20 emerged after the 1997–1998 financial crisis, but remained in the shadows until another global economic crisis, which unfolded in 2008–2009. The first G20 summit of leaders was held in 2008 in Washington, and was an attempt to bring together the largest global economies, including emerging powers, to find solutions to the global crisis [Lanshina, Barinova, 2017]. According to many authors, the G20 was quite effective in finding emergency policy responses [Narlikar, 2014], since it stabilized financial markets and started a global economic stimulus program which prevented depressions.

After the crisis, it became evident that different countries in the G20 have different policy preferences (e.g. Anglo-Saxon, other European countries and developing countries), and the G20, although comprising 4/5 of the world's economy and trade, still lacks representativeness and inclusiveness. After the crisis abated, the G20 attempted to redefine itself, its agenda has sufficiently expanded and included energy, corruption, taxation, etc. Thus the G20 has made efforts to transform from an anti-crisis forum to an economic development forum. However, some authors think that the G20 is unable to deal with a multitude of everyday problems [Narlikar, 2014]. In the last several years, the G20 has begun to engage in the global governance of the digital economy, yet this process hasn't been fully understood and analyzed.

## Defining the Digital Economy and its Characteristics

There are two main opinions regarding the origin of the term “digital economy.” According to one of them, this term appeared in the 1990s [Tapscott, 1995]. According to the other, the concept of the electronic or digital economy arose from ideas that had

been developing in world economic literature since the 1960s, and reflected Daniel Bell's concept of an "information economy" [Bell, 1974].

The digital economy is essentially spoken of in terms of the integration of technology and an ability to eliminate boundaries between physical, digital and biological systems [Yudina, 2016]. It is generally regarded as a type of economy based on digital information. To be more specific, a digital economy promotes the circulation of commodities and the development of the service industry by means of the exchange of digital information and online trade [Liu, 2001]. In the digital economy, the ICT facilities provide a globalized platform for individuals and organizations around the world, facilitating intercommunication and cooperation between different actors.

Mesenbourg [2001] identified three main components of the digital economy: e-business infrastructure, e-business itself (processes that are conducted through computer networks) and e-commerce (online sales). However, it should be noted that nowadays, the boundaries between the digital and non-digital sectors have become less and less clear. Moreover, the digital economy is being broadly applied to other economic sectors [G20, 2016]. It is even extending beyond economic sectors and businesses to comprise individuals, communities and societies through social media and through other means [OECD, 2014].

At the 2016 G20 Hangzhou Summit, the "G20 Digital Economy Development and Cooperation Initiative" was proposed, in which the digital economy is characterized as "a broad range of economic activities that include using digitized information and knowledge as the key factor of production, modern information networks as an important activity space, and the effective use of information and communication technology (ICT) as an important driver of productivity growth and economic structural optimization" [G20, 2016].

By integrating approaches to the notions of the digital economy and its aforementioned characteristics, the authors defined the *digital economy as a series of economic or social behaviors based on information and communication technology (ICT) and realized via the Internet*. In some sense, the "Internet Plus" is digital economy.

According to Accenture Strategy estimates, the United States is the world's largest digital economy. Its digital investment currently accounts for about 33% of the nation's GDP; 43% of the US workforce and 26% of its cumulative capital support digital related activities. More than one fifth of the global GDP (22%) is closely related to the digital economy, which encompasses skill and capital [Knickrehm et al., 2016].

Traditional industries have established digital content for entertainment, communications networks, the media and the cultural sphere using new types of digital technology, and through active product innovation, business integration and industrial restructuring. Nowadays, a number of digital content industries are becoming or have already become new sources of economic growth in some areas. They include digital finance, digital communications, digital entertainment and digital media art. Additionally, digital technology has already been incorporated into fields like industrial

manufacturing, which has improved the economic efficiency of the whole industrial sector and promoted wider, deeper, larger-scale industrial integration.

The digital economy exposes workers from some industries (especially traditional ones) to the risk of unemployment [OECD, 2016a]. OECD has calculated that less than 10 percent of workers in OECD area may lose their jobs due to automation. Up to 70 percent of tasks in 25 percent of jobs may be automated [OECD, 2016b]. On the other hand, the digital economy can also bring about employment opportunities, directly or indirectly. According to estimates, if all European countries develop their digital sectors to the level of the best performers in the EU, Europe would have 1.5 million new jobs [Muylle, Vijverman, 2013].

Internet penetration rates vary across countries. For example, there is a huge gap between the EU member states of northern and southern Europe. Statistics show that currently, more than 3/4 of European residents use the Internet frequently, while half of residents in Bulgaria and Romania do not. Network coverage in Belgium approaches 99%, while in Italy this figure is only 55%, far behind that of other European countries [He, 2013]. The differences between developed and developing countries are even more significant.

In recent years, there has been an increasing convergence between foreign policy and internet governance, especially after the Snowden revelations of 2013. The US preeminence in the Internet, which can largely be explained by its pioneering role, often comes under suspicion. Moreover, there are serious contradictions between states regarding the model of global internet governance. Many G20 countries, including China and Russia, have supported a multilateral model of global internet governance, which allows all states to participate in the process of governance on an equal basis, but limits the participation of non-government actors, such as the private sector and civil society. Some other G20 countries, first and foremost the US, have been proponents of the so-called multi-stakeholder approach, allowing all government and non-government stakeholders to equally participate in global internet governance [Trinkunas, Wallace, 2015].

## Digital Economy Strategies of the G20 Countries

In recent years, many (but not all, as it follows from Table 1) G20 members have mapped out their strategies of digital economy development in the medium- or long-term period. This multitude of strategies was initiated by the United States' Information Super Highway program in 1993 and continued via a three-step digital strategy in Japan. All these strategies aim to develop the digital economy, since in the coming years, it will be the vital driving force of the world economy.

The major differences lie in the following aspects: (a) The extent of maturity varies due to how long the countries have been implementing the strategy. The United States, for example, started commercializing its digital information network in March 1991, while other countries, particularly the developing ones, only began recently. As

Table 1. Digital strategies of G20 countries

Actor	Strategies	Focuses
US	• Information Super Highway (1993)	• Digital communication system • Information telecommunications network
	• National Broadband Plan (2010)	• Boosting high-speed broadband internet access
Japan	• e-Japan (2001)	• Information infrastructure and technology research and development
	• u-Japan (2004)	• Ubiquity in industries and services, diversification in application
	• i-Japan (2009)	• Focus on public administration – government, hospitals and schools
EU	• i-2010 (2005)	• Open and competitive digital economy • Information Communication Technology
	• Digital Agenda/Europe 2020 strategy	• Develop a digital single market
UK	• Digital Britain (2009)	• The country at the leading edge of the global digital economy
	• “Digital Economy Act 2010” (2010)	• Media policy issues related to digital media - copyright infringement, Internet domain names, Channel 4 media content, local radio and video games
	• “Digital Economy Strategy 2015-2018” (2015)	• Encouraging digital innovators; focusing on the user; equipping the digital innovator; growing infrastructure, platforms and ecosystems; ensuring sustainability
France	• Digital France 2020 (2011)	• Develop fixed and mobile broadband • Popularize digital applications and services, especially e-government or e-commerce
Australia	• National Digital Economy Strategy (2011)	• e-health, e-education, smart grids, e-government, digital economy, digital media, etc.
Germany	• Industry 4.0 (2013)	• Cyber-physical systems • Internet of things • Cloud-computing
	• Digital strategy 2025 (2016)	• Digital sovereignty • Digital infrastructure • Data security
Russia	• National Technology Plan (2014)	• EnergyNet, FoodNet, SafeNet, HealthNet, AeroNet, MariNet, AutoNet, FinNet, and NeuroNet
South Korea	• Manufacture innovation 3.0 (2014) • Scheme of Manufacture innovation 3.0 (2015)	• Information technology + Manufacturing
India	• Digital India (2015)	• The creation of digital infrastructure • Delivery of services digitally • Digital literacy
China	• Internet Plus (2015)	• Information Communication Technology (ICT) • Integration of internet and other traditional industries

*Note.* The order of nations is arranged according to the chronological appearance of the respective digital strategy.

*Source:* authors.



a consequence, the US is more experienced in its ICT infrastructure<sup>2</sup> [Shen, 2016]; (b) There are different priorities in the digital economy strategies of different countries due to the varieties of their traditional industries. Countries tend to focus their strategies on their competitive industries. Germany stresses the dynamic combination of the internet industry and manufacturing. The UK focuses on cultural industries like music, games and media. Australia, however, exerts more effort in industries such as digital ad sales and services, while Japan places its priority on public administration.

Diversified as they are, the digital strategies of the aforementioned nations all share the following characteristics: (a) They value construction and investment in broadband infrastructure; (b) They aim to improve the internet penetration rate; (c) They place an emphasis on the internet industry dovetailing with other industries.

By comparing the digital economy strategies of different countries, we find that a number of them still restrict the definition to information and communication technology (ICT), including technological fields such as the internet, broadband and e-commerce, and fail to integrate it with most traditional fields. In order to build up smart homes, cities, countries and societies, the development of digital economy should involve not only digitalized entertainment and publishing industries, but also industrial fields that are expected to be digitalized, such as medical equipment, transportation and military equipment.

## The G20 in the Digital Economy's Governance

As already mentioned, the digital economy is a rather new topic for the G20. It is also a rather new topic for all global governance policymakers. Previously, digital governance had been discussed in the United Nations, at the World Summit on the Information Society (WSIS), at the Internet Governance Forum (IGF), etc. However, these discussions and follow-up activity were largely limited to internet governance specifically.

Digital economy issues were first on the G20's agenda at the 2015 Antalya Summit. At that summit, the G20 leaders all realized that we are in the age of the Internet economy, which brings about both opportunities and challenges to global growth. They also realized that ICT and its usage can possibly pose a threat to national security. At the 2016 G20 Hangzhou Summit, the member states discussed the roles the digital economy played in economic growth and innovation. This Summit issued the "Digital Economy Development and Cooperation Initiative," the first of its kind in the world, forming a strategy that accelerates the digital economy and inclusive growth [G20, 2016]. The digital economy was a very important topic during the German G20 presidency in 2016-2017 as well. In April 2017, the G20 held its first digital ministers meeting, resulting in the "G20 Digital Economy Ministerial Declaration." At the 2017

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<sup>2</sup> Germany's average internet speed was 10.7 Mbps in the second quarter of 2015, and only 15% of its internet speeds exceeded 15 Mbps, whereas in America, 21% of internet speeds surpass 15 Mbps, and Japan 38%. Only 7% of German families have fiber-optic connections, whereas in America, the figure is 9% and in Japan – 73% [Shen, 2016].

G20 Hamburg Summit, the leaders promised to ensure that all their citizens would be digitally connected by 2025. They also promised to constructively engage in WTO discussions on e-commerce [G20, 2017b].

The Hangzhou Summit pointed out that the idea of innovative growth includes actions that support innovation, the “new industrial revolution” and the digital economy. In accordance with the aforementioned Initiative, G20 members agree to the following principles for the stimulation of digital economic growth: (a) Innovation. ICT innovation and the accompanying innovation in economic activities are crucial to inclusive economic growth; (b) Partnership. G20 members make a concerted and work flexible efforts in the choice of issues concerning the digital economy. A closer partnership between G20 members is conducive to sharing knowledge and experience for further cooperation; (c) Inclusiveness. An inclusive and open business environment will facilitate economic growth, build up mutual trust and safeguard the flow of information [G20, 2016].

In the “G20 Digital Economy Ministerial Declaration”, the G20 Ministers responsible for the digital economy noted that the digital economy has become an increasingly important factor in promoting inclusive global growth and reaffirmed their commitment to create “a people-centered, inclusive and development-oriented Information Society,” enabling people to achieve sustainable development and improve the quality of their lives. The ministers also noted that the role of digital technology in the global economy remains largely unknown, and it may create challenges to inclusiveness, employment, etc. According to the document, special attention should be paid to the underrepresented and disadvantaged groups that still lack access to the Internet [G20, 2017a].

It should be noted that the significance of the digital economy within the G20 agenda has been increasing. In the Antalya 2015 G20 Leaders’ Communique, the word “digital” was used 2 times in one paragraph devoted to the Internet economy [G20, 2015]. In the Hangzhou 2016 G20 Leaders’ Communique, however, the word “digital” was used 12 times in several paragraphs of the document [G20, 2016]. The Hamburg 2017 G20 Leaders’ Declaration contained a section, “Harnessing Digitalization,” where the word “digital” was used 18 times [G20, 2017b]. This suggests that global governance with respect to the digital economy may become one of the priorities of the G20.

Thus, the G20 aims towards an inclusive, large and successful digital economy that contributes to sustainable development. Still, it should pay more attention to cooperation between technologically advanced countries and countries that lag behind, especially in Africa. Within the last three G20 summit outcome documents, while the word “digital” has been used increasingly often, digital issues were mentioned in the African context only once – in the Hamburg 2017 G20 Leaders’ Declaration, which launched the G20 Africa Partnership alongside related initiatives, such as #eSkills4Girls. This initiative is aimed at tackling gender digital divide and involving women in the digital economy [G20, 2017b].

The authors also recommend promoting voluntary options aimed at bringing about an inclusive and sustainable digital transformation. This recommendation may be realized in form of an action plan or a long-term voluntary cooperation framework that would complement the general principles of cooperation set in the “Digital Economy Development and Cooperation Initiative” and focus on developing countries that lag behind in the digital revolution. Also, special initiatives in the sphere of cyber security are needed, especially taking into account that cyberwarfare has been present at the G20 meetings. One more important issue is related to the model of global internet governance. The G20 should support greater participation among non-government actors, namely private actors and civil society.

The governance problems of the digital and internet economy have been brought up by many international organizations, such as the OECD, UN, World Bank, WTO and IMF. As mentioned at the beginning of this section, the G20, as a forum, is still not very experienced with them. However, it has several unique strengths which could allow it to become one of the leading forces in the governance of the global digital economy. Since the G20 Hangzhou Summit, the G20 has been at the center of global governance initiatives. It has the advantage of being a major, comprehensive governance platform, facilitating international, multilateral cooperation on the global level. It has become a leader in the production of soft law and in the generation and promotion of voluntary and informal instruments of global action, allowing it to contribute more and more to global governance.

In terms of developing the digital economy and fostering cooperation, the G20 has the following strong points. Firstly, the number of G20 member states is comparatively limited, enabling higher efficiency in decision-making. Secondly, the major G20 members, such as the United States, Japan, Germany and China, have achieved considerable success in developing a digital economy. Such success could facilitate international cooperation and build a foundation for international trust. The joint participation of developed and developing countries in the G20 promises to include digital economy development and cooperation in the organization’s agenda and helps to foster North-South cooperation to reduce imbalances in the digital economy. Moreover, the G20 is able to keep close contact with other international organizations, especially the United Nations.

