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China and the WTO: From Difficult Access to Partial Leadership¹

J. Zhu, Y. Wei

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Abstract

In this article, the interactions between China and the World Trade Organization (WTO) are explored; these can be divided into three different stages, ranging from difficult access to comprehensive adaptation and to partial leadership. Through the three stages, the conflict and resolution of the dilemmas of market economy status and developing country status was the driving force. In the difficult access period, the market economy dilemma embodied the optional safeguard measures and anti-dumping measures, and the developing country dilemma embodied the access to the market of finance, insurance, and telecommunication in the negotiation of China's entry to the General Agreement on Tariffs and Trade (GATT)/WTO. In the comprehensive adaptation period, China, in defense of its own market economy status, used WTO rules to counter America's demands on China, such as anti-dumping proceedings and the criticism regarding the "stagnation of China's reform," claiming special and differential treatment due to its status as a developing country. In the period of partial leadership, while still insisting that it was a developing country, China strategically advocated that developing countries should realize their national interests by adopting the new policy of "open for development," embodying its leadership in the emerging issues of WTO negotiations such as e-commerce and investment facilitation.

Keywords: GATT, WTO, China, Market Economy Status, Developing Country Status

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Introduction

The year 2021 marked the 20th anniversary of China's accession to the World Trade Organization (WTO). Exploring the historical evolution of China's engagement with the WTO is helpful and significant for thinking about the relationship between China's rise within the global governance system and how it participates in the reform and construction of that system [Yang, 2018].

¹ This article was submitted on 24.04.2022.

First, the WTO is one of the most important of the international organizations that have influenced China's reform and opening up. The re-entry negotiation itself was part of this process. After its accession to the WTO, China rapidly grew to become the world's second-largest economy and the largest trader in goods. In the process, the WTO brought huge dividends to China's development. Second, China's accession to the WTO further enhanced the authority and effectiveness of the multilateral trading system. China has actively promoted negotiations on new issues in the WTO, maintained the effective operation of its dispute settlement mechanism, and fully supported the integration of developing countries into the multilateral trading system [Chinese State Council Information Office, 2018].

Why was China's WTO accession negotiation so difficult? How has China's role changed from comprehensive adaptation to partial leadership after its accession? In the existing research literature, most scholars focus on discussing the pros and cons of China's accession to the WTO, China's accession to the WTO negotiation model and strategy, the WTO and China's reform and opening up, and the WTO Doha round negotiation and China's strategic choice. There is less discussion of China's changing role in its interaction with the WTO [Lardy, 1999; Song, 2018; Zhang, 1999].

In this regard, this analysis examines the interaction between China and the WTO from a combined historical and theoretical perspective and identifies three stages in the evolution of China's relations with the WTO: from difficult accession to comprehensive adaptation and then to partial leadership. Dealing with the dilemmas of market economy status and developing country status has been the driving force of China's relationship with the WTO.

When determining whether a country is a market economy country, the position of the United States is that whether a country's resources are allocated through the market or rather by a government plan is the main standard to consider. However, China argues that every country uses both government plans and market mechanisms to allocate resources.² The key is to see whether it is from government plan to the market, or from market to government plan [Qin, 2010].

When judging whether a country is a developing country, the United States has proposed that several objective criteria should be set, for example, whether it is a member of the Group of 20 (G20) or the Organization for Economic Co-operation and Development (OECD), whether it is a high-income country as defined by the World Bank, and whether it is a country that accounts for more than 0.5% of world trade in goods, among others. However, China argues that development is a multidimensional process of change, and it is difficult to measure whether a country is a developing country by applying external criteria [Wang, 2021, pp. 42–62].

China's Access to the WTO: Difficult Negotiation

Unfolding from 1986 to 2001, China's re-entry into GATT/WTO lasted 15 years and faced many difficulties. It generally went through three stages: the preparation stage, the contact stage, and the substantive negotiation stage. In the preparation and contact stages, China had status as both a market economy country and a developing country. However, at that time, the United States did not recognize China as a market economy country and then did not recognize China as a developing country, leading to deadlocks over China's re-entry GATT/WTO negotiations on two occasions. Finally, in substantive negotiations, China and the United States adopted a flexible and pragmatic attitude to find a compromise to resolve these two identity issues.

² Deng Xiaoping famously argued that socialism has markets and capitalism has plans [1993, p. 373].

Preparation Stage: 1986–89

After reform and opening up in 1978, China resumed ties with GATT. In November 1982, China obtained status as an observer state in GATT and began to send observers to attend its meetings. On 10 July 1986, Qian Jiadong, Chinese ambassador to the United Nations (UN), applied to Arthur Dunkel, the director-general of GATT, for the restoration of the status of the People's Republic of China as a contracting party to the agreement [GATT, 1986]. The application put forward three principles for China's re-entry to GATT, marking the official start of the negotiation process.

In May 1948, China was a founding member of GATT, but due to political reasons, the Chinese government suspended China's activities therein. Thus, as a first principle, China's application was to reinstate its status as a signatory to GATT rather than to apply for membership in the agreement. Second, as a developing country, China expected to receive the same treatment as other developing countries. The issue of developing country status had both economic and political significance for China. Economically, China was still in the primary stage of development. Politically, China and other developing countries were jointly promoting the establishment of a new international political and economic order. Third, China was ready to bear the obligation of tariff reduction rather than import obligations. Historically, GATT adopted different obligation models for countries with different economic systems. For market economy countries, tariff reduction has been the main obligation, while for non-market economy countries, GATT has taken a certain proportion of the import quantity as its obligation. For example, as a planned economy, Poland entered GATT with an obligation to increase its imports with contracting countries by 7% per year. After the reform and opening up, China carried out extensive and profound reforms to its economic system and hoped to restore its contracting party status by assuming tariff reduction rather than import obligations.

The representatives of developing countries such as Pakistan, Senegal, Hungary, and Mexico welcomed the three principles proposed by the Chinese ambassador, while the representatives of western countries such as the United States, Europe, and Japan had reservations. American hubris was on display in the words of Ambassador Michael Samuels. He used formal diplomatic language to welcome China's application for re-entry to GATT but also argued that, while welcomed, this would be only the first step toward basing China's relations with its trading partners on market access. Paul Trân Van Thinh, the European ambassador, was more positive, calling China's application a significant event of great joy. The Japanese representative's remarks not only showed Japan's ambivalence on this issue, but also set the tone for the western countries to follow, that is, that political support should be offered, legal issues can be resolved, and economic negotiations need to be serious [Yi, 2007, p. 24].

In accordance with the application procedures, China formally submitted the Memorandum on China's Foreign Trade Regime to GATT in February 1987. In response, in March 1987, the GATT Council established a working party on China's status as a contracting party and held meetings in February, April, June, and September 1988 to review China's foreign trade regime. On this basis, the United States and other western powers put forward five requirements for China's foreign trade system. First, China's foreign trade system would need to be implemented uniformly throughout the country. Second, the transparency of the foreign trade system would have to be improved. Third, non-tariff measures inconsistent with GATT would have to be abolished. Fourth, a commitment to price reform to achieve the goal of market-determined prices would be required. Fifth, China would have to agree with the optional safeguard clauses.

Shen Jueren, then Vice Minister of Foreign Trade and Economic Cooperation of China, responded to these five requirements. First, on the unified implementation of the foreign trade regime, China promised to correct it once it was discovered. Second, regarding the transpar-

ency of the foreign trade system, China would undertake to publish all laws and regulations and non-confidential procedural statistics and to establish an external reporting system, excluding only enterprises with legitimate trade secrets and confidential information of public interest. Third, on the issue of non-tariff measures, China would accede to the GATT Tokyo Code for non-tariff measures consistent with GATT; for non-tariff measures inconsistent with GATT, China agreed to gradually rationalize its planning and foreign exchange management and to coordinate the use of tariff and non-tariff measures. Fourth, on price reform, China would commit to the direction of market-oriented price reform, but not to the specific timetable for such reform. Finally, regarding the optional safeguard clauses, China viewed this to be against China's opening up and reform policy, and thus, unacceptable [Shi, 2011, pp. 145–7].

The main controversy between China and the United States on the issue of China's re-entry was related to the optional safeguard clauses.³ This controversy reflects the fact that the two sides had different views on whether China was a market economy. China believed that, although its economic system still bore traces of a planned economy, the general direction toward the market economy had been established in China. However, the U.S. believed that, although China's economic system had undergone reform, there was still a long way to go toward the real market economy system.

Against the background of different views on whether China was a market economy system and whether China should accept the optional safeguard clauses, a remarkable political storm occurred in Beijing at the turn of spring and summer of 1989, and the United States began to impose economic sanctions on China, leading to a major setback in China's negotiations for the re-entry of GATT.

Contact Stage: 1992–94

On 18 January 1992, Deng Xiaoping visited Wuchang, Shenzhen, Zhuhai, and Shanghai and delivered the famous South Tour Speeches, in which he put forward an important view that the market economy is a means that can be used by both capitalism and socialism. On 9 June, Jiang Zemin delivered a speech at Party School of the Chinese Communist Party (CPC), entitled "Understand Deng Xiaoping's Important Statement and Make Economic Reform and Opening Up Faster and Better." He put forward that the goal of China's economic reform was to establish a socialist market economic system. On 12 October, the 14th CPC National Congress was held in Beijing, which formally declared this to be a reform goal.

The acceleration of the domestic reform process injected strong impetus into the negotiation of re-entry into GATT. On 21 October 1992, Tong Zhiguang, the vice minister of the Chinese Ministry of Foreign Trade and Economic Cooperation, led a delegation to attend the 11th meeting of the Working Party of China's Status. At the meeting, he proposed that China's goal for reform of its economic system was to build the socialist market economy and usher in a new stage of re-entry negotiations [Ibid., pp. 96–7]. In May 1993, the Chinese delegation submitted to the secretariat of GATT the Revision to Memorandum on China's Foreign Trade Regime, adding that the goal of China's economic reform was to establish a socialist market economy. Unfortunately, the representatives of western countries did not recognize China's market econ-

³ The legal basis for the Optional Safeguard Clause is Article 19 of GATT, which essentially allows contracting parties to selectively apply emergency safeguard measures to the exports of one contracting party but not to apply the same safeguard measures to similar products of other contracting parties. The core contradiction lies in whether China had achieved complete market regulation of prices. If China accepted the request of the United States, then it would not be admitted to GATT as a market economy, and if China's exports to GATT contracting parties were found to be dumping, then GATT contracting parties could unilaterally take emergency safeguard measures against China's exports.

omy status and still insisted that China should accept the optional safeguard clauses. Dorothy Dwoskin, the American chief negotiator, made it clear that China's market economy was not a real market economy [Yi, 2007, p. 38].

More importantly, the Uruguay round of negotiations, which coincided with China's on re-entry into GATT, was now nearing its conclusion with a decision to upgrade GATT into the WTO. Therefore, the United States began to change its price to China and turned China's GATT entry ticket into a WTO entry ticket. In addition to the initial five requirements, the U.S. also proposed to increase market access requirements in new areas such as trade in service, intellectual property rights, investment, agricultural products, textiles, telecommunications, insurance, and securities. In this context, it would be important for China to assume the market access obligation as a developed or as a developing country. In other words, while the old issue of market economy status was not solved, a new issue of developing country status was added to China's negotiations for re-entering GATT.

By the end of 1994, China's negotiations became increasingly urgent. To become a founding member of the WTO, China launched a sprint to resume the negotiations. At home, China had introduced a few reforms to match the negotiations. In early 1994, China abolished the dual-track exchange rate and foreign exchange retention systems, abolished import licenses and quotas for 283 commodities, and began to implement the Interim Measures for Managing the Import Number of General Commodities and the Measures for Bidding Quotas for Export Commodities. The Standing Committee of the National People's Congress (NPC) also promulgated the Foreign Trade Law. In June, China removed another 208 non-tariff measures on imported goods. China adopted a series of reform measures to demonstrate its determination to conclude the negotiations by 1994.⁴ However, the U.S. took advantage of China's desire for an early conclusion of the negotiations and forced China to make greater compromises and concessions on the market access issue [Ibid., p. 148].

Although the U.S. demands were beyond China's economic capacity at the time, China did not give up on negotiations and continued to seek consensus. In November, China continued its negotiations with the U.S. on market access and made concessions on tariffs, lowering the overall tariff level from 43.7% to 17%, including from 46.1% to 21.9% for agricultural products and from 42.8% to 16.3% for non-agricultural products. China also proposed a timetable for the elimination of most non-tariff measures [Shi, 2011, p. 180–4]. At the 7–11 December meetings, China pledged to partially liberalize state trade and agreed to increase the proportion of state-traded products handled by non-state enterprises. However, the United States continued to insist on its high price position and refused to compromise, which led to a failure to reach a consensus on many differences, and the Sino-U.S. market access negotiations finally broke down.

The failure of China's re-entry to GATT in 1994 was the result of America's overpricing of China, which was rooted in America's unwillingness to recognize China's status as both a market economy and a developing country. As a result, China failed to re-enter GATT by the end of 1994.

Substantive Negotiation Stage: 1995–2001

On 1 January 1995, the WTO was established and negotiations over China's re-entry into GATT were formally transformed into negotiations over accession to the WTO. On 25 October 1995, Chinese president Jiang Zemin and U.S. president William Jefferson Clinton met in New

⁴ China had hoped to complete negotiations on the re-entry to GATT by the end of 1994 and to become a founding member of the WTO before 1 January 1995.

York and exchanged views on China's accession to the WTO for the first time. President Clinton said the United States was willing to take a positive attitude toward China's accession to the WTO and had drafted a working paper for further discussions with China in the hope of breaking the negotiation deadlock. On 8 November, U.S. trade representative Charlene Barshefsky visited China and provided an informal document on China's WTO accession, the Non-Paper on China's Accession to the WTO. The United States described the informal document as a road map for China's accession to the WTO, listing the 28 requirements it made of China. Wu Yi, then the Chinese minister of Foreign Trade and Economic Cooperation, pointed out in a meeting that although the U.S.' road map showed some flexibility, the U.S. was asking too much of China [Shi, 2011, pp. 193–6]. In fact, the debate over the road map proposed by the United States showed that the two sides still had significant differences on the issue of China's accession to the WTO. Afterward, the two sides had contact, but the progress of the negotiations was limited.

On 6 November 1998, President Clinton sent a letter to President Jiang Zemin saying that he was “deeply concerned about the growing trade deficit between our two countries. American companies continue to have difficulties in exporting goods, agricultural products, and services to China...the best way to solve this problem is to open up China's markets on a good, commercially sensible basis and reach an agreement on China's accession to WTO.” [Ibid., pp. 232–3]. Against this background, the negotiation process on China's accession to the WTO was significantly accelerated.

On 15 November 1999, China and the United States opened the 25th round of bilateral negotiations on the issue of China's accession to the WTO. Substantive issues were discussed in the negotiations, including the optional safeguard clause, anti-dumping clauses, permanent most-favored-nation treatment, agricultural subsidies, state-run trade, tariff concessions, non-tariff measures, securities, insurance, and telecommunications. They reached a historic agreement, the Market Access Agreement Between the People's Republic of China and the United States of America, which removed the most difficult political obstacle for China's entry into the WTO. On 10 November 2001, the 4th WTO Ministerial Conference, held in Doha, deliberated and adopted the Protocol on the Accession of the People's Republic of China and the Report of the Working Paper on the Accession of China. On 11 December, China formally joined the WTO, becoming its 143rd member. At this point, the 15-year long negotiations on China's re-entry into GATT and accession to the WTO came to an end.

In the re-entry GATT/accession to WTO negotiations, China's market economy status and developing country status were the two major issues and were reflected in each specific topic of the negotiations. Among them, on the issues of the optional safeguard clauses, anti-dumping clauses, and permanent most-favored-nation treatment, China firmly opposed being treated by the U.S. as a non-market economy country and demanded that the U.S. abolish its discriminatory practices against China, while the U.S. stressed the need for a transition period to ensure that China truly established its market economy system. The final compromise was that the U.S. agreed to remove the optional safeguard clauses and the anti-dumping clause, in 2012 and 2016 respectively. On agricultural subsidies, state-run trade, tariff concessions, non-tariff measures, securities, insurance, and telecommunications market access, China's basic position was that, as a developing country, China would undertake the obligations corresponding to its level of development and open its market step by step, enjoying a certain transitional period, while the U.S. required China to open its market to the maximum extent within the shortest period of time. On a case-by-case basis, China ended up shouldering more obligations for opening up than most other developing countries.

China as a Full Member of the WTO: Comprehensive Adaptation

After its accession to the WTO, China's role began to change from that of a difficult negotiator to that of a comprehensive participant. The issues of China's market economy status and developing country status have not been resolved but have taken on a new form. Therefore, China and the United States continue to fight over these issues within the framework of WTO.

The WTO mainly consists of three mechanisms, including the trade dispute settlement mechanism, the trade policy review mechanism, and the multilateral trade negotiation mechanism. After China's entry into the WTO, China tried to adapt to these three mechanisms comprehensively, and experienced a process from learning rules to adapting to rules, and then to using rules to fight. In the trade dispute settlement mechanism and trade policy review mechanism, China mainly dealt with the anti-dumping lawsuit and the so-called "China reform stagnation," and defended China's market economy status in the struggle; within the multilateral trade negotiations mechanism, China has mainly insisted on the principle of special and differential treatment for developing countries, thus defending its institutional rights as a developing country.

Trade Dispute Settlement Mechanism

On 1 January 1995, the WTO trade dispute settlement mechanism was formally put into operation. It mainly consists of six parts, namely, the consultation procedure, the mediation procedure, the arbitration procedure, the expert group procedure, the appeal procedure, and the enforcement procedure. The main executing organs are the expert group and appellate body. The dispute settlement mechanism is a kind of effective means to deal with international trade disputes by establishing a set of legally binding rules [Ni, Cheng, 2001, p. 44].

After China's accession to the WTO, the U.S. trade deficit with China continued to expand, leading to an increasing number of trade disputes between the U.S. and China. In May 2004 and April 2005, China promulgated the Auto Industry Policy and the Import Management Measures of Auto Parts, and the United States challenged both. In March 2006, the U.S. referred the case of Chinese auto parts to the WTO's panel and appellate body, asking the WTO to launch an anti-dumping investigation against China. It also stopped seeking bilateral understanding with China. As stipulated in the Protocol on the Accession of the People's Republic of China, the U.S. and other contracting countries would not cancel the anti-dumping investigation against China as a non-market economy country until 2016. Therefore, the U.S. and other contracting states could determine whether China was guilty of dumping in accordance with their domestic laws during the transition period. In December 2008, the WTO's appellate body ruled that China had violated the WTO's principle of national treatment.

In response to the lawsuit, China also actively used the trade dispute settlement mechanism to launch counter-attacks. In December 2008, China submitted to the WTO expert group the anti-dumping measures taken by the United States against China on standard steel tubes, rectangular steel tubes, composite woven bags, and off-road tires. In this lawsuit, China had not only hoped the United States would cancel the anti-dumping measures on these four products but also that the common problems faced by Chinese enterprises in the United States could be resolved. To this end, China did not focus on the facts of individual cases in the investigation, but rather on the legal standards and relevant investigation methods used by the U.S. and its attempts to systematically influence the anti-dumping investigation of Chinese products. In October 2010, the WTO expert panel issued a ruling report, which found that the anti-dumping

measures of the United States were inconsistent with WTO rules. China won the lawsuit, thus effectively safeguarding China's market economy status in the WTO [Zhao, 2011, pp. 133–4].

Trade Policy Review Mechanism

While the trade dispute settlement mechanism is legally binding, the trade policy review mechanism is non-legally binding and operates as a kind of mutual criticism following sophisticated procedures [Zheng, 2021, p. 203]. First, the WTO secretariat writes an independent review report. Second, the reviewed member state issues its response statement. Finally, other member states can comment and ask questions based on the review report and response statement and request the reviewed member state to answer more questions and provide additional information.

In 2006, China was reviewed according to the trade policy review mechanism. Initially, China's trade policy received positive comments from other member states. It was widely believed that China's reform and opening up were making steady progress, and acceleration of reform in China became the consensus of WTO member states. For example, in the review, China briefed other WTO members on the details of its market economy reform and its progress in fulfilling its WTO commitments, which was well-received by all parties involved in the review. "China has made significant progress in implementing its WTO commitments and fulfilling its WTO membership obligations, and China has redefined the global trading system," U.S. ambassador to the WTO, Peter Allgeier, said in his speech [Ibid., pp. 207–8]. However, negative comments increased after 2010. In 2012, for example, the United States put forward the notion of China's so-called "reform stagnation," criticizing China's very limited market reform in the financial, telecommunications, insurance, and other sectors.

Facing these criticisms, China rejected the U.S.' accusations. For example, Yu Jianhua, then head of China's permanent mission to the WTO, pointed out that China had not stopped the pace of domestic reform and opening up [Ibid., p. 203]. At the same time, China had adopted a series of market-oriented economic reforms, such as changes to the Catalog of Industries for Guiding Foreign Direct Investment, restructuring the state-owned capital investment and operating companies, and greatly reducing the barriers to entry of foreign investment in the industry, further strengthening China's market economy status in WTO.

Multilateral Trade Negotiation Mechanism

The multilateral trade negotiation mechanism is the third pillar of the WTO framework. In 2001, the WTO launched a new round of multilateral trade negotiations in Doha, Qatar, to encourage WTO member countries to reduce trade barriers and promote growth in the developing countries—for this reason, the Doha round is also known as the development round. The negotiating parties were mainly divided into developed and developing countries: developed countries wanted to further open the markets of developing countries, asking them to reduce tariffs and apply more restrictions on their non-tariff measures. Developing countries demanded that developed countries reduce their agricultural subsidies and keep their promise of special and differential treatment for developing countries [Wang, Mu, 2010, p. 59].

In the Doha round negotiations, China firmly stood in the camp of developing countries and defended the special and differential treatment for developing countries [Jiang, 2011, p. 46]. The Declaration on the Trips Agreement and Public Health authorized the trade and development committee to review the special and differential treatment provisions in the WTO with a view to strengthening the relevant provisions and making them more precise, effective, and operational. However, the mandate triggered a sharp confrontation between the developed and

developing countries and also between China and the United States over China's identity as a developing country. The United States believed that China was no longer a developing country and argued that this claim was responsible for the stagnation of the round [Qi, Fan, 2019, p. 95]. China argued that it was still a developing country economically and politically. Economically, China's per capita gross domestic product (GDP), economic structure, and development quality were still comparatively low. Politically, China had always sided with the developing countries in the governance of global trade [Ministry of Commerce of the PRC, 2019].

Overall, China quickly adapted to the three pillars of the WTO, namely, the trade dispute settlement mechanism, the trade policy review mechanism, and the multilateral trade negotiation mechanism. In terms of trade dispute settlement, China actively responded to the anti-dumping lawsuits brought by the U.S. and initiated anti-dumping lawsuits against the U.S. using legal weapons to safeguard its market economy status. Regarding the trade policy review mechanism, China not only forcefully refuted the reform stagnation theory proposed by the U.S. but also actively promoted market reform at home, which further consolidated China's market economy status. In multilateral trade negotiations, China firmly supported the developing countries in the Doha round and upheld the special and differential treatment that China is entitled to as a developing country.

China and WTO Negotiations in New Areas: Partial Leadership

While fully adapting to the existing WTO rules, China has also begun to participate in the rule-making process in new issue areas, such as e-commerce and investment facilitation. China is proposing a new way of development through openness to realize developing countries' interests that is in sharp contrast to the traditional approach of development through protectionism.

E-Commerce

In January 2019, 76 WTO members signed the joint ministerial statement in Davos, officially launching the WTO's e-commerce negotiation process. In this context, some developing countries, such as India, refused to participate in the negotiations, claiming that developing countries face a digital divide and find it difficult to benefit from e-commerce. At the same time, it is believed that participating in the WTO e-commerce negotiations would squeeze the policy space of developing countries, which is a traditional, conservative idea of pursuing development with protectionism.

Different from other developing countries, China actively participates in the WTO's e-commerce negotiations. According to the United Nations Conference on Trade and Development (UNCTAD), in 2017, the total size of China's e-commerce market reached \$1.93 trillion, ranking third in the world. The retail sales of business-to-consumer (B2C) e-commerce reached \$1.06 trillion, ranking first in the world. Alipay and WeChat have 300 million and 70 million overseas users respectively, and Tiktok has been downloaded more than 1 billion times [UNCTAD, 2017].

China has become one of the three leading parties in the current WTO e-commerce negotiations, together with the United States and the European Union (EU), two western developed economies [Ding, 2021, pp. 176–87]. The United States wants to establish liberalization-oriented rules with a concern to promote the free flow of data across borders. The European Union, while not pressing for cross-border data flows, has traditionally valued the protection of individual privacy as a priority. Therefore, it advocates the establishment of differentiated data protection regimes for personal data and non-personal data in the WTO e-commerce negotia-

tions. While adhering to its own identity and status as a developing country, China has played an important leading role in the WTO e-commerce negotiations based on its strong e-commerce advantages. China proposes that the WTO e-commerce negotiations should be development-oriented, consider the actual difficulties and regulatory needs of developing countries, and focus on facilitating cross-border trade in goods.⁵

Investment Facilitation

Investment facilitation is another important issue on which China can play a leadership role in WTO negotiations. Traditionally, when it comes to international investment, developed countries are foreign investors, while developing countries are foreign investment recipients. Therefore, developing countries are cautious of investment liberalization.

Different from other developing countries, China has become both a large recipient of foreign direct investment and a large investor overseas. In this context, China directly initiated and led WTO negotiations on investment facilitation, proposing that developing countries should not only actively participate in the negotiations on investment facilitation, but should also actively promote their own investment facilitation and take the new path of “pursuing development” through openness [Zhou, 2021, pp. 158–75].

In October 2016, China took the lead to set the agenda of investment facilitation in the WTO. In April 2017, China proposed the establishment of the Friends of Investment Facilitation for Development (FIFD) in Geneva. The FIFD is an informal dialogue platform, combining investment, trade, and development, with a mandate to not raise the level of investment liberalization and to enhance transparency and predictability in the investment process in order to help developing countries achieve their own economic and social development goals.

On 18 May 2017, the China-promoted FIFD reached a conciliatory statement with India and other developing countries. It prompted both sides to announce the start of the negotiation process on investment facilitation, subject to their different positions, thus introducing the term “investment facilitation” to the agenda of the WTO General Council for the first time. In December 2017, on the sidelines of the 11th WTO Ministerial Conference, Zhong Shan, Chinese minister of commerce, convened a trade ministers meeting on investment facilitation and issued a joint ministerial statement on the subject [WTO, 2017].

On 18 July 2019, a WTO meeting on investment facilitation was held in Geneva. Under China’s leadership, participating members agreed that the meeting would move to a substantive discussion stage of text-based consultations. The meeting fully discussed the elements of investment facilitation, proposed relevant measures that might be covered by the framework of future multilateral rules, and finally produced a 140-page document [WTO, 2019]. On 5 November 2019, a small WTO ministerial meeting was held in Shanghai at the second China

⁵ E-commerce is just one aspect of the WTO’s reform agenda. The difference between China and the United States lies in their views on the direction of WTO reform. As a beneficiary of the existing multilateral trading system, China believes that the authority of the WTO should be further strengthened, market opening should be continuously promoted, the interests of developing countries should be sought, and the principle of consensus should be adhered to. To this end, China has actively promoted negotiations on e-commerce, investment facilitation, fishery subsidies, and other issues to safeguard the authority of the WTO. On the other hand, the United States believes that China’s development within the WTO framework damages its economic interests and hopes to bypass the WTO by building an exclusive economic system through bilateral or small-scale multilateral cooperation with other countries through its own economic strength, such as Indo-Pacific Economic Framework (IPEF). As such, the United States has continuously obstructed the normal operation of the dispute settlement mechanism in the WTO. In 2019, it also requested that the WTO abolish the principle of most-favoured-nation treatment, the principle of non-discrimination, the multilateral framework of rule-making, and the special and differential treatment enjoyed by developing countries in the WTO.

International Import Expo (CIIE). More than 200 delegates attended the meeting, including 33 ministers from the EU, Russia, India, and other member countries, and issued a joint ministerial statement, which has injected new impetus into the 12th WTO Ministerial Conference on investment facilitation.

To sum up, China is playing a partial leadership role in the WTO's rule-making process in some new issue areas, such as e-commerce and investment facilitation. Unlike other developing countries, China proposes that developing countries should pursue development through opening up rather than through protectionism.

Conclusion

This article discussed the interaction between China and the WTO and China's transition from difficult integration to comprehensive adaptation and then to partial leadership. The conflict and resolution of the dilemmas of market economy status and developing country status have been the driving forces of the evolution of China's identity change in the WTO.

During the difficult integration stage, the market economy status was reflected in the optional safeguard clauses in the process of re-entry to GATT/accession to the WTO. The developing country status was reflected in the market access obligations in the fields of finance, insurance, and telecommunications. In comprehensive adaptation, China began to use WTO rules to respond to anti-dumping cases brought by the United States and the so-called "China reform stagnation," defending China's market economy status and its institutional rights as a developing country. In the partial leadership stage, China has strategically adopted a new way of realizing the interests of developing countries by pursuing development through openness and has begun to play a leading role in new WTO issue areas such as e-commerce and investment facilitation.

The evolution of the relationship between China and the WTO has implications for China's participation in the reform of the global governance system in the current era. First, domestic reform is the basis of China's leadership in global governance. When China's domestic economic system is very different from others, China will face discriminatory measures such as the optional safeguard clause. When China's domestic reform goal of establishing a market economy is clearly stated, the pressure on China in international negotiations will be greatly reduced. Second, China should stick to its identity as the largest developing country in the world. China needs to share a common destiny with other developing countries, which is the coalition for China to participate in the reform of the global governance system; however, China's national interests are changing and sometimes inconsistent with the interests of other developing countries. Thus, China needs to adopt a flexible approach to be a bridge-builder between the developed and developing countries.

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BRICS Sustainable Development Index: Methodological Aspects¹

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Abstract

This article discusses the methodological aspects of comparative research on sustainable development in order to form the BRICS Sustainable Development Index. The index can be considered as a mechanism for assessing the progress of the five BRICS countries (Brazil, Russia, India, China and South Africa) in achieving the United Nations' sustainable development goals (SDGs) in 2015–20.

The authors systematize the accumulated experience of international studies, indices, and rankings that address social, economic, and environmental aspects of sustainability, highlighting the key research problems of these works and intrinsic issues of the SDG methodological framework in general. The methodology of the BRICS Sustainable Development Index is described in detail, taking into account the conclusions on the applicability of the available experience for the purposes of the current study. The final section presents the interim results of the Index.

Keywords: Sustainable Development Goals (SDGs), 2030 Agenda for Sustainable Development, BRICS, sustainable development

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Introduction

Six years after the adoption of the United Nations (UN) 2030 Agenda for Sustainable Development (Agenda 2030), crises in the global economy are challenging the prospects for transition to a new growth model and implementation of the sustainable development goals (SDGs). In many areas, such as the fight against poverty, inequality, and climate change, progress is slowing significantly, especially for the most vulnerable regions, countries, and population groups. Under the new conditions of significant economic constraints, Russia needs to strike a balance between short-term goals and the implementation of long-term social and environmental prior-

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ities outlined both in the SDGs and in national strategic planning documents. The importance of interaction among BRICS partners (Brazil, Russia, India, China, and South Africa) in the interest of ensuring external conditions for the country's sustainable socio-economic development is also increasing.

This article, prepared within the framework of the research work on the state assignment of RANEP, highlights the methodological aspects of the BRICS Sustainable Development Index as a mechanism for studying the progress of the five countries in achieving the SDGs in 2015–20. The necessity for the index is determined by the need for an objective assessment of the progress and contributions of the BRICS members in achieving the SDGs and the absence of similar studies focusing on the BRICS countries, taking into account their national and collective priorities.

The article presents a methodology for the assessment and comparative analysis of the implementation of the SDGs in the BRICS countries. First, it systematizes the accumulated experience and approaches to similar research tasks used in similar studies. Next, the methodology of the BRICS Sustainable Development Index is described, taking into account the conclusions on the applicability of this experience and experience for the purposes of this study.

Overview of Methodological Approaches to Comparative Research on Sustainable Development

The adoption of Agenda 2030 and the SDGs by the UN General Assembly in 2015 necessitated a deeper analysis of state and non-state actors on the different dimensions of sustainable development. Research on this topic was also conducted before 2015. The new generation of research, largely driven by the adoption of the 2030 Agenda, focuses on the analysis of progress in implementing the SDGs and, guided by the universal nature of the agenda, covers a range of issues at the intersection of economic, environmental, and social aspects. However, there are also works aimed at assessing and ranking countries' performance in specific areas of sustainable development, such as the energy transition, the circular economy, and gender equality.

The SDG indicator framework approved by the Inter-Agency and Expert Group on SDG Indicators in March 2017 provided the analytical framework and, in fact, the structure for most comprehensive studies in this area [UN, 2016]. Despite the importance of this structuring in terms of comparability, it has entailed additional methodological and substantive problems, both inherent in the chosen set of indicators and in the SDG targets themselves. Among the substantive problems is the absence in the 2030 Agenda of new challenges and thematic areas that have emerged over the past six years, such as the rapid digitalization of society and industry, as well as vulnerability to pandemic phenomena (such as COVID-19). Indeed, the SDGs have virtually no targets for digitalization as a means of promoting sustainable development or strengthening pandemic preparedness for both developed and developing economies. Similarly, these problems are not taken into account in the approved system of indicators.

Consequently, integrated research, rankings and indices of sustainable development face the dilemma of assessing the activities of actors in the field of sustainable development as close as possible to the generally accepted assessment framework, while maintaining comparability and consistency, leaving the assessment of current problem areas outside the scope of the study, or focusing on specific new challenges and departing somewhat from the UN set of commitments. To achieve a result that reflects the real progress of states in sustainable development in the current context, a balanced approach is required, supplementing the generally accepted analytical framework with indicators from new directions.

Another inherent vulnerability of the SDG framework and, as a consequence, of the approved list of indicators, is the universal nature of the 2030 Agenda for both developed and developing countries. On the one hand, this approach emphasizes humanity's commonality in the face of global challenges, while, on the other hand, it creates a situation in which the priority of the adopted goals and targets varies according to the level of wealth of states. Thus, studies may face the challenge of creating an assessment methodology that takes into account differences in national priorities and circumstances while still allowing for cross-country comparisons. Existing studies have pursued the path of maximum comparability, both in terms of choosing the focus of analysis and in the context of selecting the data to be analyzed.

Within the framework of the study a review of more than 40 existing international ratings and methodological publications in the field of sustainable development was conducted. Twenty-two international sustainability ratings and studies were selected for detailed analysis. The selected ratings were analyzed in terms of thematic scope (scale), approaches to the selection of data and sources, analytical structure (including proximity to the UN system of indicators), methodology of working with data, and the system of scoring (ranking). The results are the basis of the methodology developed by the authors for the BRICS Sustainable Development Index.

In terms of thematic coverage, the 22 international sustainability rankings and studies can be divided into four groups. The first group is made up of seven universal rankings that analyze several (or all) aspects of sustainable development. The first of these is the Sustainable Development Report (SDSN). This report, authored by the Sustainable Development Solutions Network (SDSN) team [Sachs et al., 2021], is a study that assesses states' progress toward achieving the sustainable development goals. It uses publicly available data published by international institutions (the World Bank, the World Health Organization (WHO), and the International Labour Organization (ILO), among others) and other actors, including research centres and non-governmental organizations. The system of SDG indicators is used as an analytical framework, and a wide range of sources makes it possible to replace some of its indicators with similar ones in the absence of data.

The second is the Human Development Report. This report, prepared annually (since 1990) by the United Nations Development Programme (UNDP) [n.d.a], is based on an assessment of three components: the level and length of life and the level of education. In total four indicators are used: life expectancy, expected duration of schooling, average duration of schooling, and GNP per capita. The resulting index makes it possible to assess the contribution of these components in shaping the conditions for the development of individuals in different states.

Third is GAPFRAME [n.d.]. This study focuses on the concept of "safe space" presented as four dimensions of sustainability: planet, society, economy, and governance, together including 24 areas and 68 indicators. The authors of the study, from the Swiss Center for Sustainable Development (SSH), draw on publicly available data sources and position their work as a tool to visualize data on progress toward sustainable development "for business, government and education."

The Commitment to Development Index is the fourth universal ranking. This index is produced by the Center for Global Development [2020], based in Washington DC. It analyzes the performance of 40 leading world economies in eight areas: development finance, investment, migration, trade, environment, health, security, and technology. Each area includes from two to six basic indicators not tied to the system of UN SDG indicators.

The fifth is the Global Sustainability Competitiveness Index [SOLABILITY, n.d.], which measures the competitiveness of countries based on an analysis of data on 131 indicators. The indicators are grouped into five sub-indices: Natural Capital, Resource Efficiency and Intensity of Use, Intellectual Capital, Governance Efficiency, and Social Cohesion. The main source

of data is the World Bank. Indicators from the International Monetary Fund (IMF) and specialized UN databases are also used.

Sixth is the Measuring Distance to the SDG Targets study conducted by the Organization for Economic Co-operation and Development (OECD) [2022], which focuses on persistent gaps in the achievement of the SDGs by OECD member countries. Using indicators from the UN SDG framework, the report compares the results achieved by OECD countries to a benchmark or target selected individually for each indicator. In some cases, the target values are reflected in the 2030 Agenda. The provisions of international agreements, expert assessments, and the best results achieved by OECD countries have also been used for this purpose.

Finally, there are the World Bank World Development Indicators [n.d.]. This is a collection of internationally comparable statistics on global development and poverty reduction. In fact, it is a database with information on 1,400 indicators for 217 economies over a period of more than 50 years. The indicators are divided into six groups: poverty and inequality, population, environment, economy, states and markets, and global linkages.

The second group among the 22 international sustainability rankings and studies is made up of those that focus on climate change and environmental sustainability. There are eight of these in this group, the first of which is the Environmental Performance Index (EPI) [2022], which is a ranking of 180 states in 11 categories (40 indicators) addressing aspects of climate change, environmental health, and ecosystem resilience. States' performance is compared to established environmental policy goals defined for each indicator. The EPI offers a scorecard that identifies leaders and laggards in environmental policy and offers practical recommendations.

Second is the Green Growth Index [GGGI, n.d.], measuring the effectiveness of countries' policies to transition to a sustainable growth model, including through the implementation of the sustainable development goals, the Paris Agreement on Climate and the Aichi Biodiversity Targets. In particular, four dimensions of green growth are analyzed: efficient and sustainable use of resources, protection of natural capital, green economic opportunities, and social inclusion. In 2020, 119 countries were assessed: 25 in Africa, 20 in the Americas, 35 in Asia, 36 in Europe, and 3 countries in Oceania.

The Global Green Economy Index (GGEI) is the third index in this group [Tamanini, 2014]. Sponsored by the Green Policy Platform, it assesses 60 countries and 70 cities on four key dimensions: leadership and climate change, sector efficiency, markets and investment, and environment and natural capital. The GGEI also includes an element of expert assessment of perceptions of green growth issues in the same four areas.

The fourth is the MIT Green Future Index [MIT Technology Review, 2021]. The MIT Green Future Index is a ranking of 76 countries and territories on the degree of "progress and commitment toward a low-carbon future." The study measures countries' performance in five areas: carbon emissions, energy transition, green society, clean innovation, and climate policy.

Fifth, the OECD Green Growth Indicators [OECD, n.d.a] are part of the organization's extensive database of indicators related to environmental sustainability. The OECD positions the database as a tool to support climate policy development and to inform the public. The database synthesizes data and indicators from a wide range of fields, including a number of OECD databases as well as external data sources, and covers OECD member countries and key partners (Brazil, China, India, Indonesia, and South Africa) and other selected non-OECD countries, including Russia.

The sixth index in this group is the Sustainable Development Index [Hickel, 2020], which was designed to complement the Human Development Index (HDI) by including an environmental component. Thus, to the four HDI indicators (life expectancy, school life expectancy, average duration of schooling, and GNP per capita) two more were added: CO₂ emissions per capita and total resource inputs per capita. A total of 165 economies were evaluated.

Seventh is KAPSARC's Circular Carbon Economy Index project [Luomi et al., 2021]. Developed since 2021 by Saudi Arabia's King Abdullah Center for Petroleum Studies, this index measures the performance and potential of countries on a group of parameters important in terms of building a circular economy. The index includes three key elements: a group of green economy indicators (energy efficiency, renewable energy, electrification, nuclear power, and CO₂ capture and storage), a group of "facilitator" indicators (technology, environmental policy measures, finance and investment, and socio-economic conditions), and an additional filter for oil-producing states (carbon intensity of energy balance, weighted carbon intensity of oil production, and methane emissions during hydrocarbon production). The first report provided results for 30 states, including all G20 members and a number of major energy producers.

The final index in this group is the World Risk Index [Bündnis Entwicklung Hilft-IFHV, 2021]. This index is designed to show the risk of disasters from extreme natural events for 181 countries around the world. It is calculated for each country based on two groups of indicators reflecting exposure and vulnerability to risks. A total of 27 indicators from publicly available databases are used. Since 2018, the index has been calculated by the Institute for International Peace and Armed Conflict Law (IFHV) at the Ruhr University in Bochum. The category "exposure to risks" covers threats to the population related to earthquakes, storms, floods, droughts, and rising sea levels. The category "vulnerability" is largely social and consists of three components: the probability of damage, the means of dealing with negative consequences, and the possibilities for long-term adaptation.

The third group among the 22 international sustainability rankings and studies is made up of energy ratings aimed at examining the effects of energy policies in terms of environmental sustainability. First is the International Energy Agency's (IEA) Sustainable Recovery Tracker [IEA, 2022]. This tracker monitors and evaluates the recovery plans and measures of selected countries around the world against the goals of a sustainable energy transition. Key items of the study include an analysis of public and private spending on clean energy measures during the COVID-19 pandemic and modelling the impact of public spending on attracting private investment in the clean energy sector. The reports produced as part of this work provide information on aggregate financial flows to rebuild the economy and advance sustainability goals by specific industry sectors.

Next is the Energy Policy Tracker [n.d.]. This study, led by Yvette Gerasimchuk (of the International Institute for Sustainable Development), is a weekly update of Group of 20 (G20) public policy responses to the COVID-19 pandemic from a climate and energy perspective. The work provides an overview of public financing, by country, energy type, and financing mechanism. The work tracks the share of funding for the world's largest economies allocated to sustainable energy during the economic recovery.

The Fossil Fuel Subsidy Tracker [OECD-IISD, n.d.] is also included in this group. This study, conducted jointly by the OECD and the International Institute for Sustainable Development, monitors government policies and estimates the resulting subsidies for fossil fuel production and consumption. Fossil fuel subsidies and other support measures include direct budget transfers and tax expenditures that provide benefits or preferences for fossil fuel production or consumption as well as other, including indirect, consumer support measures. The database contains information on 192 economies for 2010–20.

The fourth group among the 22 international sustainability rankings and studies selected for analysis is made up of four socio-economic rankings looking at different societal aspects of sustainability. The first is the Sustainable Society Index of the University of Applied Sciences Cologne [2018], which uses 21 indicators reflecting the degree of socio-economic sustainability, including in such areas as food security, access to drinking water and sanitation, education, gender equality, income equality, consumption, and energy. The selected indicators generally reflect the focus of the UN SDGs, but with a strong emphasis on the social dimension of the 2030 Agenda.

The OECD Framework for Measuring Well-Being and Progress [OECD, n.d.] is the second indicator in this group. It aims to create a research framework to measure the impact of public policies on human well-being along three dimensions: current well-being, inequality, and future well-being potential development. In fact, this framework is used both in research (including as part of Measuring Distance to the SDG Targets) and in the practical work of the OECD (making recommendations, standards, and initiatives). The indicators and data used in the research should reflect the three directions chosen by the organization.

Third, there is the Gender Inequality Index developed by the UNDP [n.d.b], which measures gender inequality in 162 countries on three dimensions of human development: reproductive health as measured by the maternal mortality ratio and adolescent birth rate; empowerment as measured by the proportion of parliamentary seats held by women and the proportion of adult women and men age 25 and older with at least a secondary education, and economic status as measured by labour market participation. The sub-indices are calculated for women and men, and their difference forms the resulting index.

Finally, the Social Progress Index [Social Progress Imperative, n.d.] assesses 168 states on the degree of progress in such areas as health, security, education, technological development, civil rights and freedoms, environmental quality, and inclusion. A total of 53 indicators from publicly available databases of international organizations are used.

Studies conducted over several years can evolve in terms of thematic coverage. For example, the Commitment to Development Index, compiled by the Center for Global Development since 2003 and focusing on the spillover effects of national policies to promote global development, added a health theme in 2021 to reflect new needs in pandemic preparedness.

Studies also vary in geographic scope. For example, the OECD work focuses primarily on member countries as well as partner countries, prioritizing data availability and comparability, which improves the quality of research over expanding geographic coverage. The Commitment to Development Index assesses only 40 countries, while the MIT Green Future Index assesses 76 countries, far fewer than the 193 sovereign members of the United Nations. The SDSN Sustainable Development Report comes closest to universal coverage, ranking 165 countries in 2021. Nevertheless, this result was achieved with some reservations. For example, 109 indicators were used for the OECD members, while for other countries only 86, which was explained by the difference in the availability of information.

The problem of data selection for analysis is one of the central problems in the context of comparative studies. As in many other areas of knowledge, the availability of reliable, comparable, and relevant data can be limited, especially when it comes to least developed countries or closed political systems. It also takes some time for national statistical offices to adapt their own data collection systems to the requirements of the SDG indicator system. For example, as of May 2022, Rosstat publishes data for 90 of the 248 SDG indicators [Federal State Statistics Service, n.d.]. The situation with data comparability is exacerbated as the number of indicators and the number of states selected for analysis grows.

Missing data can be replaced by values available for previous years. For example, the authors of the Green Growth Index had to replace missing values for 2020 with data for 2017–19. Were it not for the missing data, they estimate that the index could have been compiled for 243 countries, whereas in reality it only includes 117 states. In addition, the lack of data is particularly noticeable for regions such as Oceania, where information is missing for an average of 82% of the indicators.

The OECD study Measuring Distance to the SDG Targets attempted to follow the UN-approved SDG indicator framework “as closely as possible” and used the UN SDG database as its main data source. However, for 57 of the 132 indicators used in the study, the OECD database was used because, while it was largely consistent with the UN indicators, it met “more

rigorous international statistical standards.” This approach, according to the authors, made it possible to approach the statistical standards approved by UN (and OECD) member countries and to provide reliable and comparable data on the countries being assessed. Even so, only 59 indicators of the selected 132 were available for all 36 OECD members; 47 indicators were available for 30–35 members and another 26 indicators were available for fewer than 30 countries.

Thus, the issue of data availability may be a key factor in determining the geographic and thematic scope of the study, as well as its analytical framework.

In the post-2015 period, a key factor in shaping the research framework and source selection for sustainability research is the extent to which it follows the formal framework of UN SDG targets and corresponding indicators. Universal sustainability rankings have largely attempted to approximate the established framework of indicators, but with some caveats and limitations. Most work, as noted above, faces considerable difficulties due to the lack of comparable and reliable data for many of the indicators. In these cases, researchers tend to limit the number of indicators and actors considered. For example, the Human Development Index (HDI), which, although first published in 1990, can be considered a universal study of sustainable development, uses only four generalized indicators: life expectancy, expected years of schooling, average years of schooling, and gross national income (GNI) per capita. To ensure comparability of country data, the UNDP, which forms the index, relies on data from international institutions, primarily the UN Population Division (data on life expectancy), the United Nations Educational, Scientific and Cultural Organization Institute for Statistics (average years of schooling and expected years of education) and the World Bank (GNI per capita).

Researchers have also resorted to replacing problematic indicators for which, for example, data cannot be made comparable, with similar ones. For example, the SDSN Sustainability Report on SDG 4, quality education, for which there is a lack of data, uses indicators for primary school enrolment, literacy rates, and secondary school completion rates, which are similar but not identical to those used in the UN indicator system. It should be noted that even for the selected indicators, data are given including for 2011, which once again emphasizes the lack of relevant and comparable country information on many of the goals.