## Optimizing the Leadership?

### ***The US as a Digital Superpower***

The United States used to be the leading country in developing the digital economy. The digital information network was created in the United States. Between 1995 and 2000, the American Internet industry grew by a factor of 1.79x annually. Its sales revenues increased from \$301.4 billion in 1998 to \$523.9 billion in 1999, which, for the

first time in the history of the American economy, overtook the car industry and other traditional industries.

In 1992, the United States put forward the initiation of a “national information infrastructure plan”. One year later, the “information super-highway plan” was officially developed and implemented. From a macro perspective, they framed the digital information network technologies development. Afterwards, the Congress passed the “Telecommunications Act of 1996”, and the then President Clinton signed the “global e-commerce framework” in the following year. At the beginning of the new millennium, Clinton signed the “Electronic Signatures Act” with an electronic signature. This act ensures the Internet-based contracts and has the same legal effects as common on-paper signatures. This series of regulations and policies have created a highly favorable macro-economic environment for the Digital Economy. In 2000, Albert Gore, the former US Vice President, and William Daley, the former Secretary of Commerce, jointly declared the advent of an era of digital economy.

In the face of the gap between the US and other countries in Europe and Asia in the post-financial crisis era, the US should make its efforts to find proper ways to shoulder the international responsibility to help these countries by offering technical assistance, rather than turning a blind eye to the broadening gap. From the perspective of the US and other countries, G20 is a good way to lead the global economic governance in the new era which falls in line with the United States’ economic interest. As a new platform for global economic governance, G20 has a huge potential for development through continuous reform and improvement. Through the economic rise of G20 countries, the United States can put an end to the old international economic order, maintain the dollar hegemony, back up the liberalization of multilateral trade, and even boost its own political potency.

### ***The Roles of China and Russia***

With its increasingly active involvement in the international arena, China is becoming the potential leader of the digital economy. Moreover, the share of the digital sector in the Chinese economy is comparable to that of the US. [Aptekman et al., 2017] The Chinese government has been intensifying its efforts towards international cooperation in digital economy policy. The G20 Hangzhou Summit in 2016 placed the issue of the digital economy high on his agenda, proposing “The G20 Digital Economy Development and Cooperation Initiative.”

To create conditions that are more favorable to the digital economy’s governance, China is realizing a series of ideas and policies, such as “Made in China 2025,” “Internet Plus,” “National IT Development Strategy,” “Big Data Strategy” and “Strategy of Internet Power.” These strategies aim to promote China’s digital development, informatization, as well as the integration of the digital economy and the real economy. As a result, it will bring about fundamental changes in core technology, enabling the digital and manufacturing industries to excel at the international level. In October 2016,

Chinese President Xi Jinping stressed the need to focus on the internet as an area for economic development, to focus on technology innovation, and to find competitive advantages related to the internet as a strategic policy initiative. In particular, there is the need, according to President Xi, to increase investment and strengthen the infrastructure of information technology so as to promote the integration of the digital and real economy. He also underlined the necessity of accelerating the digitalization of traditional industry, developing a smarter and stronger digital economy, and generating a new space for economic development.

Since the G20 Antalya Summit in 2015, China has sought to promote cooperation between countries around the globe in developing the digital economy. It has further called for cooperation to establish an international Internet strategy among different stakeholders at both the regional and global levels, and seek greater consensus to advance a digital economy based on ICT. Thus China already plays an important role in the development of the digital economy and has great potential to strengthen its positions in the nearest future.

In terms of comparative development, Russia is not a digital economy leader. The share of the digital economy in Russia's GDP is about 3.9 percent, which is 1/3 or 1/2 that of the leaders. Nonetheless, Russia's digital sector is burgeoning: in 2011–2015, it accounted for about 24 percent of total national GDP growth [Aptekman et al., 2017]. Russia has started to supply its population and businesses with digital services, it has established large digital companies and has begun a project to eliminate digital inequalities. Many national strategic documents prioritize digital economy development, including "The Concept of the Long-Term Social and Economic Development of Russia up to 2020," "The Strategy of the Scientific and Technological Development," the roadmaps of the National Technological Initiative, etc. Recently Russia has been working on the program "Digital Economy of Russia," which will sufficiently improve the quality of life by 2025. Thus, Russia has a good starting platform and still has high potential to develop its digital economy; therefore its contribution to the global internet and digital economy governance will be of increasingly high importance.

## Conclusion

It is widely acknowledged that we are now entering an age where the digital economy will be formalized through global governance. As a new driving force of economic globalization, the development of the digital economy poses both opportunities and challenges in pursuing future development. If the world fails to take proper measures, the digital gap between developed and developing countries will only become broader, and cyber-threats will pose greater and greater risks to the resilience of the global economy. The ensuing uncertainties and disorder will escalate the tensions of uneven development and ultimately lead to economic stagnation.

The G20, as a venue for top-level international dialogue and the co-ordination of policy-making, lacks experience addressing global Internet issues and digital economy-

related governance. Nevertheless, it has a number of advantages and opportunities that could allow it to take the lead in this sphere. It has a limited number of members and at the same time represents most of the global economy. It is a leader in terms of soft power in global governance. Some of the G20 members, like the US, Germany and Japan, have already distinguished themselves through their tremendous achievements in the digital economy. The active participation of these countries in global cooperation could contribute to the progress of less experienced countries and enhance North-South cooperation. The G20 has recently started to realize its potential and has embarked on addressing the digital transformation issues.

In order to avoid the risks associated with uneven development and broaden the gap between developed and developing countries, the G20 should position itself properly and actively; in particular, it must let members coordinate their digital economy strategies, so as to optimize its functions as a hub of global governance. The authors conclude that the G20 should do more to cooperate with Africa and other technologically poor countries in the digital context. It should also promote voluntary cooperation principles with a focus on developing countries. Another recommendation is to launch initiatives in the sphere of cyber security. Finally, the G20 should emphasize a stronger involvement of the non-government sector (private actors and civil society) in global Internet governance.

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# Роль «Группы двадцати» в глобальном управлении цифровой экономикой<sup>1</sup>

Ш. Го, В. Дин, Т. Ланьшина

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**Го Шуюн** — профессор, декан факультета международных отношений и связей с общественностью (SIRPA) Шанхайского университета иностранных языков (SISU); 550 Dalian Road (W), Shanghai 200083, China; E-mail: syguo@shisu.edu.cn

**Дин Вэйхан** — аспирант факультета международных отношений и связей с общественностью (SIRPA) Шанхайского университета иностранных языков (SISU); 550 Dalian Road (W), Shanghai 200083, China; E-mail: dwh1010@foxmail.com

**Ланьшина Татьяна** — научный сотрудник Центра экономического моделирования энергетики и экологии ИПЭИ РАНХиГС; научный сотрудник Центра отраслевых исследований ИСКРАН; Российская Федерация, 119571, Москва, просп. Вернадского, д. 82, стр. 1; E-mail: lanshina@ranepa.ru

*В последние десятилетия в мире наблюдалась стремительная цифровизация, которая привела к важным, а иногда и решающим изменениям в бизнесе, обществе и экономике. После глобального финансово-экономического кризиса 2008–2009 гг. информационные технологии и прочие близкие к ним отрасли были наиболее динамичными и перспективными в мировой экономике. Тем не менее миру по-прежнему не хватает равновесия между преимуществами и рисками цифровизации, что объясняет необходимость развития инструментов глобального управления в этой сфере.*

*В статье анализируется роль и возможности «Группы двадцати» в сфере глобального управления цифровой экономикой. Авторы рассматривают определения цифровой экономики и ключевые характеристики этого сектора, освещают проблемы международного сотрудничества, анализируют цифровые стратегии стран и участие «Группы двадцати» в управлении глобальной цифровой экономикой, потенциал Китая и России в этой сфере и дают рекомендации, касающиеся участия «Группы двадцати» в глобальном управлении цифровой экономикой.*

*Авторы приходят к следующим выводам. Во-первых, международному сообществу следует стремиться к устранению диспропорций между развитыми и развивающимися странами в цифровом секторе, к укреплению кибербезопасности и отражению прочих угроз. Во-вторых, «Группа двадцати» имеет очень ограниченный опыт в области управления цифровой экономикой, но как лидер «мягкой силы» и как организация с ограниченным членством, которая включает и страны с развитым цифровым сектором, и страны, которые отстают, она может играть большую роль в глобальном управлении цифровой экономикой. В-третьих, США исторически лидируют в секторе информационных технологий и в сфере цифровой экономики. В последние годы Китай значительно улучшил свои позиции, что позволяет ему претендовать на более высокую роль в глобальном управлении. Россия может также играть большую (хотя и не ведущую) роль, учитывая ее опыт и потенциал.*

*Авторы делают вывод о том, что «Группа двадцати» должна: (1) уделять больше внимания сотрудничеству со странами Африки; (2) продвигать инструменты добровольного сотрудничества, прежде всего с развивающимися странами; (3) работать над улучшением международной кибербезопасности и (4) чаще привлекать негосударственный сектор к процессу управления Интернетом. Кроме того, «Группа двадцати» должна позиционировать себя должным образом и проявлять активность, чтобы оптимизировать свои функции в качестве центра глобального управления цифровой экономикой.*

Ключевые слова: цифровая экономика; глобальное управление; «Группа двадцати»; БРИКС

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# Global Governance of Climate Change

## The Paris Agreement as a New Component of the UN Climate Regime<sup>1</sup>

D.A. Wirth

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**David A. Wirth** — Professor of Law, Boston College Law School; Fulbright Distinguished Professor of Sustainable Development, Faculty of Law, National Research University Higher School of Economics; 885 Centre Street, Newton, Massachusetts, USA; E-mail: david.wirth@bc.edu

*The Paris Agreement, which was adopted in December 2015 and entered into force less than a year later, is the newest instrument to be adopted in the United Nations-sponsored global climate regime. The Paris Agreement takes its place under the 1992 Framework Convention on Climate Change and next to the 1997 Kyoto Protocol and 2012 Doha Amendment. After describing the historical evolution of the UN climate regime employing the tools of international law, this Article explores the structural, institutional, and legal relationships between the new Paris Agreement and the prior development and content of UN-sponsored efforts on climate protection under the auspices of the 1992 Framework Convention. The need for such an analysis is particularly urgent because the new instrument was purposely not identified as a “protocol,” and its relationship to the prior Kyoto Protocol is unclear.*

*This Article consequently traces the development of the universal, UN-anchored climate regime from its origins in the 1990s to the present moment, with particular attention to the structural relationship among its various components and historical junctures. The Article then examines the text and structure of the Paris Agreement, along with its context, against this background. The significance of the Agreement’s status as an instrument other than a “protocol,” and its uncertain textual and institutional relationship to the prior Kyoto Protocol, receive particular scrutiny. The Article concludes that the Paris Agreement, from a structural and institutional point of view, represents both a break with the past designed to initiate a new, globally-inclusive multilateral approach to climate protection, but also contains indications of continuity with prior questions of global climate policy.*

**Key words:** Paris Agreement; Framework Convention on Climate Change; Kyoto Protocol; Doha Amendment; global warming, international environmental law; sustainability; regime theory

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## Introduction

The study of the international organization as a political and social phenomenon has largely focused on international organizations as institutions. Both scholars and governmental officials are accustomed to working with intergovernmental organizations created by multilateral treaties, whose state parties are *de facto* members. These include the United Nations itself, its specialist agencies and related organizations, and other non-UN organizations [IBRD, 1945; IDA, 1960; ILO, 1919; IMO, 1948; OECD, 1960; UN, 1945; WHO, 1946; WMO, 1947; WTO, 1994]. Some international institutions are also international organizations, even though they were not created by multilateral treaty, by virtue of their institutional structure and membership consisting of states as represented in the institution by governments.<sup>2</sup> Further along the continuum are other, less structured international arrangements establishing international institutions that do not qualify as international organizations.<sup>3</sup>

While there have been academic proposals to establish a global international organization, with a functional focus on environment, there has been little if any motion by states and governments in this direction [Charnovitz, 2002; Esty, Ivanova, 2001; Runge, 1994]. The United Nations Environment Program (UNEP) is probably closest to this model, but does not meet either the formal or structural requirements for an international organization. Instead, freestanding or semiautonomous regimes have been crafted to address such environmental challenges as protection of the stratospheric ozone layer; international trade in waste, industrial chemicals, and pesticides; persistent organic pollutants; biological diversity; desertification; and international trade in endangered species.<sup>4</sup>

The number of these environmental regimes is now sufficiently large that one can identify clear patterns among them [Churchill, Ulfstein, 2000; Wiersma, 2009]. One is the “framework convention plus protocols” model, which seemed to have reached a high degree of structural specificity in the UN-sponsored climate regime.<sup>5</sup> That pat-

<sup>2</sup> OSCE, CSCE/OSCE Key Documents. Available at: <http://www.osce.org/resources/csce-osce-key-documents> (accessed: 12 March 2017).

<sup>3</sup> APEC (1989) Joint Statement, First Ministerial Meeting (Canberra, Australia, 6-7 November 1989). Available at: [https://www.apec.org/Meeting-Papers/Annual-Ministerial-Meetings/1989/1989\\_amm](https://www.apec.org/Meeting-Papers/Annual-Ministerial-Meetings/1989/1989_amm) (accessed 16 September 2017);

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<sup>4</sup> Basel Convention on the Control of Transboundary Movements of Hazardous Wastes, 1989 (1673 UNTS 57); Convention on Biological Diversity, 1992 (1760 UNTS 79); Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, 1994 (1954 UNTS 3); Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1972 (993 UNTS 243); Montreal Protocol on Substances that Deplete the Ozone Layer, 1987 (1522 UNTS 3); Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, 1998 (2244 UNTS 337); Stockholm Convention on Persistent Organic Pollutants, 2001 (2256 UNTS 119); Vienna Convention for the Protection of the Ozone, 1985 (1513 UNTS 293).

<sup>5</sup> United Nations Framework Convention on Climate Change, 1992 (1771 UNTS 107).

tern was followed strictly through one protocol and a subsequent amendment to it.<sup>6</sup> But the Paris Agreement, adopted in 2015, at least in appearance, disrupts that model by leaving the legal and institutional relationship between prior instruments in the regime largely unstated, and to a considerable extent uncertain.

With the announcement that the United States intends to withdraw from the Paris Agreement,<sup>7</sup> the multilateral climate regime threatens to be thrown into a state of disarray. Although this is not the only reason to investigate the phenomenon, the reasons provided by President Trump identify what purport to be serious deficiencies in the structure of global climate governance. This Article attempts to clarify the history and results of the UN-sponsored climate negotiations, with an emphasis on the evolution of the Paris Agreement and its place in that structure. More generally, this analysis serves as a case study in the development of free-standing multilateral regimes not expressly connected to a formally-established international organization.