A different approach is the complete rethinking and transformation of the SDG indicator system to meet the research challenge. The GAPFRAME index is an attempt to translate the SDGs into a set of 24 questions (composite indicators) in four areas—planet, society, economy, and governance—with two to four indicators for each question (68 indicators in total). These indicators differ significantly from those approved in the structure of the SDG indicators. For example, the authors acknowledge that they were limited by the lack of sufficient data in areas such as “equal opportunities,” “quality of life,” and “sustainable production,” which mostly correspond to SDG 1. The authors of GAPFRAME had to use various publicly available sources, ranging from UN, OECD, and World Bank databases to information from KPMG, Deloitte, and even Wikipedia.

Thus, faced with various problems related to unreliability, obsolescence, and incompatibility of available data sources, researchers are forced to compromise the quality and coverage of their rankings. For example, the SDSN Sustainability Report introduced the following criteria for data selection: in order to be included in the rankings, indicator data must be available for 80% of the 149 UN members with a population of more than one million people, and a country must have available data for 80% of the selected indicators.

An important component of benchmarking is the approach to transforming raw data into a final score (index/rating). This process includes the normalization and aggregation of data, as well as the presentation of the final results (scores) of the study.

Normalization methods include, among others: simple ranking of actors by the value of initial indicators; categorization of indicator values into subjective evaluation groups; distribu-

tion of indicator values on a scale from minimum to maximum; comparison of an indicator value with an “ideal” or “optimal” value (used, in particular, in the OECD Measuring Distance to the SDG Targets); standardization (z-scoring), in which indicator values are transformed into a scale with an average value, pegged to 0. The most important challenge in the normalization process is to preserve the mathematical meaning and significance of the final estimates in the context of the original values of the indicators.

The procedure of weighting indicators in the final evaluation also plays an important role. Due to the subjective nature of the process of determining the importance of individual sustainable development goals and targets, most composite indicators in this area are based on the principle of equal indicator weighting, that is, all variables are assigned the same weight in the final assessment. In essence, this means that all variables contribute equally to the composite indicator. While this method is straightforward, it should be kept in mind that it serves only to reduce the subjectivity of the study by effectively masking the absence of consensus and reliable methods for assessing global/country priorities. Moreover, singling out individual goals as relatively more or less important may run counter to the political message and inclusiveness of the 2030 Agenda.

One of the most comprehensive works on the methodology of constructing composite indicators for comparative studies, including in relation to the topic of research and development (R&D) is the OECD Handbook on Constructing Composite Indicators. This publication covers the whole range of issues related to data selection and handling, methods of normalization, weighting, aggregation of data, and presentation of results. In addition, the authors provide recommendations on the application of particular methodological approaches to specific research problems. These recommendations were also used in the development of the methodology for the pilot BRICS Sustainable Development Index.

Methodology of the BRICS Sustainable Development Index

Based on the analysis of international experience and its applicability to BRICS, the methodology of the BRICS Pilot Sustainable Development Index was formed. The index describes the relative progress of the five countries in achieving the SDGs in the first five years after the adoption of the 2030 Agenda (2015–20).

The Pilot Sustainable Development Index shows the relative (relative to each other) positions of the BRICS countries on each of the selected SDG indicators at the beginning and end of the monitoring period. For each of the two sets of raw data (beginning and end of the monitoring period, conventionally denoted as “2015” and “2020”), a static index is formed (Fig. 1). On the vertical scale 0 denotes the average BRICS result. Thus, positive values reflect results above the BRICS average, and negative values reflect results below the average, but do not necessarily mean a negative absolute value of the indicator described by the index.

The index also shows the relative (relative to each other) progress of each of the BRICS countries over the monitoring period for each of the selected SDG indicators. Based on the difference in the values of the indicators for the late and early monitoring periods, a dynamic progress index is formed for each of the BRICS countries. On the vertical scale 0 denotes the average BRICS result. Positive index values reflect dynamics above the BRICS average, and negative index values reflect dynamics below the average, but not necessarily negative dynamics. Cases of negative dynamics (regression in absolute values of the index) are additionally marked in red in the illustration (Fig. 2).

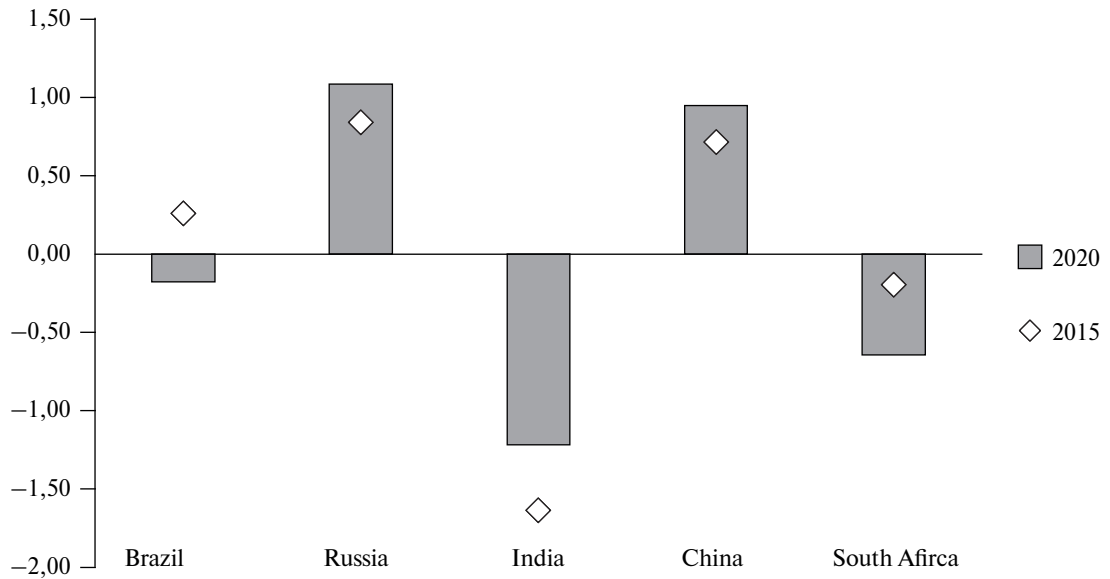


Fig. 1. Example Illustration of the BRICS Sustainable Development Index at the Beginning and End of the Monitoring Period: Indicator 1.1.1 Proportion of the population living below the international poverty line (\$1.25 per day), by gender, age, employment status and place of residence

Source: Compiled by the authors.

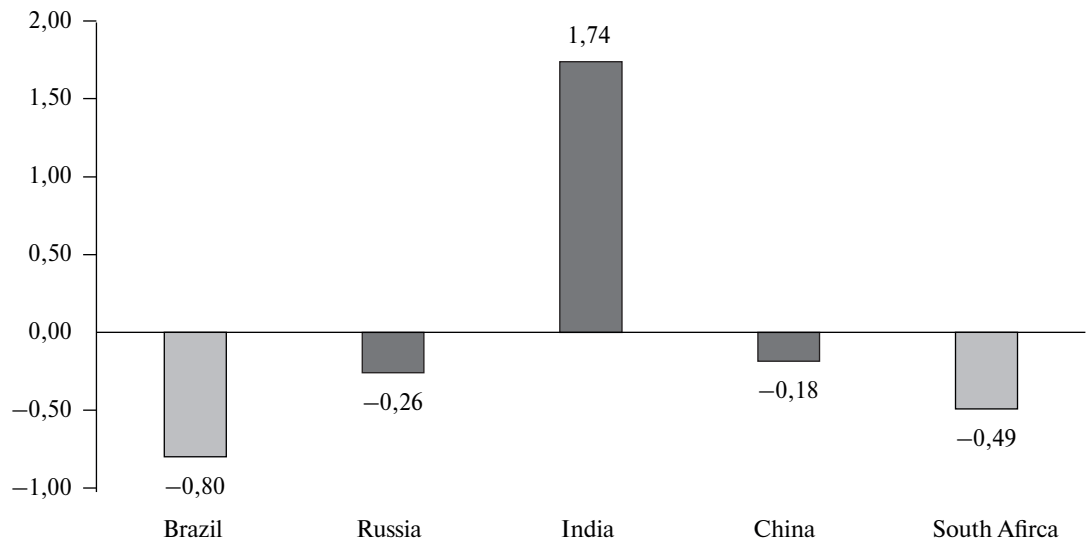


Fig. 2. Example Illustration of the BRICS Sustainable Development Index (Relative Progress): Indicator 1.1.1 Proportion of the population living below the international poverty line (\$1.25 per day), by gender, age, employment status and place of residence

Source: Compiled by the authors.

The index further indicates the average relative (relative to each other) progress of each of the BRICS countries over the monitoring period, for each of the goals and for all of the SDGs. Based on the indices of progress on the SDG indicators, the average value of the indices for individual goals and for all SDGs is calculated.

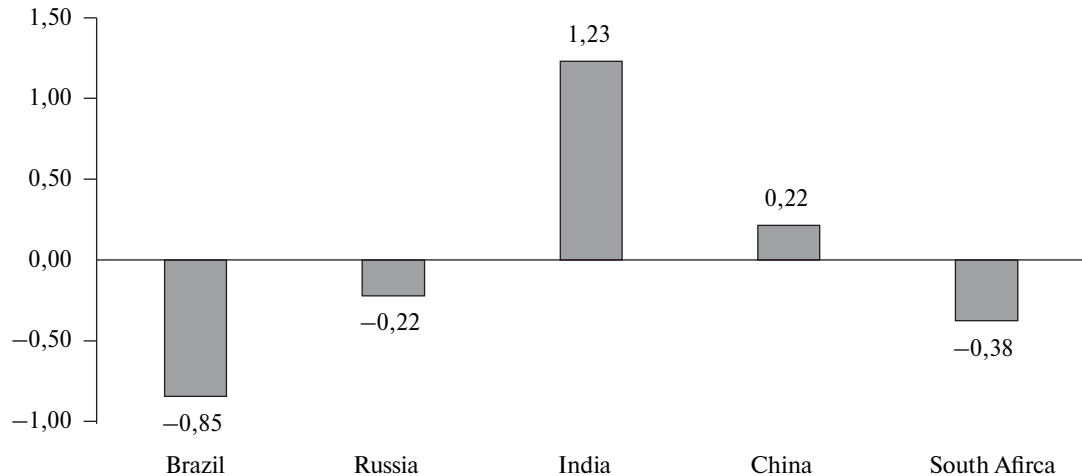


Fig. 3. Example Illustration of the BRICS Sustainable Development Index (Average Relative Progress Across the SDGs): SDG 1 Eradicate Poverty

Source: Compiled by the authors.

In the interest of ensuring close alignment with the UN Sustainable Development Goals and targets, the SDG Indicator Framework approved by the Inter-Agency and Expert Group on SDG Indicators in March 2017, including 248 indicators, was taken as the methodological basis for the pilot index. Further selection of indicators for inclusion in the analysis was based on the availability of comparable and relevant country data. International databases on SDG indicators and similar (related) indicators were used to ensure comparability, specifically: the UN SDG database [n.d.], the OECD database [n.d.c]; BRICS statistical publications [Federal State Statistics Service, 2021], and databases of specialized international institutions such as the IEA [n.d.], the Food and Agriculture Organization (FAO) [n.d.], and the UN Educational, Scientific and Cultural Organization (UNESCO) [n.d.].

The following criteria were formulated for selection of indicators for analysis: data should be available for all five BRICS countries for 2015–16 for the “early” year; data should be available for all five BRICS countries for 2017–21 for the “last available” year; and the indicator should not be an estimate or imply a binary result (yes/no) (for example, SDG 8.b.1 “Existence of a developed and implemented national youth employment strategy as a separate strategy or within a national employment strategy,” or SDG 16.a.1 “Existence of independent national human rights institutions working in line with the Paris Principles”).

At the stage of the pilot study, the goal was to ensure maximum compliance of the set of selected indicators with the SDG Indicator System and to minimize cases of indicator substitution. In this regard, the distribution of indicators according to the SDGs was also carried out in accordance with the parameters of the approved UN System. Thus, the indicator “number of dead, missing and affected directly as a result of disasters per 100,000 people” is used under three SDGs as 1.5.1, 11.5.1, and 13.1.1 (see list below). The second phase of the study will con-

sider whether this indicator should be retained to assess the performance of the BRICS countries under all three SDGs, and whether additional indicators should be included to deepen the analysis and fill data gaps.

As a result, 48 indicators were selected directly from the SDG Indicator Framework for all goals except for SDG 4, related to quality education, and SDG 16, related to peace and justice. In order to close the data gap on SDG 4, three indicators reflecting the percentage of completion of primary and secondary education, as well as the share of education expenditure in gross domestic product (GDP), were also included in the analysis. In total, the pilot index is based on 51 indicators, detailed as follows:

For SDG 1, poverty eradication, there are four indicators:

1.1.1 Proportion of population living below the international poverty line (\$1.25 per day) by gender, age, employment status, and place of residence (urban/rural)

1.3.1 Proportion of population covered by social protection floor/systems, disaggregated by sex, with a breakdown of children, unemployed, elderly, disabled, pregnant, newborn, labour-injured, and poor and vulnerable

1.4.1 Proportion of population living in households with access to basic services

1.5.1 Number of people killed, missing, and affected as a direct result of disasters per 100,000 people

For SDG 2, eradicate hunger, there are two indicators:

2.1.1 Prevalence of malnutrition

2.2.3 Prevalence of anaemia among women aged 15–49 years by pregnancy status (percentage)

For SDG 3, good health and well-being, there are eleven indicators:

3.1.1 Maternal mortality rate

3.2.1 Under-five mortality rate

3.2.2 Neonatal mortality rate

3.3.2 Tuberculosis incidence rate per 100,000 people

3.3.5 Number of people in need of treatment for “neglected” tropical diseases

3.4.1 Mortality from cardiovascular diseases, cancer, diabetes, and chronic respiratory diseases

3.4.2 Mortality from suicide

3.5.2 Alcohol consumption per capita (ages 15 and older) in liters of pure alcohol per calendar year

3.6.1 Mortality rate as a result of road accidents

3.7.2 Adolescent birth rate (ages 10 to 14; ages 15 to 19) per 1,000 adolescent girls in the same age group

3.8.1 Coverage of basic health services

3.9.3 Deaths from unintentional poisoning

For SDG 4, Quality education, there are three indicators:

Primary education completion rate

Completion rate of complete secondary education

Share of public spending on education as a share of GDP

For SDG 5, gender equality, there is one indicator:

5.5.1 Proportion of seats held by women in (a) national parliaments and (b) local governments

For SDG 6, clean water and sanitation, there are five indicators:

6.1.1 Proportion of population using water services organized in a safe manner

6.2.1 Proportion of the population using (a) safe sanitation services and (b) handwashing devices with soap and water

6.4.1 Trends in water use efficiency

6.4.2 Level of water stress: freshwater withdrawal as a percentage of available freshwater

6.6.1 Dynamics of change in the area of water-related ecosystems

For SDG 7, related to low-cost and clean energy, there are three indicators:

7.1.1 Proportion of population with access to electricity

7.2.1 Share of renewable energy sources in total final energy consumption

7.3.1 Energy intensity, calculated as the ratio of primary energy consumption to GDP

For SDG 8, related to decent work and economic growth, there are two indicators:

8.1.1 Annual growth rate of real GDP per capita

8.2.1 Annual real GDP growth rate per person employed

For SDG 9, related to industrialization, innovations and infrastructure, there are four indicators:

9.4.1 CO₂ emissions per unit of value added

9.5.1 Share of research and development expenditure in GDP

9.b.1 Share of value added by medium-tech and high-tech industries in total value added

9.c.1 Proportion of population covered by mobile networks, by technology

For SDG 10, related to reduction of inequality, there are five indicators:

10.4.1 Share of GDP attributable to wages and salaries

10.7.3 Number of people who died or disappeared during migration to international destinations

10.7.4 Proportion of refugees as a share of total population by country of origin

10.a.1 Proportion of least developed country and developing country commodity items subject to zero tariffs

10.b.1 Total development resource flows by recipient and donor country and type of flow (such as official development assistance, foreign direct investment, and other financial flows)

For SDG 11, related to sustainable cities and human settlements, there are two indicators:

11.5.1 Number of deaths, missing persons, and people directly affected by disasters per 100,000 people

11.6.2 Average annual level of fine particulate matter (for example, PM_{2.5} and PM₁₀ class) in the atmosphere of cities (per population)

For SDG 12, related to responsible consumption and production, there are two indicators:

12.2.2 Total domestic material consumption and domestic material consumption per capita and as a percentage of GDP

12.c.1 Amount of fossil fuel subsidies per unit of GDP (production and consumption)

For SDG 13, related to combating climate change, there is one indicator:

13.1.1 Number of deaths, missing persons, and those directly affected by disasters per 100,000 people

Under SDG 14, related to conserving marine ecosystems, there is one indicator:

14.1.1 Plastic scrap density

Under SDG 15, related to conservation of terrestrial ecosystems, there are three indicators:

15.1.1 Forest area as a percentage of total land area

15.4.1 Proportion of mountainous areas important in terms of biodiversity under protection

15.5.1 Red List Index

For SDG 17, related to the Partnership for Sustainable Development, there is one indicator:

17.1.1 Total government revenue as a percentage of GDP by source

For the above indicators, it was possible to meet the data availability criteria for all five BRICS countries for 2015–16 for the “early” year and for 2017–21 for the “last available year.” A key limitation of this study, as of many other similar studies, is the low degree of data availability for the SDG indicators. Only 49 out of 248 indicators were comparable and relevant data for all BRICS countries. The lack of data is particularly evident for SDG 4, related to quality education, SDG 16, related to peace, justice, and effective institutions, and for the goals of the climate block (SDGs 12–15). As a result, the indicators selected for analysis do not fully reflect the balanced nature of the 2030 Agenda and shift the focus of the study to goals with more data available. Thus, one of the goals of the second phase of this study will be to replace the missing data by including more alternative indicators reflecting selected areas of implementation of the 2030 Agenda.

For the 51 selected indicators, two data sets were formed—for each of the two chronological groups—“2015” and “2020” (beginning and end of the monitoring period).

The objective difference in the units of measurement and digit capacity of the various SDG indicators, as well as the presence of “negative” indicators, the reduction of values for which actually means progress toward sustainable development, necessitated the normalization of data to ensure comparability of results. Examples of negative indicators include: 1.1.1 Proportion of population living below the international poverty line, 3.3.2 Incidence of tuberculosis per 100,000 people, and 14.1.1 Plastic scrap density. Normalization was conducted using the z-score method. This method of normalization and scoring was chosen due to the following considerations: first, the absence of a consensus target (“optimum”) value for most of the indicators makes it impossible to tie the evaluation scale to a reference value; second, the method of z-estimation makes it possible to link the results of many indicators with different measurement units to a single scale in order to ensure comparability and aggregation of these indicators on the targets; third, the chosen method also allows for additional correction of “negative” indicators and ensures the visibility of the final results based on the comparison of static values over chronological periods and the dynamics of the achievement of the SDGs among the BRICS countries.

Data normalization for each of the two arrays, for the “early” year (2015–16) and the “last available” year (2017–21), was conducted using the formula:

$$z = \frac{x - \bar{X}}{S_x},$$

where x is the indicator value of each BRICS country; \bar{X} is the average value of the indicator of all BRICS countries; S_x is the standard deviation calculated for the set of indicator values of all BRICS countries. The Z-score allowed the countries’ results for each of the chronological groups to be reduced to a single scale, with a mean value equal to 0. In the interest of increasing the visibility of the final results, as well as making the results comparable, the normalization procedure for the “negative” indicators was supplemented by changing the sign (z^*-1). This procedure made it possible to avoid distortions in the average scores for a group of indicators within one SDG for each of the BRICS countries. The resulting values formed static indices of the BRICS countries’ sustainable development for the beginning and end of the monitoring period.

The sustainability progress index, reflecting the dynamics of the values for the SDG indicators in the BRICS countries over the period 2015–20 relative to each other's results, was calculated using a similar formula:

$$z_{\Delta x} = \frac{\Delta x - \overline{\Delta x}}{S_{\Delta x}},$$

where Δx is the difference between the values of each BRICS country's indicator in the “late” and “early” chronological group; $\overline{\Delta x}$ is the average value for Δx of all BRICS countries; $S_{\Delta x}$ is the standard deviation calculated for the set of $\overline{\Delta x}$ values of all BRICS countries. The resulting z -score brought the countries' progress results to a single scale, with a mean value equal to 0. The formation of the final dynamic progress index was also supplemented by adjusting the values of the “negative” indicators ($Z_{\Delta x}^* - 1$), by analogy with the static indices described above.

Thus, the static indices of the BRICS countries for the “early” and “late” stages and the dynamic progress index were formed. The country indices (both the static and the progress indices) were further grouped according to their belonging to specific targets, and an index of individual SDGs was formed based on the calculation of the arithmetic average for the group. The overall average index for individual BRICS countries was calculated in a similar way. The index values were grouped around 0, with no restrictions on minimum and maximum values. However, they are closely related to each other and reflect the relative position (or dynamics for the progress index) of countries in the context of the implementation of a particular SDG target. Thus, negative values of both the static indices and the progress index mean a result below the BRICS average, without necessarily indicating a regression in the absolute values for a particular indicator. The accumulated data set also makes it possible to trace the progress of the entire institution on the basis of the percentage difference between the average values of all countries in the “late” and “early” periods.

Results of the BRICS Pilot Sustainable Development Index

This pilot index should be considered as an intermediate result of ongoing research. Further work is planned to improve the quality of the BRICS Sustainability Index. In particular, it is planned to fill data gaps by including additional indicators, not included in the SDG Indicator System, across the range of goals. The feasibility of including additional indicators to deepen analysis in areas not directly addressed by the 2030 Agenda—digitalization and combating pandemics—will also be considered. Ways to improve the methodology to enhance the visibility and transparency of the index results are also being considered. The issue of refining the methodology for aggregating results within the individual goals and for the SDGs as a whole will be considered.

Nevertheless, the pilot index allows us to trace a number of regularities. In terms of the static sustainable development index at the end of the monitoring period, the five countries are ranked as follows (Fig. 4):

1. Brazil: 0.4
2. China: 0.38
3. Russia: 0.1
4. South Africa/India: –0.44

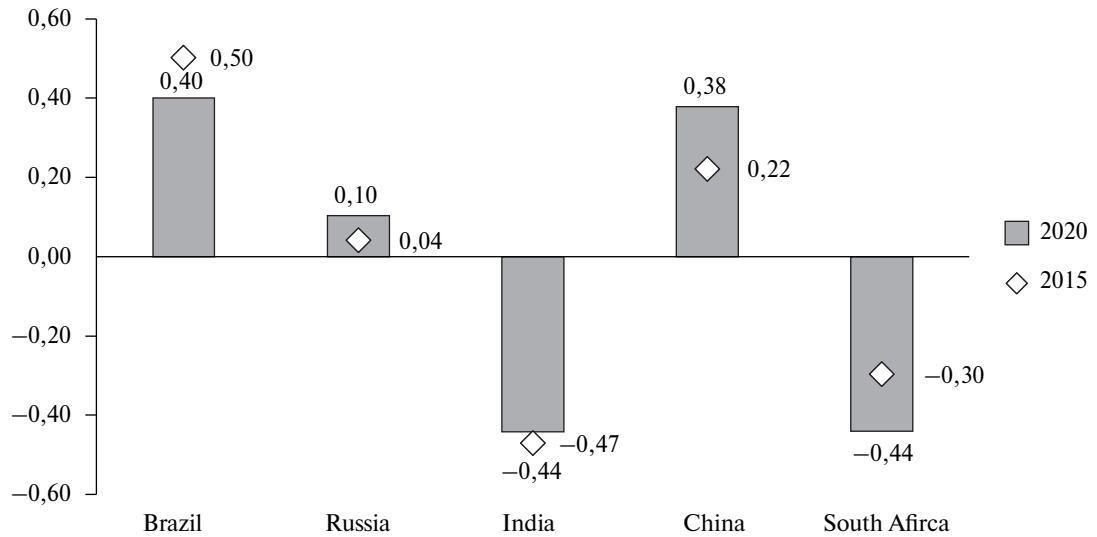


Fig. 4. Composite BRICS Sustainable Development Index at the Beginning and End of the Monitoring Period (2015 and 2020)

Source: Compiled by the authors.

The picture is different for the progress index, which reflects the relative changes in indicators over the monitoring period (Fig. 5):

1. Russia: 0.21
2. China: 0.17
3. India: 0.15
4. South Africa: -0.23
5. Brazil: -0.29

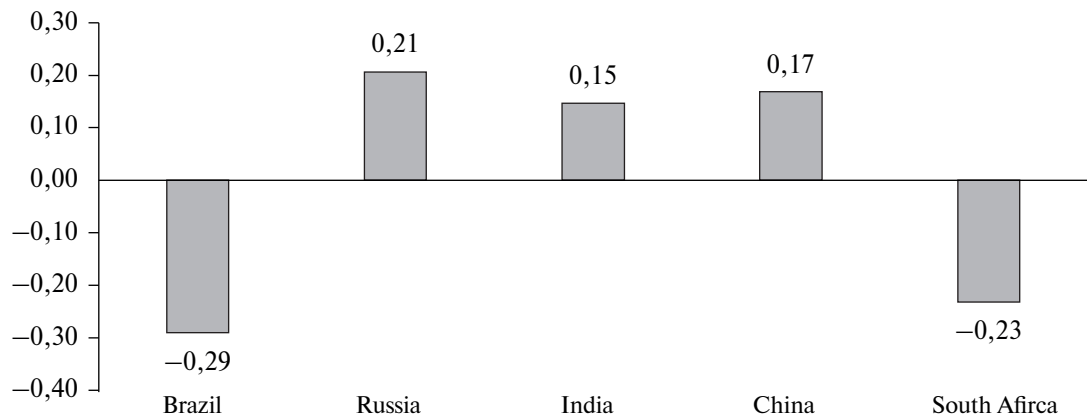


Fig. 5. Cumulative BRICS Progress Index Toward the SDGs, 2015–20

Source: Compiled by the authors.

Figure 6 shows the distribution of the BRICS Progress Index across the individual goals. It should be noted that 44 of the 51 indicators selected for analysis recorded positive dynamics on average across BRICS, indicating the overall progress of the five in achieving the goals in question. Nevertheless, the index revealed a number of problem areas for individual states and for the institution as a whole. These include an increase in the average prevalence of malnutrition, an increase in the number of people in need of treatment for tropical diseases, increasing pressure on water ecosystems in the BRICS countries amid a decrease in their area, a decrease in the share of R&D expenditures as a share of GDP, and a decline in biodiversity indicators.

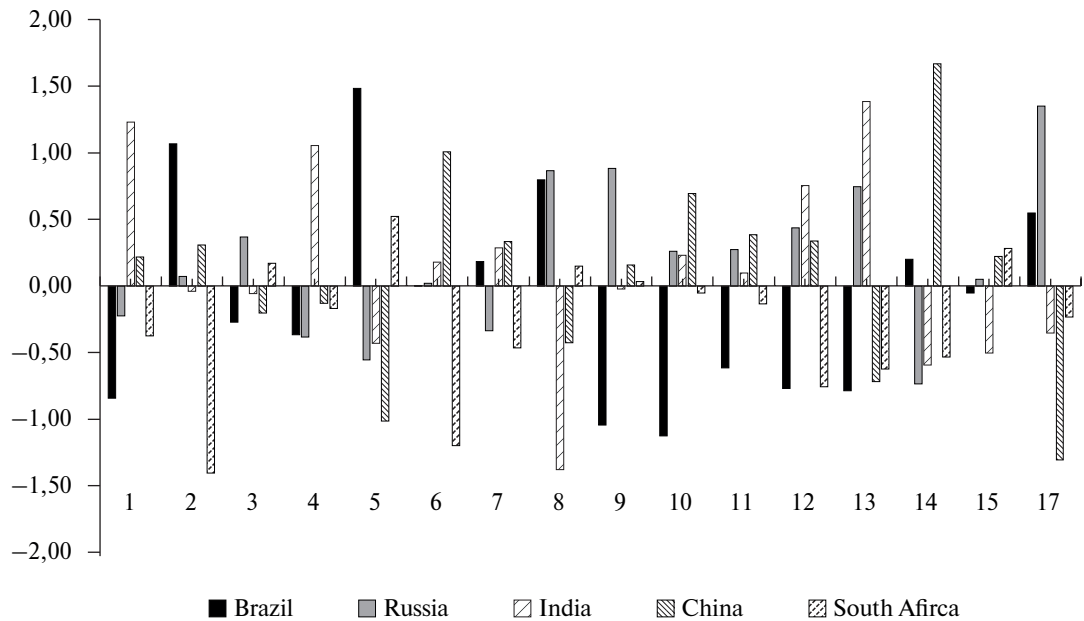


Fig. 6. SDG Progress Index, 2015–20

Source: Compiled by the authors.

Progress leaders are highlighted for the various goals. For example, Brazil progressed faster than the other BRICS countries on goals such as SDG 2, ending hunger and SDG 5, gender equality. Russia led in SDG 8, decent work and economic growth, SDG 9, industrialization, innovation, and infrastructure, and SDG 17, Partnership for Sustainable Development. India led on SDG 1, eradicating poverty, SDG 4, quality education, and SDG 13, combating climate change. China led for SDG 6, clean water and sanitation, SDG 10, reducing inequality, and SDG 14, preserving marine ecosystems. South Africa led on SDG 15, conservation of terrestrial ecosystems.

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Global Systemically Important Banks: Do They Still Pose Risks for Financial Stability?¹

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Abstract

The global financial crisis of 2007–09, followed by sweeping overhaul of international banking regulation, urged financial regulators to apply a tailored supervisory regime to global systemically important banks (G-SIBs). This approach was caused by exacerbation of the G-SIBs' systemic risks and their transmission during macro level instability. The size of G-SIBs, the extent of their market power, and the heterogeneity of their operating models resulted in their dual role in systemic stress: being a source of systemic risks for the macro level, G-SIBs are at the same time transmitters of crisis developments to the micro level, hence increasing their own exposure to risks.

Under these circumstances, the objectives of global gross domestic product (GDP) growth required a revision of regulatory priorities by shifting them from G-SIBs' profitability to G-SIBs' stress resilience through the application to them of more stringent capital adequacy standards and liquidity requirements, which ultimately contributed to G-SIBs' insusceptibility to external shocks. At the same time, the G-SIBs' role in exacerbation of systemic stress remains uncertain due to the unresolved issues of the G-SIBs' systemic importance. Given the high level of their interconnectedness in the international financial area, dysfunction of G-SIBs can provoke a domino effect of insolvency and bankruptcies in the international banking sector.

Based on 2011–21 statistics for all G-SIBs included in the annual lists of the Financial Stability Board (FSB), we found a certain decline in G-SIBs' systemic risks, which is attributable to further strengthening of their market discipline. This proves that international regulatory policy is on the right track. We also found that the stress resilience of G-SIBs, a product of the application of Basel III capital buffers and the total loss-absorbing capacity (TLAC) standard, significantly contributed to financial stability at a level sufficient not only for the integrity of G-SIBs' performance during the COVID-19 pandemic, but also for minimization of the risk of collapse of the banking systems that prevented the transformation of the related shocks and instability into an economy-wide crisis. Nevertheless, the post-crisis regulatory reform failed to contain the systemic importance of G-SIBs, mostly due to the lack of supervisory tools and techniques in reduction of the negative effects of the G-SIBs' international interconnectedness.

Keywords: Global systemically important bank (G-SIB), COVID-19 pandemic, Basel III, TLAC, stress resilience, systemic importance, systemic risks, financial stability.

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The global financial crisis of 2007–09 (GFC) overturned the primacy of market-principles-based regulation of the financial sector. The post-crisis fundamental reform of banking regulation (known as Basel III) laid the ground for more rigorous supervision of credit institutions. Special attention was given to the large, internationally active banks: although their performance, like performance of any other financial institutions (*ceteris paribus*), depends on the macro level parameters and the dynamics of global financial markets, their activities, unlike other banks, have an opposite effect on the dynamics of the macro level and financial markets, which is attributed to their size as well as activity in key segments of the global capital markets.

Against the backdrop of the fragility of the post-crisis recovery and external shocks that continue to pose threats to financial stability, the issues of stress resilience of international financial institutions were brought to the core of the regulatory policy; this becomes especially important for institutions that belong to the category of global systemically important banks (G-SIBs²).³ In the framework of the post-crisis regulatory paradigm, stress resilience is understood as the ability of banks to efficiently and promptly deliver their financial intermediary function through the absorption of losses (that is, immobilization of the external shocks without detriment to their core activities) incurred due to macro level turbulence and crisis developments which, in turn, results in the minimization of systemic risks. In this regard, the extent of stress resilience of the G-SIBs would ensure that the banking sector is not susceptible to macro level imbalances and, as such, would contribute to minimization of the likelihood of new crises.

At the same time, systemic risks in the banking sector remain one of the main drivers of financial crises, mainly due to the G-SIBs' economies of scope and scale. In this article, we attempt to determine the extent to which international banking regulation reform has reduced the level of systemic risks and improved the stress resilience of the G-SIBs, as well as to find whether the systemic importance of the G-SIBs still challenges financial stability. Additionally, we evaluate the role of the post-crisis regulatory order in overcoming the aftermath of the COVID-19 pandemic.

The Global Banking Sector in the Context of the COVID-19 Pandemic

The crisis provoked by the COVID-19 pandemic significantly downplayed the global economy, including the banking sector. Unable to fully recover from the GFC, the international financial area found itself in the grip of principally different risks associated with both the unexpectedness of a new crisis and the unpredictability of its extent, depth, duration, and consequences. The volatility of global financial markets during the COVID-19 pandemic was eight times higher than their volatility during the GFC [Gunay, 2021]. The idiosyncrasy of the situation was also characterized by the fact that banks swiftly lost their potential gained during the post-crisis recovery (Table 1), mainly due to the lack of ready-made solutions for adapting their operating models to the non-economic aspects of the crisis. Thus, in 2020, banks' loan losses in 88 countries amounted to \$892 billion, which is 64% higher than loan losses in 2019 [S&P Global Ratings, 2021].

² Also known as “too-big-to-fail” banks.

³ For the purposes of this article, the terms “international bank” and “global systemically important bank” have the same meaning, unless otherwise stated by the authors.

Table 1. Fitch Ratings Forecast for Banks in 2015–21

Forecast	End of the Period (in %)						
	2015	2016	2017	2018	2019	2020	2021
Stable	75.6	71.4	79.8	78.5	80.1	39.6	80
Negative	14.8	21.4	10.7	13.1	12.6	57.8	13.3
Positive	6.2	4.4	7.6	7.0	5.1	0.6	7.0
Evolving	3.4	2.8	1.9	1.4	2.2	2.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: [Fitch Ratings, 2021].

At the same time, instability in the banking sector was replaced by an equally unexpected and rapid recovery in the same year, as evidenced by market capitalization (Table 2) and operational parameters (Table 3) of the leading international banks. Moreover, it is expected that the loan losses in 2020–21 will not reach \$2.1 trillion, as experts had predicted in July 2020, but will amount to less than \$1.8 trillion [S&P Global Ratings, 2021], and in 2022 loan losses will further drop to \$585 billion [S&P Global Ratings, 2022]. Banking sector optimism in post-COVID-19 recovery is also driven by forecasts on the key performance indicators of the banking sectors: for example, in the United States, the volume of non-performing loans (NPL) may amount to nearly \$254 billion in 2020–22, or 2.5% of the total volume of loans, which is 4.1 percentage points lower than during the GFC, and the return on equity of US banks is expected to recover to pre-crisis levels by the end of 2021 [Deloitte, 2021].⁴

Table 2. Market Capitalization of the G-SIBs in 2020–21 (\$ Billion)

Name of G-SIB	As of:					
	01.01.2020	01.04.2020	01.07.2020	01.10.2020	01.01.2021	01.01.2022
JPMorgan Chase	429.9	274.3	282.3	293.4	387.3	494.0
HSBC	160.2	114.4	98.8	79.0	105.5	132.9
Citigroup	168.9	87.7	105.2	89.8	128.4	130.5
Deutsche Bank	16.0	13.6	19.4	17.4	22.7	29.5
BNP Paribas	73.8	37.9	49.7	45.4	66.2	84.9
Barclays	40.8	20.2	25.5	21.8	34.7	47.5
Bank of America	311.2	184.2	202.1	208.7	259.8	402.5
Credit Suisse	33.0	20.0	25.1	24.5	31.6	24.4
Morgan Stanley	81.5	53.6	75.3	76.2	124.0	186.7

⁴ Here and onward, the statistical data is available as of the date of submission of the article to the editorial office.

Name of G-SIB	As of:					
	01.01.2020	01.04.2020	01.07.2020	01.10.2020	01.01.2021	01.01.2022
Goldman Sachs	79.9	53.2	67.9	69.2	90.7	132.6
Mitsubishi UFJ	70.0	48.0	50.5	50.6	56.8	79.3
Société Générale Group	28.8	14.2	14.4	10.6	15.8	31.2
Group Crédit Agricole	41.8	21.3	28.4	25.3	37.0	43
UBS	45.6	33.8	42.0	40.2	51.2	66.7
Santander	69.4	40.6	42.7	31.2	54.0	61.1
Bank of China	201.3	183.9	181.5	124.7	131.2	131.0
Industrial and Commercial Bank of China	432.5	376.7	350.0	237.2	259.7	252.6
Wells Fargo	222.4	117.6	103.9	96.9	124.8	218.4
Mizuho FG	39.2	29.0	31.4	31.5	32.0	32.3
Bank of New York Mellon	45.3	29.8	33.6	30.4	37.6	51.5
UniCredit	32.1	17.7	20.4	17.4	18.9	33.9
State Street	28.3	18.8	22.4	20.9	25.7	37.2
ING Group	46.7	20.6	28.3	27.7	36.7	56.2
Sumitomo Mitsui FG	50.8	33.2	38.9	37.8	42.5	47.2
Groupe BPCE	13.8	10.3	8.1	6.7	9.7	15.1
Standard Chartered	30.0	18.5	18.3	14.8	19.4	20.3
Agricultural Bank of China	181.9	163.6	165.0	157.8	164.7	157.9
China Construction Bank	217.7	205.1	203.0	164.4	191.9	175.4
Royal Bank of Canada	112.5	87.5	97.1	99.3	116.7	159.8
Toronto Dominion	101.1	76.3	80.4	83.5	102.4	144.3
<i>Total</i>	<i>3,406.4</i>	<i>2,405.6</i>	<i>2,511.6</i>	<i>2,234.3</i>	<i>2,779.6</i>	<i>3,479.9</i>

Note. Market capitalization as of 1 April, 1 July, and 1 October 2020, and 1 January 2021 reflects the performance of the G-SIBs during the COVID-19 pandemic.

Source: [CompaniesMarketCap, 2021].

Table 3. Loan Loss Provisions in 2020 (\$ Billion)

Country/Region	Quarter 1	Quarter 2	Quarter 3
Top 100 banks in North America (excluding U.S.)	50.1	64.2	16.7
Top 100 U.S. banks	29.8	32.7	9.7
Top 100 EU banks	33.6	35.2	20.6
Top 100 Asia-Pacific banks	47.7	55.7	11.8

Source: [Deloitte, 2020].

In this regard, the following questions arise:

- Is the resilience to the shock associated with the COVID-19 pandemic followed by the rapid recovery in the banking sector the result of the transition to Basel III and strengthening the stress resilience of the G-SIBs?
- To what extent are banking regulators' efforts in reduction of the G-SIBs' risks consistent with regulatory objectives of minimization of systemic risks?
- Do the specifics of activity and systemic importance of G-SIBs prevent financial stability?

Dismantling Deregulation, Systemic Risks, and Basel III

Deregulation of banking activities amid financial globalization in the 1990s–2000s and expansion of international banks has increased the level of systemic risks [Ioannou, Wójcik, Dymski, 2019] and boosted their transmission channels [Ayhan Kose, Prasad, Terrones, 2009; Straetmans, Chaudhry, 2015]. In the absence of an anti-crisis stabilization mechanism in the international regulatory policy, the GFC extended beyond the banking sector. It became clear that in order to overcome crisis, the banking sector would require a principally different framework of banking regulation, which would be based on a more solid capital base of banks and a mechanism for mitigation of systemic risks in the banking sector. To this end, international regulators, including the Basel Committee on Banking Supervision (BCBS) and the Financial Stability Board (FSB), developed a new regulatory order that dismantled financial deregulation and established an algorithm to increase the stress resilience of banks together with a procedure for resolution of their insolvency, while financial stability has become the core of the regulatory policy. In other words, the post-crisis regulatory model was supposed to form the insusceptibility of the G-SIBs to crisis developments that would reduce systemic risks and systemic stress. These measures were to restore the role of the banking sector as a driving force for economic growth. The success in achieving the reform objectives depended on the following tasks:

- Strengthening the stress resilience of G-SIBs by raising the levels of their minimum capital adequacy and liquidity;
- Reducing the level of systemic stress in the banking sector⁵ by minimizing the risk of G-SIBs' insolvency;
- Ensuring financial stability based on the fulfilment of the two previous tasks.

⁵ It should be noted that along with Basel III the tasks of reduction of systemic stress in the banking sector are also assigned to macroprudential regulation, which is not addressed in this article since it is the subject of a separate study.

Since the GFC originated in the banking sector and G-SIBs are key market makers in financial markets, regulators highlighted the issues of their solvency, since during periods of macro level instability they become the main source of systemic risks [Borri, di Giorgio, 2021], the main transmitters of systemic risks [Andrieş et al., 2022] and, ultimately, an obstacle to global economic development [FSB, 2013]. Due to these circumstances, the priorities in their regulation were revised: instead of focusing on their profitability, priority was given to their stress resilience which, in turn, should have paved the way to minimization of systemic stress and to achieving financial stability.

G-SIBs in the Context of the Post-Crisis Regulatory Paradigm

G-SIBs as Determinants of the Macro Level Dynamics

The activities of the G-SIBs affect the dynamics not only of the banking sector and the financial system, but also the economy at large [Lorenc, Zhang, 2020]. This is explained by the impressive volume of their assets, which amounted to 36.1% of the global banking sector assets and 63.7% of the global gross domestic product (GDP) in 2019 (Fig. 1). It is also important to note their dominant positions in a number of national banking sectors (Fig. 2).

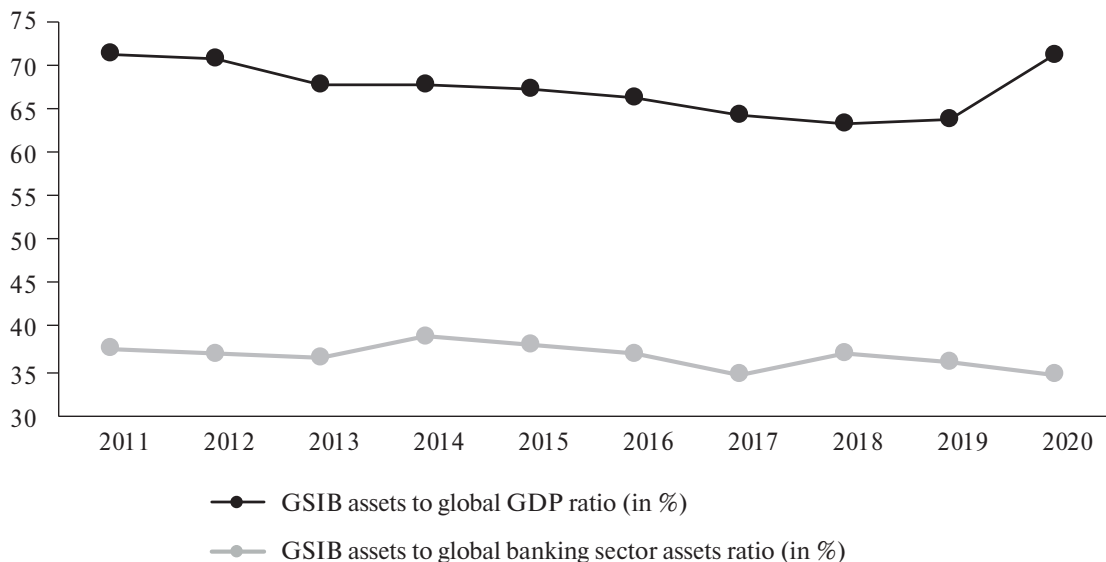


Fig. 1. The Share of G-SIBs' Assets in the Assets of the Global Banking Sector and in the Volume of Global GDP in 2011–20

Source: [Macrotrends, 2021; Statista, 2021].

On the one hand, the global strategic effect of the G-SIBs is determined by their size and extent of activity in the global financial markets and, on the other, by their role as the main transmitters of external shocks to the banking sector [Silva, Pino, 2021] and the non-financial area [Aysun, 2016]. This dichotomy is stipulated by the higher level of diversification of their assets, which expands additional opportunities for them to extend high-risk operations. The

larger the G-SIB, the more powerful its impact on macro level dynamics. Thus, the negative impact on GDP due to the shaky financial position of international banks that are in the top 0.15% of banks in terms of assets, is two times higher than the same effect from banks that are in the top 0.75% and three times greater than the impact of banks that are in the top 1% [Lorenc, Zhang, 2020]. Further, the G-SIBs' market share mirrors the sentiment of investors and other stakeholders, since G-SIBs demonstrate the ability to squeeze a relatively high rate of return compared to smaller banks, regardless of external factors [Feng, Zhang, 2012]. It should also be noted that during instability, G-SIBs remain the main creditors of the economy, while banks of other calibre are urged to redistribute their assets toward non-interest income [Tran, Hoang, Nguyen, 2020], thereby increasing the costs of adapting their operating models to the changed economic conditions.

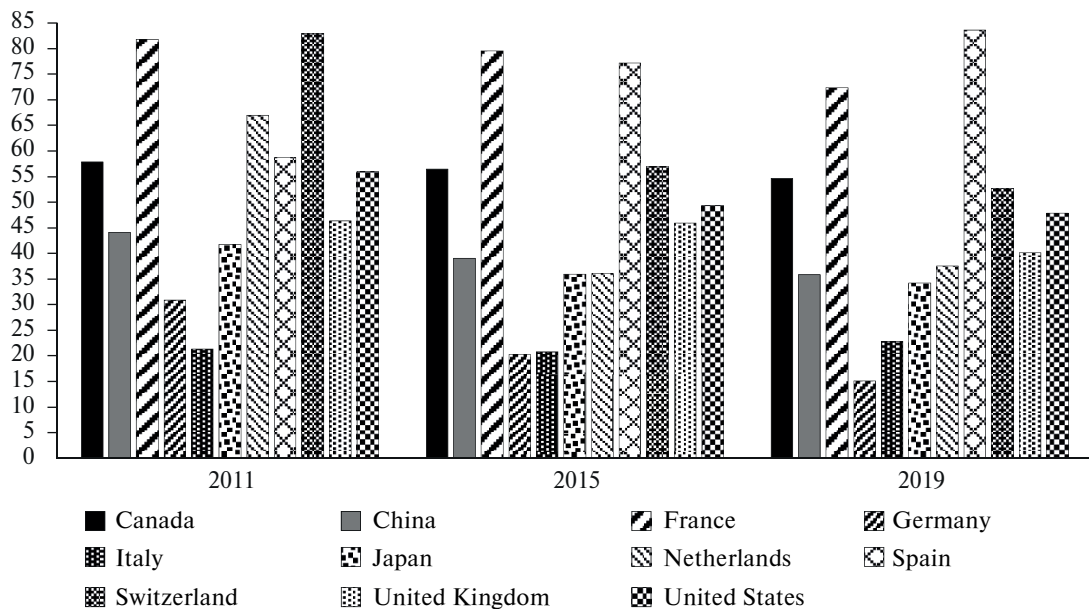


Fig. 2. G-SIBs' Assets in the National Banking Sector Assets in 2011, 2015, and 2019

Source: [Statista, 2021].

G-SIBs as a Source of Systemic Risks

The activities of the G-SIBs are associated with systemic risks⁶ [Gulamhussen, Pinheiro, Pozzolo, 2014], and their exacerbation during macro level instability may diminish the efforts of the Group of 20 (G20) and international financial regulators to achieve financial stability [Schuknecht, Siegerink, 2020]. At the same time, the G-SIBs' stress resilience is partially diluted by the specifics of unconventional monetary policy [Rubio, Yao, 2020] in that low and negative interest rates of central banks prevent a return to pre-crisis profitability in the banking sector, while a relatively low rate of return, although being sufficient for maintaining capital

⁶ Systemic risks are defined as the probability of transmission of banking sector risks to the macro level. Financial globalization is a catalyst for systemic risks per se, which could be further transformed into global financial and economic crises.

adequacy at an acceptable level, nevertheless, restrains the development of the banking sector due to a shortage of liquidity.