Accordingly, this Article first sets out the history of global climate negotiations from a structural point of view, by reference to prior models and precedents. It then traces the history of the development of that regime through the adoption of the one, and to date only, protocol formally identified as such, together with an amendment to it. The Article then takes up the negotiating history and adoption of the Paris Agreement, particularly from the point of view of its relationship to the earlier instruments. The Commentary then analyzes the significance of these developments for the further evolution of regime formation.

## The Un Climate Regime Before The Paris Agreement

The UN-sponsored climate regime is an example of an autonomous institutional arrangement, anchored by a framework convention with additional protocols, that have been particularly characteristic of environmental subject matter. As such, the FCCC has identifiable precursors, including a regional agreement on the long-range transport of air pollutants in Europe and North America and the global stratospheric ozone regime. As background, this section traces the development of the UN climate regime from those precursors through the Framework Convention on Climate Change, through the Kyoto Protocol and its Doha Amendment. That history is critical to understanding the context of the Paris Agreement.

### ***Precursors to the Framework Convention***

An important early juncture in the development of autonomous institutional arrangements on environmental issues is the multilateral Convention on Long-Range

<sup>6</sup> Kyoto Protocol to the Framework Convention on Climate Change, 1997 (2303 UNTS 148); Doha Amendment to the Kyoto Protocol, 2012.

<sup>7</sup> Statement by President Trump on the Paris Climate Accord, 1 June 2017. White House. Available at: <https://www.whitehouse.gov/the-press-office/2017/06/01/statement-president-trump-paris-climate-accord> (accessed: 12 March 2017).

Transboundary Air Pollution (LRTAP), concluded under the auspices of the United Nations Commission for Europe (ECE) in 1979.<sup>8</sup> The Convention specifically creates an Executive Body consisting of all parties to it, anticipating periodic meetings. LRTAP, as a relatively early example of this phenomenon and does not include a specific provision for the adoption of protocols.

The role of the Convention as the preliminary architecture for further cooperation is nonetheless apparent in its article 2, entitled “Fundamental Principles:”

The Contracting Parties, taking due account of the facts and problems involved, are determined to protect man and his environment against air pollution and shall endeavour to limit and, as far as possible, gradually reduce and prevent air pollution including long-range transboundary air pollution

This language is highly qualified, adjectival, and descriptive in character. By contrast, pollution control is routinely understood to require firm, measurable, quantifiable, and reportable actions by states to limit the release of pollutants. Although this provision is clearly binding under international law, creating obligations and rights for states parties to the Convention, it is virtually impossible to implement in a uniform and meaningful fashion by the current 56 member states of the ECE without further elaboration.

That expectation has been fulfilled in the intervening time by the adoption of seven substantive ancillary agreements uniformly identified as “protocols” to the Convention. These agreements address regulatory actions for a number of specifically identified substances or categories of air pollutants: sulphur compounds; oxides of nitrogen; heavy metals; persistent organic pollutants; volatile organic compounds; and ground-level ozone.<sup>9</sup> Some of these protocols have since been amended to reflect the need for greater rigor or precision.

Although the Convention does not specifically anticipate subsequent protocols, the protocols themselves articulate their relationship to the LRTAP regime. Most obviously, the protocols identify themselves as having been adopted under the authority of the Convention. Parties to the protocols are restricted to the subset of states party to the parent Convention – basically all of Europe, the Russian Federation, former Soviet

<sup>8</sup> Convention on Long-Range Transboundary Air Pollution, 1979 (1302 UNTS 217).

<sup>9</sup> Protocol on Reduction of Sulphur Emissions or Their Transboundary Fluxes by at Least Thirty Per Cent, 1985 (1480 UNTS 215); Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution Concerning the Control of Emissions of Nitrogen Oxides Or Their Transboundary Fluxes, 1988 (1593 UNTS 287); Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution Concerning the Control of Emissions of Volatile Organic Compounds or Their Transboundary Fluxes, 1991 (2001 UNTS 187); Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution on Further Reduction of Sulphur Emissions, 1994 (2030 UNTS 122); Protocol to the Convention on Long-Range Transboundary Air Pollution on Persistent Organic Pollutants, 1998 (2230 UNTS 79); Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution on Heavy Metals, 1998 (2237 UNTS 4); Protocol to the 1979 Convention on Long-range Transboundary Air Pollution to Abate Acidification, Eutrophication and Ground-level Ozone, 1999 (2319 UNTS 81).

constituent republics that are now sovereign states, Canada, and the United States. The protocols specify periodic review at meetings of the Convention's Executive Body, presumably in anticipation of subsequent amendments to respond to new scientific or public policy circumstances. At the other end of the regulatory process, the Executive Body also serves as a forum for the review of compliance and implementation.

The development of autonomous environmental regimes took another step forward with the UNEP-sponsored negotiations on protection of the stratospheric ozone layer. Early in this process, governments negotiating under UNEP auspices made an explicit decision to bifurcate this undertaking. One product was to be a "framework" multilateral convention. Ancillary agreements or "protocols" containing substantive regulatory measures would be appended to this convention. The ozone umbrella treaty evolved into the Vienna Convention for the Protection of the Ozone Layer, concluded in March 1985<sup>10</sup>.

Unlike LRTAP, the Vienna Convention contains express provisions anticipating the adoption of subsequent protocols. Those include rules governing not only the adoption of protocols, but also their amendment and the adoption of annexes to those protocols. A separate article sets out the legal and institutional relationship between the Convention and the protocols to it.

To date only one protocol to the Vienna Convention has been adopted, the 'Montreal Protocol on Substances That Deplete the Ozone Layer', which was originally negotiated simultaneously with the Convention. The Montreal Protocol, which has been amended four times and adjusted six times, both to extend coverage to new ozone-depleting substances and to alter reduction schedules, as a practical matter has largely displaced the parent Convention as the locus of activity in the stratospheric ozone regime.<sup>11</sup>

### ***The 1992 Framework Convention on Climate Change***

The centerpiece of the international climate regime is the UN Framework Convention on Climate Change (FCCC), opened for signature at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992.<sup>12</sup> The Convention is largely a procedurally oriented instrument containing obligations for reporting and information sharing. The Convention also articulates certain broad substantive principles, but contains few if any binding commitments to reduce greenhouse gas emissions.

<sup>10</sup> Vienna Convention for the Protection of the Ozone, 1985 (1513 UNTS 293).

<sup>11</sup> Under customary international law, an amendment to a multilateral treaty is binding only on those states that indicate their affirmative intent to accept those new obligations, ordinarily through ratification of the amendment [Vienna, 1969]. Article 2, paragraph 9 of the Protocol permits "adjustments" that bind all Protocol parties by a two-thirds supermajority vote. Subsequent to the adoption of the Protocol in 1987, the parties to the instrument have employed both approaches, amending the Protocol 5 times and adjusting it on 13 occasions.

<sup>12</sup> United Nations Framework Convention on Climate Change, 1992 (1771 UNTS 107).

The word “framework” by this time had acquired the status of a term of art, referring to an international regime established by a freestanding “umbrella” multilateral convention analogous to the Vienna Convention on the Protection of the Ozone Layer, which was the conscious model for the instrument [Wirth, Lashof, 1992]. The term by this point in the development of the autonomous regime phenomenon even appears in the title of the instrument.

Consistent with the basic model, the FCCC includes a number of components: (1) procedural requirements for data collection and exchange, periodic reporting, technology transfer, and scientific cooperation; (2) provision for adoption of ancillary protocols, along with rules for adoption and amendment of both the Convention itself and any protocols; (3) a periodic, typically annual, conference of the parties to the Convention and meetings of the parties to any protocols; and (4) requirements for periodic review of developments in science, policy, and procedural issues, typically addressed at the conference of parties; and (5) establishment of a financial mechanism.

Outputs from these conferences range from decisions – generally accepted to be legally nonbinding in character – to amendments, declarations, or a variety of other procedural formats. Also consistent with the general model, the FCCC establishes two institutional entities subordinate to the conference of the parties: a Subsidiary Body for Scientific and Technological Advice (SBSTA) and a Subsidiary Body for Implementation (SBI). The instrument further includes a standard provision identifying the need for a Secretariat, now housed in Bonn.<sup>13</sup>

The FCCC has a looser legal texture concerning protocols and their relationship to the parent convention than some other precedents, most notably the Vienna Convention on the Protection of the Ozone Layer. The FCCC, in an article devoted solely to the issue, anticipates the adoption of protocols. Otherwise, the treatment of protocols is much less specific than in the precursor ozone convention. The FCCC does not specify the relationship between the Convention and its protocols, or rules for the amendment of protocols or annexes to them. Nor does it set out, as the Vienna Convention does, rules for the adoption of protocols, instead merely authorizing their adoption by the conference of the parties.

Also unlike the ozone convention, the FCCC does not address protocols in final clauses dealing with such issues as ratification, acceptance, approval, accession, and entry into force. Again in contrast to the ozone model, the FCCC does not specify rules for withdrawal from protocols. It does, however, state that “[a]ny Party that withdraws from the Convention shall be considered as also having withdrawn from any protocol to which it is a Party.”

<sup>13</sup> The present article addresses the potentially universal, global climate regime established by the FCCC. Other institutional settings, such as the Major Economies Forum, the Asia-Pacific Economic Cooperation Forum, and the Montreal Protocol, have also been important in crafting climate policy, as has action at the subnational level [McGinnis, Ostrom, 1992; Ostrom, 2012; Stavins, 2015; Stavins et al., 2015; Victor, 2011].



That these decisions were purposeful becomes clearer by reference to an analysis of the UN Convention on Biological Diversity,<sup>14</sup> also intended to serve as a framework convention, and adopted at UNCED contemporaneously with the FCCC. That agreement addresses protocols in provisions dealing with the right to vote, settlement of disputes, an optional arbitral procedure, amendments, adoption and amendment of annexes, as well as in the final clauses setting out requirements for ratification, acceptance, approval, accession, and entry into force. Tellingly, the Biodiversity Convention, like the ozone convention, includes a specific provision setting out the legal and structural relationship between the convention and its protocols.

In the context of the Biodiversity Convention, the possibility for a specific protocol on genetically modified organisms, identified in the text as “living modified organisms,” is identified in the text of the Convention itself. By contrast, the negotiators of the FCCC on the whole may have been less enthusiastic about the prospect of protocols, which may account for the difference. On the other hand, as suggested by a widely respected chronicler of the FCCC negotiations, the explanation may simply be that the Climate Convention negotiators chose not to include “default” options that would apply to protocols, leaving those issues to the negotiators of the protocols themselves [Bodansky, 1993].

### ***The 1997 Kyoto Protocol***

The first, and to date only, instrument expressly to be identified as a protocol to the FCCC is the Kyoto Protocol to the United Nations Framework Convention on Climate Change.<sup>15</sup> The Convention identifies a principle of “common but differentiated” responsibilities, and contains express statements that industrialized states would be expected to bear the burden of initial cuts in emissions of climate-disrupting gases. Although the Convention contains only a modest, arguably non-binding emissions stabilization goal, its Annex I nonetheless identified industrialized states by name that were subsequently expected to take on the more onerous emissions reductions obligations.

Consistent with that, the Protocol specifies quantitative emissions reductions in gases that contribute to climate change by thirty-three enumerated industrialized countries and economies in transition, transposed into Annex B of the Protocol. The Protocol controls the emissions of six greenhouse gases, notably carbon dioxide, methane, and nitrous oxide, weighted according to their relative contributions to climate disruption as measured by “carbon equivalents” based on global warming potentials established by the Intergovernmental Panel on Climate Change (IPCC).

The overall goal of the Protocol is to lower global releases of these gases by those states with quantified emissions limitation or reduction (“mitigation”) commitments by about 5% by reference to 1990 levels. The multilaterally agreed regulatory vehicle for

<sup>14</sup> Convention on Biological Diversity.

<sup>15</sup> Kyoto Protocol to the Framework Convention on Climate Change, 1997 (2303 UNTS 148).

accomplishing this initial reduction goal was a first commitment period commencing in 2008 and ending in 2012. The Protocol anticipates additional reductions in subsequent commitment periods. The binding reduction goals accepted by Annex I parties to the Convention are set out on a state-by-state basis in an annex to the Protocol.

Among the novel features of the Kyoto Protocol is its “cap and trade” architecture. The principal vehicles for implementing this regulatory design are the Protocol’s “flexible mechanisms,” designed to reduce the cost of implementation by expanding the range of options available to states in fulfilling their obligations under the agreement.

The Protocol specifies that rights to emit may be traded among parties to the Protocol with quantified emissions reductions obligations. This provision embodies the drafters’ expectations concerning the establishment of markets in carbon emissions, such as that set out in the European Union’s Emissions Trading System.<sup>16</sup> Similar markets have been set up in North America in the form of the Regional Greenhouse Gas Initiative in the Northeast and in California’s state-level scheme.

Second, the Protocol permits Annex I parties to undertake cooperative projects that reduce emissions of greenhouse gases in other Annex I parties and to obtain credit for those reductions, an option known as “joint implementation”. The resulting “emissions reduction units” are also tradable. Third, the Protocol establishes a “clean development mechanism” (CDM), which provides a basis for those countries with emission reduction obligations to implement those commitments by undertaking projects in developing countries. “Certified emissions reductions units” generated by such projects may also be traded.

In 2001 the infrastructure for implementation of the Protocol was completed with the adoption of the Marrakesh Accords, a set of rules governing important aspects of the operation of the agreement such as accounting for greenhouse gas emissions and reductions.<sup>17</sup> The Accords, a group of decisions made at the meeting of the parties to the Protocol, also adopted a compliance mechanism [Wirth, 2002].

The Compliance Committee has two branches, one identified as “facilitative” and the other as “enforcement.” The Facilitative Branch is designed to assist those states that may have difficulty complying with their obligations, including those parties to the Protocol that self-identify as such. The Enforcement Branch has the authority to impose sanctions for parties found to be out of compliance with their obligations under the Protocol, including the suspension of trading under the flexible mechanisms.

<sup>16</sup> Directive of the European Parliament and of the Council of 13 October 2003, establishing a scheme for greenhouse gas emission allowance trading within the Community, and amending Council Directive 96/61/EC, 2003 O.J. Eur. Comm. (L 275) 32, amended, Directive 2004/101/EC of the European Parliament and of the Council, 2004 O.J. Eur. Comm. (L 338) 18, amended, Directive 2008/101/EC of the European Parliament and of the Council, O.J. Eur. Comm. (L 8) 3, amended Regulation (EC) No 219/2009 of the European Parliament and of the Council, 2009 O.J. Eur. Comm. (L 87) 109, amended, Directive 2009/29/EC of the European Parliament and of the Council, (L 140) 63.