Another factor of systemic stress is the interconnectedness of G-SIBs: once turned dysfunctional, they can cause a chain reaction of insolvency of banks that deal with them. At the same time, the interconnectedness effect is further amplified by the crisis development dilemma: on the one hand, G-SIBs are exposed to crises [Shahzad, Hoang, Arreola-Hernandez, 2019] and, on the other hand, they are a source and transmitters of systemic risks [Borri, di Giorgio, 2021]. Often, these two aspects appear simultaneously, which logically suggests the liquidity dilemma: the function of the G-SIBs as the main creditor of the economy conflicts with their efforts to remain regulatory compliant. What is more, the higher the level of interconnectedness, the higher the degree of the threat to financial stability caused by the G-SIBs [Bostandzic, Weiß, 2018] across all types of risks—macro level, market, and micro level [Mohanty et al., 2018]. Despite the efforts of international financial regulators, the level of interconnectedness of the G-SIBs in the post-crisis period not only did not decrease, but even increased according to the main regulatory criteria (Table 4).

Table 4. Measures of G-SIBs' Interconnectedness in 2013–20 (as per BCBS Methodology) (at the end of the year, € Billion)

Criteria of G-SIBs' interconnectedness	2013	2014	2015	2016	2017	2018	2019	2020
Intra-financial system assets	7,718.0	7,868.6	8,098.6	7,834.2	6,936.0	7,317.6	7,754.8	7,762.5
Intra-financial system liabilities	7,830.9	8,867.9	8,898.5	8,847.4	8,113.1	8,230.1	8,675.4	9,047.8
Securities outstanding	10,836.2	12,214.4	12,499.3	13,337.1	13,510.4	13,083.7	14,694.1	13,340.0

Source: [BIS, 2022].

Sustainability in the banking sector is a central point in the minimization of the possibility of crises and, therefore, the regulatory measures ensuring G-SIBs' market discipline are, in fact, the only approach for a consistent anti-crisis framework in the financial sector. In this regard, the earlier proposed and later implemented steps to ease the regulatory regime, which allegedly appear necessary to boost economic growth, expand the availability of banking services, and reduce banking sector costs, seem not to stand up to scrutiny.⁷ It is noteworthy to underscore that attempts to move toward deregulation 2.0 appear against the backdrop of convincing arguments by a number of researchers that easing the supervisory policy inevitably exacerbates systemic risks [Davydov, Vähämaa, Yasar, 2021; Zhang et al., 2021], which at one time became the main cause of the GFC.

G-SIBs as a Focus of Heightened Regulatory Rigor

After the GFC, stress resilience of the G-SIBs is ensured by a specific oversight regime; however, the academic and expert community still lacks consensus about the possible con-

⁷ For example, the easing of the regulatory regime is provided by the Economic Growth, Regulatory Relief, and Consumer Protection Act of 2018 (Public Law 115–174, 115 USC; <https://www.govinfo.gov/content/pkg/PLAW-115publ174/pdf/PLAW-115publ174.pdf>).

sequences of the applied regime for the global economy. One group of authors advocate the regulatory easing approach for the G-SIBs, including possibility of bail-out by the government in case of their insolvency. Their opinion is substantiated by the fact that the rigor of post-crisis regulation can not only impede “de-riskization” of G-SIBs [Ayadi et al., 2016] but also diminish their activity as a main creditor to the economy [Poledna, Boehmann, Thurner, 2017], due to which the costs of the crisis mitigation measures may exceed the benefits of the post-crisis recovery [Gunay, 2021; Welfens, 2008]. The other group of authors believes that the regulatory easing approach may scale up instability in the financial sector in case of exacerbation of systemic risks and suggests not only that the G-SIBs should receive more tightened regulation [Poledna, Boehmann, Thurner, 2017] but also their foreign subsidiaries [Kupiec, 2016], not ruling out even the bankruptcy of the G-SIBs [Schuknecht, Siegerink, 2020] in case of shortage of the bail-out funds.

The risks of dysfunction of G-SIBs that could be the principal and immediate contributor to systemic stress have become the main fears that prompted international financial regulators to resolve the crisis development and the liquidity dilemmas through the prism of three main objectives:

- Reduction of the level of the G-SIBs’ systemic importance as the main factor of the reduction of systemic risks;
- Reduction of the risk of the G-SIBs’ insolvency by strengthening their ability to absorb losses;
- Reduction of the probability of the G-SIBs’ default/bankruptcy by improving the mechanism for resolution of their insolvency [BCBS, 2021a].

It should be noted that the reduction of the G-SIBs’ insolvency and bankruptcy risks largely depends on whether and the extent to which a decrease in the level of their systemic importance affects their stress resilience. To this purpose, the BCBS and the FSB proposed five quantitative criteria for identification of a credit institution as a G-SIB (size, the extent of international activity, interconnectedness, substitutability, and complexity of the operating model), based on which banking regulation was complemented by the instruments aiming not only to scrutinize supervision of the G-SIBs but also to “contain” and reduce the level of their systemic importance. Introduction of the additional regulatory standards contributed to a more efficient mechanism of risk identification, which in the context of risk mitigation policy has become one of the main factors of stress resilience in the banking sector.

Stress Resilience of the G-SIBs as an Outcome of the Post-Crisis Regulatory Order

Basel III and Effectiveness of the Regulatory Reform

As main priorities of Basel III were completely introduced by 2019, the objectives of higher stress resilience of the G-SIBs were largely achieved. The evidence of stress resilience includes the following:

- Reduction of G-SIBs’ risk of insolvency⁸ due to a higher level of minimum capital adequacy ratio compared to non-systemic banks;
- Reduction of G-SIBs’ liquidity risk due to requirements for stable funding from external sources;
- Reduction of dependence on interbank deposits as a source of G-SIBs’ assets;

⁸ The insolvency of a credit institution is understood as a decrease in its market capitalization by more than 50% and/or a decrease in its credit rating below an investment grade (see, for example: T. Goel, U. Le-wrick, and A. Mathur [2019]).

- Decrease in the volume of securities held on G-SIBs' balance sheet;
- Reduction of the dependence of G-SIBs' lending capacity on the rigour of supervisory standards;
- Lower compliance costs due to income diversification;
- Reduction of the costs associated with adaptation of G-SIBs' operating models to the post-crisis regulatory mechanism due to optimization of their balance sheet structure [Behn et al., 2016; FSB, 2021a; Goel, Lewrick, Mathur, 2019; Martynova, Vogel, 2022].

At the same time, the objective to reduce G-SIBs' systemic importance was not achieved: out of 12 indicators belonging to criteria of systemic importance, the G-SIBs became less active in financial derivatives only [BIS, 2022]. In fact, risks associated with performance of G-SIBs increased in the mid-2010s [Bostandzic, Weiß, 2018; Mohanty et al., 2018]; subsequent analysis showed that the delay of the Basel III's response for the G-SIBs sophisticated balance sheet structure was mainly due to the limited consistency of the regulatory reform, which at the time relied upon primarily traditional supervisory standards, including a capital surcharge for systemic importance (Table 5) rather than on other critical aspects of G-SIBs' performance, including their ability to absorb losses without detriment to their function of financial intermediation. The simplified approach in regulation escalated competition among the G-SIBs in the segment of higher-risk deals [Davis, Karim, Noel, 2020] that led to a decrease in the average capital adequacy level for all G-SIBs in 2016 and, ultimately, to higher level of systemic risks (Tables 5 and 6).

Despite the efforts of the G20, the FSB, and the BCBS to reduce the level of systemic importance in the international banking area, the total number of G-SIBs in the post-crisis period increased from 27 in 2012 to 30 in 2021. In the meantime, more rigorous international supervision over G-SIBs' activity facilitated the transition of four G-SIBs to the category of banks with a lower level of systemic importance (HSBC, Citigroup, Deutsche Bank, and Barclays) while three banks were even removed from the FSB list (Royal Bank of Scotland, Nordea, and BBVA). Nevertheless, in the post-crisis period, Chinese G-SIBs demonstrated a significant increase of their systemic importance and systemic risks, in contrast to the rest of the G-SIBs, where the opposite trend is observed. This largely happened due to the leading role of Chinese banks as key creditors in the global economy, on the one hand, and the relatively high level of non-performing assets on their balance sheets, on the other hand [Avkiran, Mi, 2017]. Mirroring the growth of the Chinese economy, which, in turn, depends on bank loans rather than on raising liquidity from international capital markets [S&P Global Ratings, 2022], as well as on the process of internationalization of the Chinese national currency (yuan (RMB)), the expansion of the global activities of the Chinese G-SIBs fuelled by the lower quality of their assets exacerbates their systemic risks. Taking into account that over the recent years Chinese G-SIBs appeared in the first lines in the list of the top world banks in terms of assets,⁹ a (negative) change in the level of their risks will have an immediate effect on international financial stability.

⁹ As of 1 January 2022, the total assets of Chinese G-SIBs (four banks) amounted to \$19.1 trillion. For comparison: the total assets of U.S. G-SIBs (eight banks) is \$14.6 trillion, the G-SIBs of the Eurozone (eight banks)—\$14.4 trillion, U.K. G-SIBs (three banks)—\$5.7 trillion, Swiss G-SIBs (two banks)—\$1.9 trillion, Japanese G-SIBs (three banks)—\$7.3 trillion, Canadian G-SIBs (two banks)—\$2.9 trillion [Yamaguchi, Teris, Ahmad, 2022].

Table 5. The Level of Systemic Importance and Systemic Risks of the G-SIBs in 2011–21 (units of measurement—see Notes to the table below)

G-SIB's name	As of 1 November:																		
	2011	2012	2013	2014	2015		2016		2017		2018		2019		2020		2021		
Bank of New York Mellon	–	1.5 (2)	1.0 (1)	1.0 (1)	150	1.0 (1)	151	1.0 (1)	160	1.0 (1)	152	1.0 (1)	153	1.0 (1)	152	1.0 (1)	156	1.0 (1)	160
UniCredit	–	1.0 (1)	1.0 (1)	1.0 (1)	148	1.0 (1)	165	1.0 (1)	148	1.0 (1)	134	1.0 (1)	142	1.0 (1)	142	1.0 (1)	146	1.0 (1)	145
State Street	–	1.0 (1)	1.0 (1)	1.0 (1)	148	1.0 (1)	147	1.0 (1)	148	1.0 (1)	149	1.0 (1)	147	1.0 (1)	140	1.0 (1)	142	1.0 (1)	146
ING Group	–	1.0 (1)	1.0 (1)	1.0 (1)	144	1.0 (1)	132	1.0 (1)	140	1.0 (1)	159	1.0 (1)	161	1.0 (1)	169	1.0 (1)	160	1.0 (1)	155
Sumitomo Mitsui FG	–	1.0 (1)	1.0 (1)	1.0 (1)	142	1.0 (1)	142	1.0 (1)	154	1.0 (1)	180	1.0 (1)	173	1.0 (1)	186	1.0 (1)	197	1.0 (1)	193
Groupe BPCE	–	1.0 (1)	1.0 (1)	1.0 (1)	141	1.0 (1)	151	1.0 (1)	126	–	–	1.0 (1)	130	1.0 (1)	129	1.0 (1)	128	1.0 (1)	128
Standard Chartered	–	1.0 (1)	1.0 (1)	1.0 (1)	133	1.0 (1)	142	1.0 (1)	133	1.0 (1)	132	1.0 (1)	131	1.0 (1)	140	1.0 (1)	140	1.0 (1)	130
Agricultural Bank of China	–	–	–	1.0 (1)	132	1.0 (1)	164	1.0 (1)	191	1.0 (1)	176	1.0 (1)	183	1.0 (1)	180	1.0 (1)	195	1.0 (1)	216
Nordea	–	1.0 (1)	1.0 (1)	1.0 (1)	121	1.0 (1)	129	1.0 (1)	123	1.0 (1)	115	–	–	–	–	–	–	–	–
BBVA	–	1.0 (1)	1.0 (1)	1.0 (1)	92	–	–	–	–	–	–	–	–	–	–	–	–	–	–
China Construction Bank	–	–	–	–	–	1.0 (1)	157	1.0 (1)	210	1.5 (2)	251	1.0 (1)	225	1.0 (1)	224	1.5 (2)	241	1.5 (2)	236
Royal Bank of Canada	–	–	–	–	–	–	–	–	–	1.0 (1)	139	1.0 (1)	146	1.0 (1)	153	1.0 (1)	166	1.0 (1)	167
Toronto Dominion	–	–	–	–	–	–	–	–	–	–	–	–	–	1.0 (1)	131	1.0 (1)	144	1.0 (1)	142

Notes.

1. The G-SIBs' list has been published by the FSB since 2011 (in 2011, the list did not include capital surcharges). The left column of each year shows the capital surcharge for systemic importance (as a percentage of CET1 capital); numbers in brackets show the bucket which the G-SIBs are assigned to in accordance with the level of their systemic importance according to the FSB methodology.

2. The right column of each year shows the score of G-SIBs' systemic risk, starting from 2014, in accordance with the BCBS methodology.

Source: [BCBS, 2021b; FSB, 2021b; OFR, n.d.].

Table 6. Systemic Risks of the G-SIBs in 2014–21

As of 1 November:														Change (2021 to 2014)	
2014		2015		2016		2017		2018		2019		2020		2021	
number of banks	average score	number of banks	average score	number of banks	average score	number of banks	average score	number of banks	average score	number of banks	average score	number of banks	average score	number of banks	average score
Systemic risks of all G-SIBs:															
30	234.9	30	235.3	30	233.6	30	231.0	29	235.0	30	230.5	30	228.7	30	227.7
including:															
Systemic risks of the Chinese G-SIBs:															
3	165.0	4	181.3	4	220.3	4	231.0	4	236.3	4	244.8	4	257.0	4	260.5
Systemic risks of the U.S. G-SIBs:															
8	276.3	8	280.4	8	282.6	8	279.3	8	268.3	8	263.8	8	256.5	8	255.5
Systemic risks of the Eurozone G-SIBs:															
10	210.9	9	216.2	9	200.1	8	200.9	8	213.0	8	204.5	8	199.4	8	202.5
Systemic risks of other G-SIBs:															
9	248.0	9	238.3	9	229.4	10	216.6	9	224.3	10	219.0	10	218.6	10	212.6
Systemic risks of the G-SIBs with a capital surcharge of 2% and more:															
6	435.8	6	412.3	6	390.2	5	393.6	4	397.8	3	414.7	3	394.3	4	380.0
															–12.8%

Note. The rest of the G-SIBs include banks in the U.K., Canada (since 2017), Switzerland, and Japan.

Source: Table 5.

Introduction of TLAC and Its Effect on Regulatory Objectives

Systemic risks as a cause of banking sector instability and financial crises may diminish the objectives of regulatory reform and call into question the ability of the reform to ensure financial stability. This urged international financial regulators to search for additional, more effective tools of prudential banking supervision that would not only strengthen the market discipline of the G-SIBs, but also contribute to their higher stress resilience and help them withstand macro level uncertainty and crises. In this regard, in November 2015, the FSB conceptualized a new regulatory instrument—Total Loss-Absorbing Capacity (TLAC)¹⁰—which was supposed to enable the G-SIBs to absorb losses, regardless of their volume [FSB, 2015a].

TLAC is aimed at the minimization of the effect of the G-SIBs' fragile financial position on wider financial stability and, therefore, at minimization of the effect of systemic risks on financial intermediation. Most importantly, TLAC should encourage G-SIBs to change the priorities in using the sources of financial aid, in case of their insolvency, from external sources (for example, at the expense of state or public funds) to internal ones (for example, at the expense of shareholders and creditors). In a broader sense, the introduction of TLAC was to minimize the systemic importance of G-SIBs and, accordingly, reduce crisis developments in the financial sector.

The TLAC structure notionally combines regulatory requirements for both minimum capital adequacy and leverage ratios that contribute to clearer objectives for ensuring financial stability. Within this framework, the quantitative parameters of the G-SIBs' activity become more predictable, which is a key factor in providing insight into global financial markets' dynamics. Moreover, the simultaneous application of the Basel III standards and TLAC yields to a synergetic effect in international banking regulation policy, comparable with the effect of joint application of micro- and macroprudential regulation instruments¹¹ that is the most effective solution to further minimization of systemic risks. Further, this approach significantly reduced the systemic importance of most G-SIBs,¹² as evidenced by the decrease of capital surcharges for a number of G-SIBs by 2021 (Table 5). On the other hand, the use of TLAC along with the Basel III standards is a more reliable point for regulators to more plausibly assess the level of stress resilience of the G-SIBs, since the debt instruments as part of TLAC can be converted into common shares, thus increasing equity. The introduction of TLAC further supported regulators' efforts to strengthen confidence in the banking sector: the inclusion of debt to TLAC urges the G-SIBs to a more complete disclosure of financial information that would more transparently mirror their activities. This, in turn, stimulates the influx of new investors into the bank and, therefore, the increase of the bank's capital resulting in higher level of operational capacity and fair competition in financial markets. Unlike the Basel III capital surcharge, which only has a moderate effect on G-SIBs' credit risks, TLAC facilitates G-SIBs' more re-

¹⁰ The main objective of TLAC was to restore G-SIBs' function of financial intermediation; its regulatory assessment was based on historical data on losses of leading international banks during crises and their recapitalization [FSB, 2015b]. TLAC is a combination of Tier 1 capital (not less than 67% of total TLAC) and Tier 2 capital, which includes long-term subordinated debt and capital markets instruments (not more than 33%). TLAC has been introduced since 1 January 2019. On average, for all G-SIBs, TLAC is denominated in U.S. dollars (67%) and euros (19%) [FSB, 2019]. In the first half of 2021, the total amount of TLAC across all G-SIBs amounted to \$290 billion, which exceeded the minimum requirements set by the FSB [FSB, 2021c, p. 7].

¹¹ By combining micro- and macroprudential mechanisms in international banking regulation, it was possible to overcome the consequences of financial deregulation and regulatory lacuna of Basel I and Basel II.

¹² Except for the Chinese G-SIBs, for which TLAC implementation is scheduled from 1 January 2025 [FSB, 2021c]. It is likely that the introduction of TLAC will, to a certain extent, curb the growth in the level of systemic importance of the Chinese G-SIBs (see above for more details).

sponsible corporate governance as well as their more effective resolution, which acts as an early warning tool for the identification of risks of deterioration in their financial position. This not only facilitates prompt adoption measures to strengthen their stress resilience, but also reduces the likelihood of systemic risks in the financial sector, both by reducing the level of systemic importance of the G-SIBs and minimizing the risks of their insolvency.

Implementation of the TLAC concept also benefits the macro level: the combination of capital adequacy and debt holding strengthens market discipline and, therefore, reduces the likelihood of new crises and the social cost of overcoming the crisis aftermath. At the same time, it is assumed that such benefits should outweigh the possible costs at the micro level, which may be associated with both a forced increase in interest rates on bank loans and the TLAC regulatory compliance [FSB, 2015a].

Did the FSB live up to its TLAC-related expectations? With the introduction of TLAC the complexity of the G-SIBs' operating model has somewhat decreased [Martynova, Vogel, 2022], and they showed lower dependence of their profitability on the rigour of the supervisory standards [Dzhagityan, Podrugina, Streltsova, 2020]. This decisively contributed to the decrease of stress in the banking sector. The G-SIBs' higher stress resilience is manifested by growth of their average capital adequacy ratio from 11.0% in 2013 to 12.8% in 2019 [BCBS, 2022], while the synergetic effect of the simultaneous application of capital surcharges and TLAC was evidenced during the COVID-19 pandemic: although the latter was provoked by non-economic causes, the pre-pandemic G-SIBs' key performance indicators recovered within just a few months after the onset of the crisis, which ultimately returned the banking sector to normality. It is worth noting that the improvement of G-SIBs' stress resilience after the introduction of TLAC urged international banking regulators to reconsider their own postulates about the inevitable and forceful contraction of the G-SIBs' assets: shortage of lending facilities would possibly damage the global economy and ultimately jeopardize the conceptual foundation of the post-crisis regulatory mechanism. Moreover, according to findings, there is no relationship between a special regulatory regime applied to G-SIBs and their lending capacity, including the actual amount of extended loans [Behn, Schramm, 2021; Violon, Durant, Toader, 2020].¹³ However, the key objective of the post-crisis banking regulation—to put an end to the existence of “too-big-to-fail” banks—has not been achieved: although TLAC has become a tool for reducing the G-SIBs' risks, their systemic importance still continues to be a threat to economic stability if there are no valid regulatory policy tools for resolution of their insolvency.

Systemic Risks of the G-SIBs as a Challenge to Financial Stability

Although the level of the G-SIBs' systemic risks decreased by 3.1% in 2021 compared to 2014 (Table 6), their systemic importance still threatens financial stability. *Ceteris paribus*,¹⁴ the risks of systemic importance are associated with the increase in disproportions and crisis developments at the macro level, as well as with financial markets volatility, both being the main factors exposing the G-SIBs' activities to deterioration due to global scope and interconnectedness of their activity. This, in turn, activates risk transmission channels in the financial area. Some au-

¹³ However, some authors (see, for example: G. Favara, I. Ivanov, and M. Rezende [2021]) hold the opposite opinion, but note that a slight decrease in G-SIBs' lending was offset by growth provided by non-systemic banks. It should also be noted that the decline in lending is also associated with a more thorough check by the G-SIBs of potential borrowers in terms of credit risks.

¹⁴ In this case, we do not consider risks resulting from the G-SIBs' operations with high-margin instruments associated with higher risk which also are used in order to compensate regulatory compliance costs. The market advantages that allow G-SIBs to engage in high-risk operations normally reduce their motivation to comply with market discipline, which is one of the reasons for the decrease in competition in financial markets.

thors conclude that the continued growth of G-SIBs' assets is the main source of systemic risks [Hué, Lucotte, Tokpavi, 2019]. Other authors, however, believe that it is not the bank's size but rather lax regulation of the G-SIBs that may exacerbate systemic risks in an environment where the costs associated with external shocks may exceed the regulatory effect of ensuring their stress resilience. In this regard, interesting is the study by W. Passmore and A.N. von Hafften [2019] in which they propose to strengthen supervision by increasing capital surcharge depending on the G-SIB's funding model, which, in their opinion, would ensure adequate liquidity and reduce the risk of systemic stress in the case of G-SIBs' dysfunction.

An additional source of systemic risks is moral hazard associated with G-SIBs' systemic importance when they are highly likely to receive government aid in case of their insolvency in order to prevent both their bankruptcy and collapse of the financial sector (such assistance was provided by a number of world central banks during the GFC). This issue remains open in the BCBS's 2018 revised methodology for assessment of the performance of the G-SIBs [BCBS, 2018] which was introduced into the regulatory framework from 1 January 2022. As part of the further improvement of banking sector supervision, the BCBS is currently working on conceptualization of quantitative parameters of large risks and liquidity needs necessary for G-SIBs' consistent performance, which most probably would exclude any external financial aid in case of their insolvency.

Although TLAC has decreased G-SIBs' systemic risks, its concept is still missing full integrity. What is meant here is the shortage of transparency regarding the "internal" TLAC—a mechanism for allocation of liquidity between the G-SIBs' head offices and their subsidiaries/branches stemming from G-SIBs' regulatory requirements to be compliant with TLAC [FSB, 2017, p. 11, 2021c, p. 2]. To a certain extent, this adversely affects the investor confidence in the credit institution since the lack of transparency makes it difficult to assess the extent of the G-SIBs' ability to absorb possible losses. This issue is expected to be addressed through the additional measures, forthcoming in 2023, on strengthening the stress resilience of the G-SIBs, including the introduction of a new methodology for supervisory surcharges for systemic importance and an increase in the minimum regulatory requirements for TLAC.

A serious risk to financial stability is the lack of internationally agreed approaches to the G-SIBs' resolution mechanism. Despite the application of common standards of supervision to all G-SIBs, regardless of regulatory regime in their home countries, the legal framework of insolvency of market participants in different countries varies [Buckingham et al., 2019; Guo, 2019], thereby diluting fair and reliable assessment of resolution costs in the context of financial stability. Against the backdrop of regulatory efforts over "de-riskization" of the G-SIBs, the lack of a single methodology for assessing the likelihood of their inconsistency and dysfunction may reduce the effectiveness of regulatory efforts to strengthen their stress resilience and ensure international financial stability, which is critical given increasing differences in the macro level metrics and financial markets dynamics in different countries and regions.

The concern of international regulators about the systemic importance of the G-SIBs is also stipulated by the absence of an approach that would test them for the soundness of the resolution mechanism in times of systemic crises [FSB, 2021c]. The search for an optimal testing model is hampered by the lack of a procedure for converting debt instruments into equity or other ownership instruments, which is the central element of the latest concept of G-SIBs' resolution at the expense of shareholders and creditors (a bail-in approach). Further, in order to develop a resolution testing mechanism, it will be necessary to resolve a number of legal, regulatory, and operational issues related to the criteria and specifics of funding of G-SIBs' foreign subsidiaries/branches as an integral part of the resolution procedure.

The post-crisis reform of international banking regulation contributed to a higher stress resilience of the G-SIBs, which is a key to the continuity and soundness of financial intermediation, banking sector consistency, and financial stability. This was largely a result of a shift in the priorities of the post-crisis regulatory regime—from a stand-alone surcharge-based supervision over G-SIBs' capital adequacy to its combination with a loss absorption mechanism (TLAC). Simultaneous implementation of Basel III standards and TLAC helped reduce the G-SIBs' systemic risks, thus decreasing threat to macro level instability and crisis developments. The G-SIBs' insusceptibility to external shocks as an outcome of the rigour of the regulatory regime allowed them to regain, if not the role of the locomotive of economic growth, then certainly the role of the anti-crisis stabilizer of the financial sector, as is evidenced by the G-SIBs that have become vehicles of credit liquidity supply to the global economy during the COVID-19 pandemic.

In this regard, there is no doubt that the contemporary model of international banking regulation has no alternative in terms of approaches for minimization of systemic risks and mitigation of systemic stress in the banking sector. As key players in the global financial markets, the G-SIBs have become more savvy in adapting their operating models to external challenges and maintaining their market discipline without any detriment to their performance metrics, which is secured by their loss absorption ability. On the other hand, the transition from external sources of G-SIBs' resolution (a bail-out approach) to internal ones (a bail-in approach) contributes to the reduction of resolution costs at the macro level, thus enabling macro financial authorities to redirect more funds for overcoming the crisis aftermath.

Despite the benefits of the post-crisis regulatory reform, one of which is manifested by a certain decrease in the G-SIBs' systemic importance, “de-riskization” of their operating models lags behind the regulatory objectives of minimization of systemic risks. The main challenge for financial stability remains in the high level of interconnectedness of the G-SIBs, which has a multidirectional effect on their stress resilience, depending on the extent of global financial markets dynamics and volatility. This means that financial regulators should focus on the relationship between the G-SIBs' systemic importance and systemic risks and continue to search for valid instruments that would introduce additional parameters to more accurately measure systemic importance in the banking sector and help to further quantify the optimization of the extent of systemic risks as a threshold of crisis. Whether the level of systemic importance of the G-SIBs can be brought in line with the objectives of further mitigation of systemic stress in the international banking sector in the short run will determine whether the G-SIBs' systemic risks will not adversely affect financial stability in the long run.

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Crypto-Assets: Economic Nature, Classification and Regulation of Turnover

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Abstract

The article is devoted to the study of the economic nature of crypto-assets, the development of their original classification, and determination of the main directions of regulation of their turnover. These issues are within the framework of the modern discourse of international organizations such as the International Monetary Fund (IMF), the World Bank (WB), the Group of 7 (G7), the Group of 20 (G20), the World Trade Organization (WTO), the Organisation for Economic Co-operation and Development (OECD), the Bank for International Settlements (BIS), and the Financial Stability Board (FSB). This article reviews the modern discourse of international organizations regarding crypto-assets, presents an interpretation of crypto-assets as a new class of financial assets, justifies the classification of crypto-assets, and identifies the main types and economic characteristics of digital assets. The study was conducted using a system-functional and system-structural method.

On the basis of this study, it is concluded that the activities of international organizations are focused on developing recommendations and principles for regulating transactions with cryptocurrencies and global stablecoins, prudential supervision of their issuers, and unifying approaches to taxation and countering illegal transactions using crypto-assets. The study understands crypto-assets to be private digital assets that are recorded digitally in a distributed ledger and that can be used as a means of exchange and/or an investment tool and/or a means of access to goods and services of the issuer. Crypto-assets are divided into two main types: virtual currencies and digital tokens. Virtual currencies are a means of exchange or payment as well as a means of saving. Digital tokens represent digital rights and are issued for investment functions or consumer purposes.

The study found that there is no international regulation of crypto-asset turnover. National regulation is significantly differentiated between countries due to the lack of common interpretation and classification of crypto-assets and different assessments of economic risks of their turnover for national financial systems. In most developed countries—the U.S., European Union (EU) countries, and the UK, among others—a flexible approach to regulating various types of crypto-assets and their issuers prevails. In emerging market countries, such as China, Turkey, and Russia, regulation is more stringent and characterized by the widespread use of prohibitive measures. The main problem of the legal regulation of crypto-assets in Russia is its fragmentation and the predominance of a prohibitive bias. The modern regime of regulation of crypto-assets in Russia is weakly related to their economic nature and is not equivalent to the risks of turnover of crypto-assets.

Keywords: international organizations, crypto-assets, distributed ledger technology (DLT), nature and classification of crypto-assets, virtual currencies, cryptocurrencies, stablecoins, digital tokens, investment tokens, utility tokens

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Introduction

In recent years, the financial sector has undergone fundamental changes due to the widespread introduction of new information technologies, such as *distributed ledger technology* (DLT), *artificial intelligence* (AI), and *big data*. In turn, the distributed ledger technology¹ and *blockchain*, *as one of its forms*,² is a connecting, end-to-end technology that offers a universal platform for recording, storing, and transmitting information about financial transactions.³ As a result of the application of distributed ledger technology in recent years, a new asset class has appeared in the financial sector—*crypto-assets* or *virtual assets*, which are treated in Russia as digital financial assets.⁴

Due to the rapid development of the crypto-assets market and the cross-border nature of transactions involving their use, the topic of the crypto-assets' development has recently become one of the most widely discussed both at the level of international organizations and at the level of national regulators. However, there is still no unified definition of the term “crypto-assets” in economic science. There is also no consensus among economists, international organizations, and financial regulators on what types of assets can be considered as crypto-assets, or on what criteria these assets differ from each other. As a result, crypto-assets can include assets of different economic nature: monetary, debt, equity, and hybrid assets, issued both in a decentralized and centralized manner. At the same time, the issues of essential interpretation and classification of crypto-assets are especially important for understanding the functions that such assets perform, defining the property rights that they allow to be realized, as well as for choosing the most appropriate regime for regulating the turnover of crypto-assets both at the national and international level.

The purpose of this study is to determine the economic nature of crypto-assets, develop their original classification, and identify the main directions of regulating their turnover. It reviews the modern discourse of international organizations in relation to crypto-assets, analyzes various approaches to the interpretation and classification of crypto-assets, substantiates the author's interpretation and classification of crypto-assets, identifies the main economic features of various types of crypto-assets, and determines the main economic and legal directions for regulating their turnover in developed countries and Russia. The study was conducted using a system-functional and system-structural method.

¹ Distributed ledger technologies allow nodes in the network to safely offer, verify and record changes about data in a synchronized ledger that is distributed across network nodes [BIS, 2017, p. 2]. In the domestic economic science, this term has received an author's interpretation in relation to cryptocurrencies in the works of S.A. Andryushin, D.A. Kochergin, and others. Thus, the term “distributed ledger” refers to a decentralized or distributed unified system for recording data on financial transactions, consisting of chains of generated transaction blocks built according to certain rules, which are used in decentralized virtual currency schemes [Kochergin, 2017, p. 124].

² Blockchain is an accounting technology consisting of a chain of blocks, each of which stores information about previously performed transactions. One of the main differences between distributed ledger technology and blockchain is that in case of distributed ledger, a situation is possible in which one management body can directly control the operation of all nodes and control the functioning of a decentralized network [Andryushin, 2019, pp. 233–41].

³ According to expert estimates, currently most of the surveyed experts consider China and the United States to be the world leaders in terms of investment in blockchain (30% and 18%, respectively) [Vailshery, 2022].

⁴ It should be noted that the term “digital financial assets” used in Russia is narrower than “crypto-assets” and does not include assets issued in a decentralized manner.

Crypto-Assets Discourse in International Organizations

The topic of crypto-assets has been the subject of extensive discussion by international organizations since late 2017—early 2018, in the wake of the significant capitalization of leading cryptocurrencies and the rapid development of new financing mechanisms for venture and fintech projects through the issue of digital tokens. Leading international organizations, such as the International Monetary Fund (IMF), the World Bank (WB), the Group of Seven (G7), the Group of Twenty (G20), the World Trade Organization (WTO), the Organisation for Economic Co-operation and Development (OECD), the Bank for International Settlements (BIS), the Financial Stability Board (FSB), the European Commission (EC), as well as international institutions that set standards in the financial sector, such as the Basel Committee on Banking Supervision (BCBS), the Committee on Payments and Market Infrastructure (CPMI), the International Organization of Securities Commissions (IOSCO) have published a number of scientific studies and reports to crypto-assets.

The main tasks facing international organizations are the unification of regulatory approaches related to the issue and turnover of crypto-assets at the international level, in particular, transactions with cryptocurrencies and global stablecoins and the development of unified regulation of the activities of crypto-assets issuers, considering different degrees of risk due to the differentiated nature of crypto-assets issued. The solution of these tasks is complicated by the trans-boundary nature of the crypto-assets market, the decentralized nature of the tools used, and the presence of numerous national regulators which use different approaches to the interpretation and classification of crypto-assets and often adhere to opposite approaches regarding the risks of their widespread use and regulation of crypto-asset turnover.

In its research, the IMF focuses on the main types of risks of crypto-asset turnover, among which it includes investor risks (operational and cyber risk of digital wallets and trading platforms suppliers; market, credit and default risk of cryptocurrencies issuers and digital tokens; liquidity risk of issuers and service providers; risk of fraud in crypto-assets allocation; and market integrity risk), money laundering and terrorist financing risks, and prudential and system risk [Cuervo, Morozova, Sugimoto, 2019; Schwarz et al., 2021]. In this regard, regulation, according to the IMF, should cover the following areas: allocation/issue of crypto-assets, trading in crypto-assets, storage of crypto-assets, and prudential regulation of crypto-assets issuers [IMF, 2021a].

IMF economists point to the growth of “cryptoization” (the increasing role of crypto-assets in the financial systems of individual countries and the growing use of such assets as a means of saving and payment, as well as an investment asset). The cryptoization of the economy is especially characteristic of emerging markets, such as South American countries, Turkey, and Russia. In this regard, the IMF recommends that national regulatory authorities give special priority to the implementation of global regulatory standards in respect of crypto-assets. In addition, national regulators should control the risks of crypto-asset turnover, especially in systemically important financial areas, and coordinate their activities for effective law enforcement and levelling of regulatory arbitration [IMF, 2021b, 2022]. The Joint Financial and Payments Systems Task Team of the IMF notes that one of the most critical issues is reflecting the cryptocurrency transactions in international statistics. Should cryptocurrency be considered as a financial asset, as an intangible asset, or as an analogue of cash, keeping in mind its economic content. In this regard, the most important task is the classification of crypto-assets based on the definition of the economic nature and principles used in macroeconomic statistics [FITT, 2022].

The WB focuses on the problems of the opportunities that new information technologies equivalent to blockchain open up for making digital currencies without the participation of central banks and the way money markets will operate in a decentralized manner without intermediaries. At the same time, WB economists note that the lack of a regulatory framework for transactions involving crypto-assets and transactions using smart contracts creates difficulties in a clear interpretation of such assets and compliance with the requirements for countering money laundering and avoiding taxation of transactions with crypto-assets at the global level. The WB believes that new technologies such as blockchain should be supported at the level of individual countries and at the international level, as they contribute to the development of fair competition, stimulate innovation in other sectors of the economy, and provide an incentive for further digitalization of public services [WBG, 2018].

The WB has also studied the market potential of using cryptocurrencies. Based on the gathered data for more than 130 countries for the period from April 2019 to June 2021, using regression analysis, the WB economists confirmed two hypotheses. First, that cryptocurrencies are used as a risky asset. Second, that users in the vast majority of countries perceive cryptocurrencies as a new hedging instrument, as an alternative to gold, against unfavourable macroeconomic conditions, such as high inflation or depreciation of the national currency. Cross-sectional regressions on the volume of cryptocurrency transactions for 2020 up to the first half of 2021 showed that the use of crypto-assets is higher in less economically developed countries and in developed countries with a higher level of information and communication technologies penetration [Feyen, Kawashima, Mittal, 2022].

The G7 countries are focusing on regulating the turnover of another kind of crypto-asset—stablecoins—and in particular, on the possibilities of their global use in cross-border settlements. The G7 countries pay primary attention to the issues of minimizing legal, regulatory and supervisory risks. Their efforts are aimed at legal certainty of global stablecoin turnover; effective management of the issue, and redemption of stablecoins, including investment rules underlying their stabilization mechanism; countering money laundering and terrorist financing; supporting the efficiency and integrity of the payment system's functioning; cybersecurity and operational stability; protecting the privacy of consumers/investors' personal data; and compliance with tax legislation. In this regard, according to the G7, global stablecoins can create risks not only for the implementation of monetary policy and the maintenance of financial stability, but also for the stability of the international monetary system, fair competition and antimonopoly policy in payments [BIS, 2019a]. These risks are systemic in nature, deserve careful monitoring and require further study. The G7 believes that no project to issue global stablecoins should begin its activities until the legal, regulatory, and supervisory risks mentioned above are eliminated or minimized through compliance with risk-proportional regulation.

The G20 countries, in their approaches to crypto-assets, seek to assess the potential benefits comprehensively and eliminate possible risks to global financial stability arising from the rapid development of technological innovations in the financial sector, including cyber risks and regulatory arbitration. The G20 countries note that due to the rapidly developing crypto-asset markets lacking effective regulation and supervision, it is possible to quickly achieve a situation in which crypto-assets will pose a threat to global financial stability because of their market scale and growing interdependence with the traditional financial system. G20 finance ministers and heads of central banks point to the need for close coordination of the efforts of international bodies setting standards in the financial sector, to accelerate the monitoring and exchange of information on regulatory and supervisory approaches to cryptocurrencies, stablecoins, and decentralized financial services, to eliminate regulatory gaps, and arbitration in order to maintain global financial stability and create the necessary conditions for safe innovation [FSB, 2022b; G20, 2022].

For its part, the WTO draws attention to how the accelerated digitalization of trade, including through the use of new payment instruments and investment mechanisms, can contribute to the financing of small and medium-sized enterprises. WTO economists point out that the use of cryptocurrencies as a means of international settlements could eliminate many shortcomings and increase the efficiency of cross-border payments if their market value were not so volatile [Patel, Ganne, 2021]. At the same time, the introduction of stablecoins to solve the problem of price volatility in international settlements may also be associated with many risks, which include legal uncertainty, reliable reserves management, data confidentiality, and compliance with tax legislation.

Economists of the BIS and the Basel Committee on Banking Supervision mainly focus on the prudential approach to the risks associated with the turnover of crypto-assets. In this regard, crypto-assets are subdivided by the BCBS into groups based on the following criteria: the nature of the obligation and/or the presence of a stabilization mechanism; clarity and legal certainty of rights, obligations, and interests arising from agreements on crypto-assets; the ability to manage economic risks in the issuer's ecosystem; and the presence of regulation and control over the activities of crypto-assets suppliers [BIS, 2021b]. Since the risks for different groups of crypto-assets differ, prudential requirements (requirements for credit and market risk, minimum requirements for leverage ratios and liquidity, disclosure requirements, and others) will also be differentiated.

The OECD, in its publications, pays special attention to the study of the use of new mechanisms for raising funds, such as Initial Coin Offering (ICO), to finance the activities of medium and small enterprises. Thus, OECD economists point out the distinctive features of new mechanisms for fundraising and their advantages and limitations, and also note the need to regulate ICO processes at the level of individual jurisdictions and develop coordinated approaches at the international level [OECD, 2019].

The OECD also pays close attention to the study of the cryptocurrencies' taxation in individual countries, as well as the need to unify fiscal policy (the applicability of value-added tax (VAT), income taxes, property taxes, and so on) in relation to transactions with crypto-assets at the international level. In particular, OECD economists reasonably point out that taxation issues are related to the exact interpretation of cryptocurrencies (for example, whether they are interpreted as property, goods, an analogue of a foreign currency, or otherwise), the definition of a taxable event, and the types of taxes that may be applicable to cryptocurrencies [OECD, 2020, 2022a]. The OECD also pays close attention to the study of new types of crypto-assets such as stablecoins and DeFi tokens, and the tax consequences of transactions involving their use.

In its advisory report on the unification of the reporting system for crypto-assets and amendments to common standards, the OECD considers the issues of reporting requirements' formalization, in particular the introduction of a requirement for service providers related to crypto-assets to provide reports on transactions and to apply due diligence procedures (for individual users of crypto-assets, for legal entities, and requirements regarding self-certification procedures). In addition, the OECD proposes to include information on the turnover of crypto-assets, including data on cryptocurrencies and their derivatives, in the system of automated exchange of tax information in the G20 countries [OECD, 2022b]. This would require crypto exchanges and other intermediaries to collect and provide tax authorities with data on the owners and participants of transactions with crypto-assets, similar to data on traditional financial transactions.

The activities of the FSB are aimed at eliminating potential risks of financial stability associated with digitalization. According to the FSB, it is critical to comprehensively eliminate emerging risks of financial stability in the crypto-assets markets to avoid fragmented approaches

that may lead to regulatory arbitrage. When assessing the risks of financial stability in transactions with crypto-assets, the FSB suggests dividing crypto-assets into groups according to the criterion of potential threats. At the same time, we are talking about four transmission directions of crypto-assets' impact on the financial system: welfare effects, trust effects, the impact on the financial sector, and application in payments and settlements [FSB, 2022].

In general, it should be noted that international organizations need to give priority to cross-border and intersectoral cooperation in the field of crypto-asset turnover, considering the international nature of their market.

Interpretations of Crypto-Assets

Despite the widespread use of the term “crypto-assets” in the economic literature, there is currently no generally accepted definition of this term. International organizations, financial regulators, and banking institutions use various definitions of crypto-assets to control their turnover and supervise the activities of their issuers.⁵

The target group of the European central bank on crypto-assets defines them in a quite narrow manner as any asset registered digitally which is not and does not represent a financial requirement of any person or a legal entity and which does not contain a proprietary right with regard to a legal entity [ECB, 2019; Manaa et. al., 2019]. The International Organization of Securities Commissions defines crypto-assets more broadly as private assets that depend on cryptography and distributed ledger technology or similar technology, which are part of their inherent value. Such assets may represent a currency, commodity or security, or be a derivative instrument for a commodity or security [IOSCO, 2020].

The FSB cites a definition of crypto-assets similar to that given by the International Organization of Securities Commissions [FSB, 2020], while the G7 Working Group on Stablecoins of the BIS considers crypto-assets primarily as means of payment [BIS, 2019a]. In turn, the Banking Supervision Committee of the BIS, adhering to the position of the G7 working group, draws attention to the fact that crypto-assets are not a legal means of payment and are not supported by any government or public authority [BIS, 2019b].

The European Securities Market Supervision Authority defines crypto-assets in the same way as the FSB. At the same time, it should be noted that the European Supervisory Authority uses the term “crypto-assets” to refer to both virtual currencies and digital tokens. The latter are defined as any digital representation of an economic interest that may represent value, the right to receive income, perform certain functions, or not have a specific purpose or designated direction of use [ESMA, 2019]. The European Securities Market Supervision Authority also draws attention to the fact that crypto-assets are digital assets that are not issued by central banks.⁶

In turn, the European Banking Supervision Service defines crypto-assets as assets that: depend on cryptography and distributed ledger technology, which are part of their inherent value; are not issued or guaranteed by a central bank or government authority; and can be used

⁵ Despite the fact that the term “crypto-assets” is becoming more common in the economic literature, a number of scientific studies and regulatory documents use narrower terms to designate a new class of financial assets, such as virtual currencies, cryptocurrencies, tokens, and so on. See BIS [2019b] and E. Su [2020]. Most of these terms are more appropriate to use for naming specific types and subspecies of crypto-assets, and it will be shown that there is a semantic relationship between these assets within the developing structure of a new asset class.

⁶ The observation that crypto-assets are not issued by state authorities, such as central banks, is fundamentally important for the subsequent classification of crypto-assets. This makes it possible to exclude both digital currencies of central banks and state virtual assets from the class of crypto-assets.

as a means of exchange and/or for investment purposes and/or to access a product or service [EBA, 2019]. The EC defines crypto-assets more broadly and technologically neutrally as a digital representation of value or rights that can be transferred and stored electronically using distributed ledger technology or similar technology, and which can potentially bring significant benefits to both market participants and consumers [EC, 2020]. Likewise, the OECD interprets crypto-assets as a digital representation of value based on a cryptographically secure distributed ledger or similar technology used to verify and protect transactions [OECD, 2022b].

An analysis of the approaches proposed by international financial organisations and European regulators to the term “crypto-assets” shows that, except for the definition given by the European Central Bank’s Target Group on crypto-assets (which, apparently, due to the specifics of the organization’s powers, covers only classic cryptocurrencies), all of the above definitions have a wide scope of application. Two recurring elements contained in different definitions of crypto-assets should be mentioned: first, the private nature of the asset and, second, the use of cryptography and DLT or similar technology. In fact, these elements are pivotal to the interpretation of crypto-assets.

This study adopts a definition of crypto-assets that is broad in an economic sense and technologically neutral, which makes it possible to include various types and varieties of virtual assets within it. According to this definition, crypto-assets are a new class of private digital assets that are not issued and are not guaranteed by state authorities, that embody values or rights recorded electronically in a distributed registry protected cryptographically and are used as a means of payment and savings and/or for investment purposes and/or for access to a certain product or service on the issuer’s platform as a result of the presence of public consensus. These characteristics of crypto-assets distinguish them from both traditional assets and digital currencies of central banks and so-called national virtual assets.

Modern Classification of Crypto-Assets⁷

Having formulated the definition of crypto-assets, let us now turn to the identification of the criteria used for their classification. The first criterion can be conditionally called institutional and emission criterion. This criterion is used by the ECB target group on crypto-assets. It allows classifying crypto-assets rather narrowly, as one of several types of a set of digital assets (Fig. 1).

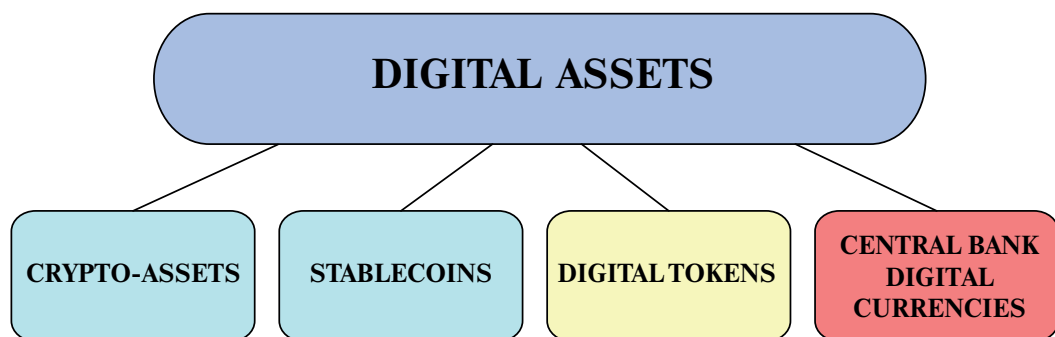


Fig. 1. Classification of Crypto-Assets by Institutional Emission Criterion

Source: Compiled by the author based on D. Bullmann, J. Klemm, and A. Pinna [2019].

⁷ In mid-May 2022, there were more than 19.4 thousand crypto-assets in circulation, and their total capitalization exceeded \$1.28 trillion. At the same time, these assets differed significantly in their nature and economic and functional characteristics [CoinMarketCap, n.d.a].

As can be seen in Fig. 1, according to the institutional and emission criterion, digital assets are divided into four groups, namely: crypto-assets (only cryptocurrencies are included here), stablecoins, digital tokens, and digital currencies of central banks [Bullmann, Klemm, Pinna, 2019]. This classification allows for a distinction between decentralized and centralized digital assets (in the case of cryptocurrencies and stablecoins respectively and focuses on specific issuers of digital assets—private or public (in the case of stablecoin/digital tokens and central bank digital currencies, respectively). At the same time, this classification criterion does not make it possible to fully disclose the economic features of certain types of crypto-assets, since, in fact, with this approach, crypto-assets become similar to cryptocurrencies.

Some economists [Maas, 2019] and regulators in developed countries, such as the UK, Switzerland, and the U.S.,⁸ propose a broader classification of crypto-assets. The criterion they use can be conditionally called functional (Fig. 2).

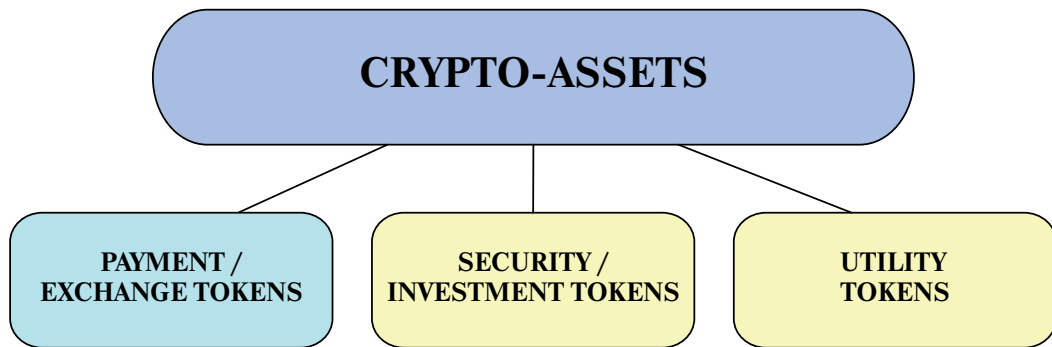


Fig. 2. Classification of Crypto-Assets by Functional Criterion

Source: Compiled by the author based on J. Clayton [2017], the FCA [2019], and FINMA [2018].

As can be seen in Fig. 2, according to the functional criterion, crypto-assets are divided into three main types: payment/exchange tokens (tokens used for payment purposes), security/investment tokens (tokens as digital analogues of traditional financial instruments), and utility tokens (tokens that perform application functions on the issuer's platform). In fact, payment or exchange tokens in this classification act as analogues of virtual currencies. Security/investment tokens are a digital analogue (in terms of rights and obligations) of traditional financial instruments, such as stocks and bonds. On the contrary, utility tokens grant holders the right to access a current or prospective product or service sold on the issuing company's platform. Such a classification is useful for understanding the initial approaches to the regulation of these assets. However, this classification has two significant drawbacks. First, cryptocurrencies belong to the category of tokens, which is not accurate from both economic and technology points. So, unlike tokens, cryptocurrencies do not embody the rights to any asset or any property powers. In addition, cryptocurrencies, unlike tokens, are issued, as a rule, based on a native blockchain. Second, it is not clear what place in this classification is taken by stablecoins, which need to be differentiated from both cryptocurrencies and investment tokens. The classification of all crypto-assets through tokens is inaccurate, since it includes in the composition of tokens other types of assets that are not tokens.

Another approach to the classification of crypto-assets was proposed by the EC and the Council in the draft EU Directive "On the Market of Crypto-Assets" [EC, 2020]. In this case,

⁸ For more details, see J. Clayton [2017], the FCA [2019], and FINMA [2018].

the criterion of targeted use is implemented, which can equally be called economic and legal (Fig. 3).

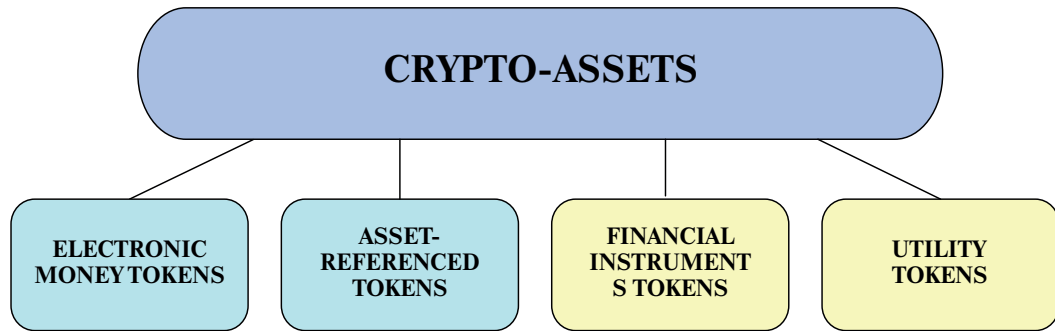


Fig. 3. Classification of Crypto-Assets by Intended Use

Source: Compiled by the author based on EC [2020].

As can be seen in Fig. 3, according to the intended use and the economic and legal nature of crypto-assets, it is proposed to divide them into electronic money tokens (tokenized e-money), asset-referenced tokens, tokens-financial instruments,⁹ and utility tokens. According to the proposals of the European Commission, electronic money tokens and asset-referenced tokens are used primarily for payment purposes (in fact, being stablecoins), while tokens-financial instruments and utility tokens perform investment and application functions, respectively. The disadvantage of this classification is that it does not include decentralized assets, such as cryptocurrencies, and also does not consider hybrid tokens in its structure, which include tokens of decentralized financing projects (DeFi tokens). Apparently, decentralized assets are excluded from the classification by the EC due to the absence of clearly identifiable issuers of such assets who answer for monetary or financial obligations and whose activities can be regulated. Such an exception, in fact, contradicts the broad definition of crypto-assets used by the EC itself, which includes the digital embodiment of both values and rights.

Finally, a peculiar approach to the classification of crypto-assets was proposed by the IMF in 2021 [FITT, 2022]. In this case, the criterion used can be conditionally called the counterclaim criterion (Fig. 4).

As can be seen in Fig. 4, in addition to the intended use (as a medium of exchange or a digital security) the IMF proposes to separate crypto-assets by the presence/absence of a counterclaim to another institutional unit: crypto-assets with a corresponding obligation and crypto-assets without a corresponding obligation. To a large extent, this classification is due to the IMF's attempt to distinguish between those types of crypto-assets that can be considered financial for macroeconomic accounting purposes (digital securities, pegged/backed stablecoins, digital currencies of central banks) and those that should be treated differently—as a new hybrid asset class (cryptocurrencies, payment tokens without counterclaim). The disadvantage of this classification is that it is not complex. It not only does not cover new varieties of crypto-assets such as DeFi tokens or NFT tokens, but also does not consider the fundamental difference between crypto-assets (assets of private issuers) and digital currencies of central banks (state

⁹ The definition of financial instruments in EU countries is contained in article 4 (15) of Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on Markets in Financial Instruments and Amending Directive 2002/92/EC and Directive 2011/61/EU [EC, 2014].

assets). This difference is important for the purposes of regulating the turnover of crypto-assets, both at the level of a separate jurisdiction and at the intercountry level.

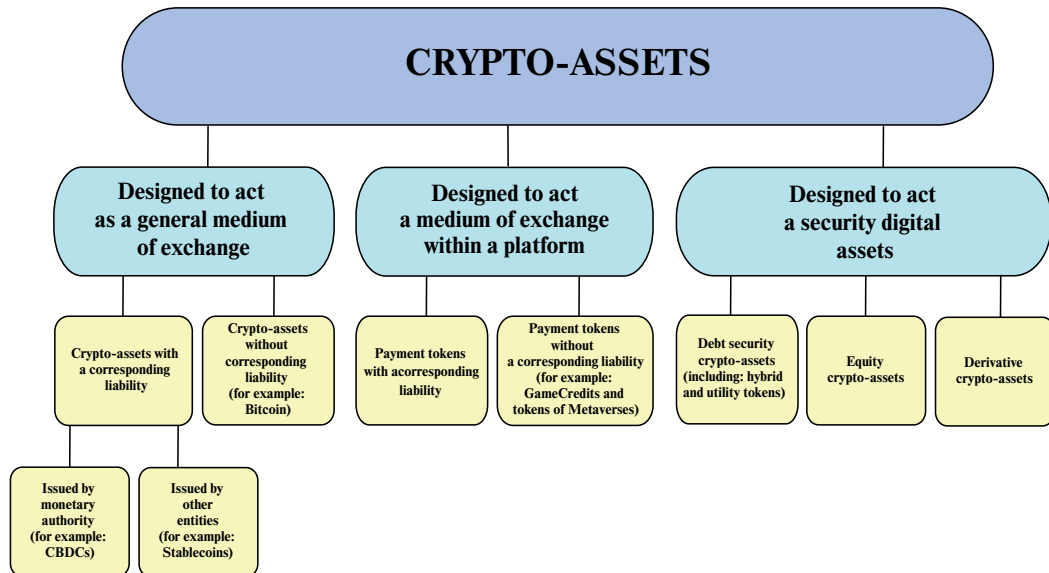


Fig. 4. Classification of Crypto-Assets by the Presence of a Counterclaim

Source: Compiled by the author based on FITT [2022].

All of these classifications have obvious disadvantages associated with the lack of a comprehensive and more detailed approach to the disclosure of the nature of crypto-assets and their systematization. A multi-criteria approach to the classification of crypto-assets will make it possible to take into account both the economic-functional and economic-legal specifics, as well as the emission-institutional features of various virtual assets in circulation.

Economic, Emission, Functional, and Legal Features of Crypto-Assets

From an economic perspective, all crypto-assets can be divided into two main types: virtual currencies and digital tokens. Virtual currencies include two main subtypes: cryptocurrencies (decentralized virtual currencies without binding or collateral) and stablecoins (virtual currencies with fiat, commodity, or other collateral/binding, which can be issued both centrally and in a decentralized manner). Theoretically, both cryptocurrencies and stablecoins can be used as an alternative to traditional fiat money in settlements between economic agents, performing basic monetary functions in one way or another. Digital tokens, on the contrary, are a type of crypto-asset that grants their holders certain economic and/or financial rights, such as the right to certain assets, products or services (or the right to access products, services or platforms). Digital tokens, in turn, can be divided into investment and utility tokens. At the same time, it is not always possible to accurately determine the true nature of digital tokens since they may have hybrid characteristics. To reveal the economic nature and determine the economic features possessed by a variety of crypto-assets in circulation, we will examine them in more detail.

Virtual currencies were the first type of crypto-asset that appeared as part of the initial stage of the development of the digital assets market (2008–15). From a functional standpoint, a virtual currency can be defined as a digital expression of value (price), which can be bought and sold digitally and function as a means of exchange and/or a unit of account and/or a means of preserving value but does not have the legal status of money at the national level (that is, it is not, from a regulatory perspective, a legal means of payment in most developed and developing countries). From an institutional perspective, virtual currency can be interpreted as a digital expression of value, which is issued by non-traditional issuers of modern forms of money—by the Central Bank, credit institutions or specialized issuers of electronic money—but at the same time can be used only as an alternative to generally recognized forms of money in settlements carried out in electronic networks.¹⁰

Among virtual currencies, the most important place is occupied by *cryptocurrencies*, which are their decentralized subtypes. Cryptocurrencies do not embody any obligation and do not have a clearly identifiable issuer. In this regard, the essential characteristics of cryptocurrencies are as follows.

The first is the trust mechanism of value formation. Cryptocurrencies are assets whose value is determined by supply and demand. Thus, their value (value) is based on a similar concept to commodities such as gold. However, unlike rare earth metals, which have a natural rarity, the volume of cryptocurrencies in circulation is regulated by a computer algorithm, which is a kind of artificial limiter of the value of their total emission volume. Moreover, unlike commodities such as gold, most cryptocurrencies do not have obvious alternative spheres of use. Cryptocurrencies are unsecured assets whose value is based on the belief that they can be useful in the future, for example, exchanged for other goods or services, or a certain amount of national currency [BIS, 2015].

The second is the presence of a built-in mechanism of a direct value exchange. The key innovation introduced by cryptocurrency systems is the use of distributed ledger technology (blockchain), which guarantees the remote exchange of value in the absence of trust between the parties. Such an exchange is carried out without the participation of intermediaries due to the implementation of various consensus algorithms that allow confirming the authenticity of transactions on the network. The presence of a mechanism for direct value exchange allows cryptocurrencies to be traded, likening them to cash in this characteristic.

The third is an institutional mechanism in which information and financial transactions are managed without the participation of intermediaries. In most cryptocurrency systems, there are no administrators managing the systems' functioning. The decentralized nature of cryptocurrencies also implies the absence of any identifiable operators, which in traditional payment systems are credit institutions or specialized payment service providers [Kochergin, 2017]. In fact, the study of the cryptocurrencies' nature goes far beyond the category of crypto-assets and concerns not only the issues of attributing them to a certain type of assets, but also touches on a much wider range of issues of monetary evolution and the principles of the monetary systems' modern and future structure.

Currently, there is no consensus in economics regarding the nature of cryptocurrencies (whether it is monetary or not, and if so, whether cryptocurrencies are a new kind of money or not). On the one hand, most national monetary regulators do not consider cryptocurrencies as money since the mechanism of their creation and management contradicts the principles of modern monetary systems and the nature of modern fiat money. However, even vociferous sceptics who do not consider cryptocurrencies to be a new kind of money indicate that cryptocurrencies have monetary functionality [Lee, Martin, 2020]. On the other hand, some econo-

¹⁰ For more details, see D.A. Kochergin [2017].

mists consider the leading cryptocurrency Bitcoin as a potentially new type of money—money of the first level (monetary reserves), which can be the foundation for building a new monetary system [Bhatia, 2021], as well as a full-fledged currency with an intrinsic value, acting as a kind of digital analogue of gold [Andryushin, 2019].

However, the costs associated with mining or forging/stacking cryptocurrencies do not give cryptocurrencies value by themselves. In this regard, it is not so essential whether cryptocurrencies have an intrinsic value or not, they must be socially useful. The market value of cryptocurrencies is determined primarily by the immediate possibilities of their current or future use. At the same time, certain types of virtual currencies may have the properties of commodity and credit money and even combine these properties, which distinguishes them from fiat money. Nevertheless, like fiat money, an essential characteristic of virtual currencies is their fiduciary nature (the presence of a trust value), which manifests itself in cryptocurrencies most clearly, due to the absence of a clearly identifiable issuer.

In fact, the first successful cryptocurrency was the Bitcoin cryptocurrency, launched in 2008.¹¹ Although Bitcoin was initially introduced as an electronic analogue of cash for inter-user settlements in a closed network environment,¹² its functionality later expanded. Over time, Bitcoin has become more often used as a means of saving and as an object of investment. Moreover, recently, many entirely new cryptocurrencies have appeared with specialized functionality that go beyond the means of payment and savings. So, in mid-May 2022, there were more than 10 thousand cryptocurrencies in circulation. At the same time, the total capitalization of the 10 leading cryptocurrencies was about \$953.8 billion or 74.9% of the total crypto-assets market capitalization [CoinMarketCap, n.d.b].

Like other subtypes of crypto-assets, cryptocurrencies are characterized by heterogeneity. They can be differentiated by different criteria, for example, by the nature of their occurrence, the process of generating new value units, the type of blockchain used, and the consensus algorithm, among others. At the same time, differences in the concept of creation and technological aspects of the issue of cryptocurrencies affect their economic and functional characteristics. For example, such characteristics include: the total supply of cryptocurrency units in circulation, the amount of remuneration for miners, the speed and cost of performing calculations in the blockchain, and user functionality. From an economic perspective, an important difference between cryptocurrencies is their intended use. Some cryptocurrencies, due to the technological features of their implementation and functional characteristics, are the most suitable for use as a means of savings and/or as a reserve asset (Bitcoin), others—for use as a means of payment (for example, Litecoin and Bitcoin Cash), and others—for use less as a means of payment and more as a tool/a platform for implementing decentralized applications based on smart contracts (for example, Ethereum, Cardano, EOS and TRON).¹³

Due to the decentralized nature of the issue, cryptocurrencies do not embody any requirement to the state, credit institution, or other issuer and therefore, from the perspective of banking regulators, are not absolutely safe to use as a means of exchange [BIS, 2019c]. In conditions of a limited number of cryptocurrencies holders and alternative directions of their use, as well as due to the lack of regulation of the volume of market supply, cryptocurrency rates are highly volatile. High volatility and a limited number of use cases do not currently allow cryptocurren-

¹¹ Bitcoin is the first successful cryptocurrency created by a programmer or a group of programmers known under the nickname Satoshi Nakamoto, which, due to its wide popularity and high capitalization, is currently a system-forming asset on the crypto-assets market.

¹² For more details, see Nakamoto [2008].

¹³ Smart contract is a program code written in a distributed ledger containing the terms of a contractual relationship and providing for their automatic execution in the future.

cies to perform monetary functions to a high degree.¹⁴ There are other problems with the use of cryptocurrencies. Also, many cryptocurrencies still do not scale adequately.¹⁵

The problems of price volatility and insufficient scalability of cryptocurrencies can currently be compensated for by modifying either the blockchains themselves, or by introducing technological solutions that increase the speed of transaction processing within existing systems.¹⁶ In addition, retail outlets or payment providers can use mechanisms for rapid exchange conversion of cryptocurrencies into fiat currencies immediately after receiving them in a payment transaction. However, as a consequence of cryptocurrencies' decentralized nature, there is virtually no possibility of complete levelling of their price volatility. In this regard, in the second half of the 2010s, the question arose of creating a kind of virtual currency that could simultaneously ensure the stability of the market rate and the issue of which could be better administered.

As a result, at the second stage of the development of the crypto-assets market (2015–present), stablecoins appeared.¹⁷ *Stablecoins* are sometimes defined as private cryptocurrencies with a fixed exchange rate or as cryptocurrencies that are resistant to significant price fluctuations due to a set of stabilization tools [Bullmann, Klemm, Pinna, 2019]. Such interpretations are not accurate, as they do not consider the essential features of stablecoins. By their nature, stablecoins are not cryptocurrencies or a variety of them, but are separate subtypes of virtual currencies. Stablecoins, as a rule, are secured/tied to the price of another reliable and highly liquid asset or asset pool, which ensures the stability of their value [OMFIF-IBM, 2019].

Unlike cryptocurrencies, which are usually issued in a decentralized manner and do not have a clearly identifiable issuer or, at least, an institution that would be financially responsible to users, stablecoins represent a “claim” on a specific issuer (on its underlying assets, funds or other rights) [BIS, 2019a]. In fact, stablecoins combine innovative mechanisms of direct value exchange and financial transaction management without the participation of intermediaries with centralized emission mechanisms and differentiated methods of maintaining price stability. Thus, the economic substance of stablecoins is manifested in the following properties. First, they are issued by identified issuers on the blockchain in the form of circulating digital monetary obligations or certificates of deposit. Second, they maintain the stability of the exchange rate by pegging to the basic low-volatility monetary or commodity security or through the use of algorithmic technologies. Third, they can be used as a means of exchange and/or a means of payment, as well as savings funds from individuals besides the issuer.

The first stablecoin secured by the U.S. dollar, Tether USD (USDT),¹⁸ was issued in 2015 by Tether Limited, a company associated with the Bitfinex crypto exchange. Later, many stablecoins emerged with different security methods and mechanisms to support a stable price. So, in mid-May 2022, there were more than 90 thousand cryptocurrencies in circulation. The total capitalization of the 74 leading stablecoins was \$161.1 billion, or 12.6% of the total capitalization of the crypto-assets market. At the same time, the trading volume of stablecoins was

¹⁴ Thus, former Fed Chair A. Greenspan called Bitcoin irrational money, comparing it with an early form of American money, the so-called “continental currency” [Moyer, 2017].

¹⁵ Cryptocurrency scalability is the ability of a cryptocurrency blockchain to cope with an increase in the number of transactions processed per unit of time by adding architected resources without compromising the quality of the blockchain.

¹⁶ One of such solutions is the use of a special Lightning Network, which is a protocol of the second layer of blockchain networks that allows for an increase in the scalability of cryptocurrencies and reduces transaction fees.

¹⁷ The concept of linking virtual currencies to certain assets was first proposed in a white paper by Mastercard [Willett, 2012].

¹⁸ Initially, USDT was fully secured by U.S. dollars, but in early 2019, the company reported mixed collateral. Such collateral, in addition to U.S. dollars, includes commercial paper and other liquid assets of the issuer.

\$81.92 billion, or about 89.23% of the total daily trading volume on the crypto-assets market [CoinMarketCap, n.d.c].

Due to the technological features of the issue, as well as due to various ways and mechanisms to support price stability, stablecoins can differ significantly from each other [Houben, Snyers, 2020]. Stablecoins can be divided according to different classification criteria: the mechanism of stabilization of their market price (assets and technologies used to ensure price stability), the design of implementation (economic and legal characteristics), and systemic significance (scale and geography of use).

Thus, according to the mechanism of stabilization of the market rate, stablecoins can be divided into the following groups: with pegging to/backed by traditional assets, with pegging to/backed by crypto-assets, and unsecured (algorithmic).¹⁹ The main ways to secure stablecoins tied to traditional assets are fiat currencies,²⁰ commodities (such as rare earth metals and hydrocarbons),²¹ and other assets characterized by low price volatility.²² The accessibility of traditional assets, their high liquidity, and predictable value make these assets a frequently used means of securing stablecoins.²³ However, since stablecoins linked to traditional assets are not only issued centrally, but also centrally redeemed, their circulation may be associated with credit risk. Also, a prerequisite for the widespread use of such stablecoins is public trust in the issuer, which controls their issue and backing. The most well-known examples of stablecoins pegged to traditional assets are: Tether USD (USDT), USD Coin (USDC), Binance USD (BUSD), TrueUSD (TUSD), Pax Dollar (USDP) and Pax Gold (PAXG).

The main ways to secure stablecoins pegged to crypto-assets are via individual native tokens/cryptocurrencies and baskets of cryptocurrencies. Such stablecoins are designed to solve the main problem of stablecoins backed by traditional assets (centralized stablecoins)—to reduce credit risk, as well as the risk of storing reserve assets. In the case of stablecoins pegged to crypto-assets, their collateral is in the same blockchain as the stablecoins themselves. Thanks to this, the stablecoins secured with cryptocurrencies are controlled by the code and the obligations are repaid automatically. Nevertheless, such stablecoins are characterized by a less stable reserve asset price than in case of fiat collateral, as well as the possibility of automatic liquidation of stablecoins during the depreciation of the underlying cryptocurrency and greater complexity in the mechanism of maintaining the stablecoin rate. Typical examples of such stablecoins are Dai (DAI), Neutrino USD (USDN), sUSD (SUSD), and Liquidity USD (LUSD).

Unlike secured stablecoins, the market rate of unsecured (algorithmic) stable coins is not directly supported by a reserve of fiat currencies, commodities or cryptocurrencies. In this case, a trust model is used to ensure the value of stablecoins similar to that used in the issue of fiduciary money, but only with the use of algorithmic technologies that regulate the aggregate volume of the market supply of stablecoins and maintain the stability of their prices. Currently, there are three main mechanisms for stabilizing unsecured stable coins: one at the applications level,²⁴ one at the protocols level, and a hybrid that combines elements of the first two mechanisms.²⁵

¹⁹ This classification criterion reveals to the greatest extent the economic nature of this subtype of virtual currencies. That is why it will further be used for stablecoins in the author's classification of crypto-assets.

²⁰ In some studies, such varieties of stablecoins are distinguished into a separate variety, calling them tokenized cash. For more details, see D. Bullmann, J. Klemm, and A. Pinna [2019].

²¹ Currently, gold is most often used as commodity collateral.

²² For more details, see D.A. Kochergin [2020].

²³ Stablecoins backed by traditional assets accounted for over 85% of total stablecoin market capitalization in May 2022 [CoinMarketCap, n.d.c].

²⁴ The most famous is the concept of the so-called "seigniorage shares," proposed by Robert Sams [2015]. It is based on the idea that it is possible to create a smart contract on behalf of the issuer that will control the volume of the market supply of a stablecoin in order to maintain its fixed exchange rate against the U.S. dollar.

²⁵ For more details, see D.A. Kochergin and A.I. Ivanova [2022].

Among modern examples of algorithmic stablecoins are TerraUSD (UST), USDD (USDD), Fei USD (FEI), and Frax (FRAX). One of the main problems of the development of unsecured stablecoins, primarily regulated at the application level, is the difficulty in realizing the main advantages of such stablecoins without control over the activities of issuers and or auditing of their financial condition.²⁶

According to the implementation design (economic and legal characteristics), stablecoins can be divided into the following groups: tokenized electronic money (stablecoins linked to fiat currencies), asset-referenced stablecoins (stablecoins backed/pegged to goods and baskets of currencies/goods/assets), and algorithmic stablecoins. This classification is due to various economic and legal consequences and financial risks that arise as a result of the use of various mechanisms to ensure the price stability of the stablecoin [EC, 2020].

In the case of stablecoins linked to fiat currencies, such stablecoins will represent a new form of electronic monetary obligation of the issuer, that is, they are a tokenized form of electronic money.²⁷ In the case of stablecoins pegged to assets, stable coins will embody the property right to a unit of the underlying asset that serves as their backing and will not represent a monetary obligation.²⁸ For example, stablecoins pegged to gold can certify the ownership of a stablecoin holder for one ounce of gold stored in the issuing company's bank depositories, thereby being a digital analogue of deposit certificates. In practice, the differences between electronic money tokens and asset-referenced stablecoins may not be so obvious without clear legal and regulatory frameworks in most countries. Thus, the issuer of stablecoin pegged to a fiat currency may not undertake to repay the stablecoins at a fixed rate or change the conditions/mechanisms for ensuring its price stability after putting the stablecoins into circulation. In this case, stablecoins can no longer be interpreted as electronic money tokens.

In order of systemic significance (scale and geography of the use of the stablecoin), stable coins can be divided into local and global/significant ones (see Fig. 5). Local stablecoins (LSC) are usually issued by financial or fintech companies directly or indirectly associated with large cryptocurrency exchanges, such as Bitfinex, PayPal, and Gemini, engaged in the trade with crypto-assets. Global/significant stablecoins (GSC) [BIS, 2019a] can be issued by large investment banks and banking consortia, for example, JPM Coin (JPMorgan Bank), Signet (Signature Bank), and others. However, of most interest are the global/significant stablecoins²⁹ developed within their own ecosystems by multinational bigtech companies such as Diem Association (Fig. 5).³⁰

As can be seen in Fig. 5, global/significant stablecoins can also be divided into significant electronic money tokens and significant asset-referenced stablecoins, while algorithmic stablecoins do not yet have signs of significance.

²⁶ For example, as a result of capital outflow and depreciation of the LUNA token, which underlies the pegging of the TerraUSD stablecoin exchange rate to the U.S. dollar, from 9 May 2022, TerraUSD lost its exchange rate pegging and ceased to function as a stablecoin.

²⁷ Electronic money tokens are a type of crypto-asset, the main purpose of which is to use them as a means of exchange, and which are designed to maintain their price stability by pegging to the value of fiat currency, which is a legal payment instrument [EC, 2020].

²⁸ Asset-referenced stablecoins are defined as a type of crypto-asset in which price stability is maintained by pegging to the value of several fiat currencies that are legal payment instrument for one or more goods or one or more crypto-assets, or a combination of such assets [EC, 2020].

²⁹ In some publications, global/significant stablecoins are also referred to as systemic stablecoins. See Bank of England [2021].

³⁰ On the characteristics of these stablecoins see Z. Amsden et al. [2020].

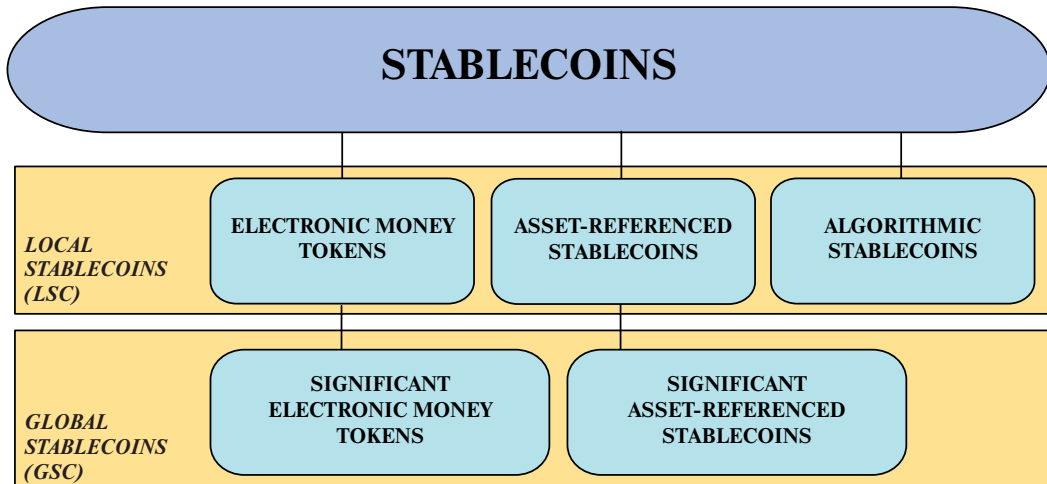


Fig. 5. Classification of Stablecoins According to Implementation Design and System Importance

Source: Compiled by the author based on EC [2020] and HM Treasury [2021].

It should be noted that stablecoins can have a number of common characteristics with digital tokens, and sometimes even be identified as tokens.³¹ Like tokens, stablecoins are usually issued not on the original, but on an existing blockchain and represent a requirement for an identifiable issuer or assets serving as collateral. However, this approach seems not really justified. While digital tokens are issued with very specific functions or for a specific purpose (for example, to grant their holders ownership rights and/or the right to receive dividends, or to grant access rights to a specific product or service), stablecoins, as a rule, do not provide such functions. Stablecoins are intended to be used as a universal means of exchange, payment, and savings, used both in trading on the exchange market and in the retail market of goods and services [Houben, Snyers, 2020]. However, stablecoins and investment tokens can function in a hybrid way, in which such crypto-assets will be classified as hybrids.

Digital tokens, as well as stablecoins, appeared at the second stage of the development of the crypto-assets market and reached the highest issuing volumes in 2017–18 [2019]. Digital tokens are digital assets that are issued by clearly identified issuers using distributed ledger technology (usually on the blockchain) and give to their owners' debt, equity, and dividend rights or access rights to the consumption of certain goods on the issuer's platform. Unlike virtual currencies, digital tokens are issued to raise capital for the implementation of new venture projects, as well as to finance startups or the development of innovative products or services. The two main subtypes of digital tokens are investment tokens and utility tokens.

Investment tokens grant their owners economic rights in the form of ownership rights and/or rights to receive interest income or dividends. Investment tokens are often issued for raising capital through the mechanisms of initial coin/token offering (ICO/ITO)³² or initial exchange

³¹ For example, Coinmarketcap.com, the largest information aggregator of the crypto-assets market, identifies stablecoins Tether, DAI, and others as tokens.

³² At the beginning of the second stage of the development of the cryptocurrency market, the term ICO was mainly used to refer to the pre-sale offer of tokens (crowdsale) to attract investment in order to cover the costs of developing new cryptocurrencies. Particularly, as a result of such crowdsales, the costs of creating the Ethereum (ETH) and Cardano (ADA) cryptocurrencies were covered. Currently, the term ICO has become widely used by economists and regulators to denote the mechanism for issuing digital tokens by fintech compa-

offering (IEO)³³ and demonstrate similarities with traditional debt and equity instruments placed through an IPO³⁴ [Blemus, Guegan, 2020]. Nevertheless, not every token issued under the ICO/IEO can be positioned by the issuer and qualified by the regulator as a security. In this regard, in the process of ICO evolution, a specialized mechanism for fundraising through the initial security token offerings (STO) has appeared. Such tokens are initially qualified as digital securities and their issuers are subject to national regulatory requirements for the issue of financial instruments.

Despite the large number of ICOs held annually, only a small number of them attract a sufficient amount of capital and an even smaller number of companies that have raised funds for investment projects are successful.³⁵ In this context, many crypto exchanges have issued their tokens through IEOs, which are often considered by economic agents as more promising. Examples of such tokens are Huobi Token (HT), the token of the Huobi crypto exchange, and KuCoin Token (KCS), the token of the KuCoin crypto exchange. These examples of tokens usually belong to the group of tokens-securities. At the same time, recently, investment tokens created as a result of the so-called tokenization of traditional assets (both financial and non-financial) have been actively distributed.³⁶ Such tokens belong to a group of tokenized assets. If, in the case of tokens-securities, we are talking about the offering of rights to new digital assets, then in the case of tokenized traditional assets, we are talking about the digitalization of existing ones, in the form of a record in the blockchain. The latter may be attributed not only to financial assets, but also to any low-liquid traditional assets, such as real estate or works of art.

Just as in the case of investment tokens, *utility tokens* are issued to raise funds, usually to finance the further development of the issuer's application, product or service. However, unlike investment tokens, the main purpose of utility tokens is not to generate future cash flows for investors, but to provide access through the issuer's blockchain infrastructure to products or services, as well as to form a user base. The value of utility tokens, as a rule, derives from their functionality.³⁷ Among the most well-known examples of utility tokens are Golem (GNT), Filecoin (FIL), and Basic Attention Token (BAT), each of which facilitates access to a specific service—computing power (GNT), data storage (FIL), and advertising content (BAT). Utility tokens can also be used as a means of payment for goods or services in the issuer's infrastructure, as is the case with the Binance exchange token, Binance Coin (BNB). However, they cannot be used for payments beyond its scope. This fundamentally distinguishes utility tokens from cryptocurrencies and stablecoins, which is due to the different nature of these assets.³⁸

Both investment and utility tokens can grant their holders certain management rights when issued, for example, the voting rights on profit distribution (investment tokens) or the right to vote

nies in order to attract investors' funds to the project in exchange for fiat money or other crypto-assets. Therefore, today the abbreviation ICO can be more accurately deciphered as "initial crypto-assets offer."

³³ A more advanced mechanism for the initial placement of tokens through the mediation of crypto exchanges, which is more reliable but also more expensive.

³⁴ Unlike IPOs, ICO/IEO mechanisms are characterized by the use of a simplified and shorter time of offering, wider access for potential investors, and fewer requirements of financial reporting.

³⁵ The most successful in terms of the amount of funds raised are the initial offers of crypto-assets of the following projects: EOS ICO (\$4.1 billion), Telegram ICO (\$1.7 billion), and Bitfinex IEO (\$1.0 billion). For more details, see PWC [2020].

³⁶ The tokenization concept is based on the capabilities of distributed ledger technology to create a system of asset ownership rights management by creating and fixing their unique digital representations. Tokenization is the process of creating a unified identifier in a distributed ledger in the form of a token [Heines et al., 2021]. Thus, a unique and permanent link can be established for the digital representation of almost any asset, both financial and non-financial [Harwood-Jones, 2019].

³⁷ For more details, see C. Brown, T. Dolan, and K. Butler [2019].

³⁸ In this case, an analogy is appropriate with electronic money, which is accepted as a universal means of payment, while prepaid single-use instruments are only used to pay for goods/services from their issuer.

on updates in the functional infrastructure of the issuer's services (utility tokens). After the issue, both subtypes of tokens can be traded on secondary markets (crypto exchanges), where transactions with them can be made both for fiat money and for cryptocurrencies. Although theoretically, it is possible to make a clear separation between investment and utility tokens, in practice it is not always possible to attribute a crypto-asset to a certain subtype. This is because digital tokens can have mixed characteristics. For example, digital tokens represent a combination of an investment and/or utility token and/or a payment instrument. Thus, tokens can be created and positioned by the issuing company as utility tokens, but actually function as investment ones.³⁹ Companies or exchanges can issue tokens as investment tokens, but in the future they can also be used for payment purposes.⁴⁰ Digital tokens that embody combinations of the above characteristics can be described as *hybrid tokens*. One of the first known examples of the hybrid token is Crypterium (CRPT), which can be used both to pay a transaction fee when using the issuer's services and to receive a discount on future services, as well as a share in the issuer's profit.

A separate type of hybrid token is the so-called *decentralized finance ecosystem token*, or DeFi token.⁴¹ As a rule, DeFi tokens give their holders the right to vote and control the development direction of the basic protocol of the blockchain platform. Such tokens can have a credit nature or be derived from other digital assets. Most typically, the so-called mechanisms of initial DEX offering (IDO) are used to offer DeFi tokens. The essence of IDO is that the tokens issued by issuers are already provided with pools of investor liquidity on decentralized exchanges, which allows their underwritten offering. Examples of DeFi tokens are Uniswap (UNI), Chainlink (Link), and Aave (AAVE) [CoinGecko, n.d.].

Another type of tokens, which can also be classified as hybrid, is the *non-fungible token*, or NFT tokens. Non-fungible tokens can be defined as digital tokens issued for declaring ownership rights, or granting rights to an object, or fixing a specific right, which are unique, and a record of which is fixed in the blockchain. Such tokens are non-fungible, that is, they cannot be replaced with the same amount of the same kind of crypto-asset. Non-fungible tokens have unique properties that distinguish them from other types of crypto-assets. Specifically, NFT tokens are incompatible (they cannot be used on other platforms), indivisible (tokens cannot be divided into smaller parts or nominal values), indestructible (token data is stored in the blockchain using a smart contract so it cannot be destroyed, deleted or replicated, unrestricted in the ownership rights (the tokens are owned by collectors, not the companies that create them),⁴² and verifiable (NFT tokens store historical data on the current and previous owners of the token in the blockchain, providing the necessary authentication). Currently, the IDO mechanism is used for the initial offering of NFTs, as in case of DeFi tokens. The main examples of NFT tokens are gaming tokens, tokens for works of art, music, media, and sports events, collectible tokens, and tokens for physical assets.

The above study of economic, functional, emission, institutional, and other features of diverse crypto-assets makes possible the following classification (Fig. 6).

³⁹ The most famous example is the GRAM (Telegram) token, implemented on the Telegram Open Network (TON) blockchain platform. The token was positioned by the company in the financial market as a utility token. However, in 2019, after studying the nature and functionality of the token, the U.S. Securities and Exchange Commission (SEC) determined that the token is of the investment type.

⁴⁰ For example, the BNB token was initially positioned by Binance as an investment token, but now it can also be used to pay for various exchange services.

⁴¹ Decentralized Finance (DeFi) is a platform model for organizing financial relations without the participation of intermediaries using distributed ledger technology, in which transactions are automated through smart contracts.

⁴² This contradicts modern ways of purchasing digital goods, such as music or movies on streaming platforms, where users do not actually own what they purchase, since they only pay a license to listen to music or watch movies.

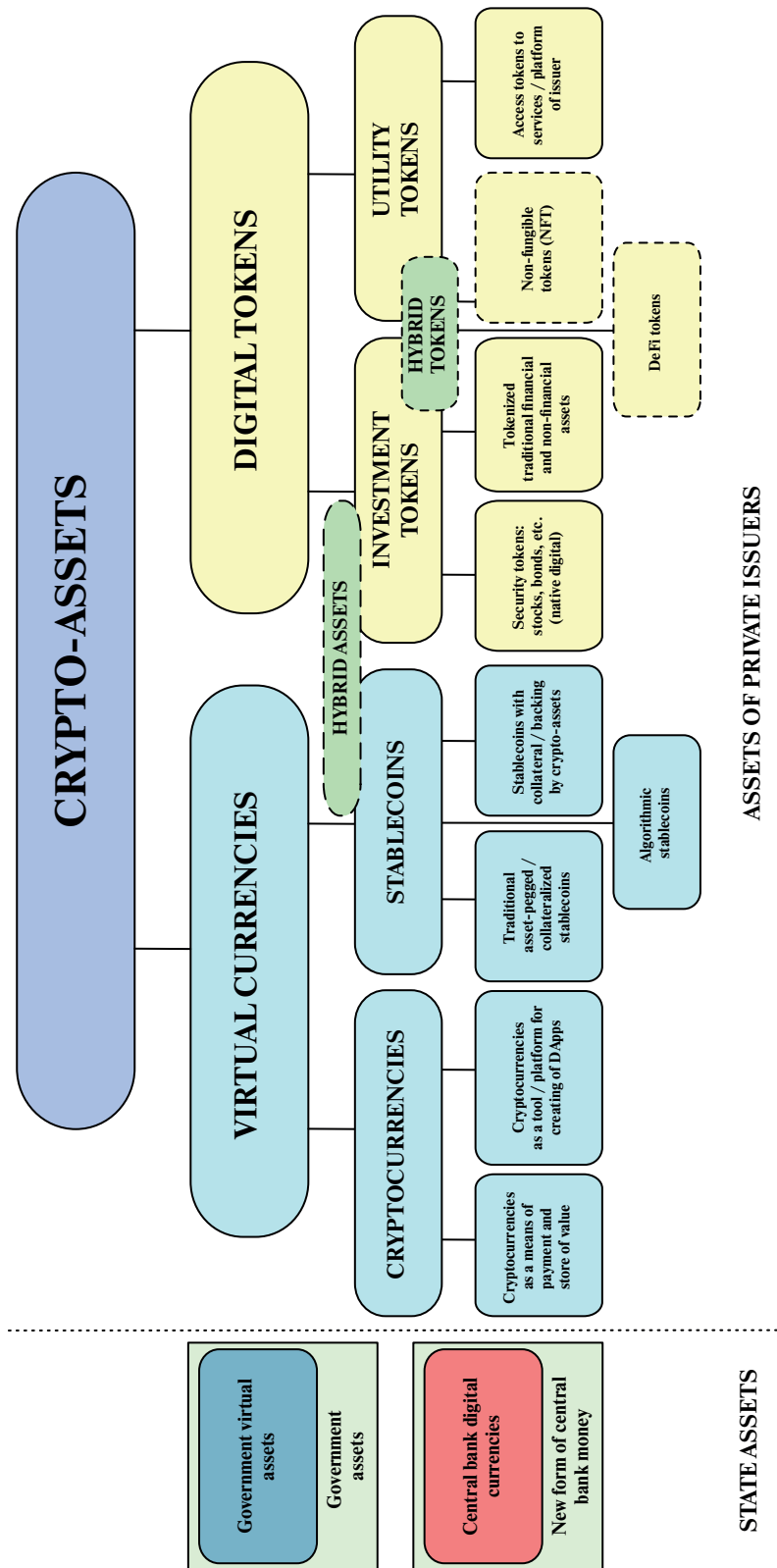


Fig. 6. Classification of Crypto-Assets Based on a Multi-Criteria Approach

Source: Compiled by the author.

As can be seen in Fig. 6, crypto-assets are one of the types of digital assets that are issued by private issuers using cryptographic technologies and distributed ledger technology. There are also digital assets that are not crypto-assets by their very nature. For example, *national virtual assets*, as well as *digital currencies of central banks*, do not fall under the definition of crypto-assets, since their issuers are state authorities or institutions and, as a rule, centralized accounting technologies are used in their issue, which is why such assets have excellent characteristics.

National virtual assets are issued, as a rule, in countries that are in a difficult financial situation, aggravated by economic sanctions. Such assets are sometimes mistakenly referred to as state cryptocurrencies or similized to digital currencies of central banks (see, for example, A. Kiselyov [2019]). In fact, these assets have more in common with stablecoins and hybrid tokens. Thus, on the one hand, it is declared that the issue of such assets is secured by real assets (petroleum or gold, for example). On the other hand, the release of these assets is carried out through the mechanism of initial offering of tokens, implemented by state authorities to attract external financing and normalize settlement relations, bypassing economic sanctions. Examples of national virtual assets are El Petro and PayMon, which are issued on a centralized basis under the control of the state authorities of Venezuela and Iran, respectively.

Central bank digital currencies (CBDCs) can be defined as an electronic obligation of the central bank, expressed in a national monetary unit and acting as a means of payment and a means of saving [Kochergin, 2021]. Unlike crypto-assets, digital currencies of central banks are issued by the state, not by private issuers. Also, digital currencies of central banks, unlike crypto-assets and national virtual assets, are a new form of money that acts as a legal means of payment within the national jurisdiction.⁴³ The CBDC issue is aimed at maintaining demand for central bank money, developing monetary policy tools, improving the security and efficiency of payment systems in the conditions of digitalization of non-cash money circulation, and the widespread use of virtual currencies.⁴⁴ Examples of central bank digital currencies in circulation are Sand Dollar (Central Bank of the Bahamas) and DCash (Eastern Caribbean Central Bank) [Auer et al., 2021].

At the same time, the largest CBDC project currently is the digital yuan (e-CNY) issue project implemented by the People's Bank of China (PBC) [Working Group on E-CNY Research and Development, 2021]. Currently, dozens of central banks, including the European Central Bank [2020a], the Bank of England [2020], and the Central Bank of Russia [2021a] are informing about the development of their national digital currencies.⁴⁵

Summing up the study of the economic features of various crypto-assets, it should be noted that their market continues to develop rapidly, so any current classifications may undergo changes in the future due to the emergence of new types and subtypes of crypto-assets. Nevertheless, the classification of crypto-assets presented in this article is currently the most comprehensive and omnifaceted and allows for the consideration of economic, emission, and functional features (among others) of various crypto-assets, as well as the substantiation of the main approaches to their regulation.

⁴³ Despite the fact that there are a number of similar characteristics of national virtual currencies and digital currencies of central banks with crypto-assets, such as issue-accounting technology (the issue of national virtual currencies and digital currencies of central banks can also be carried out in the form of digital records in a distributed registry) and intended use (use as a means of payment and/or for investment goals), the economic nature of these instruments and their institutional frameworks differ.

⁴⁴ In fact, the motives for issuing central bank digital currencies can be more diverse—from solving the problems of financial inclusion to controlling the targeted use of funds. For more details, see D. A. Kochergin [2021].

⁴⁵ For more details, see: R. Auer et al. [2021].

The Main Approaches to Regulating Crypto-Asset Turnover

The study of the world experience in regulating transactions with crypto-assets shows that the main regulatory problems in this area are related to the practical lack of fundamental research on the economic nature of virtual assets, which leads to significant differences in the regulation of transactions with crypto-assets at the state level. As a result, the regulatory and legal regimes for the turnover of crypto-assets are not always adequate to the risks of their use in the payment and investment spheres. Of course, the lack of regulatory control of transactions with crypto-assets is fraught with widespread use of these assets in the shadow economy (money laundering, terrorist financing, tax avoidance, and so on), which can destabilize the functioning of national financial markets and payment systems and lead to significant financial losses for economic agents. At the same time, excessively strict regulation of transactions with crypto-assets can slow down the innovative development of the financial and payment spheres and reduce market competition and investment attractiveness.

The main difficulties of modern crypto-asset turnover regulation primarily relate to their decentralized kinds (cryptocurrencies, algorithmic stablecoins, hybrid tokens, and so on), which is due to the peculiarities of their economic, technological and institutional features. Such assets are managed by internal protocols and algorithms, and external regulation of their turnover, which often cannot be directed at specific issuers, cannot fully offset the economic risks associated with the growing use of such assets. Special attention should be paid to regulating the turnover of global/significant stablecoins due to the large-scale and wide geography of their potential use as a means of payment and savings. The search for a “golden mean” in the regulation of decentralized and significant crypto-assets is a modern challenge for regulators around the world.

Recommendations of International Organizations

Currently, there is no unified system of international regulation of crypto-asset turnover. However, many international institutions, primarily the FSB, in cooperation with the members of the G7 and the G20, as well as the OECD, are making attempts to unify certain approaches and rules, as well as to exchange information related to the turnover of crypto-assets at the international level.

Thus, the FSB, in relation to the turnover of crypto-assets, points to the following areas that require constant monitoring by national regulators: an increase in the participation of the banking sector in ecosystems of crypto-assets not covered by regulation control, an increase in investments of institutional investors in crypto-assets using high leverage, an increase in the acceptance of crypto-assets in payment transactions, an increasing role of platforms for trading crypto-assets in the financial market, growing financial losses due to the volatility of crypto-asset rates, loss of confidence in stablecoins and sale of reserve assets, rapid growth of the DeFi sphere without identifiable intermediaries responsible for managing their ecosystem, and finally, growing differences in the regulation of crypto-assets between countries, leading to the emergence of regulatory arbitration and systemic risks [FSB, 2022a].