<sup>17</sup> Report of the Conference of the Parties on Its Seventh Session, 1/CP.7 to 14/CP.7, U.N. Doc. FCCC/CP/2001/13/Add.1 (21 January 2002) (Marrakesh Rules).

As set out in greater detail below, the Kyoto Protocol had a difficult gestation period in the United States, the particulars of which are critical to understanding the subsequent trajectory of the climate regime. Although vigorously negotiated by the U.S. government, which contributed much to its structure including the flexible mechanisms, the agreement encountered opposition in the Senate, whose advice and consent to ratification was essential as a legal condition precedent to the United States' becoming party to the instrument. In March 2001, President George W. Bush announced that The United States did not intend to ratify the Protocol.<sup>18</sup> Consequently, although the agreement was signed by the Clinton Administration, the United States has remained a signatory but not a full party to the instrument.

The difficulties in the United States also endangered the prospects of the Protocol's entry into force for any state. One of the requirements for the Protocol's entry into force was ratification by states representing 55% of 1990 global emissions of carbon dioxide. Of that amount, the United States represented about 35%, meaning that a shortfall in ratifications from states representing only 10% of total Annex I emissions would preclude the Protocol's entry into force. After much uncertainty, the Protocol entered into force in February 2005, following the Russian Federation's ratification.

In December 2011, Canada formally initiated the process of withdrawal, which according to the Protocol's terms, took effect a year later, immediately before the end of the first commitment period. It was widely acknowledged that Canada would be unable to achieve its Kyoto target of a 6% reduction in greenhouse gas emissions by reference to the base year of 1990. Informal reports suggested that Canadian emissions have increased during that period by 35% or more. In addition to relieving it of its international obligations under the Protocol, Canadian withdrawal also reduced the likelihood of the imposition of sanctions by the Enforcement Branch of the Compliance Committee established by the Marrakesh Rules.

### ***The 2012 Doha Amendment***

The Kyoto Protocol specifies that negotiations on a second and subsequent commitment periods should commence "at least seven years before the end of the first commitment period," meaning 2005 [Aldy, Stavins, 2010; Olmstead, Stavins, 2007; Stavins, Aldy, 2013]. In the event, that process was initiated at the concurrent thirteenth meeting of the parties to the FCCC and the third meeting of the parties to the Kyoto Protocol (COP 13/CMP 3) in Indonesia in 2007, which adopted the Bali Action Plan, or "Bali Roadmap".<sup>19</sup>

The Roadmap was intended to launch intensive multilateral consultations scheduled to conclude with a comprehensive agreement at COP 15 in Copenhagen at the

<sup>18</sup> Letter from President George W. Bush to Senator Chuck Hagel, 13 March 2001.

<sup>19</sup> Report of the Conference of the Parties on Its Thirteenth Session, Dec. 1/CP.13, U.N. Doc. FCCC/CP/2007/6/Add.1 at 3 (14 March 2008) (Bali Action Plan).

end of 2009. The negotiations were divided into two tracks. The first, under the Kyoto Protocol, focused on the adoption of new binding mitigation (emissions reductions) commitments by developed (Annex I) countries that were already party to that instrument. A parallel process was undertaken directly under the Framework Convention, which involved all parties to the Convention, including the United States.

As before, the Kyoto Protocol and the Convention were inextricably linked, with the Convention meeting a number of identifiable legal and structural needs beyond the Protocol. First, the Convention served, and continues to serve, as the principal forum for coordinating global climate policy among all its 197 parties (including the European Union). That includes the relationship between and among instruments such as the Kyoto Protocol, involving differentiated commitments for industrialized countries.

Second, the Convention is a vehicle for crafting global policy with respect to issues affecting all states. These include adaptation to climate change that is already inevitable, due to “banked” emissions of greenhouse gases that have already been released, or undoubtedly will be, contributing to ever increasing concentrations of these substances in the atmosphere even if global emissions may be controlled.

Third, the Convention is a venue for addressing the need to transcend the limitations of the Kyoto Protocol in discussing mitigation commitments for non-Annex I countries, including BRICS (minus the Russian Federation, an Annex I state) and developing countries. For example, China has now surpassed the United States as the largest single national emitter.

Fourth, the Convention, as anticipated in its text, is the gateway through which financial assistance can be provided to developing countries. The costs of adaptation, for instance, may be disproportionately burdensome to non-Annex I countries.

The post-Bali negotiations represented important shifts in the direction of the global climate regime. First, developing countries, for the first time, formally discussed mitigation (emission reduction) commitments. In recognition of the principle of common but differentiated responsibilities articulated in the Convention, these “nationally appropriate mitigation actions” (NAMAs) were not expected to be framed in numerical economy-wide percentage reduction goals, as for Annex I parties under Kyoto. But this development nonetheless reflected progress in casting the mitigation net wider.

Second, the United States, under the Obama presidency, had reengaged with the UN-sponsored climate negotiations. These intensive multilateral consultations were scheduled to conclude with a comprehensive agreement at COP 15 in Copenhagen at the end of 2009.

Interpretations of the Copenhagen meeting differ, but it certainly did not fully meet prior expectations<sup>20</sup>. The meeting did not even produce a non-binding consensus statement in the form of a COP decision - an unfortunate precedential juncture for the UN climate regime, which ordinarily acts by consensus. Objections by a few states such

<sup>20</sup> Report of the Conference of the Parties on its Fifteenth Session, Dec. 2/CP.15, U.N. Doc. FCCC/CP/2009/11/Add.1 at 4 (18 December 2009) (Copenhagen Accord).

as Venezuela, Sudan, Bolivia, and Nicaragua meant that the COP was able merely to “take [] note” of the Copenhagen Accord.

Formally speaking, that instrument consequently has no formal status in the UN climate regime. Its text was negotiated by a group of about 29 countries, including numerous heads of state. The breakthrough in negotiations came after a personal meeting between U.S. President Obama and the heads of state of the four BASIC countries – Brazil, South Africa, India, and China (BRICS minus Russia, an Annex I state). The result borders on incoherence to any but the most seasoned climate aficionado. The meeting did, however, result in a process in which non-Annex I states identified non-binding NAMAs and Annex I states and set out their intentions with respect to future economy-wide reductions.

After the Copenhagen juncture, multilateral efforts regrouped around a COP 21 new goal in Paris in 2015, this time in a more structured manner with clearer goals agreed in an incremental fashion along the way. After the disappointing Copenhagen outputs, the FCCC negotiations were somewhat reinvigorated at COP 17/CMP 7 held in Durban at the end of 2011<sup>21</sup> [FCCC Durban Platform for Enhanced Action, 2011]. There, the parties to both the Convention and the Protocol embarked on a stopgap effort to address the then-looming end of the first commitment period under Kyoto, as well as further collective action thereafter [Aldy, Stavins, 2012; Olmstead, Stavins, 2012].

The Durban meeting took a nonbinding decision proposing an amendment to extend the Kyoto Protocol for a second commitment period, beginning on January 1, 2013, the day after the expiration of the first commitment period, through the end of 2017 or 2020. Consistent with the requirements of the Convention and Protocol, the Amendment was formally adopted the next year in Doha mere days before the expiration of the first commitment period in 2012.<sup>22</sup> The Amendment clarifies that the second commitment period extends until 2020 and sets out further reduction obligations until then for Annex I states, thus formally maintaining the continuity of the Kyoto Protocol through the end of the current decade.

The Doha Amendment, however, can hardly be considered a success story from either an institutional or public policy point of view. Canada, having earlier withdrawn from the Protocol, did not accept further commitments. The Russian Federation, Japan, and New Zealand also declined. Those four states are literally represented by blank grey boxes on the FCCC’s official website setting out the text of the Doha Amendment and parties to it.<sup>23</sup> The Doha Amendment consequently serves as a vehicle for binding emissions reductions primarily for the EU, Norway, Ukraine, Belarus, and Kazakh-

<sup>21</sup> Report of the Conference of the Parties on Its Seventeenth Session, Dec. 1/CP.17, U.N. Doc. FCCC/CP/2011/9/Add.1 at 2 (15 March 2012) (Durban Platform for Enhanced Action).

<sup>22</sup> Doha Amendment to the Kyoto Protocol, 2012.

<sup>23</sup> Status of the Doha Amendment. Режим доступа: [http://unfccc.int/kyoto\\_protocol/doha\\_amendment/items/7362.php](http://unfccc.int/kyoto_protocol/doha_amendment/items/7362.php).

stan. Australia, in accepting reductions for the first time after the Protocol itself allowed it an increase of 8%, identified a new base year of 2000.

A total of 144 instruments of acceptance are required for the Amendment to enter into force, which as of this writing, has secured only slightly more than half the required number and consequently, is not in force. The overwhelming majority of ratifications have come from Convention parties that are not Annex I states and consequently do not have quantified emission reduction obligations under either the Protocol or the Amendment.

The EU is applying the Doha obligations among its member states on a mandatory basis within this supranational organization, but has been unable to confirm those efforts through ratification on the international level due to a veto by Poland. Consequently, the Doha Amendment quite plausibly may not enter into force before the expiration of the second commitment period in 2020.

## The Paris Agreement

Against this lengthy and convoluted history, the Paris Agreement took shape in the years 2011–2015, in the form of implementation of the Durban Platform at successive COPs. The final package, consisting of the text of the Paris Agreement proper and an accompanying non-binding decision, is much more loosely textured than the Kyoto Protocol as implemented by the Marrakesh Accords. It is also less clearly anchored in the infrastructure of the previously established structure consisting of the Convention, the Protocol, the Marrakesh Rules, and the Doha Amendment. This section consequently analyzes the negotiation of the Paris Agreement by reference to the earlier development of the regime, and assesses the significance of its structural and institutional posture with respect to further implementation.

### ***Negotiating History of the Paris Agreement***

Despite the Kyoto Protocol's difficulties, objective reports indicate that states parties have been uniformly successful in implementing their obligations [Shishlov et al., 2016]. But by the time of the Durban meeting in 2011, Convention parties had become convinced of the need to revisit the structure of the regime going forward in a structured, ordered manner that increased the likelihood of a successful outcome in Paris in 2015.

Some of this sentiment stemmed from the prior unfortunate history in Copenhagen, which from a structural point of view, was a low point in terms of both content and broad acceptance for what has always been understood to be a global regime. Second, the Kyoto Protocol had been subject to intense criticism, especially in the United States, for its allegedly rigid, "top down" structure – notwithstanding the self-evident observation that the Kyoto negotiators had voluntarily agreed to the diverse, state-by-state numerical reduction obligations.

Third, and perhaps most importantly, there was a recognition of the need to expand the coverage of the regime to include mitigation undertakings from all states, not just Annex I parties. The Kyoto Protocol's emissions reductions goals were always understood to be at best modest by comparison with the need, and global GHG releases have in fact increased during the time it has been in force.

Apart from its other attributes, the Protocol came to be viewed as the embodiment of the debilitating divide, between Annex I states and others, that dates back to the 1992 Convention. Indeed, this approach had come to be seen as the “original sin” of the UN climate regime, in part by creating a precedent for non-Annex I parties to resist mitigation undertakings, regardless of the otherwise agreed need for differentiation among Convention parties.

It consequently became clear that a mechanism was needed to engage all states in global efforts to protect the climate. Unlike the ozone regime, in which the process of evolution over time had involved the expansion in the substances covered, from the beginning in the climate negotiations there had been agreement about the principal gases of concern and the need to minimize their total impact by reference to their weighted impact on climate disruption. The negotiations leading to Paris, by contrast, involved the expansion of meaningful mitigation undertakings beyond a group of roughly the same number and economic status as the OECD.

The negotiations leading to COP 21 in Paris consequently were predicated on the assumption that a new instrument should apply to all states, not just Annex I parties. A number of states, including in particular the EU, which negotiates as a bloc, insisted on a binding legal instrument. But as described in section IV.A below, the term “protocol” had acquired a pejorative connotation in the United States, especially in the U.S. Senate. Consequently a compromise was reached on the “Durban Platform” at COP 17 in 2011 on the formulation of the goal for Paris in 2015 as “a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties,” to take effect in 2020 – that is, at the end of the Kyoto Protocol's second commitment period.<sup>24</sup>

Described as a “bottom up” approach, by contrast with the “top down” structure of the Protocol, the core mitigation undertakings were anticipated no longer to be binding, but instead are unilaterally-determined, voluntary, nonbinding “nationally determined contributions” (NDCs). This met the needs of non-Annex I countries, whose prior undertakings in the form of NAMAs were often phrased in terms of sectoral initiatives or, as in the case of China, a reduction in greenhouse gas “intensity” in the form of emissions per unit of GDP, and not in Kyoto-style economy wide percentage reduction terms. This structure also met the need of some countries, such as the United States, not prepared to frame their undertakings by reference to the Kyoto base year of 1990.

<sup>24</sup> Report of the Conference of the Parties on Its Seventeenth Session, Dec. 1/CP.17, U.N. Doc. FCCC/CP/2011/9/Add.1 at 2 (15 March 2012) (Durban Platform for Enhanced Action).

There was also a discussion as to whether establishing mitigation goals that are non-binding with respect to outcome (unlike the Kyoto Protocol's legally binding targets) might encourage greater ambition on the part of individual states. There is no clear answer to this question as a matter of principle. On the one hand, states might be more inclined to accept more aggressively ambitious aims if they are phrased on non-binding, aspirational, and hence clearly unenforceable, terms [Stern, 2014]. On the other, states might be inclined to take binding targets more seriously. In general, the EU tended to support binding, Kyoto-like targets, at least for developed country parties, whereas others, including the United States, tended toward the non-binding approach, partially as a result of experience with the Kyoto Protocol.

In a stroke of structural inspiration, COP 19, held in Warsaw in 2013, called for "intended nationally determined contributions" (INDCs) to be identified by the first quarter of 2015, "by those Parties ready to do so," eight months before the actual conference and well out of the public eye [FCCC Further Advancing the Durban Platform, 2013]. One hundred sixty four parties to the Convention have submitted INDCs as of this writing.<sup>25</sup>

The EU INDC was phrased on classic Kyoto terms:

At least 40% domestic reduction in greenhouse gas emissions by 2030 compared to 1990.

The U.S. INDC utilized a different base year:

26–28% reduction by 2025, compared to 2005.

The format allowed further variations among formulations by Annex I countries, such as Russia's INDC:

Limiting anthropogenic greenhouse gases in Russia to 70–75% of 1990 levels by the year 2030 might be a long-term indicator, subject to the maximum possible account of the absorbing capacity of forests.

China's is typical of non-Annex I states in eschewing an economy-wide percentage reduction target and instead including the following undertakings:

- To achieve the peaking of carbon dioxide emissions around 2030 and making best efforts to peak early;
- To lower carbon dioxide emissions per unit of GDP by 60% to 65% from the 2005 level;
- To increase the share of non-fossil fuels in primary energy consumption to around 20%; and
- To increase the forest stock volume by around 4.5 billion cubic meters on the 2005 level.

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<sup>25</sup> Report of the Conference of the Parties on Its Nineteenth Session, Dec 1/CP.19, U.N. Doc. FCCC/CP/2013/10/Add.1 at 2, para. 2(a) (31 January 2014) (report of Warsaw COP 19).



Brazil, another non-Annex I state, nonetheless phrased its contribution in economy-wide terms:

[To] reduce greenhouse gas emissions by 37% below 2005 levels in 2025. Subsequent indicative contribution: reduce greenhouse gas emissions by 43% below 2005 levels in 2030.

States tend to coalesce into loosely configured, like-minded groups or blocs in the global climate regime, which tends to make these immensely complicated negotiations somewhat more manageable<sup>26</sup> [Gupta, Mandal 2015]. The membership of some groupings, such as the European Union, a regional economic integration organization responsible for at least some of the implementation of the resulting agreement, are pre-ordained by existing structures. Others, such as the Alliance of Small Island States (AOSIS), which has worked as an identifiable coalition since negotiations on the Framework Convention, have relatively obvious common interests – in this case, avoiding the risks of inundation by rising sea levels.

In Paris, the negotiations overcame the numerous impediments to success for a number of reasons. First, the extraordinarily elevated hopes for success, with 150 heads of state or government attending, raised expectations to a very high level. A disappointing repeat of COP 15 in Copenhagen, while possible, was consequently a highly undesirable result, and it was in all delegations' interest to reach a compromise and avoid being identified as impeding consensus. Second, the preparation period of essentially six years since Copenhagen facilitated early airing, and resolution of, participating delegations' concerns well before the actual conference. Indeed, appropriately viewed, the Copenhagen Accord itself is a direct precursor to the Paris Agreement, in which many of the major issues had already been resolved [Bodansky, 2016]. Third, the open and very loosely-textured nature of the Paris Agreement – whose obligation are closer in kind to the Framework Convention than to the Kyoto Protocol – made it relatively easy for states to accept the new instrument.

This context facilitates compromise on the questions left unresolved before the time of the actual conference. Some of the outstanding issues, even going into the meeting itself, were quite contentious, such as the temperature target at which mitigation efforts would be directed. AOSIS favored the most aggressive goal, 1.5 °C, by comparison with the prevailing view of other delegations focused around 2 °C.<sup>27</sup> In the end, this question was resolved in article 2, paragraph 1(a) of the text, which articulates the 2 °C target while preserving the 1.5 °C goal as a desirable aim that would further reduce

<sup>26</sup> Paris Climate Talks: Who are the Negotiating Groups? (27 November 2015). Available at: <https://www.carbonbrief.org/interactive-the-negotiating-alliances-at-the-paris-climate-conference> (accessed: 23 June 2017);

Yeo S. Paris 2015: What do the negotiating alliances want? (17 November 2015). Available at: <https://www.carbonbrief.org/paris-2015-what-do-the-negotiating-alliances-want> (accessed: 23 June 2017).

<sup>27</sup> Earth Negotiations Bulletin, Summary of the Paris Climate Change Conference, no 12 (663). International Institute for Sustainable Development (15 December 2015). Available at: <http://enb.iisd.org/vol12/enb12663e.html> (accessed: 23 June 2017).

the risk of climate disruption. Another example concerns the legal force of the NDCs, with the European Union and other delegations arguing in favor of their internationally legally binding character.<sup>28</sup> In the end, the NDCs were instead determined to be non-binding as to outcome for all parties to the Agreement, including the EU. Yet a third example concerns article 4, paragraph 4 of the Agreement, which articulates the need for developed country parties to take the lead in proposing successively more ambitious mitigation goals, as articulated in subsequent NDCs. In what was identified as a typographical error, the final minutes of the conference were delayed by the demand of the United States, that this provision be phrased in non-legally binding terms, as indicated by the word “should” [Bodansky, 2015]. Not surprisingly, all of these compromises involve a relaxation of the rigor of the Agreement, toward a least-common-denominator result.<sup>29</sup>

### ***Structure and Basic Content of the Paris Agreement***

The Paris Agreement is intended to set out a new framework for global cooperation by all parties to the Convention. A number of its substantive goals go well beyond those of the Kyoto Protocol. For example, the Agreement sets out a goal of limiting average global warming to 2 °C, and (as discussed above) identifies a further need for efforts to confine the increment to 1.5 °.<sup>30</sup> Reflecting much prior learning from the global warming negotiations in terms of the need for, and difficulty of identifying near-term obligations, the Agreement specifies that total global emissions should peak and begin to decline only “as soon as possible,” as opposed to identifying a specific date.

A further global target is the achievement of “a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century.” Like many other locutions in the climate lexicon, the meaning of this phrase is less than apparent upon first encounter. The intent, however, was clear enough: to assure net zero global greenhouse gas emissions or worldwide “carbon neutrality” by 2050, with any remaining GHG emissions fully offset by removal mechanisms, such as efforts to expand forest cover.

The binding mitigation obligations going forward, like many other components of the Paris Agreement, are primarily procedural in nature. All states are obliged to submit successively more ambitious NDCs covering 5-year increments. As of this writing, 143 parties to the Convention have submitted final NDCs covering at least the period 2020–

<sup>28</sup> Submission by Latvia and The European Commission on Behalf of the European Union and Its Member States (6 March 2015). Available at: <http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Latvia/1/LV-03-06-EU%20INDC.pdf> (accessed: 23 June 2017).

<sup>29</sup> Just as the Obama Administration played a particular role in negotiating the Copenhagen Accord, so too a joint China-United States bilateral initiative played a major role in overcoming impediments to conclusion of the Paris Agreement [White House, 2014].

<sup>30</sup> An analysis of the INDCs taken together suggests that this goal is unlikely to be met through existing commitments, even if fully implemented [UNEP, 2016]. Instead, the likelihood is closer to 3°C, and a goal of 1.5 °C is probably already beyond the range of reasonable expectations.

2025.<sup>31</sup> Developed country – no longer “Annex I” – parties are expected to continue to frame their NDCs in economy-wide percentage emission reduction targets. Russia, which as of this writing has not ratified the Paris Agreement, has not yet submitted a final NDC.

With respect to adaptation, the Paris Agreement requires parties to prepare and periodically transmit adaptation plans. Adaptation plans are to (1) be “country-driven, gender-responsive, participatory and fully transparent in approach; (2) “tak[e] into consideration vulnerable groups, communities and ecosystems; and (3) be “based on and guided by the best available science and, as appropriate, traditional knowledge, knowledge of indigenous peoples and local knowledge systems, with a view to integration adaptation into relevant socioeconomic and environmental policies and actions, where appropriate.”

The Paris Agreement further specifies the need for international financial support for developing countries with respect to both mitigation and adaptation. The non-binding accompanying COP decision reiterates the goal of contributions of \$100 billion (U.S.) per year. The Agreement further sets out the need for support for capacity building, technology transfer, and climate education. The Agreement identifies the need for a “transparency framework,” so as to assure the reliability and comparability of reporting under it. Periodic “global stocktakes” are identified, commencing with the first in 2023, to be reviewed every five years thereafter. The Conference of the Parties is directed to establish a new compliance mechanism, and the Agreement specifies that further work on the controversial issue of compensation for loss and damage will continue.

## The Paris Agreement as a Component of the UN Climate Regime

As set out the Durban Mandate, the Paris Agreement meets the requirement that it be adopted “under the Convention.” For one thing, the Paris Agreement was adopted by the Conference of the Parties to the Convention. The Agreement and its accompanying decision refer repeatedly to the Convention, as in establishing that the Convention COP will serve as the meeting of the parties under the agreement, that the Convention’s Secretariat will service both agreements, and that the Convention’s amendment procedures apply to the Paris Agreement as well.

Although article 17 of the Convention authorizes “protocols” to that instrument, it does not establish it as the only form of ancillary or subsidiary agreements. The Conference of the Parties, which adopted the Paris Agreement, arguably has considerable flexibility in identifying the structure and forms of actions that it takes. The Paris Agreement is clearly consistent with the Durban Mandate, adopted by the Conference of the Parties, impliedly in recognition of the possibility that the resulting instrument might

<sup>31</sup> Intended Nationally Determined Contributions, 2017. Available at: [http://unfccc.int/focus/indc\\_portal/items/8766.php](http://unfccc.int/focus/indc_portal/items/8766.php) (accessed: 23 June 2017).

not be a “protocol.” And in any event, the Paris Agreement bears a relationship to the Convention similar to that of a protocol, although not expressly identified as such.

This may be just a question of terminology, or, alternatively, it may signal a more significant difficulty in accommodating the Paris Agreement within the larger UN-sponsored, autonomous climate regime. Accordingly, this section first addresses the reason for avoiding the term “protocol.” Then it takes on the more difficult question of the relationship between the Paris Agreement and its direct precursor, the Kyoto Protocol as modified by the Doha Amendment.

### ***The Difficult Term “Protocol”***

Terminology can be challenging, and occasionally fraught, in multilateral interactions. During the negotiations on the Convention, Malta proposed the identification of climate as a component of the global commons, the “common heritage of mankind.” The phrase, however, proved to be too closely connected with the use of the same term in the context of the controversial deep seabed mining provisions in Part XI of the 1982 UN Convention on the Law of the Sea. In the end, the phraseology “common concern of mankind” was included in the Convention instead [Bodansky, 1993].

Similarly, the term “Protocol” acquired a highly charged connotation in the United States, to the point that governments had widely understood that the next agreement could not be called a ‘protocol’ without complicating U.S. participation. This is reflected in the Durban Platform’s call for a “legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties,” mandated by COP 17. Negotiators subsequently referred to this formula by the neutral shorthand “Paris Outcome” during the preparations leading to COP 21.

The options available strictly within the Convention regime are quite clear. The most obvious is a new protocol, which could be applicable to all Convention parties, including the United States.

An additional amendment to the Kyoto Protocol beyond the Doha Amendment might technically meet the test established in the Durban Platform, but would be fraught with procedural and political difficulties, especially given the United States’ rejection of Kyoto. The Kyoto Protocol, moreover, does not apply to “all parties.”

The identification of a third commitment period under Kyoto would likely have encountered even worse analytical and political difficulties. Other important states, including Japan, Canada, and the Russian Federation, had already declined to accept further reduction commitments under the Doha Amendment.

Yet another option for a legally binding instrument applicable to all parties could conceivably have been an amendment to the Convention itself, expressly anticipated by article 15 of that instrument. A decision of the Conference of the Parties would not meet the requirement of “legal force,” as decisions are generally not understood to be legally binding.

The United States negotiators signalled their discomfort with these choices, by electing the answer, in effect, “none of the above”. The form of the next multilateral climate agreement, as indicated in part by the name of the instrument, was discussed as far back as the year before COP 15 in Copenhagen, which laid the foundation for the broad contours of the Paris Outcome. The U.S. submission to the pre-Copenhagen process uses the unexpected (from the perspective of the Convention and the Protocol) term “implementing agreement”.<sup>32</sup> The U.S. submission prior to COP 20 in Lima in 2014 referred specifically to the “Paris Agreement.”

The term “protocol” carries additional baggage in the United States because of the history accompanying adoption of the Convention, to which the Senate gave its advice and consent in 1992 and to which the United States has been party since the instrument entered into force.<sup>33</sup> Neither the President’s Letter of Transmittal nor the Secretary of State’s Letter of Submittal of the Convention to the Senate mentions the domestic procedure anticipated to be followed with respect to subsequent protocols to the UNFCCC.<sup>34</sup>

In response to subsequent written questions from the Senate Foreign Relations Committee, the Executive Branch stated that, if a protocol containing targets and time-tables “were negotiated and the United States wished to become a party, we would expect such a protocol to be submitted to the Senate”.<sup>35</sup> Then the Senate Foreign Relations Committee, in its report on the resolution of ratification for the UNFCCC, expressed the expectation that future actions, that would require legally binding emission reductions, would require the Senate’s advice and consent.<sup>36</sup>

The Kyoto Protocol itself received a scathing response in the U.S. Senate. The Kyoto Protocol was negotiated for the United States by the Clinton Administration, and the agreement owes much of its content to US government input. But even before the Protocol’s adoption, the Senate had expressed its objection to the agreement in a resolution sponsored by Senators Byrd and Hagel and adopted by a vote of 95-0, referencing two factors: the Protocol’s failure to identify emissions reduction goals for non-Annex I countries; and anticipated “serious harm to the economy of the United States”.<sup>37</sup>

Vice President Al Gore nonetheless signed the Kyoto Protocol in November 1998, toward the end of the Clinton presidency, presumably on the expectation that the com-

<sup>32</sup> U.S. Submission on Copenhagen Agreed Outcome, 2009. Available at: [unfccc.int/files/kyoto\\_protocol/application/pdf/usa040509.pdf](http://unfccc.int/files/kyoto_protocol/application/pdf/usa040509.pdf) (accessed: 23 June 2017).

<sup>33</sup> Senate resolution of advice and consent to Framework Convention, U.S. Senate 138 Cong. Rec. 33527 (1992).

<sup>34</sup> The United Nations Framework Convention on Climate Change, adopted May 9, 1992, by the resumed fifth session of the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change (“Convention”), and signed on behalf of the United States at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro on June 12, 1992.

<sup>35</sup> More generally, the Executive noted that, “given that a protocol could be adopted on any number of subjects, treatment of any given protocol would depend on its subject matter.”

<sup>36</sup> S. Exec. Rept. 102-55, 102nd Cong., 2d Sess. (1992), at 14.

<sup>37</sup> S. Res. 98, 105th Cong. (1997).

position of the Senate would shift in a direction more receptive to the agreement. In the end, the Protocol was never submitted to the Senate for its advice and consent. In March 2001, President George W. Bush announced that the United States would not ratify the Kyoto Protocol.<sup>38</sup>

As a strictly legal matter, these junctures are not necessarily impediments to the conclusion of a protocol subsequent to Kyoto, even by the Executive Branch without Senate advice and consent [Wirth, 2015; Wirth 2016]. At best, the action of the Senate Foreign Relations Committee in 1992 is a preference expressed by a Congressional committee, and was not included as a formal reservation to the resolution of advice and consent adopted by the full Senate, which has wide discretion to give or withhold its consent to ratification subject to binding conditions or reservations. Committee reports, while perhaps helpful in interpreting the Senate's resolution of advice and consent, do not have the force of law. The Byrd-Hagel resolution is non-binding and confined to the Kyoto Protocol. And in any event, the Paris Agreement is self-evidently designed effectively to respond to the two criteria identified in the resolution.