The FSB also pays special attention to the unification of requirements for global stablecoin arrangements (GSC arrangements). In this regard, in October 2020, the FSB published the so-called high-level recommendations on the regulation and supervision of global stablecoin arrangements. Recommendations are as follows:

- 1) authorities should have and utilize the necessary powers and tools, and adequate resources, to comprehensively regulate, supervise, and oversee a GSC arrangement and its associated functions and activities and enforce relevant laws and regulations effectively;

2) authorities should apply comprehensive regulatory, supervisory and oversight requirements, and relevant international standards to GSC arrangements on a functional basis and proportionate to their risks;

3) national regulators should cooperate and coordinate with each other, both domestically and internationally, to foster efficient and effective communication and consultation in order to support each other in fulfilling their respective mandates and to ensure comprehensive regulation, supervision, and oversight of a GSC arrangement across borders and sectors;

4) authorities should ensure that GSC arrangements have in place a comprehensive governance framework with a clear allocation of accountability for the functions and activities within the GSC arrangement;

5) national regulators should ensure that GSC arrangements have effective risk management frameworks in place, especially with regard to reserve management, operational resilience, cyber security safeguards, and AML/CFT measures, as well as “fit and proper” requirements;

6) authorities should ensure that GSC arrangements have in place robust systems for collecting, storing and safeguarding data;

7) authorities should ensure that GSC arrangements have appropriate recovery and resolution plans;

8) national regulators should ensure that GSC arrangements provide users and relevant stakeholders with comprehensive and transparent information necessary to understand the functioning of the GSC arrangement, including with respect to its stabilization mechanism;

9) national regulators should ensure that GSC arrangements provide legal clarity to users on the nature and enforceability of any redemption rights and the process for redemption, where applicable;

10) authorities should ensure that GSC arrangements meet all applicable regulatory, supervisory, and oversight requirements of a particular jurisdiction before commencing any operations in that jurisdiction, and adapt to new regulatory requirements as necessary [FSB, 2020].

According to the FSB, consistent application of the recommendations outlined above by all authorities in countries where global stablecoin arrangements operate can help ensure comprehensive regulation and reduce the possibility of regulatory arbitration. Integrated surveillance systems should also solve such important tasks as countering money laundering and terrorist financing, ensuring cybersecurity and protecting the confidentiality of market participants’ data, and maintaining fair competition.

For its part, the OECD makes many recommendations to national regulatory authorities regarding the taxation of virtual currencies. Thus, the OECD points out the need to develop a clear legislative framework for virtual currencies, justify the adopted tax regime for transactions with virtual currencies, decide whether the tax regime of virtual currencies will correspond to the tax regime of other assets, decide whether it is possible to provide a simplified tax regime for individual transactions with crypto-assets/stablecoins or individual companies (small/medium-sized enterprises and retail outlets), and decide how the tax regime in relation to virtual currencies will be consistent with the objectives of fiscal and monetary policy [OECD, 2020, 2022b].

The Main Approaches to Regulating the Turnover of Crypto-Assets in Developed Countries

Currently, regulators in economically developed countries use the so-called technologically neutral approach to the regulation of crypto-assets. The essence of this approach is that assets

of the same economic nature that cause similar economic risks, regardless of the technology of issue, accounting and/or settlement used, should be regulated similarly. Although this approach is theoretically sound enough, it has certain drawbacks. In particular, new information technologies used in financial assets affect the directions of use and the breadth of such assets' turnover, making them more universal when using on the one hand, but on the other hand, generating new risks. An example is tokenized electronic money or significant stablecoins.

Modern regulation of crypto-assets at the state level can be considered in three main directions: in the monetary/payment and investment spheres, in the field of countering money laundering and the financing of terrorist activities, and in the field of taxation.

In most developed countries, three main interpretations used to regulate the turnover of cryptocurrencies prevail: property (U.S., UK, and Russia), currency/means of payment⁴⁶ (Germany and Japan), and good (China and France). Although each of these interpretations of crypto-assets has its advantages and disadvantages, the interpretation of cryptocurrencies as property seems the most justified from a regulatory perspective, since it allows for the inclusion of a wide list of assets in its composition: money, goods, financial instruments, and others. According to the degree of rigidity of regulation of cryptocurrency turnover, all countries can be divided into six groups.

The first group includes countries in which the Bitcoin cryptocurrency is recognized as a legal means of payment (El Salvador and the Central African Republic). In these countries, Bitcoin can be used in all payment transactions along with the U.S. dollar and the Central African CFA franc, respectively. All trading and service points in these countries are required to accept Bitcoin on a par with fiat currencies.

The second group includes countries where legislation provides for the use of cryptocurrencies as a means of payment at the national level. At the same time, the norms of the national legislation on countering money laundering and corresponding taxation collection requirements (Japan and Germany) are applied to participants in the turnover of cryptocurrencies [Kochergin, Pokrovskaya, 2020].

The third group includes countries in which the turnover of cryptocurrencies is not regulated in a specific way. In such countries, cryptocurrencies can be used only in certain types of payment transactions at the national level or in certain territories/regions. At the same time, regulatory authorities can consider each case of transactions with digital assets for its identification and regulation. The same legislative norms on countering money laundering and taxation apply to participants in the turnover of cryptocurrencies as to traditional credit and payment institutions (Switzerland, the U.S., the UK, Singapore, and others).⁴⁷

The fourth group includes countries where there is a ban on the use of cryptocurrencies for payment purposes, while trading and investment operations with cryptocurrencies may be partially allowed. As a rule, the tax regulation of cryptocurrency turnover in these jurisdictions is in the process of formation and has not taken a stable form. Such countries include Russia and Turkey.

In the countries of the fifth group, there are significant restrictions or prohibitions on all types of transactions with crypto-assets. Such restrictions or prohibitions are usually associated with the country's consistent policy of strict control over monetary sovereignty and with the

⁴⁶ The term "currency" means in this context a foreign currency.

⁴⁷ Income taxation of crypto-assets generally corresponds to the structure of the tax systems of countries. The greatest detail of the rules of income taxation of digital assets is applied to individuals. At the same time, in almost all developed countries, income related to crypto-assets is subject to corporate income taxes. The greatest concordance among developed countries is observed in approaches to indirect taxation, where transactions with crypto-assets are not subject to taxes on goods and services. For more details, see: D.A. Kochergin and N.V. Pokrovskaya [2020].

purposeful introduction of digital payment technologies by the state, including the introduction of a CBDC. These countries include China⁴⁸ and India.

Finally, in the countries of the sixth group, all types of transactions with cryptocurrencies are prohibited. These bans may be due to the inability of these countries to ensure regulation over the turnover of cryptocurrencies at the national level in conditions of weak development of national financial systems. Such countries are Algeria, Bolivia, Bangladesh, Pakistan, and Vietnam.

It is obvious that there is a relationship between the rigidity of the regulation of cryptocurrency turnover and the general level of development of the national monetary system. First, cryptocurrencies are used as a legal means of payment in countries with a low level of development of the national monetary system, which are thus trying to solve the problem of the economy's dollarization. Second, cryptocurrencies can be used as a means of payment in countries with developed national monetary and payment systems, in which competition is encouraged and innovation is stimulated by private business.

The analysis of the main approaches to the interpretation and regulation of stablecoins in developed countries such as the U.S., EU countries, Great Britain, Switzerland, Japan, and Singapore, among others, testifies to their great differentiation. To a large extent, this is due to the wide variety of stablecoins, which differ both in the mechanisms for achieving price stability and different types of reserve assets, as well as in the implementation design and the systemic significance of stablecoins. In general, in developed countries in the areas of monetary and tax regulation, the following interpretations of stablecoins prevail: electronic money (EU countries, Great Britain, Japan, and Singapore), deposits (Switzerland and the U.S.),⁴⁹ securities or their derivatives (the U.S. and Switzerland), and a variety of crypto-assets with specific characteristics (Malta, BIS, G20 Financial Security Council, and others).⁵⁰ In this regard, in some countries, both the legal payment and banking regulation and the norms of legislation in the field of securities can be applied to stablecoins and their issuers [Overall, Adams, 2019]. Among the main problems of using stablecoins today are the need for rational management of the ecosystem of stablecoins and the investment rules underlying the stabilization of their value, control over the efficiency and integrity of the payment systems functioning, countering money laundering and financing terrorism [FATF, 2019a; 2019b; 2020], ensuring cybersecurity, protection of personal data and consumer rights, and tax discipline issues.⁵¹ Global stablecoins can create risks to conducting monetary policy, ensuring financial stability, and the stability of the international monetary system [Adachi et al., 2020; Malloy, Lowe, 2021].

Despite the difference in regulatory approaches in developed countries, stablecoins are primarily payment instruments issued by clearly identifiable issuers. Therefore, when stablecoins are backed with fiat money and embody the issuer's monetary obligation in digital form, the current regulatory regimes of electronic money issuing institutions, payment institutions, or money transmitters may be applied to such stablecoins and their issuers, depending on the jurisdiction. Nevertheless, the traditional legislation regarding electronic money should be modified to consider the increased risks associated with the tokenized form of monetary obligations, which allows them to trade on crypto exchanges and to circulate. The rapid development of stablecoins in the coming years may require the adoption of separate regulatory and legal norms

⁴⁸ At the end of September 2021, the PBC announced the introduction of a complete ban on transactions with crypto-assets, which began to be considered as illegal financial activity [2021].

⁴⁹ In the EU countries, certain varieties of stablecoins can be interpreted as "electronic money" and are regulated by the Electronic Money Directive, EMD2 [EC, 2009]. Other varieties of stablecoins can be interpreted as "funds" and are regulated by the Payment Services Directive, PSD2 [EC, 2015].

⁵⁰ For more details, see Kochergin [2020].

⁵¹ For more details, see D. Arner, R. Auer, and F. Frost [2020] and ECB [2020b].

that consider the increased risks associated with the use of various types of reserve assets by issuers of stablecoins and their widespread use, not only as a means of payment, but also as a new form of money [Bank of England, 2021].

Among the countries that have recently made attempts to regulate the turnover of stablecoins are the EU countries, the U.S., and the UK. Thus, at the end of 2020, the EC published a draft EU directive “On the Crypto-Assets Market” [EC, 2020], which introduced a clear definition of various stablecoins⁵² and provided for the establishment of differentiated regulatory requirements and prudential supervision measures for issuers of electronic money tokens, asset-backed stablecoins, as well as global/significant stablecoins. Such requirements and measures include mandatory licensing, the size of the issuer’s equity, investment directions of reserve assets, and regulatory standards defining the limits of investment concentration.⁵³ In addition, the criteria for classifying stablecoins as significant ones are established. Such criteria are the size of the issuer’s customer base, the number of the issuer’s shareholders or organizations participating in the turnover of the stablecoin, the value of the issued stablecoin or its market capitalization, the number and value of transactions using the stablecoin, the size of the issuer’s reserve assets of the stablecoin, and the significance of the issuer’s cross-border activities [EC, 2020].

In April 2021, the Bank of England published a report called “New Forms of Digital Money” [2021], in which it indicates that payment chains using stablecoins should be regulated in accordance with standards equivalent to those applied to traditional payment chains, namely: the regulation of payments should reflect the risk of financial stability, not the legal form of payment activity; regulation should ensure end-to-end operational and financial stability in all system payment chains; and sufficient information from payment firms should allow monitoring emerging risks to financial stability. If stablecoins are used in system payment chains as monetary instruments, they must comply with standards equivalent to those applied to the money of commercial banks regarding the stability of the money value, the validity of legal claims in case of non-fulfillment of monetary obligations assumed by the issuer, and redemption at face value in fiat currency. In order to justify these requirements for issuers of stablecoins, a basic set of requirements of banking regulation can be applied (legal norms, requirements for the amount of capital, requirements for the amount of liquidity and financial support mechanisms, the formation of reserves, and the use of insurance schemes).⁵⁴

The Bank of England also suggests using one of the four models of stablecoin regulation (a banking model, a model with reservation of highly liquid assets, a model with deposit regulation, and a model with reservation of Central Bank liabilities). The main difference between the models lies in the nature of the reserve assets that serve as collateral for stablecoins. Each of the models provides for interaction between issuers of stablecoins and central banks by standardizing the requirements for reserve assets that serve as collateral for the issue of stablecoins. Such measures are aimed at maintaining a low level of financial risks of stablecoin turnover, which are comparable to the risks of using commercial banks’ money. It is envisaged that in all models there will be a requirement to grant the holder of the stablecoin the legal right to redeem the stablecoin in fiat money upon presentation at par value [Bank of England, 2021].

In recent years, various regulatory and executive bodies of the United States have increased efforts to regulate the turnover of stablecoins. At the same time, interpretations and approaches to the regulation of stablecoins in the United States differ from EU countries and the UK. Thus, in December 2020, the President’s Working Group on Financial Markets (PWG) issued a statement

⁵² In the text of the draft EU Directive “On the Crypto-Assets Market,” all types of stablecoins are called tokens.

⁵³ For more details, see EC [2020] and ECB [2021].

⁵⁴ For more details, see Bank of England [2021].

on key regulatory and supervisory issues related to stablecoins, which indicated that, depending on the issue procedure and collateral, stablecoins can be a security, commodity, or derivative subject to federal laws on securities, commodities, and/or derivatives [PWG, 2020]. The functioning of stablecoin ecosystems must comply with applicable regulatory and supervisory requirements of national legislation, including ensuring the security and reliability of settlements, countering illegal financing, ensuring consumer protection, promoting market integrity and operational stability, ensuring the stability of the payment systems and trading markets functioning, promoting financial and international monetary stability, and comprehensive cross-border supervision. At the same time, stablecoins issuers and other participants in their ecosystems must fulfill all stipulated obligations in the framework of Anti-Money Laundering, Combating the Financing of Terrorism (AML/CFT) and sanctions before they enter the market. In cases where stablecoins used for retail payments are accepted extensively in the United States, the risks associated with this may require additional regulatory measures and guarantees [Ibid.].

In December 2020, the U.S. Financial Crimes Enforcement Network (FinCEN) submitted proposals, according to which the definition of a monetary instrument in the U.S. was expanded to include convertible virtual currencies (CVC). For banks and money transmitters, a requirement was introduced to submit to FinCEN a report containing information on convertible virtual currencies or transactions using digital assets with the status of a legalized means of payment and on their counterparty, as well as to confirm identity if an offline wallet is used and the transaction exceeds \$10,000 [Department of the Treasury, 2020]. In addition, in January 2021, the U.S. Office of the Comptroller of the Currency confirmed the authority of national banks and federal savings associations to participate as validators in distributed ledger networks. Permission was also given for the use of stablecoins in payment and other banking operations [Office of the Comptroller of the Currency, 2021].

Regarding the regulation of digital token turnover and the mechanism for raising funds through STO, transactions with investment tokens in most countries are successfully controlled by regulatory legal acts in the field of traditional financial instruments and stock markets. Such approaches are used, for example, in the U.S. [Securities Act, 1933; Securities Exchange Act, 1934], EU countries [EC, 2014], Singapore [Securities and Futures Act, 2001] and other countries. On the contrary, there is no regulation of the turnover of utility tokens and mechanisms for fundraising through ICO/IEO in many countries, or it is carried out based on individual regulatory assets in a simplified manner. This is because utility tokens are not identified as financial instruments, and the mechanisms for their initial offering differ from both IPOs and crowdfunding. It should be noted that a separate regulation is needed for the turnover of hybrid tokens (DeFi/NFT tokens), which is currently absent in most developed countries. The only exceptions may be those jurisdictions in which such tokens are defined as investment tokens.

Most countries adhere to the recommendations of the Financial Action Task Force (FATF) to counter money laundering and terrorist financing using crypto-assets. According to the updated FATF recommendations on the risk approach to virtual assets (VA) and virtual asset service providers (VASPs) adopted in October 2021,⁵⁵ the definition of virtual assets and their service providers was clarified to avoid cases when the assets in question avoided falling under the FATF standards (either as a virtual asset, or as a traditional financial asset). Second, instructions were given on how FATF standards should be applied to stablecoins. Third, the provisions on risks and measures to reduce them in relation to peer-to-peer transactions using anonymous virtual wallets were explained.⁵⁶

⁵⁵ The FATF recommendations apply regardless of the definition of virtual assets at the national level (property, cash, and other assets).

⁵⁶ For more details, see FATF [2021].

According to the updated FATF recommendations, to manage and mitigate the risks arising from virtual assets, banks and financial institutions⁵⁷ should regulate the activities of virtual asset service providers through their licensing and/or registration, use of effective monitoring systems, and compliance with regulatory measures provided for in the FATF recommendations on new virtual asset technologies. In cases where it is difficult to determine the characteristics of a particular asset, countries should decide which interpretation of the asset is best suited to reduce the risks of its turnover. At the same time, countries should consider the generally accepted use of the asset (for example, whether it is used for payment or investment purposes) [Virtual Assets and Virtual Asset Service Providers, 2021].

According to the provisions of the 6th Anti-Money Laundering Directive (AMLD6), the basic requirements for identifying customers and combating money laundering, previously applied to banks, payment systems, and gambling establishments, now also apply to crypto exchanges and service providers in the field of virtual assets, as well as banks that simultaneously work with virtual and fiat currencies. The main requirements of AMLD6 for operations with virtual assets are as follows: virtual asset trading platforms are required to perform a Customer due Diligence (CDD) and provide Suspicious Activity Reports (SAR); financial information collection units may be instructed to obtain addresses and identify the owners of virtual assets, which makes their anonymous use impossible; and crypto exchanges and companies serving digital wallets for storing virtual currencies will be required to register with regulatory and supervisory authorities at their location and obtain a license to carry out such activities [EC, 2018]. In general, the regulation of crypto-assets in developed countries is differentiated, but not systemic. It depends on many factors, including the interpretation of the crypto-assets' economic nature and the chosen ways to minimize the risks of their circulation.

Specifics of Regulation of Crypto-Asset Transactions in Russia

Unlike most developed countries, the Russian Federation has special legislation designed to regulate the turnover of digital tokens on the territory of the country. Thus, since January 2020, the Federal Law "On Attracting Investments Using Investment Platforms and on Amending Certain Legislative Acts of the Russian Federation" (Federal Law "On Attracting Investments") came into force, designed to regulate the turnover of utility tokens (utility digital rights, according to Russian legislation) and the order of functioning of investment platforms on which transactions using these digital rights are carried out. According to the text of the law, *utility digital rights* (UDR) are rights created and circulated in an information system to demand the transfer of a thing or intellectual property rights, the right to demand the performance of works, or the provision of services [Federal Law of 2 August 2019 No 259-FZ].

The Federal Law "On Digital Financial Assets, Digital Currency and Amendments to Certain Legislative Acts of the Russian Federation" (Federal Law "On Digital Financial Assets"), which regulates transactions with investment tokens (digital financial assets under Russian law) and procedures for information system operators and digital financial asset exchange operators, also came into force in January 2021. According to the text of the law, *digital financial assets* (DFA) are digital rights, including monetary claims, the possibility of exercising rights attached to equity securities, the right to participate in the capital of a non-public joint-stock company, and the right to demand the transfer of equity securities. The issue, accounting, and circulation of such digital rights are possible only by making (changing) entries in an informa-

⁵⁷ According to the current interpretation of the FATF, virtual assets are a digital representation of value (value) that can be traded and transferred, as well as used for payments and investments. At the same time, virtual assets do not include a digital representation of fiat currencies, securities, or other financial assets.

tion system based on a distributed ledger or in other information systems [Federal Law “On Digital Financial Assets,” 2020]. Although the law does not specify a list of specific regulated assets, except for digital financial assets certifying the rights to participate in the capital of a joint-stock company and digital financial assets certifying the possibility of exercising rights under equity securities, a broad interpretation of digital financial assets provides for the inclusion of any investment token subtypes, as well as some varieties of stablecoins. The law provides for a wide list of transactions with digital financial assets in Russia.⁵⁸

In fact, within the framework of the regulation currently adopted in Russia, differentiation between the two main types of crypto-assets—digital tokens (digital financial assets and utility digital rights) and virtual currencies (digital currencies, according to Russian legislation)—is carried out based on the centralization/decentralization characteristic of their issue (the ability to identify the issuer), as well as the purpose of the issue.⁵⁹ Thus, according to the legislative interpretation, digital financial assets always have one clearly identifiable issuer, and digital currencies can have many issuers that cannot be clearly identified.

According to the current legislation, *digital currency* in the Russian Federation is a set of electronic data (digital code or designation) contained in an information system that can be accepted as a means of payment and/or as an investment, and, in respect of which, there is no person obligated to each owner of such electronic data. At the same time, such a digital currency is not a monetary unit of the Russian Federation, a monetary unit of a foreign state, and/or an international monetary or settlement unit [Federal Law “On Digital Financial Assets,” 2020]. “On Digital Financial Assets” prohibits the use of digital currency as a means of payment, but at the same time allows the issue of digital currency and exchange operations with it, as well as mining activities. It is envisaged that the specific procedure for organizing the issue and circulation of digital currency, as well as the regulation of mining, will be regulated by separate national laws and by-laws of the Bank of Russia.⁶⁰

In January 2022, the Bank of Russia published a consultation report “Cryptocurrencies: Trends, Risks, Measures,” designed to indicate the position of the regulator regarding the further control of transactions with cryptocurrencies and stablecoins in the country [2022]. The Bank of Russia proposed to introduce a ban on the organization of the issue and circulation of digital currencies (cryptocurrencies and stablecoins) on the territory of the country. In particular, to restrict the activities of crypto exchanges, P2P platforms and other exchange services in Russia. The regulator also proposed to ban investments of financial organizations in cryptocurrencies and related financial instruments, as well as the use of Russian financial intermediaries and domestic financial infrastructure for transactions with cryptocurrencies and stablecoins. It was proposed to introduce a ban on cryptocurrency mining in the country. In addition, the Bank of Russia, in addition to introducing a ban on transactions with cryptocurrencies in Russia, proposed to coordinate a prohibitive regime for transactions with cryptocurrencies within the Eurasian Economic Union (EAEU) to exclude regulatory arbitration [Ibid.].

⁵⁸ Federal Law No. 331-FZ of 14.07.2022 “On Amendments to Certain Legislative Acts of the Russian Federation and on Suspension of Certain Provisions of Article 5-1 of the Federal Law “On Banks and Banking Activities” [Federal Law of 14 July 2022 N 331-FZ] prohibits payment for goods and services using digital financial assets and utility rights on the territory of the Russian Federation.

⁵⁹ According to the Russian legislators, the term “digital currencies” was supposed to be equivalent to the term “cryptocurrencies,” in the international sense. However, in fact, the term “digital currencies,” according to the Federal Law “On Digital Financial Assets,” is broader, which allows even electronic bonuses to be attributed to digital currencies.

⁶⁰ The basic provisions of the Federal Law “On Countering the Legalization (Laundering) of Proceeds from Crime” apply to digital currencies and digital financial assets, as well as organizations involved in their turnover [Federal Law of 7 August 2001 No 115-FZ].

The prohibitive approach of the Bank of Russia was motivated by high risks associated with the turnover of cryptocurrencies and stablecoins, namely: violation of financial stability (undermining monetary circulation, loss of monetary sovereignty, capital outflow from the country, and the flow of funds from bank deposits into cryptocurrencies), reduction of the welfare of citizens (high volatility of cryptocurrencies and the possibility of manipulating market prices, limited opportunities for legal protection of investors, and the spread of fraudulent schemes in cryptocurrency trading), expansion of illegal activities (the use of cryptocurrencies for money laundering, terrorist financing, and tax evasion) [Ibid.]. The Bank of Russia also pointed out the existence of risk factors associated with mining activities: the negative impact of mining on the environment, non-productive consumption of electricity, and the formation of demand for the infrastructure of cryptocurrency operations.

Despite the numerous risks, an analysis of the experience of regulating the turnover of cryptocurrencies in developed countries shows that most financial risks can be minimized using extensive regulatory tools. Since the development of distributed ledger and blockchain technology in the financial sector, which led to the emergence of crypto-assets, decentralized finance, and metaverses, is one of the fastest growing, any ban on the issue and use of cryptocurrencies and stablecoins in Russia would not only reduce the pace of the information technology industry's development and lead to the outflow of highly qualified specialists to other countries, but would also facilitate the transfer of cryptocurrency capital from Russia to countries with a more favourable investment climate. We can also expect a significant loss of tax revenues to the budget [Ibid.] and an increase in the costs of tracking illegal actions in the cryptocurrency sphere. World experience shows that the effectiveness of prohibitive measures is low and contributes to the withdrawal of such activities in the field of cryptocurrencies into the gray area.⁶¹ In this regard, the proposals of the Bank of Russia to ban transactions with cryptocurrencies and stablecoins in the country cannot be considered effective or constructive.

In parallel with the Bank of Russia, the Ministry of Finance of the Russian Federation presented its proposals on regulating operations with cryptocurrencies, which were supported by the Government of the Russian Federation [Tetkin, 2022]. The Draft Law "On Digital Currency" proposed by the Ministry of Finance in February 2022 provides, instead of banning, a certain procedure for regulating the issue and circulation of cryptocurrencies in Russia. In particular, the Draft Law proposes: to keep in force the ban on payments using cryptocurrency for goods, works, and services, but at the same time to allow trading and investment transactions using cryptocurrency; to conduct transactions using cryptocurrencies in the framework of the banking infrastructure; to provide for the possibility of transactions by both individuals and legal entities, which will be divided into qualified and unqualified investors; determine that the organizers of the digital currency exchange system can be banks with a universal license; use the transparent blockchain service for monitoring and tracking cryptocurrency transactions;⁶² to use the Swiss Aximetria system as a model for the implementation of the full identification procedure;⁶³ to create digital currency exchange operators that can have basic (P2P model) and universal (exchange model) rights that will be entered into the register of the Central Bank; to develop special rules for regulating mining activities, including maintaining their register and establishing differentiated tariffs for persons engaged in mining.⁶⁴

⁶¹ According to CNBC experts, despite the introduction of a ban on mining in China, illegal Chinese miners still provide about 20% of the Bitcoin hashrate [Sigalos, 2021].

⁶² A system for analyzing cryptocurrency transactions using artificial intelligence.

⁶³ The system collects and analyzes personal data of customers, starting from passport data and ending with bank account numbers.

⁶⁴ For more details, see Ministry of Finance of the Russian Federation [2022].

Although, in general, the proposals on regulating the issue and circulation of cryptocurrencies in Russia proposed by the ministry of finance are more progressive compared to the prohibitive position of the central bank, there is a risk of excessive regulation (overregulation) of this sphere. So, at the discussion stage, the Draft Law was supplemented with many restrictive measures, which are largely due to the position of the Bank of Russia. For example, there is a ban on the exchange of cryptocurrencies outside licensed exchangers, on the use of non-certified digital wallets for storing cryptocurrencies, and on transfers using cold wallets [Kulikova, 2022]. Thus, the Draft law on regulating transactions with cryptocurrencies in Russia is becoming less and less attractive for both businesses and users. Such bans, coupled with the economic sanctions imposed on Russia in February-March 2022, may contribute to the outflow of crypto-assets from Russia rather than an influx.

In relation to the taxation of transactions involving digital financial assets and utility digital rights in Russia, the Federal Law “On Amendments to Part Two of the Tax Code of the Russian Federation (in respect of the Digital Rights Taxation)” came into force in July 2022 [Federal Law of 14 July. 2022 No 324-FZ]. The Federal Law determined the rates of corporate income tax and personal income tax, as well as the procedure for taxing operations on the sale of DFA and UDR with value added tax. According to the adopted law, the income tax on the sale of digital rights for Russian companies and the personal income tax for residents is 13% (if the tax base exceeds 5 million roubles per year—15% of the excess amount). The income tax on the sale of digital rights for foreign organizations and the income tax on non-resident individuals is 15% [Federal Law of 14 July. 2022 No 324-FZ]. At the same time, value-added tax will not be levied on operations for the sale of DFA on the territory of the country, as well as services of information system operators and DFA exchange operators. Whereby, the financial result of transactions with digital financial assets is determined on the date of income payment.

Currently, a bill on taxation of transactions with digital currencies has also been adopted in the first reading, under which cryptocurrencies are considered as property [Draft Law No 1065710-7]. It is assumed that the proceeds from operations with digital currency will be subject to income tax or personal income tax.⁶⁵ At the same time, transactions with digital currency will not be recognized as an object of VAT taxation. Both Russian legal entities and representative offices of foreign companies, as well as individuals-citizens of the Russian Federation will be required to report on obtaining the right to dispose of digital currency, submit reports on transactions with digital currency and on digital currency balances to the tax authorities. The information is submitted to the tax authority if, for a calendar year, the number of receipts or charges of digital currency exceeds the amount equivalent to 600 thousand roubles in monetary terms. The amount is calculated based on the market price of the digital currency on the date of each transaction. It is stipulated that the procedure for determining the market price for a digital currency should be established by the federal executive authority authorized to control and supervise taxes and fees.

Despite the existence of Federal Laws “On Digital Financial Assets” and “On attracting investments using investment platforms,” as well as tax requirements for transactions with digital rights, the regulation of crypto-asset turnover in Russia can hardly be considered satisfactory. The main problems of the current regulation in Russia are as follows.

First, the Law “On Digital Financial Assets” lacks clear terminology. The definitions used in the text of the law contradict those used in world economic and legal practice. For example, the interpretation of the term “digital currency” is quite broad, but it does not reveal the eco-

⁶⁵ It is proposed, by analogy with the regulation of taxation of digital rights, that the personal income tax rate from transactions with digital currency will depend on the amount of annual income of individuals and will be 13% on income up to 5 million roubles and 15% on amounts exceeding this.

conomic essence of this category, which is especially obvious in light of the introduction of digital currencies by central banks. Also, the text of the law lacks key concepts in the field of crypto-assets, such as “cryptocurrency,” “stablecoin,” “payment token,” “non-interchangeable token,” “decentralized finance,” and so on, which leads to terminological confusion when the Bank of Russia does not make a fundamental distinction between cryptocurrencies and stablecoins.⁶⁶

Second, the Laws “On Digital Financial Assets” and “On Attracting Investments Using Investment Platforms” actually regulate only the turnover of investment tokens and some varieties of stablecoins. It is envisaged that the turnover of digital currencies and mining activities should be regulated by the Law “On Digital Currency.” At the same time, on the part of the Bank of Russia, there is a prevailing tendency to tighten regulation of transactions with cryptocurrencies and maintain a ban on their use for settlements within the country [Nabiullina, 2021]. Under these conditions, it is unclear why companies or financial institutions should issue and trade digital currencies in the Russian market if they cannot be used for their intended purpose as a means of payment.

Third, the issue and use of stablecoins for investment purposes are not prohibited in Russia, but their use as a means of payment is not allowed by the regulator. The Bank of Russia opposes stablecoins as, according to the regulator, this instrument can undermine the mechanism of monetary policy and create risks to financial stability. Like cryptocurrencies, the Bank of Russia considers stablecoins as quasi-money [FinMarket, 2021]. The Bank of Russia also opposes the use of internal accounting units by ecosystems (as a means of payment, accumulation, and means of borrowing).⁶⁷ Such a position is not sufficiently justified. The Bank of Russia should have chosen a more flexible policy regarding the regulation of stablecoin turnover. Thus, the Central Bank could determine the range of possible issuers, develop acceptable models for regulating the issue and circulation of stablecoins, and provide unified mechanisms for backup of their issue, allowing minimizing the economic risks of holders and issuers of stablecoins. Unlike cryptocurrencies, stablecoins may become an important element of the financial and monetary system in the coming years. It should be noted that the proposed draft Law “On Digital Currency” also does not provide for the regulation of the use of stablecoins in Russia.

Fourth, DeFi tokens and NFT tokens actually remain outside the legal field in Russia. The first is due to the decentralized nature of these assets, the second is due to the lack of a way in Russian legislation to transfer copyrights through tokens recorded in the blockchain. Therefore, a transaction using NFT tokens in Russia is considered from a legal perspective as an agreement without compliance with a written form, which in fact does not allow confirming either expenses for tax purposes or the rights of the holder of NFT tokens in case of judicial protection. According to the Law “On Digital Financial Assets,” NFT tokens can be called a digital asset to some extent, since certain rights are transferred through them. However, the implementation of the CFA in Russia is provided only on the corporate blockchain, which in meaning differs from the idea inherent in the concept of the NFT token. Thus, the use of NFT tokens in Russia currently does not have any legal consequences. Apart from the above-mentioned problems of regulating the turnover of crypto-assets in Russia, there are many topical issues related to improving the taxation of transactions with cryptocurrencies, which should be the subject of a separate study.⁶⁸

In conclusion, it should be noted that many difficulties of regulating the use of crypto-assets in Russia can be solved by conducting fundamental scientific research on the economic nature of crypto-assets and qualitative appraisal of any legislative proposals and initiatives, es-

⁶⁶ For more details, see Bank of Russia [2022].

⁶⁷ For more details, see Bank of Russia [2021b].

⁶⁸ For the international experience of crypto-asset taxation, see Kochergin and Pokrovskaya [2020].

pecially those related to the regulation of innovative financial and payment instruments based on the use of new information technologies. Flexible regulation of crypto-asset turnover, considering the interests of a wide range of economic agents, is an important factor in increasing the competitiveness and innovative attractiveness of the domestic financial market. Such attractiveness should not only be associated with the initiatives of the central bank (the issue of a central bank digital currency,⁶⁹ the development of a fast payment system, and so on), but also provide support for private initiatives of credit institutions and fintech/bigtech companies to introduce and use various crypto-assets in the field of payments and investment in Russia.

Conclusion

The activities of international organizations in relation to crypto-assets have focused on unifying regulatory approaches to the issue and circulation of crypto-assets, taking into account the different levels of risk associated with the differentiated nature of crypto-assets. International organizations pay particular attention to the regulation of cryptocurrency and global stablecoin transactions, prudential supervision of their issuers, and the unification of approaches to taxation and countering illegal transactions involving crypto-assets. The accomplishment of these tasks is complicated by the trans-boundary nature of the crypto-assets market, the decentralized nature of the instruments used, and the presence of many national regulators applying different approaches to the interpretation and classification of crypto-assets.

Crypto-assets are presented in this article as representing a new class of private digital assets that are not issued and are not guaranteed by state authorities, embody values or rights recorded electronically in a distributed ledger protected cryptographically, and are used as a means of payment and savings and/or for investment purposes, and/or for access to a certain product or service on the issuer's platform as a result of the public consensus. These characteristics of crypto-assets distinguish them from both digital currencies of central banks and national virtual assets.

An original classification of crypto-assets was proposed, according to which crypto-assets are divided by the economic-functional criterion into two main types: virtual currencies and digital tokens. Virtual currencies, regardless of their subtypes, are a means of exchange or a payment instrument, as well as a store of value. The main difference between stablecoins and cryptocurrencies is the use of stabilization mechanisms designed to offset the risks of price volatility, as well as the presence of a clearly identifiable issuer to which the holder of a digital asset can address financial requirements. Digital tokens, regardless of the subtypes, are issued with specific investment functions or consumer goals. The main difference between investment and utility tokens is that the former provide their owners with various economic rights, while the latter provide access to the consumption of certain products or services on the issuer's digital platform.

The study reveals that cryptocurrencies are the most significant crypto-assets in terms of capitalization and number of transactions, differing in terms of their functionality. Cryptocurrencies can be a means of payment, savings, and/or investments (their performance of monetary functions is not universal), or act as a tool or platform for the implementation of decentralized applications based on smart contracts. Functional features of cryptocurrencies are also premised on emission protocols and consensus algorithms in blockchains. However, the directions of the cryptocurrencies' designated use depend not so much on their functionality, as they are conditioned by the public preferences of economic agents when choosing payment or investment instruments and the regulatory policy of monetary authorities.

⁶⁹ See Bank of Russia [2021a].

Stablecoins are the second most important type of crypto-asset. The differences between stablecoins are caused by the use of various reserve assets and stabilization mechanisms, as well as determined by design features and various systemic significance. In an economic sense, most stablecoins are circulating digital monetary obligations of their issuer. In this regard, it is reasonable to define collateral stablecoins backed by fiat currencies as tokenized electronic money or deposits (depending on the regulatory features of national banking and payment systems). Certain types of stablecoins can be treated as securities or derivatives. At the same time, global/significant stablecoins are of the greatest research interest due to the potential for widespread use of the new form of money.

Investment tokens represent digital property rights embodied in equity, debt, or derivative financial instruments. By their nature, investment tokens are a digital form of securities, information about the issue of which is registered in a distributed ledger or in the issuer's blockchain. On the contrary, utility tokens grant holders the right to access a current or prospective product or service sold on the issuing company's platform. In most cases, investment and utility tokens appear as a result of using new mechanisms for fundraising—an ICO/IEO or STO.

Among digital tokens, a special place is occupied by the so-called hybrid tokens, the economic nature of which is not homogeneous. Hybrid tokens can be created and promoted by the issuing company as utility tokens, but actually function as investment tokens, or can be issued as investment tokens, but later used in payments or for access to other services on the issuer's blockchain platform (DeFi tokens). Hybrid tokens can also be conditionally referred to as NFT tokens, which are issued for declaring ownership right, or granting right to an object, or fixing a specific right, which are unique and recorded in the blockchain. In most cases, hybrid tokens are issued as a result of the use of a new fundraising mechanism—the IDO.

There is no international regulation of crypto-asset turnover. Currently, international organizations are concentrating their efforts on ensuring financial stability by adopting uniform recommendations on minimizing risks and exchanging tax information related to the turnover of crypto-assets. At the same time, the regulation of transactions with crypto-assets at the national level in most countries is aimed at strengthening state control over their turnover and is carried out both in the monetary/payment and investment spheres, as well as in the areas of countering money laundering and taxation.

In most developed countries, the regulation of crypto-assets in the monetary, payment, and investment spheres is not systemic, but consists either in adapting the current legislation (in relation to investment and utility tokens), or in developing special directives regulating the turnover of certain types of crypto-assets (in the case of stablecoins). As a rule, the regulation of cryptocurrency turnover is reduced to the implementation of AML/CFT procedures in national legislation with respect to crypto-asset service providers, in accordance with the FATF recommendations. Procedures are used to reduce financial risks and prudential supervision of crypto-assets issuers' activities, recommended by the FSB and the BIS, as well as tax regulation of transactions with crypto-assets, in accordance with national taxation standards for such types of income.

The regulation of crypto-asset turnover is significantly differentiated between countries. This is due not only to the lack of common interpretative approaches to different types and subtypes of crypto-assets and differences in the assessment of economic risks and consequences of widespread turnover of crypto-assets for national financial systems, but also to the particularities of national legislation and the application of regulatory practices. In most developed countries—including the U.S., EU countries, Great Britain, Switzerland and Japan—a fairly balanced and flexible approach to the regulation of various types of crypto-assets and their issuers prevails. At the same time, in a significant number of emerging market countries, such as

China, Turkey and Russia, regulation is heavier and is characterized by the use of prohibitive measures.

The current regulation of crypto-asset turnover in Russia cannot be deemed satisfactory due to its fragmentation and prohibitive bias. It is a fair assumption to say that at present the regulation of crypto-asset turnover in Russia is carried out outside the framework of the recommendations of international institutions and without due consideration of the experience of developed countries. In particular, there is no clear terminology in the field of crypto-assets in national legislation, the proposed procedure for regulating the issue and circulation of digital currency is excessively strict, and transactions with stablecoins, DeFi/NFT tokens are not regulated at all. The ban on the use of cryptocurrencies and stablecoins in Russia under economic sanctions does not seem justified from an economic point of view. In addition, the procedure for taxation of transactions with crypto-assets in Russia should provide for a preferential regime or a period to stimulate the introduction of a new asset class in the Russian financial market.

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Estimating the Effect of Taxing CO₂ Emissions on Russian Oil Industry¹

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Abstract

The impact of hypothetical restrictions on fossil fuel consumption, implemented through the introduction of a tax on CO₂ emissions in the global economy and certain regions, on oil production by Russia, Organization of the Petroleum Exporting Countries (OPEC), and eight other major oil producers is assessed in this article.

The first part of this study reviews the current literature on taxation of emissions in the global economy. Approaches to modelling such a policy and the problem of choosing the trajectory of the tax rate are analyzed, as are the main conclusions, consequences, and recommendations for the economic policy of oil exporting countries. Approaches to modelling pricing in the oil market are considered separately. The analysis shows that the premise of oligopolistic strategic interaction of oil exporters plays an important role in modelling the oil market.

Subsequently, a model of strategic interaction between countries in the oil market is built according to the Cournot model. This model is calibrated using data on the parameter of demand as well as supply, including the production costs of individual exporting countries according to Rystad. Twelve scenarios for taxation of the industry through the introduction of a tax on CO₂ emissions in the amount of \$25, \$50, and \$75 dollars per ton of emissions are built. It is assumed that this tax is converted into a tax on the purchase of oil in proportion to the amount of emissions that are produced when using each barrel of oil. For each initial value of the rate of tax on emissions, cases are considered when the rate remains unchanged or increases at a constant rate of 1.5% per year. Further, the same options for taxation when applied only by developed countries are also considered.

The analysis in this article shows that a gradual increase in the tax rate leads to accelerated oil production. It also reveals the significant role of the spillover effect between markets in the case of the introduction of a tax only in some countries. Thus, with the introduction of a tax of \$50 per ton of emissions with an annual growth of 1.5% worldwide, the peak oil price is lower by \$29.6 per barrel. With the introduction of such a tax only in developed countries, the fall in oil prices at its peak compared to the baseline scenario without taxation is \$18.4 per barrel in the market where a tax was introduced and \$7.8 per barrel in a market that did not impose a tax. It is also indicated that, due to the introduction of the tax, Russia has one of the largest losses in revenue among all oil exporters.

Keywords: oil, emissions tax, OPEC, oligopoly, cartel, pricing

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Introduction

The global oil market has faced uncertainty recently due, in part, to the risks associated with the pandemic and a temporary drop in energy demand, the risks of an oil embargo against Russia, as well the policy of reducing CO₂ emissions and switching to green energy undertaken primarily by developed countries and likely to spread to the entire world economy in the future.

In December 2015, the Paris Accord was ratified, according to which countries should strive to pass the peak of global greenhouse gas emissions as soon as possible. In addition, in 2021, the European Union (EU) announced the introduction of a border carbon tax on goods imported into the EU (CBAM). The tax is applied to goods requiring substantial emissions in production, such as cement, electricity, fertilizers, and aluminum. Oil and gas were not included in the list, which significantly reduces the potential effect on Russian producers. To mitigate the consequences of taxation, it was decided to introduce it gradually over several years, but the list of taxed carbon-intensive goods may extend toward oil and petroleum products. In any case, it is obvious that the tax will significantly reduce the competitiveness of Russian goods in the European market. Consequently, all these trends may significantly reduce the future global demand for oil.

The model constructed in this article makes it possible to estimate the effect of taxation on the global oil price and revenues of the key producers considering their strategic interaction in the context of various options for taxation of CO₂ emissions. The first section contains a review of the research on modelling global oil demand and supply, various pricing structures in the world oil market, and game-theoretic approaches to cartel formation. The next section discusses the model's structure and the calibration of its parameters. The following section presents simulations of taxation and discusses the results. In addition, due to the events of February 2022, the world community is very likely to seek to reduce dependence on hydrocarbons due to an assessed increase in geopolitical risks. These intentions can be implemented under the auspices of the fight against global warming. All these trends may significantly reduce the global demand for oil in the future.

The purpose of this study is to quantify the impact of hypothetical restrictions on fossil fuel consumption implemented by introducing a tax on CO₂ emissions in the global economy, or in certain regions, on oil production in Russia, the Organization of the Petroleum Exporting Countries (OPEC) and eight other major oil producers. Calculations are based on the Cournot model of oligopolistic competition for the global oil market. The model proposed in the study is an extension of R.S. Pindyck's work [1978] regarding the choice of functions for oil exporters and Z. Yang's work [2008], which also relies on Cournot interpretation of strategic interaction, as well as an iterative algorithm for numerical solution of the model. In this study, interaction of a larger number of players compared to the mentioned works is modelled. To calibrate the model, we use current data and results of econometric studies on the oil market. The key element of novelty is the numerical simulation analysis and the estimates of the impact of restrictions on oil consumption within the framework of the Cournot oligopoly model on the world oil market. As far as we know, no such calculations have been carried out before.

The model remains quite stylized; however, the calculations carried out may contribute to the discussion about the consequences for the Russian economy of the green changes in global economic policy, as well as induce further research of more complex models.

Literature Review

There are many studies devoted to the problem of taxation of CO₂ emissions. W. Nordhaus [2015] analyzed sustainability of coalitions of countries committing to reduce CO₂ emissions

following the example of the Kyoto Protocol. The simulation results showed that for coalition stability, small fines are needed for countries that violate the agreement. He considered emission tax rates of \$12.5, \$25, \$50, and \$100 per ton as realistic values. W. Nordhaus [2017] estimated the optimal tax in 2015 at the level of \$31 per ton of CO₂ (in 2010 prices) with an average growth rate of 3% per year until 2050. This value of the optimal tax can be described as very moderate among the estimates found in the literature.

S. Paltsev [2014] studied the effect of the EU emissions tax on the Russian economy. He concluded that a decrease in demand for natural gas corresponding to the planned EU emissions reduction of 80% would lead to a drop in Russian gas exports to the EU by 75%. S. Paltsev and E. Kalinina [2014] showed that the introduction of an increasing emissions tax in the global market at the level of \$160 per ton by 2050 would cause a reduction in Russia's gross domestic product (GDP) by 10–20%. Similar calculations [Orlov, Aaheim, 2017] indicate a loss of welfare of Russians by 1.8% due to the global fight against emissions. I. Makarov, H. Chen, and S. Paltsev [2020] also showed that the Paris Accord will lead to a significant reduction in Russian exports of fossil fuels, as well as energy-intensive goods. From this point of view, diversification of production and investment in green energy will play a decisive role in the development of the Russian economy.

Pricing in this market is crucial for estimating the effect of taxation on the energy market. The world oil market has gone through numerous stages, which are characterized by changes in the pricing mechanisms used. At the present stage, the volatility and instability of world oil prices has an impact on the economies of oil-producing countries. Above all, it is critical to identify the type of strategic interaction.

Researchers identify the type of pricing in the global oil market, considering OPEC policy from different angles and using various methods to obtain their results: dynamic models, optimization problems with discrete and continuous time, numerical methods and differential equations, as well as broad economic theory (game-theoretic approaches of Nash, Cournot, Stackelberg models, price leader, perfect competition and pure monopoly). In a study by A.F. Alhajji and D. Huettner [2000], the hypothesis of dominant producer for OPEC, OPEC core countries, and Saudi Arabia was tested, when non-OPEC oil producers are considered as a competitive fringe. They found evidence that neither OPEC nor the core of OPEC can be considered to be a leader. S. Böckem [2004] confirmed that OPEC is the price leader, while all non-OPEC countries are price followers. Estimation of a system of simultaneous equations in P.A. Almoguera, C.C. Douglas, and A.M. Herrera [2011] answered two questions: which market structure characterized best the global oil market in 1974–2004 and whether there were transitions from collusion to non-cooperative behaviour during this period. The results showed that during the period OPEC's behaviour is best described by the Cournot model, when faced with competitive non-OPEC producers, and despite periods of collusion, the organization was unable to consistently keep prices above the level of quantitative competition. The null hypothesis that there was no switching of OPEC policy from collusion to non-cooperative behaviour was rejected in favour of the alternative, according to which both cooperative and non-cooperative behaviour was observed in the period 1974–2004. In D.P.T. Young [1994] two key aspects of price behaviour were combined: presence of OPEC monopoly power in pricing and importance of interaction and investment behaviour of its participants. It was found that although OPEC does not match the general theory of monopoly, there is clearly a certain degree of monopolism in the behaviour of prices. J.M. Griffin and W. Xiong [1997] developed the topic of the gains from various strategies of OPEC members. Their study calculated price trajectories and profits in cases of perfect competition, Cournot, and maximizing the joint profit of all members. It was found that actual oil prices are higher than Cournot price, but lower than prices that maximize total profits, which indicates that the cartel has at least partially succeeded in achieving higher

profits. Second, unlike non-resource industries with rapidly growing production, the presence of short-term capacity and resource constraints in the oil industry significantly weakens the incentive of participants to fraud. It is also shown that the biased system of market quotas inherent in the organization in favour of small producers weakens but does not eliminate their incentive to deviate from collusion.