These junctures nonetheless continued to haunt the U.S. posture in the negotiations, and by implication have held the rest of the world hostage to representations in some cases made a quarter of a century ago. In the process, the term "protocol" acquired a highly suspect connotation as a political if not a legal matter. Indeed, as described above the U.S. delegation held up the final minutes of the Paris negotiations in navigating a delicate divide to assure that the multilateral text would conform to the distinction in American law that would allow the United States to conclude the pact as an "executive agreement" without the need for Senate advice and consent to ratification.

There is at least one instance in which this legal ambiguity may have practical significance. With the U.S. having announced its intention to withdraw from the Paris Agreement, the legal relationship between that instrument and the Framework Convention is now no longer a question in a hypothetical scenario. Denunciation of the Framework Convention was one of the options under consideration by the White House in the lengthy, public deliberations before President Trump's actual announcement.<sup>39</sup> In addition to the mitigation commitments undertaken by the United States, that decision also terminated an anticipated contribution of \$2 billion toward a \$3 billion pledge made in 2014 by President Obama, of which \$1 billion had been paid by the end of Obama's term.<sup>40</sup>

That approach might have reduced the hiatus between a notice of withdrawal and the effective cessation of legal obligations under the Agreement from four years to one. It would also, not coincidentally, require withdrawal from two multilateral treaties, in-

<sup>38</sup> Bush G.W. Letter from President George W. Bush to Senator Chuck Hagel, 13 March 2001.

<sup>39</sup> Park M. Three Ways Trump Could Dump Paris Climate Agreement//CNN, 1 June 2017. Available at: <http://edition.cnn.com/2017/06/01/politics/paris-climate-agreement-trump-ways-to-withdraw/index.html> (accessed: 23 June 2017).

<sup>40</sup> Fact-Checking Trump on Climate Finance. World Resources Institute, 2017. Available at: <http://www.wri.org/blog/2017/06/fact-checking-trump-climate-finance> (accessed: 23 June 2017).

cluding the Framework Convention, the foundation on which the remainder of the global regime has been erected. The legal effectiveness of this option turns on the interpretation of the text of the Convention's article 25, paragraph 3, which specifies: "Any Party that withdraws from the Convention shall be considered as also having withdrawn from any protocol to which it is a Party."

If this option had been elected, a relatively obvious legal question would arise, namely "Is the Paris Agreement a protocol to the Framework Convention?" While perhaps having a purpose similar to that of a protocol to the Convention judged in terms of its structure and function, the Paris Agreement is expressly not a "protocol". Moreover, the negotiating history quite plausibly suggests that that choice was a purposeful rejection of a characterization of the Paris Agreement as a "protocol"<sup>41</sup>.

In this instance, the legal ambiguity is partially resolved by the Paris Agreement, which provides in its article 28, paragraph 3, that "any party that withdraws from the Convention shall be considered as also having withdrawn from this Agreement." But what about the time frames in this scenario? Would the withdrawal provisions of the Convention apply? Or would those of the Paris Agreement? Does it make a difference that the Paris Agreement is not a "protocol," in which case only the standard set out in the Paris Agreement would apply? These are open legal questions as to which, depending on the future behavior of key actors such as the United States government, there may be a need for resolution. The absence of a binding, third-party, neutral dispute resolution mechanism in the Paris Agreement adds further uncertainty to the mix.

From a public policy point of view, it would certainly make sense to conclude that a party cannot speed its withdrawal from the Paris Agreement by withdrawing from the Convention. That result would create perverse incentives for states to withdraw from both. On the other hand, would it make sense for a state in the position of the United States to have withdrawn from the Framework Convention, but still to be bound by the Agreement, which is the cornerstone of the international regime? Moreover, because the Convention is so widely accepted and has been in force for so long, most states would be in the position of the United States – that is, having become party to the Convention so long ago that the initial three-year waiting period passed long ago. It is too early to say whether there are significant consequences to other, currently less obvious situations in which the uncertain legal relationship between the Paris Agreement and the Convention may assume significance, such as the requirement in the Convention that the Secretariat service not only the Convention but its protocols as well.<sup>42</sup>

<sup>41</sup> Consulting the negotiating history ("*travaux préparatoires*") in interpreting a treaty is appropriate only when the plain meaning of the text leaves the result ambiguous, obscure, unreasonable, or manifestly absurd [Vienna, 1969]. In this particular situation, both the text and the *travaux* seem to support the conclusion that the Paris Agreement is not a protocol to the Convention.

<sup>42</sup> Another example in which prior previously-established procedures were circumvented, also to accommodate the United States, is the Agreement Relating to the Implementation of Part XI of the 1982 Convention on the Law of the Sea, which modified a major multilateral through a procedure other than that specified in the parent agreement [UNCLOS, 1994].

## ***The Paris Agreement's Relationship to the Kyoto Protocol***

In the end, the Paris Agreement is not a “protocol . . . under the Convention,” but a “legal instrument or an agreed outcome with legal force,” as set out in the Durban Mandate. This, of course, does not affect its binding legal character, which is clear by reference to the usual tests, such as those set out in the Vienna Convention on the Law of Treaties.<sup>43</sup> The more interesting question is the Paris Agreement’s legal and structural relationship to the larger UN climate regime, consisting of the FCCC, the Kyoto Protocol, the Doha Amendment, the Marrakesh Rules, and a host of other decisions adopted, and actions taken, by twenty-two successive conferences of the parties.

More problematically, although the non-binding decision in which the Paris Agreement is embedded makes passing reference to the Kyoto Protocol, the Paris Agreement proper makes not a single reference to that instrument. The context and structure of the negotiations leading to Paris indicate that the Agreement is intended to be a successor instrument to the Protocol, if for no other reason than that the Agreement is intended to govern the period beginning in 2020, after the end of the second commitment period under Kyoto.

Beyond that however, little is clear. One possibility, presumably of interest to Kyoto parties such as the EU that have invested a great deal in the scheme, would be to salvage as much as possible from the earlier undertaking. Another, presumably represented by non-Annex I states that did not have emission reduction obligations under Kyoto, along with the United States which never became party to the instrument, might be to approach implementation of the Paris Agreement as writing on a clean slate. Or there might be some amalgam of the two.

While there is nothing to prevent continued use of the flexible mechanisms, they are now optional and are no longer part of the overall binding structure of the deal. There is no express reference to emissions trading in the Paris Agreement, despite its central importance to the EU’s Emissions Trading System, the U.S. northeastern states’ Regional Greenhouse Gas Initiative (RGGI), California’s state-level scheme, and elsewhere<sup>44</sup> [Jaffe, Stavins, 2008; Ranson, Stavins, 2008, 2012].

Emissions trading and joint implementation survive in some form or other under article 6 of the Paris Agreement as voluntary “internationally transferred mitigation outcomes”, which “shall be supervised by a body designated by the COP”. A principal

<sup>43</sup> Vienna Convention on the Law of Treaties 1155 UNTS 331, 1969.

<sup>44</sup> Directive of the European Parliament and of the Council of 13 October 2003, establishing a scheme for greenhouse gas emission allowance trading within the Community, and amending Council Directive 96/61/EC, 2003 O.J. Eur. Comm. (L 275) 32, amended, Directive 2004/101/EC of the European Parliament and of the Council, 2004 O.J. Eur. Comm. (L 338) 18, amended, Directive 2008/101/EC of the European Parliament and of the Council, O.J. Eur. Comm. (L 8) 3, amended Regulation (EC) No 219/2009 of the European Parliament and of the Council, 2009 O.J. Eur. Comm. (L 87) 109, amended, Directive 2009/29/EC of the European Parliament and of the Council, (L 140) 63.



purpose, as under Kyoto, is to “deliver an overall mitigation in global emissions” as a result of such trades.

The successor to the CDM, also addressed in article 6, is “[a] mechanism to contribute to the mitigation of greenhouse gas emissions and support sustainable development.” Unlike the project-based approach of the CDM, policies and programs may also qualify. Because tradeable credits can be generated in any country, there is the potential for some overlap with Kyoto’s joint implementation mechanism, which governs offsets among Annex I parties. There are provisions against double-counting of emissions in both originating and host states, but as to most of the details of implementation, the COP is instructed to “adopt rules, modalities and procedures” to implement the mechanism.

Because of the altered status of trading, the elaborate compliance mechanism of the Marrakesh Rules is no longer needed. Instead, a new compliance process is to be crafted by the Conference of the Parties pursuant to article 15 that is, in contrast to the Marrakesh Rules’ Enforcement Committee, “facilitative in nature and... non-adversarial and non-punitive”.

Moreover, consistent with its bottom-up, loose texture, the text of the Paris Agreement includes a mixture of binding and non-binding provisions. This is indicated in the text by an alternation between “should” and “shall” [Bodansky, 2016a]. This is a considerable departure from Kyoto’s structure, which relied heavily on the binding nature of obligations and their enforceability, particularly to insure the integrity of internationally-traded emissions rights.

## Challenges of Implementation

COP 22 took place in Marrakech, which also served as the first Meeting of the Parties to the Paris Agreement (CMA 1) after the Agreement’s entry into force on November 4, 2016. The meeting began three days later, on November 7, one day before the U.S. election in which that country voted for a new President who had campaigned on a promise to “cancel” the Paris Agreement. In response, COP 22 – which by all accounts was considerably disrupted by the event – adopted the high-level Marrakech Action Proclamation for Our Climate and Sustainable Development [FCCC, 2017].

COP 22 began the process of adoption of the “Paris Rulebook,” scheduled to be completed as a series of decisions by 2018, presumably somewhat analogous to the earlier Marrakech Rules implementing the Kyoto Protocol. On account of the work still in progress, the meeting was extended going forward to COP 23 in Bonn in 2017, concluding “at the latest” at COP 24 in 2018. This is far from unprecedented, and a similar approach was utilized at least once before in extending COP 6, also disrupted by a U.S. election [Wirth, 2002].

Analogous to the two standing bodies established in the Convention, SBSTA and SBI, the decision accompanying the adoption of the Paris Agreement at COP 21 es-

tablished a new Ad Hoc Working Group on the Paris Agreement (APA). Although it is still too early to predict the outcome of negotiations on the Paris Rulebook, a number of issues emerged in Marrakech that are familiar from the history of the earlier negotiations set out above. Depending on one's point of view, the meeting also exposed the persistence of prior issues, despite the new context of the Paris Agreement.

The work of COP 22 was largely preliminary and preparatory. In addition to mitigation and adaptation, issues expected to be addressed in future decisions include market mechanisms, implementation and compliance, finance, transparency, and accounting. The COP also started preparatory work on the "global stocktake" mandated by the Paris Agreement.

On June 1, 2017, President Trump announced his intention on the part of the United States to withdraw from the Paris Agreement.<sup>45</sup> His statement also proposed renegotiating the Paris Agreement. In response, the heads of state and government of France, Germany, and Italy released a joint statement stating that "the momentum generated in Paris in December 2015 [is] irreversible," and "that the Paris Agreement cannot be renegotiated".<sup>46</sup> As of this writing, the United States has not given formal, written notice to the depositary, the United Nations, as required by the Paris Agreement. Instead, it has stated that it "intends to exercise its right to withdraw from the Agreement . . . in accordance with Article 28, paragraph 1 of the Agreement [by providing] formal written notification of its withdrawal as soon as it is eligible to do so," in November 2019.<sup>47</sup> In any event, all of Trump's demands can likely be accommodated within the existing structure of the Agreement [Wirth, 2017].

## Conclusion

Although often governed by legal rules, international organizations are ultimately political institutions whose principal purpose is to serve as vehicles to fulfil the coordinated policy objectives of their member states. It is tempting to think of autonomous institutional arrangements on climate and other environmental questions – or any other functional issue such as trade, for that matter – as establishing a rule of law framework that channels and confines future actions by states.

Before Paris, there was wide acceptance of the need for maturation and differentiation in the UN-sponsored climate regime to engage all states on the planet, not just those with quantified emissions reductions under the Kyoto Protocol. And so, too,

<sup>45</sup> Statement by President Trump on the Paris Climate Accord, White House, 1 June 2017. Available at: <https://www.whitehouse.gov/the-press-office/2017/06/01/statement-president-trump-paris-climate-accord> (accessed: 23 June 2017).

<sup>46</sup> Statement on the United States of America's announcement to withdraw from the Paris Agreement on climate change // Bundesregierung, 1 June 2017. Available at: [https://www.bundesregierung.de/Content/EN/Pressemitteilungen/BPA/2017/2017-06-01-joint-statement\\_en.html](https://www.bundesregierung.de/Content/EN/Pressemitteilungen/BPA/2017/2017-06-01-joint-statement_en.html) (accessed: 23 June 2017).

<sup>47</sup> Depositary Notification of United States Intent to Withdraw, 8 August 2017. Available at: <https://treaties.un.org/doc/Publication/CN/2017/CN.464.2017-Eng.pdf> (accessed: 23 June 2017).

there is arguably a commensurate need to rethink existing institutional structures to accommodate those twenty-first century needs.

In particular, if the Paris Agreement had been identified as a “protocol,” that could very well have doomed its chances of acceptance by one important state, the United States. But at the same time, the makeshift workaround, in which continuity with the existing Kyoto Protocol and its Doha Amendment were abandoned, at least as a formal matter, may yet have unintended consequences, including but not limited to uncertainty in the interpretation of the withdrawal provisions in the Framework Convention.

In any event, states are the ultimate masters in such regimes, and are free to alter what appear to be fundamental principles, rules, and procedures just as they are to create them. As demonstrated by the Paris Agreement, when there is a need for a new structural approach, the present needs of states can prevail over the requirements of apparently well-accepted previously-established architecture. From a public policy point of view, that is not necessarily good or bad, desirable or undesirable. But, as demonstrated by the case of the Paris Agreement, it is wise to keep that dynamic in mind as an ever-present possibility in dealing with the discipline of international organization.