Quantitative methods and iterative algorithms used in Z. Yang [2008; 2013] are of particular interest for oil market analysis. Yang [2008] investigated the impact of exploration of new Arctic National Wildlife Refuge (ANWR) deposits on strategic behaviour of OPEC members using a dynamic Cournot model. Numerical simulation of the game (using an iterative algorithm to obtain optimal price and production trajectories in the case of an oligopoly and in the case of an OPEC collusion) yielded the following result: even though ANWR exploration could increase U.S. domestic production, its scale cannot change the fact that the country will continue to depend on foreign oil; OPEC strategic decisions have a much stronger impact on the U.S. oil market than ANWR exploration. In a subsequent article, Yang [2013] explored oil production profiles in the Stackelberg equilibrium scenario. After calibration according to real data of the world oil market, the problems in the case of Stackelberg and Cournot-Nash were solved numerically to study some properties of the Stackelberg equilibrium in the market of exhaustible resources. In a calibrated model of the depleted resources sector, simulating the international oil market, an oligopolistic market structure is established, where OPEC is the leader in production volumes according to Stackelberg, and other major producers are followers who strategically interact with each other. The results of applying the numerical modeling approach were as follows. Compared to the Cournot-Nash equilibrium, Stackelberg's leader retains a moderate advantage over its followers. However, the advantage decreases as the size of the followers increases. The leader slightly delays its mining profile, and followers slightly accelerate their mining profiles while they are functioning in the market. In general, the differences between the Cournot-Nash and Stackelberg equilibria turned out to be small.

There are also studies indicating a weakening of the role of OPEC in its ability to have a significant impact on world oil prices, for example that by B. Fattouh [2007], which additionally states that the price of OPEC is not constant and varies depending on oil market conditions. At the same time, the so-called shale revolution and the increase in crude oil production in the United States caused by technological advances in hydraulic fracturing and horizontal drilling, have brought long-term changes to the global oil market. Therefore, the impact of the development of alternative energy sources on world oil prices is actively discussed in foreign literature, for example, in H.C. Bjørnland, F.M. Nordvik, and M. Rohrer [2019], N.S. Balke, X. Jin, and M. Yücel [2020], H. Bencheckroun, G. van der Meijden, and C. Withagen [2020], G. Bornstein, P. Krusell, and S. Rebelo [2017]. Balke, Jin, and Yücel [2020], constructed and evaluated a dynamic structural model of the global oil market in order to quantify the impact of the shale revolution, which is modelled as a sharp reduction in shale production costs, and investigated how the growth of shale production affects the level and volatility of oil prices and conventional oil production. They found that oil prices in 2018 would have been about 36% higher if the shale revolution had not occurred and that the shale revolution implies a decrease in current oil price volatility by about 25% and a decrease in long-term volatility by more than 50%. The authors also noted that, despite the sharp increase in the market share of shale oil, OPEC's market share did not change in this period, which indicates that the growing share of shale in world oil production is mainly due to other producers of conventional oil.

In Bencheckroun, van der Meijden, and Withagen [2020] it was found that the OPEC market power leads to inefficient use of oil reserves. Because of this inefficiency, the authors noted the detrimental impact on the overall well-being of the U.S. shale revolution. By decomposing the effects of imperfect competition on welfare and climate into the "conservation ef-

fect” and the “consistency effect,” the authors showed that the first of these really slows down climate change by increasing the initial oil price. On the other hand, imperfect competition causes an excessively high supply of polluting unconventional oil, which exacerbates climate change. In their model of imperfect competition, the recent shale revolution not only increases climate damage, but also reduces well-being, as shale oil displaces OPEC oil produced with less damage to the environment. However, despite the detrimental impact on the ecology of shale oil and oil produced by non-OPEC exporters noted in Benchechrout, van der Meijden and Withagen [Ibid.], the study by Bornstein, Krusell, and Rebelo [2017] found that one of the consequences of the shale revolution was a decrease in oil price volatility. The authors used a data set covering all oil fields in the world to evaluate a stochastic equilibrium model of the oil industry with two alternative market structures. In the first, all manufacturers are perfect competitors. In the second, OPEC acts as a cartel and non-OPEC producers are a competitive periphery. With their model specification, it was confirmed that the demand for oil is relatively inelastic in price and that supply is elastic in the long term, since firms can invest in the discovery of new oil fields, but inelastic in the short term.

Thus, the problem of pricing at the world markets of exhaustible resources has been studied extensively. However, though many economic studies have been conducted in relation to the oil market, there is no generally accepted description of this market. The articles tested various hypotheses about the structure of the global oil market, internal structure of cartels, and the scheme of cooperation between their participants, as well as the external actions of cartels in relation to competitive countries. Using various methods and assumptions, the researchers identified optimal pricing strategies and the division of production and production between cartel members.

Russia, a state with a significant share of production and exports in the raw materials market, cannot ignore the policy of OPEC. Nevertheless, studies of the interaction between OPEC and Russia are practically absent from the literature. Although many economists confirm that OPEC benefits from cartelization, Russia is in no hurry to join the cartel. But, the formation of a stable oil price is a common task for both.

The Model

The dynamics of the global oil market are set with simultaneous demand and supply equations (1)–(3):

$$Q_t = \alpha_1 (p_t + \tau(1 + \gamma)^t)^{\beta_1} Q_{t-1}^{\rho_1} g_1^t, \quad (1)$$

$$S_{dirty_t} = \alpha_2 p_t^{\beta_2} g_2^t, \quad (2)$$

$$S_{clean_t} = \alpha_3 (p_t + \tau(1 + \gamma)^t)^{\beta_3} g_3^t, \quad (3)$$

Q_t —global demand for oil in year t , million BBL;

p_t —world oil price in year t , \$ per BBL;

τ —emissions tax rate, \$ per BBL;

γ —emissions tax rate growth rate;

S_{dirty_t}, S_{clean_t} —oil supply of competitive fringe in year t , million BBL;

g_1^t, g_2^t, g_3^t —parameters of demand and supply in year t ;

$\alpha_1, \alpha_2, \alpha_3, \beta_1, \beta_2, \beta_3, \rho_1, \rho_2$ —coefficients.

We study the Cournot competition among 10 oil exporting players. These are OPEC (Algeria, Angola, Venezuela, Gabon, Iran, Iraq, Congo, Kuwait, Libya, UAE, Nigeria, Saudi Arabia, Equatorial Guinea—taken together as one player) and another nine of the largest oil producers, according to the Energy Information Administration (EIA): Russia, U.S., China, Canada, Brazil, Mexico, Kazakhstan, Norway, and Qatar. We consider all oil exporters of the rest of the world as the competitive environment, as described by equation (2) and biofuel is equation (3). As biofuel is not subject to carbon taxation, its consumer's and supplier's prices both equal .

The goal of each oil producer is to maximize the present value of its profit. Therefore, the value function of each exporter is (4) under constraint (5):

$$\sum_{t=1}^T \frac{1}{(1+\delta_i)^t} (p_t q_{it} - c_i(r_{it}, q_{it})) \rightarrow \max\{q_{it}, r_{it}\} \quad i = 1, \dots, N, \quad (4)$$

q_{it} —exporter's i production in year t , million BBL;

p_t —oil price in year t , \$ per BBL;

r_{it} —exporter's i oil reserves in year t , million BBL;

$c_i(r_{it}, q_{it})$ —exporter's i cost in year t ;

δ_i —exporter i discount rate;

N —number of producers;

T —number of periods.

Various cost functions can be found in the literature (for example, depending on oil production and reserves, see Pindyck [1978] or quadratically dependent on production, see Yang [2008, 2013]). It is crucial that the cost function implies higher average cost for larger output. We use the same specification as Pindyck [1978]:

$$c_i(r_{it}, q_{it}) = \frac{m_i}{r_{it}} q_{it}, \quad (6)$$

where m_i is initial reserves of exporter i multiplied by its initial cost.

We employ an iterative algorithm to determine the optimal choice of output in Cournot oligopoly. Solving the dynamic problem of maximizing a nonlinear function with constraints gives optimal trajectories for output, reserves, and equilibrium prices. We maximize function (4) under constraints (5), taking into account that the world oil supply is given by equation (7):

$$Q_t = q_t^o + S_t = q_{it} + \sum_{j \neq i} \bar{q}_{jt} + S_{dirty,t} + S_{clean,t}, \quad (7)$$

where $\sum_{j \neq i} \bar{q}_{jt}$ is exogenous production of other exporters except for i .

The algorithm is as follows:

- 1) We determine present value function for exporter i profit;
- 2) We exogenously introduce other exporters' output treated as given by i ;
- 3) We maximize (4) under constraints (5), (7) and system (1)–(3) that gives optimal output, price, and reserves for i ;
- 4) We proceed for $i = 1, \dots, N$;
- 5) We update the exogenous output of other (non- i) players on every iteration;
- 6) We continue until convergence.

Calibration

We need to specify the model's parameters that generate the oil market's dynamics: oil demand, shale oil and biofuel supply, and oil production cost functions. There is much literature estimating elasticity of demand (both for individual regions and global) by price and income. The estimates vary substantially depending on the data and methods used.

J.C.B. Cooper [2003] estimated a regression model for 23 countries (non-OPEC members). The estimates confirmed that demand for crude oil on a global scale is insensitive to price changes. The average estimate of short-term elasticity across countries is -0.05 and long-term is -0.21 . As expected, all long-term elasticities exceed the short-term values.

In P.K. Narayan and R. Smyth [2007] the main conclusion from panel data analysis of the Middle East countries was that the demand for oil is slightly elastic in terms of income and extremely inelastic in terms of price in the long run. This is consistent with the observation that oil demand in the Middle East is largely driven by strong economic growth, while consumers are largely insensitive to price changes. The long-term elasticity of oil demand by price for the entire data panel is -0.015 and by income is -1.014 ; the short-term elasticity by price is slightly different from zero. In L. Kilian [2017] it was mentioned that the traditional estimate of the long-term elasticity of oil demand at a price is -0.8 .

An article by J.D. Hamilton [2009] presented a review of studies in which it was concluded that the average estimate of the short-term price elasticity of demand is -0.06 . However, more recent studies have presented higher estimates: for example, L. Kilian and D. P. Murphy [2014] obtained a short-term elasticity value of -0.26 based on structural vector autoregression. The authors noted that common estimates of short-term elasticity presented in studies such as by Cooper [2003] and C. Dahl [1993] are not trustworthy, pointing out that the methods they used lead to a bias. They provided a superior model taking into account the role of reserves in the global oil market. In addition, they used a global model of the world oil market instead of regressions for individual countries.

Hence, we specify price elasticities as -0.25 for short-term and -0.8 for long-term. As for the long-term elasticity of demand by income, its estimate is assumed to be 0.55 , obtained in N. Krichene [2002] and D. Gately and H.G. Huntington [2002]. An estimation of the short-term elasticity of oil supply is given in F.M. Nordvik [2019]. Using panel data, the authors concluded that there is a low positive elasticity of oil supply at a price, the resulting value of which is 0.71 . We use this value for both competitive sectors S_{dirty}_t and S_{clean}_t .

We also assume that the autonomous demand for oil will grow in the future at a rate of 1.5% per year, the autonomous supply of the competitive oil producers will decline at a rate of 1% per year, and biofuel supply will grow at the rate of 4% per year as a consequence of technology growth. The values of constants in the total demand function and the supply function of producers in the competitive environment were calibrated based on data on crude oil prices and data on the volume of oil produced by all producers with the exception of the 10 exporters considered in the model. τ and γ are equal to 0 in the basic scenario.

The costs of type (6) are calibrated in accordance with the data on the reserves of the oil exporting countries under consideration and the average costs of oil production. The volumes of reserves come from the EIA, and the cost data are from the Wall Street Journal reports (which published the results of calculations by Rystad Energy [2016]), as well as from the report of the Saudi oil company Saudi Aramco [2019], which published calculated data on the total cost of oil in different countries with included taxes.

The data used by Rystad Energy to estimate cost curves includes information on 62920 fields for 1970–2014, obtained from reports of government agencies in countries such as the U.S. and Norway, including financial and environmental regulators, reports of large private

companies, as well as interviews with representatives of major oil and transport companies. Such a time-consuming complex approach is explained by the fact that the oil industry is quite information-closed both for commercial and political reasons, primarily in the Middle East. For example, for closed countries such as Syria, tanker traffic is used to approximate macro data on production, and micro data is estimated using engineering models. Engineering and geographical factors are taken into account, such as capital costs for exploration, drilling, maintenance of the facility, operational costs of production, transportation, sale and administration, tax costs and other payments to the state, and licensing. These data are used in a number of academic papers modelling the global oil market [Asker Collard-Wexler, de Loecker, 2019; Bartik et al., 2019; Bornstein, Krusell, Rebelo, 2017]. Alternative estimates were made by the World Bank [2011] by aggregating all the costs of a country's oil industry and dividing the amount by the volume of production. Despite the five-year gap in the evaluation time, the results of the World Bank and Rystad Energy analyses show a correlation of 0.84 for a sample of 340 observations.

Incorporating newer data for extraction costs in Russia allows us to account for significant increase in the cost of Russian oil, also noted in Rosstat data showing, for example, that in 2018–22 production costs in rubles increased 2.6 times. To calculate the ratio of oil prices of various oil grades, the current quotes of Brent, OPEC basket, Mexican, Canadian and Chinese oil, Urals, WTI, Lula, CPC, and Qatar land are used.

The profit discount rates for each player are calibrated so that the model correctly reproduces oil production by exporters in the base year. Indeed, the current production rates in some countries are very high relative to reserves, which indicates a significant discounting of profits. In the real world, there are significant differences between countries in production rates relative to reserves. Thus, the low production rates relative to the opportunities in the Persian Gulf countries are explained by the high propensity to save in these countries and are confirmed in E. Hnyilicza and R.S. Pindyck [1976]. High production rates and, thus, discount rates in politically unstable countries are explained, among other things, by expropriation risks [Mabro, 1987] and, in the case of state ownership of oil production, by the acute need of the state for money in the short term [Hartley, Medlock, 2008]. These values are shown in Table 1.

Table 1. Official Data for Extraction, Costs, Relative Prices and Reserves of Major Oil Exporters and Calibrated Discount Rates

Country	Extraction, Billion BBL, 2021	Reserves, Billion BBL, 2021	Price, % of Brent	Costs, \$ per BBL	Discount Rate
OPEC	11.5	1226.5	98	30	0.045
Russia	3.9	80.0	97	43	0.160
U.S.	2.3	31.0	89	46	0.145
China	1.7	26.0	105	57	0.145
Canada	2.0	170.3	66	50	0.148
Brazil	1.3	12.7	96	52	0.165
Mexico	0.7	5.8	87	47	0.150
Kazakhstan	0.7	30.0	95	48	0.042
Norway	0.7	8.1	100	44	0.080
Qatar	0.7	25.2	98	19	0.017

Source: Extraction and reserves—EAI, costs—Saudi Aramco и Rystad.

Simulations

Cournot Oligopoly Baseline

Before considering the impact of emissions taxation on production of exporters and the world price of oil, we analyze the baseline scenario of Cournot oligopoly. Figure 1 shows the equilibrium trajectories for this case. The year 0 corresponds to 2022. In the baseline global oil production and consumption decline from 26.8 billion BBL per year to zero in 95 years. For instance, Russia's production contracts from almost 3.8 billion BBL yearly to zero in 70 years.

To facilitate comparison between policy scenarios, we breakdown global oil consumption to two markets: the U.S., EU, Canada, UK, Switzerland, and Japan (western market) and the rest of the world (eastern market). We assume the ratio of consumption in these two regions to be constant, which according to the EIA is 40 and 60%. Due to supply cuts by major exporters, the price of oil rises until about 2100, then the effect of shrinking supply is offset by alternative energy sources ($Sclean_t$). OPEC remains the largest oil exporter throughout the period under review, followed by Canada (CND), the United States (US), China (CHI), Qatar (QAT), and Russia (RUS). Kazakhstan (KAZ), Brazil (BRA), Mexico (MEX), and Norway (NOR) have smaller market shares.

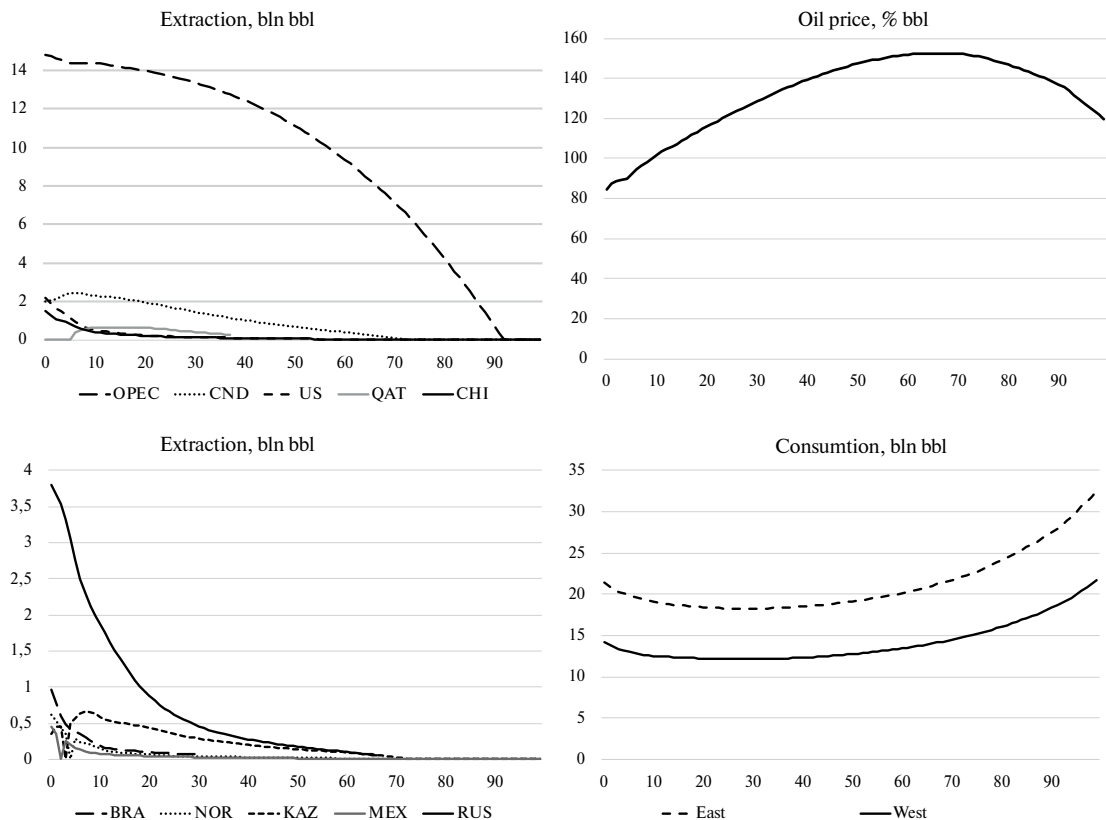


Fig. 1. Oil Price and Consumption in the Baseline

Source: Authors' calculations based on EAI, Rystad, Saudi Aramco.

A Worldwide Emissions Tax Scenario

Now assume that all oil consumers impose a tax on CO₂ emissions. As a basic option, we consider a tax of \$50 per ton of emissions. Since 1 million British thermal units (Btu) account for 72.6 kg of emissions, and one barrel of oil gives 5.7 million Btu, consumption of one barrel of oil releases an average of 0.414 tons of CO₂. Accordingly, in the model, a \$50 emissions tax is equivalent to a tax of \$20.1/BBL. Also assume that the tax is growing at a rate of 3% per year throughout the period under review.

As can be seen in Fig. 2, this leads to a reduction in oil production and consumption. Since the tax rate is gradually increasing, the optimal production trajectories approach the zero level more sharply. The price increase is not limited to \$152.6/BBL, as in the baseline scenario, but at the level of \$123.0/BBL. The Russian oil supply is reduced from 3.2 billion BBL to zero in 60 years.

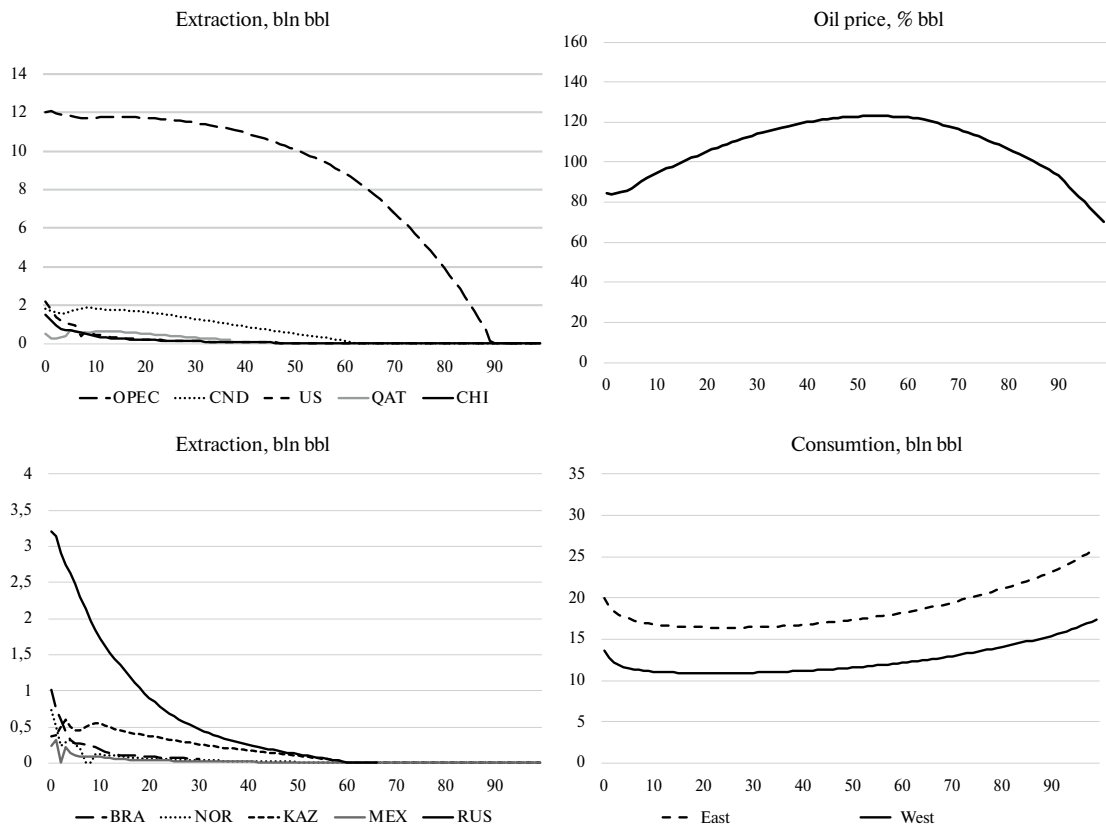


Fig. 2. Oil Price and Consumption Under a Global Emissions Tax Scenario

Source: Authors' calculations based on EAI, Rystad, Saudi Aramco.

A Regional Emissions Tax Scenario

Since developed countries are more active regarding taxation of emissions, consider a scenario where the tax is imposed only in parts of the regions: the U.S., EU, Canada, Great Britain, Switzerland, and Japan. We also assume that Russia's access to these markets is limited.

Thus, we introduce two separate markets (western and eastern) into the model, and we believe that Russian oil is sold only on the eastern market.

In this scenario, if a similar tax is introduced only in the western market, there will be a significant reduction in the volume of the western market. In the base year, it will be equal to 13.1 billion BBL instead of 14.2 billion BBL. The left over oil will be sold on the eastern market, as a result of which its volumes in the base year will increase compared to the base scenario. Oil supply from Russia would be 3.7 billion BBL in the starting year and would last 72 years.

Due to differences in taxation, prices in the two markets will differ markedly. The price on the western market will noticeably decrease in comparison with the baseline scenario, its peak will be \$134.2/BBL, instead of \$152.6/BBL in the basic scenario. The price in the eastern market will also decrease due to the overflow effect, but to a lesser extent, from \$144.8/BBL in the peak. However, these price levels turn out to be higher than in the case of the introduction of a tax on the entire world oil market.

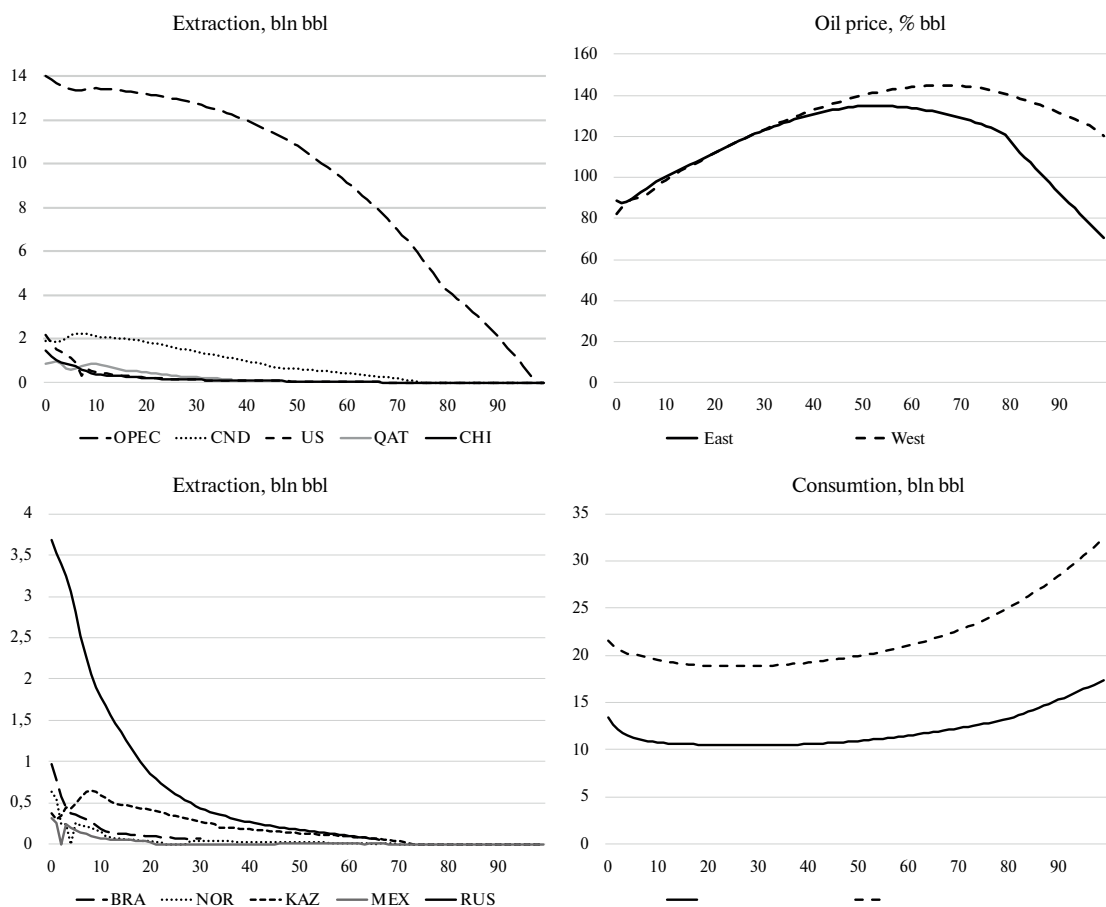


Fig. 3. Oil Price and Consumption Under a Regional Emissions Tax Scenario

Source: Authors' calculations based on EAI, Rystad, Saudi Aramco.

Tables 2 and 3 present other options for an emissions tax imposed on the entire world market and only on the western market, respectively. Prices, production volumes, and revenue of each exporter are given as a percentage of the baseline scenario. Output and revenues are cal-

culated as totals for the specified periods and prices are calculated as averages for these periods. Each table shows 12 scenarios involving the introduction of an emission tax in the amount of \$25, \$50, or \$75 per ton of CO₂ emissions and an increase in the rate of 1.5% or staying constant.

A monotonous negative dependence of the oil price on the tax rate and its growth rate is revealed. Also, the introduction of a tax that increases over time stimulates an even greater acceleration of oil production by major exporters. Revenue changes proportionally to prices and production. For example, in the case of a constant initial tax rate of \$50 per ton for Russia, Russia will lose 14.3% of revenue on average for the period up to 2030 and 9.1% of revenue for the period 2031–40, while a gradual increase in the tax rate by 1.5% per year will cost from 5.7% to 12.6% of revenue depending on the period, and under a 3% tax increase, losses will range from 17.0% to 11.8% over the selected periods. Thus, with the selected tax values, a twofold acceleration of the rate leads to a commensurate reduction in revenue for Russia, which is one of the largest percentage drops among the 10 allocated by the exporter. This is the implementation of the spillover effect: the introduction of a tax in one market will displace producers to another market, where they will compete with Russia.

For a permanent tax of \$25 per ton of emissions, the reduction in Russian oil revenue will be about 8.7% for the period up to 2030 with a further reduction in the effect. However, for a tax growing at a rate of 1.5%, the losses of the Russian Federation will increase to 9.7%. If the tax is imposed only on markets from which Russia is isolated, then the losses amount to about 2–3% over the entire horizon, both with a growing and with a constant tax rate.

For the tax rate of \$75 per ton of emissions, the revenue received by the Russian Federation in the initial periods is 20.9% for the constant rate and 23.3% for the growing one, and, for example, for the period 2041–50, it will be 3.3% and 10.5%, respectively. If the tax is imposed only on the western market, taking into account the oil embargo, losses for Russia will vary from 3.6% to 6.1% for a constant tax rate and from 6.2% to 7.6% for an increasing one.

Conclusion

We constructed a model of Cournot oligopoly for the global oil market represented by OPEC, Russia, Canada, the U.S., China, Qatar, Kazakhstan, Brazil, Mexico, and Norway with demand and cost parameters calibrated to current data. We produced 24 scenarios of taxation of CO₂ emissions from oil consumption and analyzed their impact on demand for oil. The global oil market is quite a complex object to model. Different types of participants operate within it: completely competitive agents, large oligopolists and national monopolists, state-owned companies, and state regulators, which can be controlled by managers pursuing their own political goals. In addition to the complex structure of the market, the researcher also inevitably faces the problem of limited and closed data on the industry. Despite this, the proposed model of the oil market, in our opinion, considers the main factors, and gives fairly accurate quantitative estimates. The calculations carried out can contribute to the discussion on this topical topic. In particular, the model considers the possibility of restricting access of Russian oil to the markets of several developed countries.

Twelve scenarios of possible options for taxation of CO₂ emissions from oil consumption and their impact on oil demand were analyzed. We assumed the initial tax rate equaling \$25, \$50, or \$75 per ton of emissions constant or with a yearly increase of 1.5%. We distinguish global and regional emissions taxation, that is, taxation in developed countries only: the U.S., the EU, Canada, the UK, Switzerland, and Japan. The restriction of access to these markets for Russia is also considered.

The major results are as follows. A monotonous negative relationship is revealed between the emissions tax rate, as well as its growth rate and oil prices, both under the tax introduced worldwide and regionally. For Russia, the lost oil revenue due to the introduction of an unchanged tax rate of \$50 per ton of emissions will amount to 14.3% on average for the period up to 2030 and 9.1% of revenue for the period 2031–40, and in the case of an increase in the tax rate at a rate of 1.5% per year, the losses will amount to significantly more: 17% and 11.8% for the corresponding time periods.

If such a tax is imposed by developed countries that do not buy Russian oil, Russia will also face revenue losses. They will be from 2.8% to 4.0% and from 3.3% to 6.0%, respectively, for permanent and growing taxes. Thus, in the world oil market, strong effects of overflow between local markets are revealed in the case of the introduction of a tax in parts of countries that are transmitted through oil prices. Thus, with the introduction of a tax of \$50 per ton of emissions with an annual growth of 1.5% worldwide, the peak price of oil is lower by \$29.6/BBL. With the introduction of such a tax only in developed countries, the drop in oil prices at the peak compared to the baseline scenario without taxation is \$18.4/BBL in the market where the tax was introduced and \$7.8/BBL in the market where the tax was not introduced.

The article also shows that in the short term, with an increasing tax, production is higher than with an unchanged tax rate, since players, expecting higher taxes and, accordingly, declining profitability in the future, increase production in the current time periods—world oil consumption in later periods (2030–40) falls the most. At the same time, it is precisely for 2030–40 that fuel production in the baseline scenario falls. Thus, with increasing taxes on emissions, the profile of oil production becomes more uneven.

In addition, due to the introduction of an emissions tax, Russia is experiencing one of the most significant reductions in oil revenue compared to other oil-producing countries, which indicates relatively high risks of reducing oil demand for Russia.

Table 2. Oil Price, Production and Revenue of Major Oil Exporting Countries Under a Worldwide Emissions Tax (% from the baseline)²

Scenarios	Price	Consump	Extraction										Revenue									
			OPEC	RUS	US	CHI	CND	BRA	MEX	KAZ	NOR	QAT	OPEC	RUS	US	CHI	CND	BRA	MEX	KAZ	NOR	QAT
25-0%																						
2023-2030	-2,3	-5,4	-10,3	-6,6	-2,5	-2,8	-10,8	-2,6	-16,0	12,5	1,0	90,2	-11,8	-8,7	-4,2	-5,1	-12,7	-5,2	-19,1	9,7	0,2	85,6
2031-2040	-3,0	-5,5	-8,5	-0,7	-3,9	-5,9	-8,9	-5,5	-22,3	-10,8	-10,6	-5,2	-11,3	-3,4	-6,8	-8,7	-11,6	-8,5	-24,2	-13,6	-13,5	-8,3
2041-2050	-3,9	-4,0	-6,3	3,5	-1,8	-2,4	-4,0	-3,5	-6,0	-6,4	-2,7	-11,2	-9,8	-0,5	-5,6	-6,2	-7,7	-7,2	-9,6	-10,0	-6,3	-14,7
25-1,5%																						
2023-2030	-2,9	-5,3	-9,8	-7,1	-3,0	-3,4	-12,7	-3,4	-16,9	13,9	0,6	113,1	-11,9	-9,7	-5,3	-6,3	-15,1	-6,5	-20,5	10,4	-0,9	105,9
2031-2040	-3,8	-6,2	-9,2	-2,0	-5,1	-7,2	-11,0	-6,6	-23,5	-10,2	-8,6	-0,8	-12,7	-5,4	-8,6	-10,7	-14,4	-10,3	-26,0	-13,8	-12,3	-5,0
2041-2050	-5,2	-5,5	-8,0	2,2	-3,8	-4,3	-6,6	-5,8	-8,3	-7,1	-4,3	-13,0	-12,7	-3,0	-8,7	-9,2	-11,4	-10,6	-12,9	-11,9	-9,0	-17,5
50-0%																						
2023-2030	-3,1	-10,3	-18,2	-11,9	-6,2	-7,9	-21,5	-7,8	-5,8	8,3	-1,9	143,0	-20,8	-14,3	-8,7	-10,6	-24,2	-10,7	-8,8	3,2	-5,3	126,1
2031-2040	-6,2	-10,3	-16,4	-3,2	-5,6	-6,5	-16,1	-4,6	-1,5	-11,4	-7,3	-7,9	-21,5	-9,1	-11,4	-12,3	-21,2	-10,5	-7,7	-16,7	-12,7	-13,6
2041-2050	-7,5	-7,8	-12,3	6,3	-2,9	-4,2	-9,0	-6,3	-7,6	-10,6	-4,3	-17,9	-18,8	-1,6	-10,1	-11,3	-15,8	-13,1	-14,3	-17,2	-11,2	-24,0
50-1,5%																						
2023-2030	-4,4	-10,6	-18,2	-13,5	-7,5	-9,4	-24,9	-9,0	-7,6	11,7	-0,9	194,9	-21,8	-17,0	-11,1	-13,1	-28,4	-12,5	-10,9	5,6	-5,1	170,7
2031-2040	-7,6	-11,6	-17,7	-4,8	-6,9	-8,6	-20,2	-7,2	-4,4	-11,1	-12,8	-4,6	-23,9	-11,8	-13,8	-15,5	-26,1	-14,1	-11,6	-17,7	-18,8	-11,9
2041-2050	-9,8	-10,5	-15,6	3,9	-6,5	-8,2	-14,4	-10,3	-12,1	-11,8	-6,4	-20,8	-23,8	-6,2	-15,6	-17,1	-22,7	-18,9	-20,5	-20,3	-15,3	-28,5
75-0%																						
2023-2030	-4,6	-14,4	-25,4	-17,4	-9,5	-11,8	-30,2	-10,5	-8,3	13,3	-2,1	202,6	-28,9	-20,9	-13,3	-15,6	-33,7	-14,5	-12,3	6,2	-6,8	176,3
2031-2040	-9,0	-14,8	-23,3	-5,2	-7,0	-9,2	-24,1	-9,0	-6,7	-18,0	-13,8	-12,5	-30,0	-13,5	-15,3	-17,3	-30,8	-16,9	-15,0	-25,1	-20,9	-20,3
2041-2050	-10,9	-11,5	-18,0	8,4	-4,9	-7,4	-14,5	-9,7	-12,1	-15,2	-7,3	-24,4	-26,9	-3,3	-15,1	-17,2	-23,6	-19,2	-21,3	-24,2	-16,9	-32,6

² W and E are prices in western and eastern markets.

Scenarios	Price	Consump	Extraction										Revenue									
75-1,5%			OPEC	RUS	US	CHI	CND	BRA	MEX	KAZ	NOR	QAT	OPEC	RUS	US	CHI	CND	BRA	MEX	KAZ	NOR	QAT
2023-2030	-5,9	-14,5	-24,8	-18,8	-11,0	-13,7	-34,2	-12,4	-10,3	17,9	-2,9	260,7	-29,2	-23,3	-15,7	-18,5	-38,4	-17,4	-15,3	9,0	-8,7	224,6
2031-2040	-10,9	-16,6	-25,3	-8,2	-9,4	-11,9	-29,4	-11,7	-9,2	-16,8	-14,8	-6,3	-33,3	-18,0	-19,1	-21,4	-36,9	-20,9	-18,9	-25,5	-23,4	-16,6
2041-2050	-13,9	-15,4	-22,8	3,7	-11,5	-14,3	-22,7	-17,8	-19,9	-17,3	-11,9	-28,6	-33,5	-10,5	-23,6	-26,0	-33,3	-28,9	-30,7	-28,6	-23,7	-38,4

Source:

Table 3. Oil Price, Production and Revenue of Major Oil Exporting Countries Under Emissions Tax in the Western Market (% from the baseline)³

Scenarios	Price		Consump	Extraction												Revenue											
	E	W		OPEC	RUS	US	CHI	CND	BRA	MEX	KAZ	NOR	QAT	OPEC	RUS	US	CHI	CND	BRA	MEX	KAZ	NOR	QAT				
25-0%																											
2023-2030	0,1	-1,4	-1,9	-4,3	-1,0	-1,6	-1,6	-4,9	0,4	-3,7	10,0	4,2	49,8	-5,1	-2,4	-2,7	-3,3	-6,0	-1,2	-5,6	9,4	-4,2	0,8				
2031-2040	-1,3	-1,1	-2,2	-3,0	-0,9	0,2	-1,0	-3,2	-6,1	-40,8	-7,8	-13,5	4,3	4,2	-1,9	-0,7	-2,0	-4,4	-7,6	-40,3	-9,0	159,7	-2,0				
2041-2050	-1,6	-1,5	-1,5	-9,0	-0,4	-0,7	-0,8	-1,0	-1,0	-6,0	-2,5	2,5	-5,5	-3,8	-1,9	-2,2	-2,4	-2,5	-2,6	-7,5	-3,9	-	63,0				
25-1,5%																											
2023-2030	-0,2	-1,6	-1,9	-4,0	-1,1	-1,8	-1,8	-5,5	0,3	-3,8	10,9	4,2	57,2	-5,1	-2,8	-3,1	-3,7	-6,9	-1,6	-5,9	10,0	-5,1	1,8				
2031-2040	-1,6	-1,4	-2,4	-3,2	-1,3	-0,4	-1,7	-4,1	-6,8	-41,5	-7,9	-12,5	-2,2	4,7	-2,5	-1,5	-2,9	-5,5	-8,4	-41,2	-9,4	171,8	-1,5				
2041-2050	-2,1	-1,9	-2,1	-11,9	-0,9	-1,4	-1,5	-2,0	-1,9	-7,1	-2,9	1,6	-6,3	-4,9	-2,8	-3,4	-3,5	-3,9	-4,0	-8,9	-4,9	-	67,2				
50-0%																											
2023-2030	-1,1	-1,6	-3,8	-6,9	-1,3	-2,3	-2,9	-8,9	-10,2	-6,4	-2,8	-5,0	11,9	-8,4	-2,8	-3,5	-4,1	-10,3	-11,4	-7,6	-4,5	-6,1	8,0				
2031-2040	-2,4	-2,3	-3,8	-5,9	-2,5	-2,6	-3,2	-6,1	-9,6	-35,0	-2,8	-9,4	-3,0	-8,2	-4,8	-4,9	-5,6	-8,3	-12,0	-35,7	-5,2	-12,0	-5,2				
2041-2050	-3,1	-2,8	-2,8	-16,8	-1,2	-0,3	-0,7	-2,6	-0,9	-14,6	-3,0	-5,3	-6,1	-7,2	-4,0	-3,3	-3,7	-5,5	-3,9	-17,0	-5,9	-7,9	-8,9				

³ W and E are prices in western and eastern markets.

Scenarios	Price		Consump	Extraction												Revenue											
	E	W		OPEC	RUS	US	CHI	CND	BRA	MEX	KAZ	NOR	QAT	OPEC	RUS	US	CHI	CND	BRA	MEX	KAZ	NOR	QAT				
50-1,5%																											
2023-2030	-1,6	-1,9	-3,8	-6,6	-1,6	-2,6	-3,4	-10,2	-3,9	-0,8	0,5	-1,9	50,7	-8,4	-3,3	-4,0	-4,7	-11,9	-5,3	-1,9	-1,9	-5,2	0,7				
2031-2040	-2,8	-3,0	-4,2	-6,3	-3,1	-3,4	-4,1	-7,4	-1,9	-10,0	-2,5	-8,1	2,6	-9,1	-6,0	-6,2	-7,0	-10,2	-5,0	-12,6	-5,5	210,3	-1,9				
2041-2050	-4,0	-3,6	-3,8	-21,7	-1,9	-1,5	-1,8	-4,3	-2,6	-19,1	-4,0	-8,5	-7,7	-9,0	-5,4	-5,3	-5,6	-7,9	-6,5	-22,1	-7,7	-	69,9				
75-0%	E	W		OPEC	RUS	US	CHI	CND	BRA	MEX	KAZ	NOR	QAT	OPEC	RUS	US	CHI	CND	BRA	MEX	KAZ	NOR	QAT				
2023-2030	-2,0	-2,3	-5,3	-9,5	-1,6	-2,7	-3,3	-11,9	-4,3	-0,6	-1,3	-3,2	43,6	-11,6	-3,6	-4,4	-4,9	-13,9	-5,9	-1,7	-4,0	-6,3	1,7				
2031-2040	-3,2	-3,3	-5,3	-7,9	-4,5	-6,7	-10,0	-10,7	-8,3	-45,9	-5,4	-19,2	2,9	-10,9	-7,5	-9,7	-13,2	-13,7	-12,1	-48,4	-8,9	218,8	-2,0				
2041-2050	-4,6	-4,2	-4,0	-23,6	-1,8	2,7	4,7	-2,9	7,1	-12,0	-2,9	5,9	-10,1	-10,3	-6,1	-2,4	-0,8	-7,3	1,3	-17,0	-7,1	-	70,2				
75-1,5%	E	W		OPEC	RUS	US	CHI	CND	BRA	MEX	KAZ	NOR	QAT	OPEC	RUS	US	CHI	CND	BRA	MEX	KAZ	NOR	QAT				
2023-2030	-1,4	-2,9	-5,0	-8,6	-3,5	-4,1	-4,7	-12,9	-4,0	-9,7	4,5	-2,4	77,8	-11,0	-6,2	-6,1	-6,7	-15,1	-5,8	-10,6	1,8	-7,4	2,6				
2031-2040	-4,0	-3,9	-5,5	-8,2	-2,5	-2,9	-4,9	-10,5	-6,0	-37,1	-6,9	-12,5	-0,1	-11,9	-6,3	-6,7	-8,7	-14,1	-9,9	-39,8	-10,7	224,0	-2,7				
2041-2050	-5,4	-4,8	-5,0	-28,2	-2,9	-2,8	-3,3	-5,9	-3,8	-53,8	-5,8	-12,4	-11,1	-11,8	-7,6	-7,7	-8,2	-10,6	-8,8	-55,2	-10,5	-	67,3				

Source:

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Russia's Arctic Science Diplomacy: Theory and Practice¹

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Abstract

Arctic science diplomacy (ASD) is both a relatively new topic and an acute issue in Russian academic and political circles. There is neither a clear definition of the concept nor a consensus on the stakeholders, tools, and activities of science diplomacy. This article focuses on the main approaches in Russia in relation to the concept of ASD. The first approach considers ASD as a soft power tool of regional players. Science diplomacy helps to promote a positive image of specific states and to gain access to non-state resources that are usually inaccessible to state actors. A technical/instrumentalist approach to ASD involves the use of academic and scientific-technical cooperation between regions, countries, and societies to create reliable international partnerships on a non-ideological basis and to solve generally significant world problems. The third direction considers ASD as a form of new diplomacy, the strategic goal of which is not only to build friendly relations and cooperation with all Arctic countries, but also to develop international scientific cooperation and improve the international image of Russia.

This analysis makes it possible to explain the strategic motives and driving forces of ASD and to identify the stakeholders and key forms of Russia's ASD. It is established that the majority of participants in ASD share the idea that international scientific cooperation to ensure the sustainable development of the Arctic can become an effective mechanism for solving the most acute problems of the region, as well as for improving the current relations of western countries with Russia. The authors believe that Russia has largely managed to form the necessary platforms for the implementation of both strategic and tactical goals of its ASD. These platforms include both national platforms—The Arctic: The Territory of Dialogue and The Arctic: Present and Future—and the active use of international platforms—Arctic Frontiers, Polar Circle, and Arctic Science Summit Week—and organizations such as the Inter-Agency Standing Committee (IASC), the International Arctic Social Sciences Association (IASSA), and the Association of Polar Early Career Scientists (APECS).

Keywords: Russia, Arctic, science diplomacy, international cooperation, soft power, public diplomacy

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Introduction

In the 21st century, the interest of the entire global community in the Arctic has grown steadily. An analysis of the Arctic agenda shows that in addition to economic, environmental, and military interests, circumpolar states also have pronounced research interests in this polar region.

As a result of the interest in the development of research activity in the region an agreement was concluded in May 2017 under the auspices of the Arctic Council (AC) on enhancing international Arctic scientific cooperation [Arctic Council, 2017]. In addition to the full members of the AC, much attention is paid to scientific research in the region by states that have observer status in the council, in particular Switzerland, Italy, Poland, Great Britain, China, Japan, and Korea.

In addition, numerous international governmental and non-governmental organizations and forums are active subjects of research activities in the region, ranging from the United Nations (UN) and its specialized agencies—the World Meteorological Organization (WMO) and the Intergovernmental Panel on Climate Change (IPCC)—to regional structures including the Barents Euro-Arctic Council, the Northern Forum, and the European Union (EU). In this list, a special place is occupied by organizations whose goal is to directly study the region—the International Arctic Science Committee (IASC), the International Arctic Social Sciences Association (IASSA), and the “network” University of the Arctic, which unites about 200 universities from around the world engaged in the study of the Far North and/or training for this region.

The above dynamic processes have led to the emergence of the phenomenon of Arctic science diplomacy (ASD) in the 21st century, which complements and sometimes challenges traditional diplomacy. This study is aimed at understanding this phenomenon, as well as its nature, functions, forms, and platforms.

Theoretical Approaches to the Study of Science Diplomacy

The first widely known theoretical attempt to comprehend the phenomenon of science diplomacy was the seminal report of the American Association for the Advancement of Science, entitled *New Frontiers in Science Diplomacy: Navigating the Changing Balance of Power* [The Royal Society, 2010]. The main result of the report was the identification of the dimensions of science diplomacy.