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# Парижское соглашение: новый компонент климатического режима ООН<sup>1</sup>

Д.А. Вирт

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**Вирт А. Дэвид** — профессор школы права Бостонского колледжа, стипендиат программы Фулбрайта, эксперт в области устойчивого развития, профессор факультета права Национального исследовательского университета «Высшая школа экономики»; 885 Centre Street, Newton, Massachusetts, USA; E-mail: david.wirth@bc.edu

*Парижское соглашение, подписанное в декабре 2015 г. и вступившее в силу менее чем через год, является новейшим инструментом климатического режима ООН. По своей значимости Парижское соглашение занимает позицию после Рамочной конвенции ООН об изменении климата 1992 г. наравне с Киотским протоколом 1997 г. и Дохинской поправкой 2012 г. Настоящая статья описывает процесс становления международного климатического режима ООН с точки зрения международного права, а также раскрывает структурные, институциональные и правовые взаимосвязи Парижского соглашения с более ранними нововведениями в сфере защиты климата под эгидой Рамочной конвенции ООН об изменении климата 1992 г. Потребность в подобном анализе обусловлена тем, что новый инструмент не носит статус «протокола», а его взаимосвязь с Киотским протоколом остается неочевидной.*

*В представленной статье рассматривается процесс развития универсального климатического режима ООН от его истоков в 1990-е годы и до настоящего момента. Особое внимание уделяется структурным взаимосвязям между компонентами режима и реалиями исторического периода, проводится анализ текста и структуры Парижского соглашения с учетом исторического контекста. Тщательно рассматривается важность статуса Парижского соглашения в качестве инструмента, а не «протокола», а также его неочевидная текстуальная и институциональная взаимосвязь с предшествующим Киотским протоколом. В заключительной части статьи сделан вывод о том, что Парижское соглашение со структурной и институциональной точек зрения представляет новый тип соглашения, призванный закрепить инклюзивный, многосторонний подход к защите климата. Кроме того, было выявлено, что Парижское соглашение несет признаки преемственности с более ранними инструментами глобальной климатической политики.*

Ключевые слова: Парижское соглашение; Рамочная конвенция ООН об изменении климата; Киотский протокол; Дохинская поправка; глобальное потепление; международное экологическое право; устойчивость; теория режимов

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# USA Withdrawal from Paris Agreement – What Next?<sup>1</sup>

S. Chestnoy, D. Gershinkova

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**Sergey Chestnoy** – PhD, Advisor to the CEO of UC RUSAL; 1, Vasilisa Kozhina, 121096 Moscow, Russian Federation; E-mail: sergey.chestnoy@rusal.com

**Dinara Gershinkova** – Climate Advisor, International Projects, UC RUSAL; 1, Vasilisa Kozhina, 121096 Moscow, Russian Federation; E-mail: dinara.gershinkova@rusal.com

*In June 2017, President Trump announced the USA's withdrawal from the Paris Climate Accord, which had been ratified for less than a year, thanks in large part to the USA. That drastic shift followed the change in residency at the White House. Withdrawing from the Paris Accord presents an interesting topic for analysis. There's the practical side of the withdrawal procedure as set out in Article 28 of the agreement, not to mention the consequences of US non-participation in addressing international climate issues. There are other international forums (Such as G8 and G20), which also have an interest in climate related topics.*

*The Article analyses the U.S. position in negotiations and its commitments assumed the moment the United Nations Framework Convention on Climate Change (UNFCCC) came into effect until now: the reduction of greenhouse gas emissions, financial aid and reporting. It also provides general analysis of national legal obligations under the Paris Accord, ratification of that agreement in general and in particular another that took place in the USA, it focuses on the specifics of withdrawal. The specified three-year period from the Agreement becoming active, after which any party may withdraw from it (2019), is a noteworthy detail.*

*It is well-known that the Paris Agreement provides a framework that does not impose individual national commitments or a commitment to a compliance system. In essence, and from a legal point of view, it is non-binding. This was what allowed the USA to accept the terms of the accord relatively quickly and to use the simplified procedure, which by-passed Congress. In the opinion of the authors, President Trump's resolution to withdraw should, possibly, be considered as a simple continuation of his election discourse and the fulfilment of a campaign promise. Additionally, President Trump's declared intent to review the Paris Accord has legal grounds on which to launch further international negotiations, consequently that will never come to pass.*

*The Article was been written based on the analysis of resolutions passed at conferences attended by parties to the UNFCCC, other UN documents and international forums, the laws and regulations of the Russian Federation, information published by international legal experts and mass media coverage of the topic.*

*The Article sums up the consequences of US withdrawal from the Paris Accord, noting that the Agreement's status will not change after the USA withdraws. The Accord will remain in force having become effective in 2016 and the US will remain a party to the fundamental UN Climate Convention. The reduction in contributions to the Green Climate Fund will undoubtedly limit the project's potential in developing economies. A 'domino effect' is not inconceivable – with similar resolutions following the U.S. example, Turkey for example has announced the likelihood that it too will suspend ratification. There is though still time before 2019 for the U.S. to change its position.*

**Key words:** Climate Change; UNFCCC; Paris Agreement; US withdrawal

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<sup>1</sup> The editorial board received the article in July 2017.

A year ago, the world's two largest economies, the USA and China (which, together, account for 37% of global anthropogenic greenhouse gas emissions) announced they were joining the Paris Climate Agreement. To a large extent, it was that declaration that sealed the Paris deal, with the agreement officially going into effect on November 4, 2016.<sup>2</sup>

Naturally, when Donald Trump announced June 1, 2017 that the USA would be pulling out of the Paris Agreement, it sent shockwaves through the world, not only stirring up a flurry of official statements condemning the White House but also causing many to ask some practical questions, such as whether this move by the USA would alter the status of the Paris Agreement. How is the USA going to change its policy regarding the UN climate change process as a whole? Will the USA remain a party to the agreement at all? What's going to change in the UNFCCC negotiation process? Let's consider these issues.

***The USA in the international climate change process.*** The main international climate change agreement is the United Nations Framework Convention on Climate Change (UNFCCC), which was adopted in 1992 and went into effect in 1994. The UNFCCC was endorsed by 196 countries and the EU, and thus the Convention often gets cited as a rare example of a truly universal agreement.<sup>3</sup> The USA ratified the UNFCCC in 1992.

The objective was to stabilize greenhouse gas concentrations in the atmosphere “at a level that would prevent dangerous anthropogenic interference with the climate (Article 2).” At the same time, the developed nations are attempting to return “individually or jointly to their 1990 levels these anthropogenic emissions of CO<sub>2</sub> and other greenhouse gases not controlled by the Montreal Protocol (Article 4.2b).”

The Kyoto Protocol, adopted in 1997,<sup>4</sup> was an important step forward that defined a specific aggregated objective for the developed nations. This was to reduce the total anthropogenic greenhouse gas emissions “by at least five percent to the 1990 level in the period between 2008 and 2012 when the obligations apply” (Article 3.1) and defined individual obligations for 40 developed nations (which at that time accounted for roughly half of all total greenhouse gas emissions). Under the Kyoto Protocol, the USA was obliged to reduce emissions by 7%, to the 1990 level.<sup>5</sup> However, the USA, having signed the protocol in 1998,<sup>6</sup> never ratified it for the exact same reasons cited by US President Donald Trump 19 years later: cutting emissions and implementing other related measures to curb climate change would slow down the economic development of the country and would thus be bad for America. Neither Republican President George W. Bush nor his Democrat successor Obama ever got around to ratifying the Kyoto protocol. The USA's position on climate change is quite clear and pragmatic; it essentially boils down to never agreeing to any quantitatively defined international ob-

<sup>2</sup> It's symbolic that for Russia, November 4 is the date when the country ratified the UN Framework Convention on Climate Change in 1994 and the Kyoto Protocol in 2004.

<sup>3</sup> See: [http://unfccc.int/essential\\_background/convention/status\\_of\\_ratification/items/2631.php](http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php)

<sup>4</sup> CO<sub>2</sub> Emissions from fuel combustion highlights (2016 edition), IEA, <http://www.iea.org>.

<sup>5</sup> UNFCCC Decision 1/CP.3 “Adoption of the Kyoto Protocol to UNFCCC”, 1997.

<sup>6</sup> [http://unfccc.int/kyoto\\_protocol/status\\_of\\_ratification/items/2613.php](http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php)

ligations. Here, it should also be noted that the USA never ratified the UN Biodiversity Convention or the Basel Convention on the Control of Transboundary Movements of Hazardous Waste, recognizing in all of them a threat to its economic security.

Trump never made a secret of his negative take on the Paris Agreement or his skepticism regarding the entire climate change issue; he had been open about it since the start of the US presidential campaign. The official platform of the Republican Party stated that climate change was not a national security priority, that the Intergovernmental Panel on Climate Change is a political instrument rather than an independent scientific institution and that the agendas of both the Kyoto Protocol and the Paris Agreement “represent only the personal commitments of their signatories; no such agreement can be binding upon the USA until it is submitted to and ratified by the Senate...”<sup>7</sup> Furthermore, the GOP’s ultimate strategic goal in the matter was to cut the financing of the UNFCCC and the Green Climate Fund.

***The Paris Agreement.*** The Paris Agreement is the product of many years of negotiations. It’s a fairly comprehensive document that is less structured than the UNFCCC or the Kyoto Protocol; it’s full of verbose definitions, replete with cross references and what not. Its aim is to “hold the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C.”<sup>8</sup> At the same time, the agreement describes the actions that every signatory country must implement in rather general terms, presenting them primarily as recommendations in the form of “the parties should” rather than imposing specific obligations with the form “the parties shall.”<sup>9</sup> However, the most important part is that the Paris Agreement does not make any allowances whatsoever for the specific circumstances of any individual countries. Instead it uses such general terms as party, parties, developed parties, developing parties, each party, etc.

The obligations to cut emissions are replaced with nationally-determined contributions (NDC) which each party gets to determine on its own, including specific emissions reduction targets, deadlines for their achievement and the base year. Thus, the nationally determined contributions vary greatly from absolute reductions in emissions to reductions in the hydrocarbon content of the GDP. The NDC that the USA committed to promised to reduce emissions by 26–28% of the 2005 level by 2025<sup>10</sup>. It should be stressed again, though, that the NDCs are not part of the text of the Paris Agreement that has to be ratified, meaning that there are serious limits to how legally binding the agreement is. There are no sanctions for failure to abide by the NDCs.

The financial obligations involving the raising of USD 100 billion to help developing countries by 2020 are also expressed in general terms. This objective was adopted back in 2009 at the Copenhagen conference.<sup>11</sup> The obligations concern developed

<sup>7</sup> Republican platform 2016. <https://www.gop.com/the-2016-republican-party-platform/>, page 22.

<sup>8</sup> Article 2 of the Paris Agreement.

<sup>9</sup> Multilateral Environmental Agreement Negotiator’s Handbook, UNEP, 2007, pp. 3–65.

<sup>10</sup> USA first NDC submission, 03.09.2016, <http://www4.unfccc.int/ndcregistry/PublishedDocuments/United%20States%20of%20America%20First/U.S.A.%20First%20NDC%20Submission.pdf>.

<sup>11</sup> UNFCCC Decision 2/CP.15 “Copenhagen Agreement”, 2009.

nations,<sup>12</sup> but there are no specific instructions regarding how this burden should be allocated among them. In 2017, contributions were announced by 43 countries, including 9 developing ones (which can provide financing voluntarily as well), but their total was a little over \$10 billion (USD).<sup>13</sup> Of this total, \$3 billion was pledged by the USA. Barack Obama managed to transfer \$500 million literally three days before leaving office in January, 2017. In other words, there is a tenfold gap between the target amount of the fund and its actual amount, but since there is no mechanism for ensuring that obligations are met, there is no other option than to make calls for an increase in amount of climate change aid in the future.

It's obvious that in terms of its power to legally bind signatories, the Paris Agreement is no match for the Kyoto Protocol. All of this resulted from the consensus-based decision-making procedure used by the parties to the UNFCCC. On the other hand, it's the soft nature of the obligations that ensured the fast ratification of the Paris Agreement by all the parties including the US. If the Paris Agreement was even a little more specific, it probably would never have gone into effect in less than one year after its adoption. It should be noted here that as of today, the parties to the Paris Agreement include 159 developed and developing nations, which together account for the most greenhouse gas emissions.<sup>14</sup>

With the above taken into account, Trump's arguments about how the USA supposedly would incur huge losses if it were to participate in the Paris Agreement sound completely unconvincing. One thing is certain, though: Trump is delivering on his campaign promises.

***Ratification, adoption or approval.*** Under Article 20, the Paris Agreement is to be ratified, adopted or approved by states and the regional economic integration organizations that are parties to the Convention.... Ratification, adoption, approval or accession documents are to be submitted for storage to the Depositary (the UN General Secretary). In other words, the Paris Agreement allows for a variety of forms for the parties to express their obligations under it as an international agreement, exactly in accordance with the provisions of international law. The form of accession to the agreement is chosen by each party based on their national laws.

The USA signed the Paris Agreement on April 22, 2014, and on September 3 of the same year the country submitted acceptance documents to the UN. In other words, the USA formally accepted rather than ratified the agreement because the decision was made within the authority of President Obama, who hadn't secured approval from Congress.<sup>15</sup> A publication by the World Resources Institute (WRI, 2016)<sup>16</sup> offers a de-

<sup>12</sup> Historically, in the terms used in the UNFCCC Russia is classed as a country with a transition economy and is thus given a certain amount of leeway (Article 4.6) and thus is under no obligation to provide financial aid to developing countries. Naturally, this does not mean that Russia is prohibited from voluntarily offering financial aid.

<sup>13</sup> Status of Pledges and Contributions made to the Green Climate Fund, 02.06.2017, [https://www.greenclimate.fund/documents/20182/24868/Status\\_of\\_Pledges.pdf/eef538d3-2987-4659-8c7c-5566ed6afd19](https://www.greenclimate.fund/documents/20182/24868/Status_of_Pledges.pdf/eef538d3-2987-4659-8c7c-5566ed6afd19).

<sup>14</sup> See: <http://unfccc.int/2860.php>.

<sup>15</sup> See: [http://unfccc.int/paris\\_agreement/items/9444.php](http://unfccc.int/paris_agreement/items/9444.php).

<sup>16</sup> Domestic processes for joining the Paris Agreement, WRI, 2016.

tailed analysis of the legislation of 100 countries, the largest parties whose law applies to the accession to the Paris Agreement. It concludes that an executive order by the US President is sufficient as an acceptance document.

Commenting on the form of acceptance used by the USA, former White House legal advisor Melvin Purvis noted that the main guiding principle in situations like this is whether or not joining an international agreement would require amendments to national legislation. If the answer to that question is no, then it's more than enough for the President to sign the agreement without getting it ratified by the Senate. It's the same legal principle that many US presidents have relied upon since the time of George Washington.<sup>17</sup> In other words, President Obama was acting well within his authority and in accordance with US law. Trump's decision to discontinue the USA's participation in the Paris Agreement only confirmed the legitimacy of Obama's actions: the fact that the US had joined the Paris Agreement under Obama was never denied.

It should be noted that the domestic process for joining the Paris Agreement for the US (or any other country), whether it's ratification or acceptance, is determined by the individual countries' domestic laws exclusively, and does not in any way affect the country's status as party to the Agreement.

***Pulling out of the Paris Agreement.*** Both the process for joining and ratifying an international agreement as well as the process for pulling out of it are stipulated in the international agreement. However, the latter is hardly ever used. In the entire history of multilateral international cooperation on climate change, there has only been one example: when Canada pulled out of the Kyoto Protocol in 2012.<sup>18</sup>

Parties can withdraw from the Paris Agreement under Article 28: a country can formally announce it's withdrawing from the agreement at any time after three years from the date the agreement goes into effect (November 4, 2016). The termination of the country's participation in the agreement then goes into effect within one year, since the Depositary gets notified about it at a later date, specified in the official notice announcing the termination.

In other words, a party can only officially leave the Paris Agreement after November 4, 2019 and the decision will only go into effect one year after the official notice is given. This means that the US can only officially leave the Paris Agreement on the day following the 2020 presidential elections. However, nobody knows if the official position of the US administration is going to change by then or not....

The Vienna Convention on the Law of Treaties stipulates that a multilateral agreement does not cease to exist simply because the number of its participants drops below the number of parties that were needed for it to go into effect.<sup>19</sup> This is also true for the Paris Agreement. In other words, after the USA pulls out of it, the Paris Agreement will still remain a valid international agreement that went into effect on November 4, 2016.

<sup>17</sup> See: [https://www.washingtonpost.com/news/powerpost/wp/2015/11/30/trick-or-treaty-the-legal-question-hanging-over-the-paris-climate-change-conference/?utm\\_term=.78e42f1d0d86](https://www.washingtonpost.com/news/powerpost/wp/2015/11/30/trick-or-treaty-the-legal-question-hanging-over-the-paris-climate-change-conference/?utm_term=.78e42f1d0d86).

<sup>18</sup> See: [http://unfccc.int/files/kyoto\\_protocol/background/application/pdf/canada.pdf.pdf](http://unfccc.int/files/kyoto_protocol/background/application/pdf/canada.pdf.pdf).

<sup>19</sup> The 1969 Vienna Convention on the Law of Treaties, [http://www.un.org/ru/documents/decl\\_conv/conventions/law\\_treaties.shtml](http://www.un.org/ru/documents/decl_conv/conventions/law_treaties.shtml).

Experts are also talking about the possibility of the USA pulling out of the UNFCCC, as that would expedite the termination of their participation in the Paris Agreement: they would not need to wait for three years as the Convention has been in effect for over 20 years.<sup>20</sup> However, since the UNFCCC was ratified by the USA, i.e. it was approved by Congress, Congress would also have to pass a resolution to pull out of it and that would require time and support in both the Senate and the House of Representatives. For a more detailed treatment of this process, see the publication by the American international law expert D. Bodansky (2016).<sup>21</sup>

***Response in the USA and around the world.*** The response to Trump's decision in the USA and around the world has been quite emotional and very vocal.

In the US, a number of state governors, mayors, universities and companies announced their continued commitment to climate change goals, coalitions of Paris Agreement supporters were set up and a whole 'We are Still In' movement emerged, bringing together 125 cities, 9 states, 183 colleges and universities, 900 businesses, for a total of 120 US citizens and \$6 trillion in the national economy.<sup>22</sup> The UNFCCC secretariat was also inundated with statements from various groups. However, although decisions preceding the Paris Agreement welcomed actions and initiatives by interested groups that were not parties to the agreement,<sup>23</sup> these initiatives do not in and of themselves create any legal grounds for joining the Paris Agreement; its parties can only be nation states that are members of the UN.

The heads of the EU, Canada, India, Japan, Mexico, China and a number of other countries made public statements, which, while not exactly condemning the USA's decisions, expressed dismay. Even North Korea joined the fray; Kim Jong Un called Trump's decision the height of egoism.<sup>24</sup>

Speaking at the international economic forum in Saint Petersburg this June, Russian President Vladimir Putin noted that the USA "didn't have to pull out of the Paris Accords, as they are essentially a framework agreement; what they should have done instead was change the USA's commitments under these Paris accords." Russia, meanwhile, signed the Paris Agreement in 2016 and plans to ratify it in 2019.

The media have started comparing the USA with two other countries that didn't sign the Paris Agreement: Nicaragua and Syria.<sup>25</sup> It's hardly a valid comparison, seeing that Syria couldn't even have participated in the talks, given the sanctions the EU has imposed on members of its government and the civil war that's been tearing the country apart for the better part of the decade. Meanwhile, Nicaragua stated clearly,

<sup>20</sup> Article 25 of the UNFCCC allows members to leave at any time once the Convention has been in effect for three years.

<sup>21</sup> Daniel Bodansky, Sandra Day O'Connor College of Law, Arizona State University 'Legal note: could a future President reverse U.S. approval of the Paris Agreement', 2016.

<sup>22</sup> See — "We are still in", <http://www.wearestillin.com/>.

<sup>23</sup> UNFCCC Decision 1/CP.21, Section V (2015).

<sup>24</sup> See: <http://www.telegraph.co.uk/news/2017/06/07/height-egotism-north-korea-blasts-donald-trump-pulling-paris/>.

<sup>25</sup> See: <http://www.politifact.com/truth-o-meter/statements/2017/jun/01/debbie-wasserman-schultz/are-nicaragua-and-syria-only-countries-not-sign-pa/>

back when the talks were still underway in Paris, that voluntary commitments to reduce emissions would not be able to ensure the required reduction in emissions to save Mother Earth and thus it had no intention of signing the document.

Trump's decision to pull out of the Paris Agreement has changed the format of other multilateral forums the USA takes part in: there can no longer be joint statements on climate change backed by all participants. Thus, the final document signed after a meeting of the G7 environmental ministers in Bologna on June 11–12, 2017 only enumerates the countries that confirmed their commitment to the Paris Agreement, with the USA's 'minority report' being mentioned in a footnote. At the same time, what the footnote says is actually quite positive: the USA has managed to reduce its carbon footprint since 1994 and intends to continue cooperating with partners while pursuing the national interests of ensuring economic growth and maintaining a healthy environment.

The G7 summit in Hamburg also made special mention of the USA's special position in its final communique. For the first time, a separate paragraph was used to talk about the special position of a G7 member. But here too, the USA confirmed its commitment to reducing greenhouse gas emissions while trying to maintain economic growth.

*The start of new talks or what's next?* In his speech on Jun 1<sup>st</sup>, President Trump proposed starting new talks to develop a new agreement that the USA would be fine with several times.<sup>26</sup> It has to be noted here that the UNFCCC has almost 200 member states and the way it works is that every proposal must be unanimously agreed to. It should also be noted that the Paris Agreement was signed after 10 years of negotiations (if we start counting from the second period of the Kyoto Protocol that started in 2005). So it's unlikely that Trump's idea to start from scratch will meet with much support. The UNFCCC secretariat essentially said as much in its official statement, 'The Paris Agreement is a historic document signed by 195 parties and ratified by 146 countries and the EU, so it cannot be revised at the request of a single country.' At the same time, the statement notes the organization is open to dialogue with the USA.

Since the decision to leave the Paris Agreement only goes into effect in four years, the question is: what's going to happen until 2020?

Under the terms and conditions of the agreement and in accordance with simple logic, until the decision to pull out of the agreement goes into effect, the USA must remain a full-fledged participant of the Paris Agreement process. The country can take part in negotiations and any other events for parties to the agreement. Naturally, one can hardly expect a country that has just announced it will be leaving to take an active part in these processes or abide by the resolutions passed by the parties, but there are no formal grounds for expelling the USA right now. On the other hand, there is no formal mechanism for forcing the USA to abide by Paris Agreement resolutions either.

Trump has announced that the US will no longer contribute to the financing of the Green Climate Fund. Thus, the budget of the Green Climate Fund will be cut by

<sup>26</sup> See: <https://www.whitehouse.gov>.

almost a third. In all probability, the implementation of climate programs in developing countries will be reduced by roughly the same amount. The situation can only change if the other countries pledge to provide additional financial aid, but so far none have volunteered.

Some experts say the USA's decision to abandon the Paris Climate Change Agreement could kick off a domino effect and other countries may soon follow suit.<sup>27</sup> At the G20 summit in Hamburg, Turkey's president said the Turkish parliament was unlikely to ratify the Paris Agreement because of the USA's decision to pull out of it, as well as its refusal to abide by its obligations under it and its abandonment of its financial aid pledges.<sup>28</sup>

It goes without saying that any country can take advantage of Article 28 of the Paris Agreement, but so far it's only been the USA that has officially announced it will be pulling out.

What's more important is that the USA still remains a party to the UNFCCC, so they're still subject to related obligations, such as taking an annual inventory of anthropogenic greenhouse gas emissions and filing national greenhouse gas emissions reports, preparing national climate change policy and climate change measures reports, making annual financial contributions to the UNFCCC, and so on. They fully participate in all the negotiations that parties to the UNFCCC participate in, as well as in the work of the auxiliary bodies of the UNFCCC tasked with developing implementation solutions for the Paris Agreement.<sup>29</sup> They can potentially be given the status of an observer under the Paris Agreement, similar to the status they had in the Kyoto Protocol (i.e. without the right to discuss issues and vote on them).

## Conclusions

First. The USA's decision to pull out of the Paris Agreement is not going to affect the status of the Agreement. It remains an international agreement that went into effect on November 4, 2016, when it was ratified by the USA and China. That's at least one link between the US and the Paris Agreement, and is similar to the link between Russia and the Kyoto Protocol, which only went into effect because it was ratified by Russia in 2004.

Second. Pulling out of the Paris Agreement entails no sanctions for the USA. The damage to the country's reputation will undoubtedly be severe, though.

<sup>27</sup> See: <http://www.climatedepot.com/2017/06/01/failure-of-paris-climate-deal-was-inevitable/>.

<sup>28</sup> See: <http://www.rbc.ru/rbcfreeneews/596127629a794733bd3692fe>.

<sup>29</sup> August 4, 2017 the United States submitted a communication to the United Nations, in its capacity as depositary for the Paris Agreement, regarding the US intent to withdraw from the Paris Agreement. In the official comment it is stated that the United States will continue to participate in climate change negotiations, including ongoing negotiations related to guidance for implementing the Paris Agreement, and the US is open to re-engaging in the Paris Agreement, as was indicated in President Trump's June 1, 2017 announcement <https://www.state.gov/r/pa/prs/ps/2017/08/273050.htm>.



Third. Once the US stops financing the Green Climate Fund, its budget will be cut by a third. Consequently, a number of climate change programs in developing countries currently being financed by the fund are going to have to be cut back or abandoned. In addition, the US may also reduce financing through the UNFCCC. At the moment, the US share in the budget of the UNFCCC is 22%.

Fourth. Until the decision to leave the Paris Agreement formally goes into effect, the US will remain a full-fledged party to the agreement and be able to participate in all negotiations and all events organized under the Agreement.

Fifth. It can't be ruled out that other countries may follow suit (there is already a precedent: Turkey's President Erdogan said at the G20 summit in Hamburg that his country was putting the ratification of the Paris Agreement on hold). However, at this point, the majority of the parties to the agreement have confirmed their commitment to it.

Sixth. Trump's proposal that the Paris Agreement be revised has no legal grounds and doesn't warrant the launch of an international negotiation.

At the same time, there's time until 2019. The US may still change its mind on the Paris Agreement. At least in theory, that still remains possible.

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# Выход США из Парижского соглашения – что дальше?<sup>1</sup>

С.Ю. Честной, Д.А. Гершинкова

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**Честной Сергей Юрьевич** — к.э.н., советник генерального директора ОК РУСАЛ; Российская Федерация, 121096, Москва, ул. Василисы Кожиной, д. 1; E-mail: sergey.chestnoy@rusal.com

**Гершинкова Динара Александровна** — советник по климату Дирекции по международным проектам ОК РУСАЛ; Российская Федерация, 121096, Москва, ул. Василисы Кожиной, д. 1; E-mail: dinara.gershinkova@rusal.com

*В июне 2017 г. президент Д. Трамп объявил о выходе США из Парижского соглашения, которое вступило в силу менее года назад во многом благодаря самим же США. Такая резкая смена курса произошла вместе со сменой хозяина Белого дома. Выход из Парижского соглашения — интересная ситуация для анализа практической стороны процедуры выхода, прописанной в ст. 28 Парижского соглашения, а также с точки зрения изучения последствий для участия США в международном климатическом процессе и иных международных форматах («Группа восьми», «Группа двадцати»), содержащих климатические вопросы.*

*В статье анализируется позиция США на переговорах и принятые обязательства с момента вступления в силу Рамочной конвенции по климату (РКИК ООН) и до настоящего времени: по снижению выбросов парниковых газов, оказанию финансовой помощи, предоставлению отчетности. Приводится общий анализ юридических обязательств стран по Парижскому соглашению, процедуры ратификации Парижского соглашения — в общем и конкретно имевшей место в США, а также особенности выхода из Парижского соглашения. Особенностью является установленный трехлетний период после вступления в силу соглашения, после которого любая сторона соглашения может выйти из него — не ранее 2019 г.*

*Известно, что Парижское соглашение носит рамочный характер, в котором отсутствуют индивидуальные обязательства стран и система соблюдения обязательств, то есть оно не является с правовой точки зрения жестким договором. Именно это обстоятельство позволило США достаточно быстро и в упрощенном порядке (минуя конгресс) принять соглашение. По мнению авторов, решение Трампа о выходе, вероятно, стоит расценивать как продолжение предвыборной риторики и демонстрацию выполнения предвыборных обещаний. А высказанное предложение Трампа о пересмотре достигнутых в Париже договоренностей не имеет юридических оснований для запуска международного переговорного процесса и поэтому не может быть реализовано.*

*Статья подготовлена на основе анализа решений конференций сторон РКИК ООН, иных документов ООН и международных форумов, нормативно-правовых актов Российской Федерации, публикаций юристов-международников, публикаций в СМИ.*

*В заключении сформулированы выводы о последствиях выхода США из Парижского соглашения. Так, отмечается, что с выходом США статус Парижского договора не изменится — соглашение останется действующим, вступившим в силу в 2016 г. США останутся стороной основополагающего соглашения ООН по климату — Рамочной конвенции. Сокращение взносов в Зеленый климатический фонд, безусловно, сократит возможности для реализации проектной деятельности в развивающихся странах. Кроме того, не исключен «эффект домино» — когда вслед за США последуют аналогичные решения от других стран. Уже есть пример Турции, которая объявила о возможной приостановке процесса ратификации. Однако до 2019 г. еще есть время, в том числе и для пересмотра США своей позиции.*

Ключевые слова: изменение климата; Рамочная конвенция ООН об изменении климата; Парижское соглашение; выход США из соглашения

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