The first dimension is science in diplomacy, that is, the provision of consulting services by the scientific community to government bodies to develop effective foreign policy to solve significant world problems. The report mentioned, for example, the IPCC as an organization that informs national governments and international organizations about global climate change. In the Arctic region, in addition to the IPCC, important consulting activities are also carried out by the AC working groups on the protection of the Arctic marine environment and the sustainable development of the Arctic, the elimination of pollution in the Arctic, the conservation of Arctic flora and fauna, the prevention, preparedness, and elimination of emergencies, and the implementation of the Arctic monitoring and assessment programme. Such cooperation between diplomats and scientists, according to the authors of the report, is mutually beneficial since the former make political decisions on international issues based on a scientific approach, while the latter begin to better understand the mechanisms for making political decisions.

The second dimension is diplomacy for science, that is, support for international scientific cooperation. This dimension is based on the idea that current global problems can only be solved by the joint efforts of the governments of all countries of the world. The CERN Large Hadron Collider and the ALMA International Radio Telescope Complex in Atacama have be-

come ideal types of such interaction. In the Arctic region, the main achievement is the already mentioned Agreement on Enhancing International Arctic Scientific Cooperation of 2017.

Third is science for diplomacy, that is, using the potential of scientific collaborations to strengthen trust between individual states and maintain international stability. The manifestation of this dimension includes, for example, scientific conferences and forums (including Arctic Frontiers, Arctic Circle, and the Arctic Science Summit Week), declarations of cooperation, and the creation of intergovernmental and non-governmental scientific organizations (IASC, IASSA). The 2010 report marked the beginning of research in the field of theory and practice of science diplomacy, and this phenomenon is currently being scrupulously analyzed by foreign policy analysts and specialists in the field of international relations. The London report was a milestone in the study of science diplomacy. A number of authors continued research in this field, relying on the report, while others argued that it was based on contradictory theses and that its conclusions were incorrect [Smith, 2014]. In addition, there was a discussion about how applicable the theory of science diplomacy is to different branches of science and regions of the planet.

In addition to expanding the theoretical discourse on the nature of science diplomacy, certain organizational decisions were made. In 2008, the American Association for the Advancement of Science established the Center for Science Diplomacy and began publishing a journal called *Science and Diplomacy*, which has become the main platform for specialists studying this phenomenon.

Subsequently, many experts began to lose interest in the theoretical foundations of science diplomacy laid down in the London report. This was largely because this concept was not aimed at explaining the very nature of science diplomacy, but rather at describing the relationship between diplomacy and science.

The renewal of interest in the concept of science diplomacy began with a search for its differences from the concept of international scientific cooperation (ISC). Science diplomacy is closely linked to the public interest, in contrast to ISC, which can be carried out by business representatives without the participation of the state and can be motivated by commercial or practical scientific benefits. Science diplomacy is based on the idea of achieving joint progress in research; however, unlike ISC, the improvement of relations between the parties to cooperation is proclaimed as its main motive. Moreover, ISC is usually implemented by individuals and groups of individuals, while science diplomacy, although it can be the result of the activities of specific individuals, often implies the initiative of the state in this area. In this regard, ISC may or may not include science diplomacy.

Despite the fact that the term “science diplomacy” is mentioned in the Russian Strategy for Scientific and Technological Development of 2016 and the Concept of International Scientific and Technical Cooperation of the Russian Federation of 2019, and is often used by politicians, scientists, and the media, there is still no consensus about the content of this concept. The main approaches that have developed today in Russia regarding the ASD concept are examined below.

Technical/Instrumentalist Approach to Science Diplomacy

This approach to ASD has recently become quite popular in the Russian political and academic community. It is characterized by the understanding of academic and scientific and technical cooperation between societies, regions, and countries as a means of building strong international collaborations on a non-ideological basis and creating long-term international partnerships.

Most scientific research in the Arctic is international in nature, goes far beyond the boundaries of one state, and is implemented by international teams of scientists and the joint efforts

of many countries, institutions, and organizations. Within the framework of this approach, science diplomacy is considered to be a set of networked cognitive practices, such as consulting, reporting, research, and evidence provision. These practices appear and are supported at the level of routine activities and everyday life through research platforms, including universities, institutes, centres, laboratories, conferences, seminars, and training events. ASD acquires a network character due to the need to harmonize and coordinate efforts and the timely communication for its implementation (see Fig. 1).

The signing of the aforementioned Agreement on Enhancing International Arctic Scientific Cooperation in 2017 revealed the global significance of ASD. According to then representative of Russia to the AC, V.V. Barbin, the conclusion of the agreement demonstrated the responsibility of the Arctic states for the sustainable development of the region and “the firm determination to achieve this goal by stimulating regional cooperation based on advanced knowledge” [PRO-ARCTIC, 2018]. At the initial stage, Russian experts, cooperating with foreign colleagues on the development of the terms of the agreement, made a great contribution to the preparation of the text of the document.

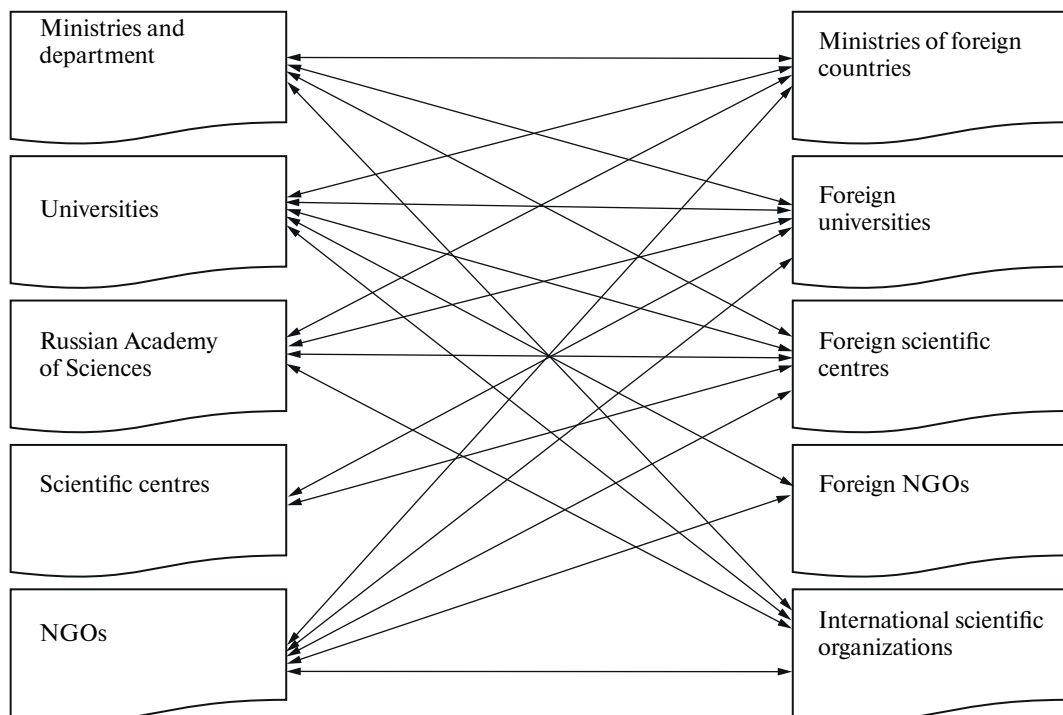


Fig. 1. International Scientific Cooperation in the Arctic

Source: Prepared by the authors.

A prominent representative of the technical (instrumentalist) approach is the Russian researcher N.M. Antyushina. In the article “The Many Faces of the Arctic,” Antyushina analyzed the features of the region and stated that the joint scientific activities of states in the Arctic are developing quite actively, which allows them to collect a sufficient amount of data: “countries willingly join their efforts in this regard and agree to exchange the results of the observations obtained” [2013, p. 45]. In addition, the author concluded that the Arctic is an innovative region, “a kind of laboratory for establishing international cooperation on a wide range of issues”

[Antyushina, 2013, p. 45]. According to Antyushina, the goal of ASD should be a transition to the principles of sustainable development of the region agreed between the states. Science diplomacy is designed to prevent the predatory use of natural resources of the Far North and to ensure the use of advanced technologies to establish a management system in which the course for the sustainable development of the region will be consistently pursued without harming its population.

At the Days of the Arctic and Antarctic in Moscow meeting, held on 25–27 November 2020, representatives of the Russian foreign ministry noted that the Russian Federation, in its role as chair of the AC, would rely on the strong foundation of Arctic science. According to the ambassador of the Ministry of Foreign Affairs of the Russian Federation, N.V. Korchunov, ASD should help make the agenda of the AC truly comprehensive: “The scientific approach allows us to build policy in the Arctic in the most optimal and efficient way. This is both meteorological cooperation and cooperation in the field of maritime activities, to which we will also pay close attention during the Russian chairmanship” [Days of the Arctic and Antarctic, 2020].

Russian-American scientist A.N. Petrov, who was the president of the IASSA in 2017–21, noted the special importance of the social sciences in ASD, which “play an important role in understanding what and how we need to do in the Arctic—talk to people, receive data on economic, social, demographic development—all this is a paramount task if we want to ensure the sustainable development of the region” [Ibid.]. At the same time, Petrov noted that one of the main platforms of ASD is the International Congress of Arctic Social Sciences, which takes place every three years.

N.K. Kharlampeva (St Petersburg State University) edited a monograph entitled *International Scientific Cooperation in the Arctic*, which explored the causes of key changes in the study of the Far North and highlighted the following characteristics: the use of knowledge to create a common environmental space; expanding the possibilities of research expeditions, including their use for scientific tourism; and the internationalization of the research and educational system [Kharlampeva, 2017, p. 5]. Kharlampeva noted that in order to understand the modern characteristics of ASD, it is necessary to determine the expanding composition of participants in international cooperation, as well as to study changes in the methods of decision-making at the national, regional and global levels. According to Kharlampeva, the object of the research should be “the process of formation of the Arctic regional innovation system,” and the subject of research should focus on “the process of improving strategic scientific planning and an effective mechanism for the decision-making process” [Ibid.].

M.R. Kalinina (Northern (Arctic) Federal University (NArFU)) asserted that ASD could become the most important resource for the development of universities, because, thanks to joint scientific activities, one can obtain relevant and unique scientific knowledge and understand the processes taking place in the region: “that direction which we are now developing and supporting—science diplomacy and a constant dialogue of experts from the scientific community and authorities at all levels—this is what is needed in the Arctic today precisely in order for the results of scientific research to be the basis for informed decisions” [Days of the Arctic and Antarctic, 2020].

Critics of the instrumentalist approach, however, point out that its proponents significantly narrow the meaning of ASD, reducing it to cooperation between scientists in functional areas and a utilitarian attitude toward the results of this cooperation, applying them only to solve specific technical or administrative problems. According to these critics, the instrumentalists fail to notice that ASD has much more potential than just enhancing scientific cooperation to solve the practical problems of the region [Krynzina, 2018; Romanova, 2018].

The following approaches to ASD interpret this phenomenon in a much broader context, as part of the state’s foreign policy toolkit.

Science Diplomacy as a Tool of Soft Power

The consideration of science diplomacy as a tool of soft power is consistent with the theory of neoliberalism, which views non-military methods of foreign policy in modern conditions to be more effective than the use of hard power. The scientific attractiveness of the state (along with economic, cultural, educational, and other factors) is one of the most important characteristics of the soft power of ASD (Fig. 2). Countries that occupy leading positions in soft power ratings are very active in ASD. These states include Japan, Germany, the United Kingdom, France, and Switzerland—countries that are not Arctic states but have observer status in the AC. Thanks to their scientific work, they have gained great prestige in the field of Arctic research, and the “official” Arctic countries have to reckon with them in matters of regional policy. Understanding the capabilities of ASD for solving the most important foreign policy tasks is also reflected in Russian political discourse.

Russian researcher A.A. Todorov touched on the theme of ASD, studying the activities of foreign countries in the region. In the article “Interests of Switzerland in the Arctic,” Todorov described the main research institutions of the confederation and made predictions about the prospects for cooperation between Switzerland and Russia in the Arctic. ASD, according to Todorov, could significantly contribute to strengthening the polar status of the state: “Switzerland has taken a course on the use of science as a tool of state diplomacy in the international Arctic areas. Thanks in large part to increased research in the Arctic and the establishment of the Swiss Polar Institute, the country became an observer on the Arctic Council in 2017” [2018, p. 6].

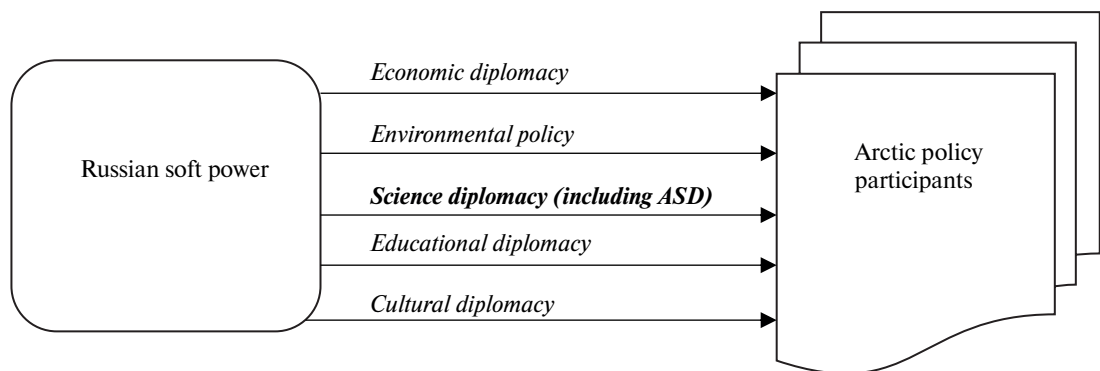


Fig. 2. Arctic Science Diplomacy in Russia’s Soft Power Strategy

Source: Prepared by the authors.

In a later article, “British Interests in the Arctic,” Todorov considered the science diplomacy concept as a tool to strengthen the influence of London in the region: “By developing bilateral cooperation with the Arctic countries, as well as other interested players, Britain... relies on science diplomacy” [2019, p. 93].

Many Russian scientists and politicians believe that Russia can effectively draw on the experience of other countries and use ASD as its own tool of soft power in the region. Proponents of this approach believe that science diplomacy can help strengthen Russia’s positive image in the Arctic, change the foreign policy behaviour of international partners, and gain access to non-state resources that are usually inaccessible to state actors.

This direction follows the logic of J. Nye [2004] and considers soft power to be the ability to be attractive. Russian scientists are very active in all expert and working groups of the AC; to-

gether with foreign colleagues, they participate in research activities at polar stations in Chersky (Yakutia), Snezhinka (Yamal), and Barentsburg (Spitsbergen), as well as Russian sea and land expeditions.

The director of the Institute of Regional Consulting, Professor A.N. Pilyasov, sees ASD as the basis of Russia's soft power in the region. According to Pilyasov, ASD is an important tool with which Russia is able to maintain the status of the world's Arctic leader. Pilyasov argued that science diplomacy is the key to maintaining control over the Arctic territories for Russia: "Russia needs to be present at all international scientific forums, participate in international research projects, initiate them itself in order to acquire the new world knowledge about the Arctic territories, which accumulated over the past one and a half to two decades and is rapidly updated from year to year" [2012]. Pilyasov held that Russia should recognize the internationalization of research that has already taken place in the Arctic, and that the main task of Russian ASD should be the creation of its own research initiatives in priority areas to fill gaps in research.

In their joint study, N.Yu. Zamyatina and A.N. Pilyasov concluded that there is a need for the formation of Arctic regional science. According to them, the cementing factor for its creation would be "the highly specific environment of the Arctic itself, the study of which requires an interdisciplinary synthesis of sciences that study the properties of this space" [2017, p. 7]. The open project of the new Arctic science, the researchers noted, will contribute to the consolidation of intellectual efforts aimed at a better understanding of the region.

In many respects, the popularity of this approach to ASD is connected with the positions of the Russian political elite. The Kremlin is showing a steady interest in ASD as a geopolitical tool of soft influence on political processes in the Arctic region. Statements by Russian top officials, as well as some normative and doctrinal documents, indicate that the Russian political leadership is well aware of both the potential benefits and the threats that soft power can hide.

In 2012, V.V. Putin, in his article "Russia and the Changing World," defined soft power as "a set of tools and methods to achieve foreign policy goals without the use of weapons, but through information and other levers of influence" [2012]. He stressed that such tools can often be used to manipulate public consciousness and interfere in the internal affairs of sovereign states. Following Putin's logic, it can be assumed that ASD could be a tool for broadcasting soft power in the region and used by the subjects of international relations to strengthen their polar status and protect national interests.

Many Russian soft power initiatives (including ASD) often pursue pragmatic goals and do not take account of the interests of international partners. In this regard, Russia's science diplomacy may be perceived by other regional players as a continuation of the Kremlin's "expansionist" policy in the Arctic, but by other (non-military) methods.

Science Diplomacy as a Kind of New (Public) Diplomacy

This approach considers science diplomacy as a form of new diplomacy, which has become a general concept that describes a number of informal and formal research, academic, and technical exchanges within the general sphere of international relations. Science diplomacy, along with digital, economic, sports, non-state, and paradiplomacy, is a sub-category of "new" diplomacy, as opposed to classical state-oriented diplomacy. As part of this approach, ASD uses not only state, but also non-state actors and institutions to communicate with foreign partners. Depending on the nature of interstate relations, ASD may target either governmental or non-governmental partners, or both (Fig. 3).

ASD is not only a tool for improving the image of Russia in the international arena and turning it into an attractive scientific partner, but also a mechanism for participating in long-term and meaningful cooperation with the academic communities of foreign countries in or-

der to solve the most important practical and theoretical problems related to research in the Far North. In fact, this approach does not negate the previous two; rather, it tries to combine and subordinate them to a more general strategic goal—to use ASD to establish good relations with all circumpolar players. Prior to the start of the special military operation in Ukraine, the supporters of this approach believed that the use of ASD was especially relevant in the face of deteriorating relations between Russia and the West. Cold War science left a legacy of examples of the successful use of science diplomacy to defuse international tensions.

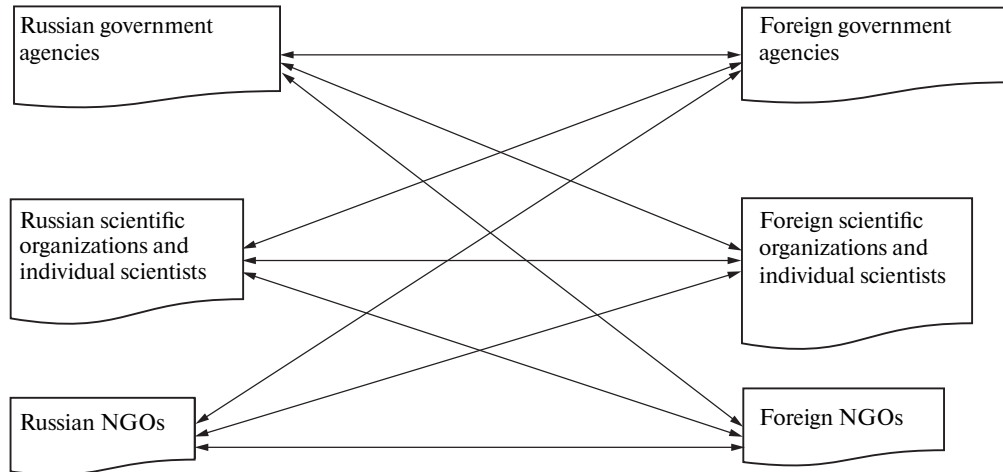


Fig. 3. The Place of ASD in Russian Public Diplomacy

Source: Prepared by the authors.

At the height of the Cold War, the USSR and the United States entered into several agreements on scientific cooperation, one of which was devoted to bilateral cooperation in the field of ecology and led to the creation of the Commission on Environmental Protection, which included the best experts from these two countries [Robinson, 1988]. At the 1986 summit between U.S. president R. Reagan and the general-secretary of the Communist Party of the Soviet Union, M.S. Gorbachev, plans to prepare a joint report on climate change were announced. The report was published in 1990 as a book called *Future Prospects for Climate* [MacCracken et al., 1990]. Long before the IPCC had reached similar conclusions, the report made predictions about the main parameters of climate change, including in the Arctic region.

Examples like these from the Cold War are encouraging even today. It is likely that after the end of the special military operation in Ukraine, science diplomacy will become one of the priority mechanisms for building trusting relations between countries. Apparently, the Kremlin recognizes the important role of science diplomacy in the entire system of Russian public diplomacy, which is aimed at influencing not only the governments of other countries, but also their publics. Thus, the 2016 Presidential Decree “On the Strategy for the Scientific and Technological Development of the Russian Federation” emphasized that science diplomacy is a kind of public diplomacy. In accordance with this document, science diplomacy is one of the mechanisms to protect the identity of the Russian scientific sphere and state interests in the context of the internationalization of science and increase the effectiveness of Russian science through mutually beneficial international cooperation. In this case, one of the main functions of ASD is the formation and promotion of the current scientific agenda of the state as a member of international organizations, increasing the level of Russia’s participation in international

systems of scientific and technical expertise and forecasting interaction in the region [President of Russia, 2016].

Associate Professor of the Higher School of Economics O. A. Krasnyak observed that effective science diplomacy has real potential for reducing tensions between nations, bringing the world closer to solving global problems and finding ways to improve people's lives. She noted that "Russia's compliance with international treaties, for example, treaties on the Arctic ... as well as participation in international scientific projects, such as the International Space Station, allow Russia to maintain its position as a reliable partner for other countries" [2018, p. 75].

According to an international team of scientists, one of whom is MGIMO professor A.N. Vylegzhanin, The Agreement on Enhancing International Scientific Cooperation in the Arctic (2017) represents an important stage in the development of regional scientific and diplomatic practices. It confirmed the global importance of ASD, which allows for productive interaction, while other diplomatic channels between states do not work properly: "In the Arctic, as elsewhere, science diplomacy helps to combine national and common interests for the benefit of all people on Earth with hope and inspiration for generations" [Berkman et al., 2017]. A number of Russian and American scientists have proposed specific measures to implement this agreement [Anisimov et al., 2020].

Within the framework of this approach, Russian scientists believe that the removal of obstacles to scientific cooperation will help to defuse international tension. While contacts between scientists cannot resolve specific disputes between Russia and the West, they can still help create many platforms for dialogue at the horizontal level. Working together to address issues such as biodiversity conservation, ensuring maritime security in the Arctic, and increasing resilience to climate change could eventually become the basis for other ways to resolve interstate conflicts.

In principle, this approach to ASD does not exclude the previous two. Rather, it includes them in its toolkit, while subordinating them to a more general strategic goal—to establish working relationships with other participants, both state and non-state, in Arctic policy. A comparative analysis of the characteristics of these three approaches is given in Table 1.

Table 1. Comparative Analysis of Three Theoretical Approaches to ASD

ASD Specifications	Technical/Instrument- list Approach	ASD as Soft Power	ASD as a New (Public) Diplomacy
Strategic Goal of ASD	Expansion of international scientific cooperation in the Arctic	Improving the image of Russia, turning it into a more attractive international partner in the Arctic	Includes the previous two goals, plus improving relations with other participants in Arctic policy (state and non-state)
ASD Members	State and non-state actors with a predominance of state players	State actors	Equal participation of state and non-state actors
ASD Results	Sustainable long-term academic partnerships, joint research projects	A more attractive international image of Russia in the region	Two previous outcomes, plus more friendly relations between Russia and the Arctic, including both state and non-state actors; sees the Arctic as a region of peace and stability
ASD Research Agenda	Orientation to natural science issues	Focus on serving the foreign policy goals of the Russian Federation in the region	Equal representation of natural science and social science topics

Source: Prepared by the authors.

Tools to Implement Russian ASD

This study identifies four main tools for the implementation of ASD in Russia: scientific infrastructure, the availability of international dialogue platforms, membership in international educational and intergovernmental organizations, and specific areas of Arctic scientific cooperation.

The **objects of scientific infrastructure** in which foreign scientists can engage in joint scientific activities include research polar stations, centres, laboratories, research vessels (RVs), icebreakers, and universities engaged in the study of the Far North.

The largest research stations in Russia in the Arctic are the Cape Baranov ice base on Bolshevik Island, the hydrometeorological base in Tiksi, the North-Eastern Scientific Station of the Russian Academy of Sciences in the village of Chersky, and the observatory of the Polar Geophysical Institute in Barentsburg. Starting from 2023, the all-year-round Arctic station of the new generation “Snezhinka” (Snowflake) will start operating in Yamal. According to one of the authors of this project, Snezhinka should become a kind of magnet for scientists from different countries [Sotskova, Kudryavtseva, 2020].

The INTERACT International Terrestrial Research and Monitoring Network allows scientists from all over the world to carry out fieldwork and research in the fields of ecology, meteorology, biology, and cryolithology. The key Russian components of the international network include the following facilities: Aktru Research Station, Bely Island Research Station, Chokurdakh International Tundra Research Station, Elgeeyi Research Station, Igarsk Geocryological Laboratory, Kaibasovo Research Station, and the Khanymei Research Station.

Russian icebreakers play an important role in organizing scientific research in the Arctic. They provide scientists with access to the Arctic Ocean, and also allow them to deliver materials and equipment to research stations located on the polar islands remote from the continent. The Russian Federation annually conducts about 50 marine research expeditions to the Arctic. The domestic icebreaking fleet consists of 40 vessels, five of which are nuclear-powered. In the near future, it is planned to put into operation several more modern, nuclear-powered icebreakers.

Russia has about a dozen RVs capable of conducting research at polar latitudes. Thus, since 2012, with the support of the Russian Geographical Society, NArFU, and the Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet), an innovative educational project, the Arctic Floating University (AFU), has been implemented. Every year the expedition takes place on the research ice vessel *Professor Molchanov*. Members of the expedition have included politicians, representatives of business, students, graduate students, and researchers of Russian and foreign scientific and educational institutions. During the sea expedition, scientific and educational programmes dedicated to Arctic science are organized for students. The development of international scientific and educational cooperation, including with the countries of the Arctic Council, as part of expeditionary activities in the Arctic, is one of the priorities of AFU [NARFU, 2020].

Currently, more than 500 organizations located in 50 regions carry out scientific research on the Arctic in the Russian Federation. These are higher educational institutions, institutes and departments of the Russian Academy of Sciences, research institutes that are subordinate organizations of federal authorities, and corporate research centres. The international network-type University of the Arctic includes 55 Russian universities, which is the largest indicator among the states participating in this project.

To facilitate research in remote areas of the Russian Arctic by foreign scientists, the Chukotka Science Support Group (CSSG) was established. This organization has been providing logistical and other support services for polar scientists from all over the world since 2001, in-

cluding the issuing of local research permits, translation services, accommodation and meals, collecting and sending samples, and assistance in obtaining a Russian visa.

At the beginning of the 21st century, a number of **international dialogue platforms** were opened in the Russian Federation, allowing domestic scientists, politicians, and business representatives to exchange their experience and opinions on pressing issues in the Arctic. Starting in 2010, with the support of the Russian Geographical Society, an international forum, The Arctic: the Territory of Dialogue, has been held. Since 2017, this forum has been supported by the State Commission for the Development of the Arctic. The forum has become the largest international platform in Russia for discussing the prospects for sustainable development of the Arctic, developing multi-level, multilateral mechanisms for the joint disclosure and effective development of the powerful resource potential of the region. In 2019, the event was attended by over 3,600 representatives from 52 states, and the forum was covered by 845 media representatives [Roscongress, 2019].

Since 2013, with the support of the regional government of the Republic of Sakha (Yakutia), the International Organization of the Northern Regions (the Northern Forum), established in Anchorage in 1991, has again intensified its work. At present, with the support of the government of Yakutia, all the debts of the Northern Forum have been paid off, and the main secretariat of the forum has been moved to Yakutsk. The forum is a platform for dialogue between northern regions. Using the status of an international organization, representatives of the political elite, transnational companies, scientists, and heads of educational institutions received direct access to the international platform and the opportunity to share the results of scientific research, to launch initiatives to improve the socio-economic development of the Arctic, and to call for solving specific problems [Northern Forum, 2022].

The leadership of the Northern Forum does not forget about the direct role of ASD in maintaining international stability in the region and organizes an event on an annual basis—the Northern Forum for Sustainable Development. Thus, D.D. Maksimova, deputy executive director of the Northern Forum for Sustainable Development and senior researcher at the Institute for the USA and Canada of the Russian Academy of Sciences, confirmed that ASD is one of the missions of the forum, noting that science is a key element in building relations, for example, between Russia and Canada [NEFU, 2020].

Other significant dialogue platforms of the Russian Federation include: Polar Readings, an international scientific and practical conference organized with the support of the Arctic and Antarctic Research Institute; Arctic: Present and Future; and Arctic: History and Modernity, an international scientific conference (all are held in St Petersburg on an annual basis). Arctic scientific conferences and forums, organized with the support of the federal and regional authorities of the Russian Federation, are an effective platform to demonstrate the country's huge contribution to the development of the polar region. In addition, to promote its scientific agenda, Moscow effectively uses international platforms provided by annual conferences such as Arctic Circle (Reykjavik, Iceland), Arctic Frontiers (Tromsø, Norway), and Arctic Science Summit Week (which moves between different cities and countries).

Membership in international educational and intergovernmental organizations can also be an effective tool for the promotion of ASD. The Russian Federation is a member of many organizations aimed at developing regional and international scientific cooperation in the Arctic in various fields of research. These organizations make a significant contribution to the promotion of science among the general public of foreign countries. An extremely important direction in the development of the Russian Academy of Sciences is its activities within the ASD framework. In the foundations of the state policy of the Russian Federation in the Arctic, it is emphasized that the Arctic Council is assigned the role of a key institution coordinating international activities in the region.

In conditions of tension in the Arctic, work in the Arctic Council on the issues of sustainable development of the region as well as environmental and scientific tasks is the most effective way to find solutions through common efforts based on mutual understanding and mutual respect. The activation of the potential of the forum in order to promote the Russian agenda for the period of Russia's tenure as chair is evidenced by paragraph 16 of the Development Strategy of the Russian Arctic, which notes "the active participation of Russian state and public organizations in the work of the AC and other international forums dedicated to the Arctic issues" [President of Russia, 2020a]. A significant part of the events held within the framework of Russian tenure as chair of the AC in 2021–23 is devoted specifically to scientific issues [Government of the Russian Federation, 2021].

Since 1990, Russian experts have been actively involved in the working groups of the IASC, which provides scientific advice to the AC. The fact that the Russian Academy of Sciences is historically at the forefront is evidenced by the emergence in 1993 of the idea of creating the International Scientific Initiative in the Russian Arctic (ISIRA) within the framework of the IASC. The emergence of ISIRA was a joint Russian and international initiative to promote scientific cooperation and sustainable development in the Russian Arctic. The collapse of the Soviet Union and the further reduction of real cooperation between western and Russian scientists, problems with research funding, and language barriers are only some of the problems that foreign scientists faced as they explored the Russian Arctic in the early 1990s. During the existence of this initiative, a number of major projects in the field of social and natural sciences have been implemented. At present, the activities of ISIRA greatly facilitate the solution of the problems of scientific research in the Russian Arctic for foreign scientists [IASC, n.d.].

In addition to the above bodies, scientists and experts of the Russian Federation are actively working within the framework of the following programmes and organizations: IPCC, IASSA, Northern Dimension, Association of Young Polar Scientists (APECS), and the WMO. The extensive representation of domestic scientists in reputable international organizations is an important indicator of Russian ASD.

The list of **areas of international scientific cooperation of the Russian Federation** is long. In "Fundamentals of the State Policy of the Russian Federation in the Arctic for the Period up to 2035," the priority areas of research in the Arctic are laid out: the implementation of complex expeditionary research, development of technologies for saving health and increasing the life expectancy of the population, environmental protection, study of dangerous natural and artificial phenomena, improvement of the environmental monitoring system, active involvement of the Arctic and non-regional states in mutually beneficial economic cooperation in the Arctic Zone of the Russian Federation, development of the research fleet, and assistance to small-numbered indigenous peoples in the implementation of cross-border cooperation, cultural contacts, and contacts in the field of economic activity with kindred peoples and ethnic groups living outside the Russian Federation [President of the RF, 2020b]. A wide range of areas of scientific research in Russia testifies to Moscow's intentions to maintain its leading position in the field of ASD. The Russian Federation also makes a significant contribution to the financial support of international research projects in the AC working groups. As D.N. Voronchikhina, citing the official data of the AC website, noted, "Russia and Canada occupy the first place in financing the Council's projects, Norway and Finland are slightly inferior to them" [2019]. It is very likely that during its tenure as chair of the Arctic Council in 2021–23 Russia will become the sole leader in the financing of the activities of the AC working groups, which, probably, could become one of the measurable indicators of Moscow's contribution to the development of ASD.

Conclusion

Several conclusions emerge from the above analysis.

First, among Russian politicians and scientists, there is still no common understanding of the ASD concept, although it has firmly entered the Russian political and scientific lexicon and is actively used by officials responsible for the development and implementation of a scientific strategy for the Arctic.

Second, part of the Russian academic community and political elite perceives ASD as an effective tool of Russia's soft power in the Arctic. Considering the fact that Russia seeks to avoid aggravating relations with western countries in the Arctic by turning it into a region of peace and cooperation, it can be assumed that the role of ASD in the overall system of Russia's soft power strategy after the end of the special operation in Ukraine will only increase.

Third, Russian discourse is dominated by the understanding of ASD as a mechanism for building strong international partnerships on a non-ideological basis, establishing scientific relations with foreign colleagues to solve common problems, and gaining access to the research infrastructure of foreign partners as well as additional sources of funding.

Fourth, in Russian political and academic discourses, the interpretation of ASD as a form of new diplomacy is gradually gaining momentum. This interpretation does not have a pronounced state-oriented character, but at the same time, it does not refuse to coordinate its activities with official diplomacy. Proponents of this approach to ASD believe that amid the current tension between the West and Russia, less formal non-state diplomacy can achieve more progress than official science diplomacy. This approach to the study of ASD, to some extent, tries to incorporate the two previous approaches (improving Russia's image in the international arena along with the stimulation of ISC by the state) into a single strategy that uses ASD to improve Moscow's relations with other Arctic players.

Fifth, before the start of the special military operation, the majority of participants in ASD shared the idea that ISC, in order to ensure the sustainable development of the Arctic, could become an effective mechanism for solving the most pressing problems of the region, as well as for improving the current relations of western countries with Russia.

Sixth, as a result of increased research funding from the state in the Russian Arctic, research infrastructure has been significantly improved. In addition, Russia has largely managed to form the necessary platforms for the implementation of both the strategic and tactical goals of its ASD. These include national platforms and the active use of a number of international platforms and professional organizations.

At the same time, it would be premature to assume that Russian ASD is absolutely effective or that it has achieved its final form. Currently, Russian science diplomacy in the Far North is under active development. In the near future, it remains to be seen what form the domestic discourse of ASD will take, what the Russian strategy for ASD will be, and whether Moscow will be able to provide synergy between ASD and other components of its polar strategy.

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A Bumpy Road to Bright Goals: North Korea's Approach to Implementing the 2030 Agenda and Prospects for International Cooperation¹

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Abstract

One of the issues on the national agenda of low-income developing countries is the formulation of their own sustainable development strategies. The United Nations (UN) 2030 Agenda for Sustainable Development is an important benchmark and road map for achieving this goal. At the same time, local specifics have an impact on the approaches, methods, and possibilities for achieving the declared goals in each particular state.

This study analyzes the Democratic People's Republic of Korea's (DPRK) Voluntary National Review on the Implementation of the 2030 Agenda, official North Korean statements, and Russian and foreign academic and analytical publications in order to outline North Korea's approach to localizing the sustainable development goals (SDGs), identify problems arising in this process, and highlight prospects for international cooperation. Methods of comparative and content analysis were used in the research. It is maintained that, in search of its own strategy, the DPRK's leadership is trying to use international experience by integrating the SDGs into national development plans. North Korean specifics lie in reformulating global SDGs according to the national narrative of local-style socialism construction, the decisive role of the state in the development and implementation of actual plans, a formal approach to the implementation of some SDGs, and a focus on economic self-sufficiency as a guarantee of sustainable development.

Despite the need for external assistance to achieve the main national SDGs, at present, the possibilities for international cooperation with the DPRK are significantly limited. The implementation of joint initiatives or assistance projects requires both obtaining permission from the UN Security Council 1718 Sanctions Committee and opening the borders of North Korea, which have been closed due to the coronavirus pandemic. However, given the global scope of the tasks set out in the 2030 Agenda, it is highly likely that in the medium and long term the DPRK will resume international cooperation in key areas of sustainable development—agriculture, healthcare, access to clean drinking water and sanitation, and climate change, as well as energy and transport infrastructure modernization. The main partners in this cooperation could be international organizations and neighbouring Russia and China.

Keywords: DPRK, North Korea, 2030 Agenda, Sustainable Development Goals, self-reliance, sanctions, international cooperation

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Introduction

In 2015, the 70th session of the United Nations (UN) General Assembly adopted the 2030 Agenda for Sustainable Development. The sustainable development goals (SDGs) contained in it are intended to become a guide for all states in developing their national policies and should contribute to international cooperation in combating the current global challenges [Larionova, Safonkina, 2018, p. 97]. In 2020, 47 states, including the Russian Federation, submitted their voluntary national reviews on the implementation of the SDGs.

The Democratic People's Republic of Korea (hereinafter referred to as the DPRK or North Korea) also supported the 2030 Agenda. North Korea seriously approached the issue of implementing the SDGs at the national level, despite difficult relations with the outside world after the UN Security Council (UNSC) imposed severe economic sanctions on the DPRK in 2016–17 in response to Pyongyang's nuclear and missile tests.² In June 2021, the country's government presented the DPRK Voluntary National Review on the Implementation of the 2030 Agenda [Government of the DPRK, 2021], which provides an insight into how the North Koreans localized the SDGs and at what stage the country is on track to achieve national targets integrated with the SDGs.

The UN is one of the few international organizations of which the DPRK is a member. Interaction with the Food and Agricultural Organization (FAO), the World Food Programme (WFP), UNICEF, and other organizations from the UN system can be considered a systemically important area of North Korea's international cooperation. For reasons of national security, the DPRK does not publish detailed statistics or detailed data on the country's socio-economic development plans. However, after Kim Jong-un came to power in late 2011, the trend toward greater openness to the outside world became obvious. This, in particular, is evidenced by the very fact of preparing (for the first time in the history of the country) a voluntary review on the implementation of the 2030 Agenda and its publication in the public domain. Kim Jong-un also systematized the long-term planning of the DPRK's socio-economic development. After 2015, it has been carried out within the framework of five-year cycles—the economic development strategy for 2016–20 and the economic plan for 2021–25. The young leader wants his country to develop and is ready to use international experience for this purpose. In this regard, the UN appears to be a natural partner for receiving methodological, advisory, and practical assistance.

The topic of implementing the SDGs in North Korea is closely related to the analysis of the domestic socio-economic situation. Its various aspects have been studied in the Russian literature (see for example, G.D. Toloraya [2015], A.V. Torkunov, G.D. Toloraya, and I.V. Dyachkov [2021], S.S. Suslina [2015, 2018] and L.V. Zakharova [2017]) and by foreign researchers (see, for example, W.B. Brown [2018], J.H. Hong [2018], R. Frank [2019], B.-Y. Kim [2022], V. Koen and J. Beom [2020]; S. Lee [2021], H. Smith [2015], D. von Hippel and P. Hayes [2021], and M.-S. Yang [2021]), as well as in analytical reports of international organizations [FAO-WFP, 2013, 2019; Panel of Experts, 2022; UNOCHA, 2020]. A number of publications have been devoted to the impact of international sanctions and the coronavirus pandemic on North Korea (see, for example, G.B. Bulychev and I.A. Korgun [2019], J.Y. Choi [2020], S. Haggard and M. Noland [2017], H. Smith [2020], and A.V. Vorontsov [2020]). Several works on the analysis of North Korea's progress toward sustainable development have been published in the Republic of Korea [Choi, Hong, 2021; Sung, Jung, Jin, 2022].

This study analyzes the Voluntary National Review of the DPRK on the Implementation of the 2030 Agenda (hereinafter referred to as the VNR), official North Korean statements, and Russian and foreign scientific and analytical materials in order to study the country's approach

² For a more detailed overview of the UNSC sanctions, see L. Zakharova [2019].

to localizing the SDGs, identify problems arising in this process, and locate opportunities for international cooperation. Despite the fact that the country is closed at the moment,³ official documents of the DPRK government indicate the existence of areas in which North Korea is ready to cooperate and even needs to. The study uses methods of comparative and content analysis.

The research results may be of interest from both theoretical and practical perspectives. From a theoretical perspective, the analysis contributes to the accumulation of knowledge about approaches to the implementation of the SDGs in low-income developing countries using the example of the DPRK. From a practical point of view, understanding the problems that North Korea encounters in the implementation of the SDGs is important when building Russia's relations with this neighbouring country, especially in providing development assistance to the DPRK. North Korea is one of the main recipients of Russian foreign aid [Zaytsev, 2020, pp. 68–9].

The study consists of the two main parts. The first outlines the DPRK's approach to the SDGs' localization and highlights its main specific features and problems based on the analysis of the VNR, official statements, and scientific publications. The second part is devoted to the importance and prospects of international cooperation for the advancement of North Korea's national sustainable development agenda. Based on the reports of international organizations and Russian and foreign scientific publications, the most critical problems for the implementation of the SDGs in North Korea are identified.

North Korean Approach to the Implementation of the SDGs at the National Level

The DPRK views the 2030 Agenda as conforming to the national development policy for building a powerful socialist country. To implement the SDGs, the North Korean government set up the National Task Force for Sustainable Development headed by the vice premier and chair of the State Planning Commission, and formed the Technical Committee responsible for collecting and evaluating statistical indicators. Localizing the goals of the 2030 Agenda, the government of the DPRK took the path of formulating each of the SDGs according to the national specifics (see Table 1), choosing the corresponding tasks and indicators, and linking them to specific national development goals (NDGs). The VNR highlights four NDGs: to strengthen the people's government and display the people- first principle, to develop all sectors based on science and education, to build a self- supporting and knowledge-based economy, and to construct a fully developed socialist culture. The national North Korean sustainable development agenda includes 17 goals, 95 tasks, and 132 indicators (the 2030 Agenda contains 17 SDGs, 169 tasks, and 232 indicators), reflecting the priorities of the government. Fifty-three percent of the global SDG targets were selected as the national SDG indicators or were integrated with the NDGs [Government of the DPRK, 2021, p. 8], which created a structured system for monitoring progress for each of the goals. South Korean researchers note that in the VNR North Korea "strategically" reformulated the global SDGs in accordance with the systemic characteristics of its state, emphasizing the strengthening of socialism as a necessary basis for sustainable development [Choi, Hong, 2021, pp. 1, 6].

³ In response to the outbreak of the coronavirus pandemic, North Korea imposed severe restrictions on contacts with the outside world, closing its borders from January 2020.

Table 1. Global SDGs and Their North Korean Equivalents

Global SDGs	DPRK's National SDGs
1. No poverty	1. Improving people's livelihood
2. Zero hunger	2. Sustainable development of agriculture, self-sufficiency of food
3. Good health and well-being	3. Ensure healthy lives and promote well-being for all
4. Quality education	4. Prepare all as intelligent workers
5. Gender equality	5. Consolidate gender equality and rights of all women and girls
6. Clean water and sanitation	6. Ensure sustainable use and management of water and sanitation
7. Affordable and clean energy	7. Ensure access to sustainable and modern energy for all
8. Decent work and economic growth	8. Establish self-reliant and knowledge-based economy, and ensure work for all
9. Industry, innovation, and infrastructure	9. Put the national economy on a Juche-oriented and scientific basis and modernize infrastructure
10. Reduced inequality	10. Enhance the position and role of all the masses as masters of state and society
11. Sustainable cities and communities	11. Ensure living conditions and environment for more affluent and civilized life
12. Responsible consumption and production	12. Ensure sustainable consumption and production
13. Climate action	13. Combat climate change and its impacts
14. Life below water	14. Conserve and sustainable use the coast, sea and marine resources
15. Life on land	15. Sustainable management of forests, reverse land degradation, maintenance of biodiversity
16. Peace, justice and strong institutions	16. Consolidation of the socialist system
17. Partnership for the goals	17. Development of friendly partnership

Source: Government of the DPRK [2021, pp. 8–11].

The VNR provides a comprehensive picture of the main challenges which the DPRK is facing at the current stage of its development, although it is saturated with elements of national ideology and propaganda. In particular, it mentions the Juche principle which means independence in all spheres but which is difficult to implement in North Korea's economic conditions. The report emphasizes the existence of a public supply and distribution system for all households, free compulsory 12-year universal education, and free medical services for all citizens. The fact that the volume and quality of goods and services provided by the state is often not sufficient fades into the background. The main achievement is the implementation of socialist principles and the strengthening of the independence of the North Korean economy.

At the same time, the DPRK's leadership cannot be accused of hushing up the existing problems as a whole complex of these are reflected in the VNR. The government pays more attention to the description of progress (or lack of it) on the SDGs in those areas that the DPRK considers to be top national priorities directly related to economic growth and the living standard of the population. These areas include energy, agriculture, WASH (water, sanitation,

hygiene), and the environment. Given the closed nature of the DPRK's statistics and the government's desire to focus on the progress made, only a few indicators of the global SDGs were chosen to monitor achievements at the national level. For example, a measuring indicator of improving people's livelihood (SDG-1) is "proportion of households living in shared dwelling" [Government of the DPRK, 2021, p. 13].

An analysis of the declared results, challenges, and future plans for each of the national SDGs makes it possible to identify the "more exemplary" and the "less exemplary" among them in terms of the progress achieved in 2015–20. Among the goals on which more tangible progress has been made are:

- SDG-1: the proportion of households living in shared dwelling decreased from 0.8% to 0.5% over 2015–19 due to the construction of housing deployed in different parts of the country and provided free of charge to the citizens, according to official data.
- SDG-4: goals for universal primary and secondary education have already been achieved (compulsory 12-year school education in the DPRK, free higher education), 100% literacy of the population aged 15 to 24, development of distance learning.
- SDG-15: a forest recovery campaign has been conducted as a mass movement since 2015, resulting in increasing the forest area by 1.7% annually between 2015 and 2020 and reducing the area of land affected by deforestation from 10.6% in 2010 to 5.5% in 2019.

For the "less successful" SDGs, some progress has been recorded, but their achievement faces a whole range of challenges. For example:

- SDG-2: despite increased food production, the goal of harvesting seven million tons of grain per year (the minimum level of self-sufficiency for the DPRK) was not achieved due to natural disasters, lack of agricultural materials, and the low level of mechanization.
- SDG-3: despite the universal free healthcare system for all citizens and some successes in reducing child and maternal mortality, serious challenges are posed by the lack of the capacity of health personnel, the low technical foundation of pharmaceutical and medical appliance plants, and by shortages of essential medicines, as well as the high level of tobacco use among persons aged 15 or over (46.1% in 2017).
- SDG-6: there has been slow progress in providing the entire population with clean drinking water and sanitation. In 2017, 60.9% of the population had access to clean drinking water (71.3% in urban and 44.5% in rural areas), 47.5% of the population had access to a safely managed sanitation facility (70.8% in urban and 11.4% in rural areas).
- SDG-7: according to the DPRK's official data, 99.7% of the population has access to the national power grid, but the needs of citizens for electricity are not met; electricity generation in the country is declining (largely under the influence of seasonal and climatic factors). The main sources of energy are hydropower and thermal power stations. The use of renewable energy is being promoted, but the share of the population using clean fuels and technologies remains low (less than 10.3% in 2017), and progress is slowing. Coal is mainly used for heating and cooking in the city, while firewood and agricultural waste are used in the countryside.
- SDG-9: Manufacturing value added as a proportion of the gross domestic product (GDP) of the DPRK was more than 38% in 2019. The government systematically increased spending on science and technology and the number of researchers has been growing (by 2.9% per million people annually), but the modernization of infrastructure remains a key challenge. The implementation of the tasks of modernizing roads and railways according to international standards is behind schedule.

The North Korean government sees the ongoing international sanctions on the DPRK (which practically led to the economic blockade of the country), natural disasters (droughts and floods that hit the country every year) and the protracted "world health crisis" as the main

obstacles to the DPRK's efforts to achieve the sustainable development and improve the people's livelihood [Government of the DPRK, 2021, p. 5]. The last challenge is a problem for the implementation of the SDGs on a global scale [Larionova, 2020, p. 164]. The need to reform the existing system of economic management in order to increase its efficiency is not raised in the VNR, although foreign researchers regularly write about this (for example, Brown [2018]).

Not all national SDGs of the DPRK have specific numerical indicators, although this is not unique to the North Korean approach. At the same time, the VNR recognizes the importance of further improving the statistical work in the country and applying international methodology for developing indicators and monitoring progress toward achieving the SDGs. Prior to the outbreak of the coronavirus pandemic, representatives of the DPRK participated in UN-organized consultations on the implementation of the 2030 Agenda.

The DPRK practices a formal approach to some SDGs, which is characterized by general formulations and an abundance of propaganda. This includes the goals related to human rights. For example, SDG-5 is considered generally achieved, as gender equality is enshrined in law, and psychological and physical violence in the country "is not a social issue" [Government of the DPRK, 2021, p. 24]. Some SDG-8 targets are considered achieved, as all citizens are legally provided with decent work, and youth unemployment and child labour in the DPRK "do not exist." Within the framework of SDG-16, the principle "everything for the people" is proclaimed to have been implemented and the absence of social problems such as bribery and violence against children is recorded because they are prohibited by law. At the same time, even in the official North Korean media there are calls for the fight against corruption and other malpractices (see, for example, KCNA [2021a]), which points to their ongoing presence in modern North Korean society. However, the leadership of the DPRK refuses to bring this topic up for international discussion, which is reflected in the closing of this topic in the VNR.

To sum up, at the present stage, the North Korean approach is characterized by embedding the global SDGs into the narrative of building "socialism of our style," emphasizing the decisive role of the state in the development and implementation of specific plans, a formal approach to the implementation of some SDGs (if it is enshrined in law, then it is guaranteed; if guaranteed, then it is considered achieved) and focus on maximum self-sufficiency of the economy as a guarantee of sustainable development. Priority areas for the implementation of the 2030 Agenda in the DPRK include solving long-term problems of socio-economic development, such as energy and food deficits. An important place is given to combating the consequences of climate change and preventing damage from natural disasters. In the context of continuing international sanctions and the ongoing "self-isolation" of North Korea, the country's leadership has to rely on internal potential and mobilization of the population. At the same time, despite the inclusion of the SDGs in the DPRK's national strategy to create an economy relying on its own natural resources, technologies, and human resources, the VNR recognizes the importance of cooperation with the international community in the implementation of the 2030 Agenda, especially in key areas related to improving people's living conditions.

Significance and Prospects of International Cooperation for the DPRK in the Context of the SDGs' Implementation

The importance of international cooperation to implement the SDGs for North Korea is determined, first, by the low level of the country's economic development and its unstable growth dynamics [Sung, Jung, Jin, 2022, p. 36]. According to the UN, the DPRK is a developing country, with a per capita GDP in 2020 of \$618 [UNSC, n.d.] (slightly higher than Malawi, but lower than Chad and Rwanda). According to the VNR, the DPRK in 2015–19 grew by an aver-

age of 5.1% annually, but external estimates paint a different picture. In particular, according to the UN, North Korean GDP began to decline from 2018, and according to the Bank of Korea (Republic of Korea) it decreased by about 4% for the entire period of 2015–19 [Choi, Hong, 2021, p. 8].

Domestic resources for sustainable economic development of the country are limited. North Korea has no significant proven reserves of oil or natural gas, and therefore depends on imports of relevant raw materials and energy resources. Their acute shortage was one of the reasons for the sharp decline in industrial production in the 1990s, which led to the deindustrialization of the economy and a protracted economic crisis. Suslina noted that solving the energy problem is one of the main priorities of the DPRK's domestic policies [2015, p. 266]. At the same time, according to researchers from the American Nautilus Institute, in 2019, the production of electricity and coal, as well as oil imports, amounted to only about a third of the 1990 level, holding back the country's economic development [von Hippel, Hayes, 2021, p. ii].

The lack of fuel, fertilizers, and equipment, as well as the natural disasters that hit North Korea every year, do not allow for stable agricultural production. This century's record grain harvest in 2019 (6.65 million tons, according to North Korean data) is still 30% lower than the gross grain harvest in 1982 (9.5 million tons) [Trigubenko, 1985, p. 104]. Due to crop volatility, the authorities failed to meet the government's stated grain supply target of 573 grams per person per day. In January 2013, rations averaged 400g [FAO-WFP, 2013, p. 29]; in January 2018 they fell to 380 g and in January 2019 they were further reduced to 300 g per day per person. According to available estimates by the FAO and the WFP, based on the population surveys conducted by employees of international organizations, in the late 2010s about 40% of the DPRK's citizens (more than 10 million people) required food assistance [FAO-WFP, 2019, p. 4].

The transport infrastructure of the DPRK is underdeveloped and requires modernization due to both the difficult terrain (mountains prevail) and a lack of investment. Investments in transport equipment have remained at a low level since the 1990s, limiting the physical mobility of labour and goods and complicating interregional ties [Toloraya, Korgun, Gorbacheva, 2020, p. 14]. North Korea ships by rail more than 90% of its domestic freight at an average train speed of 30–50 km/h. Only 10% of highways are paved [Koen, Beom, 2020, p. 18]. According to external estimates, the restoration of infrastructure in North Korea could cost tens of billions of dollars and require foreign assistance [Brown, 2018, p. 6].

The North Korean authorities blame international sanctions for creating serious obstacles to the implementation of the SDGs in the country. However, the Panel of Experts of the 1718 Committee of the UN Security Council, assessing the situation in the DPRK in the early 2020s as “close to a humanitarian crisis,” also cited the COVID-19 pandemic and the resulting border closures, natural disasters, and changes in domestic economic policy toward the greater use of administrative command methods as its causes. At the same time, experts recognize that the UNSC resolutions adopted in 2016–17 “contributed to limiting the ability of the country to legally acquire humanitarian necessities and medical commodities, and the degradation of social services including health care” [Panel of Experts, 2022, p. 80–1].

Researchers in Russia and abroad consider various aspects of the negative impact of sanctions on the socio-economic situation in the DPRK. H. Smith [2020, p. 184] drew attention to the sharp decline in the agricultural production of North Korea in 2018, considering it to be the result of the UN Security Council sanctions in the energy sphere. Bulychev and Korgun [2019, p. 69–70] emphasized the impossibility of developing medical care in the country due to the existing bans on the import of equipment, as well as a significant reduction in the volume of food supplies under international humanitarian aid programmes after the tightening of sanctions. Russian scientists also note the “radical reduction in livelihoods” which calls into question the possibility of survival for people employed in key sectors of the DPRK's economy

[Toloraya, Korgun, Gorbacheva, 2020, p. 17]. According to South Korean researchers, as a result of the sanctions, household income in North Korea had decreased by an average of 25% by 2020 [Kim, 2022, p. 1].

A reduction of the DPRK's exports by more than 90% in 2015–18 significantly limited the possibility of importing raw materials, spare parts, and materials due to a decrease in the inflow of foreign currency. The ban on the supply of industrial equipment to North Korea negatively affected domestic investment in production [Choi, 2020, p. 376] further aggravating the problem of fixed assets' modernization. Some experts also note the environmental consequences of the sanctions. The lack of energy resources leads to an increase in the need for firewood and deforestation, which negatively impacts progress on sustainable development goals in North Korea [Korgun, Zakharova, 2022, p. 25].

In early 2020, the DPRK government decided to “hermetically” close the country's borders and sharply reduce contacts with the outside world to prevent coronavirus from entering the country [Vorontsov, 2020, p. 30]. This became a new factor influencing the socio-economic situation. As a result, according to South Korean estimates, the DPRK's foreign trade decreased by another 80% over the year, the country's financial system was destabilized, and industrial enterprises and markets worked only intermittently [Lee, 2021, p. 16]. At the official level, in January 2021, North Korean leader Kim Jong-un admitted that the goals set by the leadership in the field of economic development for 2016–20 had not been achieved in almost all areas [KCNA, 2021b].

In general, the DPRK's progress in the SDGs for 2015–20 can be assessed as modest, and in most areas, as insufficient, including the areas of food and energy security. This is largely due to the simultaneous restructuring of the country's economy to function under the severe sanctions of the UN Security Council, the lack of internal resources for more ambitious work on the SDGs, the virtual lack of access to foreign sources of investment and technology, and the voluntary self-isolation of the country from external contacts starting in 2020. In the national plan of economic development for 2021–25, state investments are concentrated on the metallurgical and chemical industries with the aim of their full shift to domestic raw materials. Kim Jong-un proclaimed agriculture and light industry as another “front” for the application of nationwide efforts to provide the population with everyday goods. However, in the absence of external assistance, the results of these measures are unlikely to put the economy on the path of sustainable development. The DPRK has not yet exceeded the level of industrial and agricultural production of the 1980s, when it was more engaged in the system of international economic cooperation.

Given Pyongyang's selective approach, the opportunities for international cooperation with the DPRK on the 2030 Agenda are limited to specific areas, primarily related to improving the basic living conditions of the population and the environmental agenda. The VNR notes successful examples of obtaining external assistance in agriculture, healthcare and nutrition. In particular, in cooperation with the World Food Programme, UNICEF, the United Nations Development Programme (UNDP), the FAO, and other international organizations, as well as foreign NGOs, the DPRK implemented projects on seed improvement, reduction of post-harvest losses, and nutritional improvement for vulnerable groups of the population. With the support from the Global Fund to Fight AIDS, Tuberculosis and Malaria, the incidence of malaria and tuberculosis has been significantly reduced [Government of the DPRK, 2021, p. 17, 19]. As promising areas for cooperation in the future, the DPRK government has identified the improvement of the educational environment, the expansion of access to clean drinking water, and waste disposal and recycling. The climate action is of particular relevance for Pyongyang at the present stage: according to internal estimates, by 2030, with external assistance, the DPRK

can reduce greenhouse gas emissions by 50%, and without it, only by 15% [Government of the DPRK, 2021, p. 41].

Although North Koreans are willing to receive external assistance, especially through the channels of international organizations, their activities in the DPRK have encountered obstacles since the second half of the 2010s. The UNSC resolutions maintain that the implementation of international sanctions should not have adverse humanitarian consequences for the civilian population. For these purposes, there is a mechanism for obtaining exemptions from the sanctions regime from the Committee 1718 of the UNSC. However, according to a survey of international and non-governmental organizations that had previously provided assistance to the DPRK, sanctions have significantly hampered the organization of humanitarian supplies to the country, calling into question the very possibility of such assistance. A separate set of problems is associated with the absence of a banking channel for financing humanitarian work in North Korea [Panel of Experts, 2022, p. 83] making it impossible for some NGOs to return to the country even after it reopens its borders.

In the foreseeable future, the UN Security Council is unlikely to ease its sanctions against the DPRK, since such a scenario does not meet Washington's goals of causing maximum economic damage to a potential enemy, which North Korea is [Toloraya, Korgun, Gorbacheva, 2020, p. 10]. At the same time, a new political situation unfolding in the world in 2022 may also affect the external relations of North Korea. The DPRK openly supports China and Russia in their confrontation with the United States, and Beijing and Moscow for the first time vetoed a draft resolution on tougher sanctions against Pyongyang in the UN Security Council [Asmolov, 2022]. All this creates political conditions for expanding cooperation between Russia and China with the DPRK.

Economic exchanges between Russia and North Korea in 2021 were frozen because the DPRK closed its border. However, before that, the two countries pursued trade cooperation. The RF was an important supplier of oil products to the DPRK and provided humanitarian assistance to its Far Eastern neighbour. For example, in 2019, Russia donated \$4 million to the World Food Programme for food aid to North Korea and \$4.8 million for medical assistance through UNICEF. In 2020, the RF supplied 50,000 tons of wheat to the DPRK as bilateral assistance, half of which was sent to the regions previously affected by typhoons [Ministry of Foreign Affairs of the RF, 2020]. Thus, Russia contributed to the improvement of nutrition and healthcare for the North Korean population, which is in full compliance with SDG-2 and SDG-3. Prior to the pandemic, the Khasan-Rajin joint transport and logistics project was an important direction of cooperation. Within its framework, Russian investors reconstructed and modernized the railway and port infrastructure in the northeast of the DPRK [Torkunov, Toloraya, Dyachkov, 2021, p. 360–1]. Further participation of Russian companies in the modernization of the North Korean transport network could help achieve more progress on SDG-9. Moreover, Pyongyang has long shown interest in cooperating on the reconstruction of local power plants built with the use of Soviet technologies. Such interaction in the energy sphere is in line with the implementation of SDG-7, and also corresponds to the directions of Russian development assistance to North Korea specified in the intergovernmental agreement on the settlement of the DPRK's debt to the Russian Federation ["Agreement," 2012]. At the present stage, however, the potential of bilateral cooperation, which could contribute to progress on the SDGs, significantly exceeds the level of its real implementation due to the difficulties in financing joint projects.

Cooperation with China, which in the 2010s became the republic's largest trading partner,⁴ has brought bigger practical results for the DPRK. The main forms of Beijing's assistance were

⁴ According to South Korean estimates, in 2021, China accounted for more than 95% of all North Korea's foreign trade (compared to 88% in 2020) [KOTRA, 2022].

energy exports, investments in infrastructure projects, food aid, training, and humanitarian supplies [Reilly, 2014, p. 1167]. By sending significant amounts of grain as well as fuel and fertilizers⁵ to the DPRK, China has contributed (and continues to contribute) to the implementation of SDG-2. Since the late 2000s, there has been an increase in Chinese investments in the port and border infrastructure of the DPRK (for example, the construction of a new bridge in the Dandong-Sinuiju area or paving the highway from the Chinese border to the port of Rajin) [Park, Kim, 2017, p. 82]. All these projects were closely linked to China's own economic interests, while simultaneously contributing to the modernization of the North Korean transport network (SDG-9). Such a model is typical of the modern Chinese approach to financing aid to low-income developing countries [Mikhnevich, 2020 p. 91]. Further cooperation in the border transport infrastructure could contribute to the implementation of SDG-9 at the regional level but would require exemptions from sanctions restrictions and the resumption of exchanges between the DPRK and the outside world.

To sum up, although North Korea needs external assistance to achieve its main national sustainable development goals, the country's opportunities for international cooperation are significantly limited. The implementation of joint initiatives or assistance projects requires obtaining both permission from the UN Security Council sanctions committee and consent to the import of goods from the North Korean government. However, given the inclusive nature of the SDGs and the global scale of the 2030 Agenda, the DPRK's international cooperation will likely resume in the medium and long term with the focus on the republic's priority areas of sustainable development—agriculture, healthcare, access to clean drinking water and sanitation, climate action, and energy and transport infrastructure modernization. The main partners in this could be both international humanitarian organizations and neighbouring Russia and China.

Conclusion

One of the issues on the national agenda for low-income developing countries is the formulation of their own sustainable development strategies. The 2030 Agenda is an important benchmark and roadmap for achieving this goal. At the same time, local specifics have an impact on the approaches, methods, and possibilities for achieving the declared goals in each state. In search of its own strategy, the DPRK's leadership is trying to use international experience by integrating the SDGs into national development plans and by using more than 50% of the indicators included in the 2030 Agenda to monitor progress. At the same time, the logic of the current developments in the world emphasizes the value of self-reliance as the most relevant sustainable development strategy for the North Korean leadership. However, there is also an understanding of the serious obstacles to the implementation of the SDGs at the national level without normal international cooperation, which is currently significantly limited for objective and subjective reasons.

As far as the external restrictions are concerned, at the end of 2019, China and Russia tried to start a discussion on a draft resolution that would partly ease the sanctions against the DPRK in the UN Security Council. In particular, the draft included easing restrictions on Pyongyang's exports of textiles and seafood (together accounting for about 50% of North Korean exports in 2017) and the supply of certain types of industrial equipment to the DPRK (all supplies were banned in 2017), as well as the possibility of hiring a North Korean labour force abroad, which

⁵ Beijing does not provide official data on the volume of assistance to North Korea. However, according to foreign estimates, grain supplies may range from 250,000 tons [Reilly, 2014, p. 1172] to 500,000 tons per year [The Asahi Shimbun, 2020].

was an important source of foreign exchange earnings before the ban came into effect at the end of 2019 [Haggard, Zhang, 2020]. Due to the opposition of western countries led by the United States, the initiative was not supported, and is unlikely to be supported in the foreseeable future.

As for internal restrictions, the VNR postulates the need to strengthen the anti-epidemic system to protect the lives of DPRK's citizens [Government of the DPRK, 2021, p. 21]. This means maintaining strict control and quarantine for all people entering the country, as well as quarantine and disinfection of all imports for the coming years. The first cases of coronavirus infection, officially recognized by the authorities in May 2022, did not change the country's strategy of "maximum closure."

As a result, at the present stage, international cooperation with the DPRK on the SDGs can only be carried out in compliance with all external sanctions and internal quarantine restrictions. Russia, which provided aid to neighbouring North Korea in the 2010s both bilaterally and through the channels of international organizations, in 2021 was no longer able to do so due to the closure of the DPRK's border. However, judging by the practice of resuming Chinese-North Korean trade after the launch of a special import disinfection centre in early 2022, the restoration of cargo traffic between Russia and the DPRK may also be possible if similar measures are taken. The revitalization of bilateral cooperation, to which the governments of both countries are committed [Ministry for the Development of the Russian Far East, 2022], may include the development of a road map for the joint implementation of the SDGs. In this case, education, healthcare, and energy could be considered as priority areas as they are indicated as potential spheres for joint projects in the Agreement on the settlement of the DPRK's debt to Russia signed in 2012. In a broader context, it is possible to consider cooperation formats with the participation of third countries, primarily China.

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The Impact of the Strategic Partnership AUKUS on the Geopolitical Situation in the Indo-Pacific Region¹

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Abstract

The purpose of the AUKUS strategic alliance is to develop cooperation between the member countries (Australia, the UK, and the U.S.) in the field of security and defence in the Indo-Pacific region. The agreement provides for the supply of submarines powered by nuclear reactors to Australia. The emergence of this new strategic alliance was caused by the following factors: the increased power of China in the region, the weakening of the U.S. position in the Indo-Pacific, the desire of the UK to implement the “global Britain” strategy in practice, and the need for the U.S. to have reliable allies to contain China. These factors reveal the true purpose of AUKUS—containment of China and opposition to its active policy in the region.

In this article, the author uses comparative analysis to reveal the different goals and geopolitical interests of the AUKUS countries. The systematic approach helps to describe the essence of the complex geopolitical system developing in the Indo-Pacific region. The theories of new institutionalism and constructivism make it possible to identify both continuity and gaps in the security policy and foreign policy of regional actors.

Australia’s participation in AUKUS allows it to strengthen its political ties with influential partners—the United States and Great Britain, receive additional security guarantees from them in the context of increased activity of Chinese policy in the region, raise the country’s status in the regional hierarchy, and strengthen its defence capability. Australia’s entry into AUKUS means the formation of a new, anti-Chinese strategy in the region.

For the UK, membership in AUKUS allows it to expand its naval presence in the Indo-Pacific region, strengthen its special relations with the United States, improve its image (which was shaken after the country’s exit from the European Union), and restore traditional ties with Australia.

For the United States, AUKUS is the implementation of the strategy of pivot to Asia and the creation of a new alliance that has greater opportunities for military-strategic cooperation in the face of the threat from China to use the Pacific Ocean to oust the United States from a leading position.

There are some potential regional geopolitical consequences of AUKUS. They include escalation of tension and the nuclear arms race of the opposing parties, a new cold war with China, expansion of the club of nuclear powers because of Australia, imbalance of geopolitical forces in the region, the undermining of transatlantic unity, and the emergence of a common strategy in the foreign policy of European countries and the United States.

Keywords: AUKUS, strategic alliance, Indo-Pacific region, balance of power, Australia, USA, UK, China

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Introduction

The Indo-Pacific region (IPR) has recently begun to play an important role in world politics. The stability of the global political system largely depends on the dynamics of the processes taking place in the region, an arena in which the strategic activities of the great powers and their geopolitical rivalry are being played out [Medcalf, 2020].

New trends have emerged in the development of the region with the creation of a security pact between Australia, the UK, and the U.S.—AUKUS—announced in September 2021. As a strategic alliance, AUKUS is positioned as “a new enhanced trilateral security partnership.” Its official goal is to ensure “peace and stability in the Indo-Pacific over the long term” and “to better meet the threats of today and tomorrow” [The White House, 2021].

AUKUS does not include a provision on mutual defence of its members along the lines of Article 5 of the treaty that established the North Atlantic Treaty Organization (NATO).² The main content of this partnership is the technological cooperation of the parties and assistance to Australia to deploy its own nuclear attack submarines. Deepening cooperation among the three members in the field of security and defence in the IPR [Chinoy, 2021] provides for the supply of submarines with conventional weapons operating on nuclear reactors to Australia [The White House, 2021]. These submarines are equipped with quiet propulsion systems (which means they have less chance of being noticed) and high-precision, long-range systems and are able to travel much greater distances.

The member countries officially emphasize that AUKUS has a defensive purpose only, and that military cooperation is the main content of its activities. However, the characteristics of military equipment indicate that it can also be used for offensive purposes.

Other important tasks of AUKUS, as stated by U.S. president Joe Biden at a briefing on its proclamation, are to “expand our edge in military capabilities and critical technologies, such as cyber, artificial intelligence, quantum technologies, and undersea domains” [The White House, 2021].

The purpose of this article is to identify how the creation of AUKUS and the strengthening of the partnership mechanism of the participating countries might affect the geopolitical situation in the Indo-Pacific region.³

Literature Review

The topic of the balance of power in the Indo-Pacific region [Medcalf, 2020], new trends in its development, its role in world politics, and the geopolitical rivalry of the great powers is widely covered in the work of scientists outside of Russia. According to M.R. Auslin, geopolitical competition in the IPR is escalating and is beginning to threaten stability not only in Asia, but also around the world [2020]. R. McGregor believes that the determining factor for the balance of power in the region is the trilateral relationship between the United States, China, and Japan—the strengthening of China and the weakening of the United States could change the balance of power and destroy the existing security structure [2018].

² Article 5 states: “The Parties agree that an armed attack against one or more of them in Europe or North America shall be considered an attack against them all and consequently they agree that, if such an armed attack occurs, each of them, in exercise of the right of individual or collective self-defence recognised by Article 51 of the Charter of the United Nations, will assist the Party or Parties so attacked by taking forthwith, individually and in concert with the other Parties, such action as it deems necessary, including the use of armed force to restore and maintain the security of the North Atlantic area” [The North Atlantic Treaty, 1949].

³ For more information about the balance of power in the ITR that developed before the appearance of AUKUS, as well as about the strategy of the United States and China in the ITR, see: M. Barthwal-Datta and P. Chacko [2020], P. Chacko [2016], R.J. Heydarian [2020], S. Kumar, S.S. Verma and S.H. Kumar [2020], and O.G. Leonova [2021].

Researchers have paid great attention to the role of the United States in the *Asia-Pacific* region, and later, after a new name reflecting its geopolitical expansion was established in the political discourse, in the *Indo-Pacific* (IPR), as well as the sub-regions of East and South-east Asia.⁴ In 2016, when the term IPR had not yet been officially adopted, J. Kennedy and H.W. Pant devoted their research to the study of the consequences of the American strategy of pivot to Asia, and in particular to the Asia-Pacific region [2016]. A number of works consider U.S. foreign policy in the region during the presidency of Donald Trump, the reaction of regional powers to it, and the consequences for the balance of power [Akaha, Yuan, Liang, 2021; Heydarian 2020; Hiebert, 2020].

The focus of M. Green's work is the problem that determines U.S. policy toward East Asia, namely the threat from China to use the Pacific Ocean to oust America from a leading position [2019]. Researchers are also interested in the problem of U.S.-China rivalry in this strategically important area. R. Hass predicted that competition would remain the dominant feature of their relationship, but that they will have to interact in solving common global problems [2021].

J.J. Mearsheimer believes that a growing China will seek to dominate Asia and the desire of the United States to maintain its leading position in the region will inevitably lead to a clash of interests between the two great powers [2014]. R.D. Kaplan, analyzing the interests of the United States in the Asia-Pacific region, also interpreted them in the context of the increasing activity of China's policy [2015]. A book by R. Doshi is devoted to the description of China's strategy to become a global superpower and oust the United States from the position of leader in East Asia [2021]. Similarly, D. Shambaugh [2020] and S. Strangio's [2020] research is devoted to the strategic competition between the United States and China in Southeast Asia. According to them, the outcome of this competition depends on whether the Southeast Asian countries will leave the sphere of American influence and fall under the influence of China. A.M. Denmark, describing the dynamics of the geopolitical situation in the Indo-Pacific region, noted the weakening of the U.S. position and the strengthening of China's influence and believes that American allies and partners can play a decisive role in the competition between the two countries [2020].

A special group consists of studies on the role of Australia as a middle power and its ability to influence the geopolitical situation in the region [Reus-Smit, 2021; Strating, Westendorf, 2020; Turnbull 2021]. A number of articles are devoted to Australia's foreign policy and its defence strategy, including the history, essence, and goals of the alliance with the United States [Erskine, 2022; Henry, 2020; Sheng Hao Chai, 2020; Wirth, 2019]. There are also quite a few studies that trace the evolution of Australia's relations with China, noting their deterioration and the growth of tension between the countries [He, 2021; Hewes, Hundt, 2022; Johanson et al., 2019; Köllner, 2021; Medcalf, 2019; "The Deterioration," 2020].

However, the problem of the influence of AUKUS on the geopolitical situation and the balance of power in the region requires a separate study.

Hypothesis

AUKUS continues the trend toward deepening the geopolitical split in the IPR, turning the region into an arena of military-political confrontation and may lead to a change in the balance of power. AUKUS helps to accelerate the formation of a local bipolar system: on the one hand, the anti-Chinese (pro-American) bloc (U.S., Australia, and Japan), on the other hand, China. To prove this hypothesis, it is necessary to identify the factors that caused the appearance of AUKUS, formulate the goals and objectives of Australia's participation in AUKUS

⁴ For more information see: W. Choong [2019], T. Doyle and D. Rumley [2020], M.A. Kuo [2018], and M.S. Pardesi [2020].

and its political consequences, describe the position of the UK and its goals and objectives of participation in the alliance, reveal the interests of the U.S. and the role of AUKUS in their implementation, and show the interrelation of the goals and interests pursued by the parties on the formation of a new geopolitical situation in the region.

Research Methods

A comparative analysis method is used, which allows for the study of the dynamics of the political situation in the IPR, as well as the political processes and the correlation of political forces. This method makes it possible to identify the difference between the goals, interests, and positions of the AUKUS countries. Structural and functional approaches help determine the goals, objectives, and positions of stakeholders. The systematic approach reveals the trends in the formation of a new geopolitical situation in the region, where the interconnection and interdependence of the leading elements forms a complex developing geopolitical system. The theories of new institutionalism and constructivism help to show both continuity and gaps in the security policy and foreign policy of the leading actors in the IPR.

Factors Contributing to AUKUS

The appearance of AUKUS was due to a number of factors. First was the increased power of China in the region [He, 2021; Mearsheimer, 2014] and its claim to the status of regional leader [Sheng Hao Chai, 2020], which has long been a matter of concern to the United States and Australia [Hass, 2021; Shambaugh, 2020]. As stated in the new Indo-Pacific Strategy of the United States, “the Indo-Pacific faces mounting challenges, particularly from the PRC” [The White House, 2022, p. 5]. In recent years, China has made major investments in military modernization and it now has the world’s largest naval and submarine forces. In the western Pacific, it has already achieved parity with the United States, and, in some areas, it may even have gained superiority [Doshi, 2021].

The second factor, according to a number of researchers, was the weakening of the U.S.’ position in the IPR, [Auslin, 2020; tarting, Westendorf, 2020], which was quite obvious during Trump’s presidency [McGregor, 2018]. Therefore, in order to maintain its dominance in the region, the United States needed allies that could share the risks and costs associated with confronting a growing global power, including an arms race [Denmark, 2020; Strangio, 2020].

The third factor was the strategy of “global Britain,” to which Brexit had dealt a tangible blow.

Thus, the emergence of AUKUS was due to the convergence of the strategic interests of the three member countries [Blaxland, 2021], and in the ideological sphere it was supported by their “democratic” identities.

Therefore, undoubtedly, the real goals of AUKUS are to confront China and its active policy in the region [Curran, 2021] and to preserve the United States’ regional leadership in Asia.

Goals, Objectives and Interests of the Parties

Australia’s Position

The emergence of the AUKUS partnership showed that Australia has made its final strategic choice [Turnbull, 2021]. It has clearly defined its positions in the growing competition with China for influence in the region. For a long time, Australia tried to “sit on two chairs at once”

and took an ambivalent position, believing that it can ensure its security through an alliance with the United States [Henry, 2020; Wirth, 2019] and its prosperity thanks to its economic partnership with China [Johanson et al., 2019]. Different Australian governments have openly criticized China's policy in the region [Hewes, Hundt, 2022] and positioned themselves in the vanguard of anti-Chinese opposition. Because of Beijing's active policy in the Pacific region, which western countries regard as "naval expansion," Australia has embarked on a fundamental revision of its policy toward China [Chinoy, 2021; He, 2021; Medcalf, 2019].

Recently, the relationship between Australia and China has deteriorated significantly, despite the fact that they have been close trading partners for a long time. It was Australia that called on other governments to conduct an independent investigation into the origin of COVID-19 ["The Deterioration," 2020], expressed concern about the treatment of Uighurs,⁵ and was "one of the first countries to bar Chinese 5G communications technology from its infrastructure over security concerns" [French, 2021].

China's reaction was harsh: as part of its sanctions policy, it imposed tough economic tariffs against a wide range of Australian goods, including wine and beef, annual exports of which are estimated at about \$3.5 billion ["The Deterioration," 2020].

In this context, Australia's participation in AUKUS accomplishes several important tasks. First, it allows Australia to deepen and develop its traditional partnership with the United States and Great Britain by strengthening political ties with them through the AUKUS partnership [Henry, 2020; Wirth, 2019]. Second, it is believed in Australia that membership in this pact increases its status in the regional hierarchy.⁶ Relying on the support of two other global powers, it can now realize its ambitions for leadership in the IPR, the geopolitical importance of which has increased dramatically recently, and even "go global" [Reus-Smit, 2021]. Third, experiencing tension due to China's policy in the region, Australia is counting on the support of the United States and Great Britain. Australian prime minister Scott Morrison, speaking at a briefing on the creation of AUKUS, called it "a next-generation partnership built on a strong foundation of proven trust" [The White House, 2021]. Traditionally, the two countries' close security ties have been reinforced by Australia's willingness to participate in United States' operations and missions in the region and beyond. Fourth, the country's defence capability is strengthened in the face of the growing power of China, whose policy Australia considers aggressive [Medcalf, 2019], and which a number of researchers believe threatens Australia's safety [Johanson et al., 2019; Köllner, 2021]. Australia is concerned about the country's growing economic dependence on trade with China, its cyber-attacks, alleged interference in the internal politics of other countries in the region, territorial claims and the construction of islands in the South China Sea, and threats to free maritime navigation in the region [Blaxland, 2021]. All of these are regarded as challenges posed by China that must be countered, including by increasing Australia's defence capability.

The rise of China and its increasingly active role in the region has become a problem for Australia. Therefore, it relies on the United States as its ally and leader in creating a new security architecture in the IPR, counting on its expanded and permanent presence in the region. As a middle power, Australia believes that it can influence the situation in the region only through cooperation with other institutional agents [Erskine, 2022]. Joining AUKUS marked the emergence of a new Australian strategy in the region, the final point of the formation of its anti-

⁵ Uighurs are a national minority professing Islam and living in the Xinjiang Uygur Autonomous Region of China.

⁶ For more information about the factors affecting the dynamics of a country's geopolitical status and its position in the global hierarchy, see: I. Rossi [2020, pp. 105–23, 1031–44] and I.V. Ilyin and O.G. Leonova [2017, pp. 45–52].

Chinese policy, and the culmination of a foreign policy doctrine, the core of which has become the idea of the “Chinese threat.”⁷

There are plans to build new submarines in Australia, in Adelaide [The White House, 2021]. As a result, Australia will become a unique naval ally of the United States in the Indo-Pacific region. At the same time, Prime Minister Morrison emphasized that “Australia is not seeking to acquire nuclear weapons or establish a civil nuclear capability” and that it will continue to fulfil its nuclear non-proliferation obligations [Ibid.]. The AUKUS deal, according to J. Curran, may be “the biggest strategic gamble” in the history of Australia [2021]. Australia has finally made a bet on the United States, counting on its long and permanent presence in the Pacific Ocean.

Participation in AUKUS will bring Australia political dividends, but it also has its drawbacks. First, Australia is losing billions of dollars due to sanctions in trade with China. Second, the first submarines will arrive in the country by the end of the 2030s; until then, Australia will have to rent submarines from the United States at a considerable cost. Third, Australia has no experience with nuclear technology and therefore it will have to train the staff urgently. In addition, the need to rely on the supply of submarines from abroad maintains the country’s dependence on its technological partners. The downside of such dependence on the United States may be a further weakening of Australia’s sovereignty and loss of freedom of political manoeuvre in foreign policy. Thus, it once again confirmed its readiness to take the side of the United States in any future military conflict with China, for example, over Taiwan.

However, Australia also needs to take into account the reaction of its neighbours in the region, since relations with them are an important vector of its foreign policy. The country made a diplomatic mistake by not informing its Asian neighbours in the region about the impending deal, and this provoked negative reactions [Chinoy, 2021].

The United Kingdom’s Position

For the UK, membership in AUKUS is important for the implementation of its “global Britain” strategy, as it allows the UK to consolidate its naval presence in the Indo-Pacific region. Second, by participating in AUKUS, the UK is able to emphasize its special relationship with the United States, which increases its international status. Third, membership strengthens strategic relations with the United States, which allows the UK to compensate for the geopolitical losses from Brexit and patch up the gaps in its political image that appeared after the country’s exit from the EU [Blaxland, 2021]. Fourth, it allows for the reanimation of its traditional historical ties with Australia, whose importance as a partner, thanks to AUKUS, has undoubtedly increased. Finally, with AUKUS there is the possibility of developing its military-industrial complex. This deal will not only bring financial dividends, but will also help solve social problems, namely, “creating hundreds of highly skilled jobs across the United Kingdom, including in Scotland, the north of England, and the Midlands” [The White House, 2021]. It will undoubtedly contribute to improving the overall standard of living in the country, as Prime Minister Boris Johnson stated in his speech at the briefing on the proclamation of AUKUS [The White House, 2021].

⁷ After the Morrison government was defeated in the Australian federal election, there were hopes that there would be a “soft reset” of relations with China. However, they do not seem to have been justified. This became clear after April 2022. Beijing signed a security agreement with the Solomon Islands, which evoked a negative reaction from the United States, Australia and Japan. The position taken by China on the conflict in Ukraine and its refusal to comply with the demands to put pressure on Russia confirms forecasts in favour of the likelihood of Australia continuing its anti-Chinese policy, regardless of the change of government in the country.

Thus, the UK, through participation in AUKUS, is preparing to expand its role in Asia as a part of its “global Britain” strategy [Bhatia, 2021].

The U.S.’ Position

The AUKUS agreement is a logical consequence of the American strategy of pivot to Asia, and in particular to the Asia-Pacific region, proclaimed by the Obama administration [Kennedy, Pant, 2016]. U.S. policy is dictated by its national interests [Kaplan, 2015] and the threat by China to use the Pacific Ocean to oust the United States from a leading position [Green, 2019].

The new edition of the Indo-Pacific Strategy of the United States notes that the region has strategic value and that its influence in the 21st century, as well as its importance for the United States, will only grow [The White House, 2022, p. 4]. Therefore, the United States intends firmly to gain a foothold in this region, is determined to strengthen its long-term positions there, and believes that America’s role in the region should be more effective and sustainable than ever [Ibid., pp. 5–6].

The United States views AUKUS as a new stage of trilateral security cooperation with its traditional allies—the United Kingdom and Australia [The White House, 2021].

Previously, American nuclear submarine technology had never been transferred to third countries [Blaxland, 2021] as it was believed that this could undermine the U.S.’ global maritime dominance. The delivery of such submarines to Australia shows that the United States, feeling its vulnerability, hopes to enlist the support of Australia and Great Britain in consolidating the status quo in the region and maintaining its position as a regional leader and guarantor of the security of Pacific countries. Therefore, the United States needed a regional grouping with potential great opportunities for expanding military-strategic cooperation. Washington obviously took into account the deterioration of Australia’s relations with China, which were on the verge of rupture, and the difficult situation in the country due to Chinese sanctions. Therefore, the U.S. was sure that Australia would side with the United States in the event of an open dispute with China. This became an additional motive for choosing Australia as a member of AUKUS. I. Johnson believes that helping Australia create a fleet of nuclear submarines will help the United States find an important military ally to counter the growing naval power of China, as well as strengthen its alliances in the Pacific [2021]. The intention of the United States, contrary to its tradition, to share nuclear submarine technology with Australia, shows its serious intentions and willingness to take decisive steps to respond to China’s challenge. The provision of submarines with nuclear technology on board will also strengthen diplomatic and military ties with Australia and reanimate the traditional military-political alliance with it [Jackson, 2021]. The joint use of these technologies with Australia clearly demonstrates American concerns about maintaining the U.S.’ faltering status in the IPR and the importance of having reliable partners at the forefront of the conflict with China.

The AUKUS defence partnership, including the deployment of all models and variants of American aircraft in Australia, will strengthen the U.S. position in strategic competition in the Indo-Pacific region [Jackson, 2021] in several ways. First, it allows the U.S. Air Force to practice and improve the developing concept of flexible combat use (ACE), which involves the dispersal of the air force and the projection of combat power from many places at the same time. Second, the planned joint exercises and the exchange of strategies and tactics contribute to improving the interoperability and interaction of allied armed forces. Third, the United States receives guaranteed access, basing, and overflight of their aircraft from airfields in Australia. This will help to avoid the difficulties in obtaining permission from third countries for an air corridor.

The United States seriously expects that AUKUS will serve as a deterrent to Beijing's behaviour in the region [Jackson, 2021]. Now, the U.S. will direct its efforts to attracting to its side those countries that have not yet made a choice between the United States and China and are not sure whether they need to make such a choice at all [Akaha, Yuan, Liang, 2021]. Thus, the countries of the region face a dilemma: they must either bet on the United States, which together with Australia will have a dozen new submarines, or on a trade pact headed by China (the Comprehensive Regional Economic Partnership) in which participation is very attractive to countries with dynamically developing economies.⁸

The Geopolitical Consequences of AUKUS

AUKUS is an integral part of the Indo-Pacific Strategy of the United States and, according to its official version, corresponds to the proclaimed goal of creating a "free and open, connected, prosperous, secure, and resilient" region [The White House, 2022, pp. 7, 18].

The formation of a new alliance may be one of the most important geopolitical realignments of the post-Cold War era [French, 2021]. This seemingly private deal between the United States, Great Britain, and Australia for the sale of submarines means the practical implementation of the United States' pivot to the Asia-Pacific region as its most important foreign policy priority. This strategy was formulated during the presidency of Barack Obama [Kennedy, Pant, 2016], but it has not yet received its effective implementation. AUKUS will undoubtedly make a certain contribution to it. Its creation, according to H.W. French, will have "profound ramifications" for the geopolitics of not only the region, but also the world as a whole [2021].

According to the AUKUS member countries, the creation of this alliance represents an important step forward in the West's efforts to ensure comprehensive containment of China and to victory in an era of strategic competition. Although this partnership does not involve a NATO-style collective defence mechanism, the sum of the interaction of the three partner countries, and especially the rapprochement of Australia with the United States, actually leads to the deployment of a new cold war with China [Curran, 2021]. A new defence pact backed by an arms race (nuclear-powered submarines) could lead to an escalation of tensions in the region, and, in the worst-case scenario, to a military conflict with China. The risk of nuclear submarine collisions is growing as the navies of China and the United States increase the deployment of nuclear capabilities in the waters of the Pacific Ocean. This is especially true of the disputed waters of the South China Sea. The AUKUS deal (which actually means the creation of a nuclear submarine fleet of another country, Australia) significantly increases this risk [Zhou, Ng, 2021].

A representative of the Chinese Ministry of Foreign Affairs criticized AUKUS as an "an exclusive bloc" and "clique" that seriously undermines regional peace and security and reflects a cold war mentality [Chinoy, 2021]. Undoubtedly, China will try to maintain its strategic advantage in this sea and in the region. Therefore, this may motivate it to take retaliatory actions, including joining the nuclear arms race. In any case, an increase in the number of nuclear submarines cruising in the Pacific Ocean may upset the balance of power in the region.

There is another important geopolitical consequence of the formation of AUKUS: previously, only six countries had nuclear submarines, and all six are members of the nuclear club of powers engaged in the development of nuclear weapons. Australia's accession to this club marks a break with this historical norm and, in the future, the emergence of another country with military-grade nuclear technologies.

⁸ About Comprehensive Regional Economic Partnership see: the ADB [2022], D. Mukherjee [2019], and S.C. Park [2021].

Further developments may lead to an escalation of the nuclear arms race in the region. South Korea has already set itself to the task of developing its own nuclear submarine, and Japan may also think about it. And, perhaps the AUKUS members' attempt to use their advantage—advanced nuclear technologies—will push China to further strengthen its economic, political, and military power and more actively draw other countries into its orbit [Johnson, 2021].

There is no unity in the EU in relation to AUKUS. Some European countries consider partnerships with China as promising great economic opportunities. Others believe that its growing dominance in Asia is leading to a new cold war and the formation of bipolarity, which are not in the interests of Europe. These countries view the strengthening of naval and technological capabilities to combat China within the framework of AUKUS very positively [Bhatia, 2021].

The creation of the AUKUS pact demonstrated to Europe the contemptuous attitude of the United States toward their European allies and undermined the credibility of their policy, which had already been damaged due to the unilateral decision of the United States to withdraw troops from Afghanistan.

Previously, France had signed a contract worth \$66 billion for the supply of submarines to Australia [French, 2021]. This deal was of particular importance for France, which wanted to strengthen its geopolitical influence on Australia (which is an outpost in the Indo-Pacific region), as well as to increase its global significance and status. The announcement by the U.S. president of the AUKUS deal came as a complete surprise to France [Kupchan, 2021]. The decision of the government in Canberra to abandon a multibillion-dollar submarine contract with France (without prior notice) in favour of American technologies and a new security pact with the United States and Great Britain was regarded by President Emmanuel Macron as a betrayal [South China Morning Post, 2022], a breach of trust, and as undermining allied commitments.

All this compromises the efforts to develop a common transatlantic strategy to counter China's growth. All attempts by European countries together with the United States to develop a common policy toward China have been called into question. The behaviour of the United States has demonstrated the risks of such cooperation, which will now be difficult to restore in full.

C. Kupchan believed that the AUKUS deal “has produced a diplomatic setback to advancing transatlantic unity” [2021]. However, recent events indicate the opposite—the involvement of the European Union and NATO in the American policy of containing China and Russia in the IPR.

And if, for the UK, this is a step forward in implementing its concept of “global Britain,” then for other European countries which remain outside this bloc it is undoubtedly a step back and undermines transatlantic ties.

As the AUKUS partnership strengthens, namely, by the time Australian submarines are deployed in the late 2030s, the geopolitical situation in the Indo-Pacific region will look different. The countries of the AUKUS group do not name the power they are called upon to resist, although it is obvious to everyone—China. The creation of a new bloc may spur the development of an open conflict in the Pacific with China, the trigger of which may be a new hot spot—Taiwan. Beijing makes it clear that, if necessary, it is ready to use force to keep it as part of Greater China and a part of its sovereign territory. The United States is equally determined to fight with China for the preservation of Taiwan's autonomy, so we can expect that the economic competition between the two powers will be complemented by a full-scale military-strategic rivalry under the slogan of preserving security in the IPR. The creation of AUKUS raises the stakes in this confrontation.

The overlooking of France, which was not invited to AUKUS, is explained not only by the desire to intercept a lucrative contract for the supply of submarines and get a significant profit.

Indeed, the allies in the new bloc were sure that France would never risk its business interests with China for the sake of achieving political superiority over it in this region.

French believes that the United States is making a mistake with the AUKUS partnership. “By so greatly privileging military answers to challenges, Washington is inching toward the classic hammer dilemma. When that’s your only tool, every problem starts to resemble a nail. The danger is that, in East Asia, the nails are connected to detonators” [2021].

Russia, being a Pacific power, has its own national interests in this region, which may conflict with the actions of the AUKUS countries. Russia needs to clearly define its position in this situation, formulate a strategy in the Indo-Pacific region, and include it in the new edition of the Foreign Policy Concept of the Russian Federation.

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Approaches of BRICS Countries to Data Regulation¹

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Abstract

Data are not a new resource in the economy, but they are now growing at an unprecedented rate as a result of the proliferation of digital devices and services. An analysis of emerging national data regulation systems identifies significant differences in national approaches, especially in relation to cross-border data flows, due to economic specifics and national interests. Differences of approach among the major players create challenges for other countries, increase the fragmentation of the global regulatory environment, produce uncertainty, and increase compliance costs for businesses. These factors determine the importance of international cooperation in the field of data management.

This review presents the approaches of the BRICS countries—Brazil, Russia, India, China, and South Africa—to the regulation of data, primarily of their cross-border flows, as well as the requirements for localization of data storage and operations.

Based on the results of the review, general trends in the approaches taken by the BRICS countries to regulation can be identified, leading to the conclusion that it is possible to strengthen interaction within BRICS, primarily in relation to mutual recognition of the adequacy of existing and contemplated data protection measures to ensure mutually beneficial cross-border movement of data.

Keywords: digital economy, data governance, cross-border data flows, BRICS

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Introduction

Data are becoming an increasingly important resource in the global economy, and the use of data has a significant impact on economic and social processes. The role of data in the global economy is stipulated by rapid digitalization, the inexhaustibility of data as a resource, and the possibility of its use by a large number of actors without significant costs to create economic and social value.

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In the context of acute geopolitical contradictions and information wars, mistrust and risks of misuse and malicious use of data are growing. Accordingly, there is an increasing desire to protect data privacy through conditional cross-border data transfers or requirements for data storage and processing within specific state boundaries. Contradictions between actors in international regulatory regimes are aggravated. In order to reduce the risk of influence in multilateral institutions that contradicts Russian interests and approaches in relevant areas, it is important to strive for the formation of international principles for regulating data flows and protecting data in cooperation with key partners, primarily the other BRICS countries (Brazil, India, China, and South Africa).

To assess the prospects for data governance cooperation within BRICS, the approaches of these partner countries are examined. The analysis includes the normative documents these four countries have in force or plan to adopt. The main emphasis is on approaches to cross-border data flows, an area with the most significant differences in regulation across countries.

BRICS Approaches to Data Governance

China

Despite China's leading position in the digital economy, including its status as the largest actor in cross-border data flow chains, the relevant regulatory system in China began to take shape only relatively recently. The current economic and political system of China implies the active government participation in economic and social processes, which determines the significant role of the state in the digital economy and, in particular, the relatively strict regulation of cross-border data flows across borders and within the country.

The concept of digital sovereignty is at the core of China's policy on data flows. China's approach to digital sovereignty is based on the understanding of digital technologies and the Internet as the most important geopolitical asset. Chinese policy is aimed at promoting technology leadership on a global scale, as well as data protection (a key government concern, see S. Budnitsky and L. Jia [2018]), with a particular emphasis on security [Creemers, 2020]. This approach is also reflected in Chinese policy on data flows.

China's data flows regulatory system, which is still under development, is based on three acts that came into force in the past five years—the Cybersecurity Law, the Data Security Law, and the Personal Information Protection Law—and related regulations and by-laws.

China's Cybersecurity Law explicitly sets out localization requirements for certain categories of data. In accordance with the law, personal information and important data collected and generated by critical information infrastructure operators in China must be stored within the country [Creemers, Triolo, Webster, 2018]. While the Cybersecurity Law does not provide a detailed definition or scope of activities for critical information infrastructure operators, it notes that China will focus on protecting certain critical industries, including, but not limited to, public communications and information services, energy, transportation, finance, and public services where destruction, loss of functionality, or data leakage may lead to a threat to national security or public interest [Ibid.].

The Cybersecurity Law also provides that if the cross-border transfer of personal and sensitive data is necessary due to business needs, a security assessment must be carried out following the measures formulated by the state Cyberspace Administration and the relevant departments of the State Council ("security assessment"). The Cybersecurity Law does not directly list the measures and procedures for security assessment, however, in recent years, some draft documents in this area have been issued. One such document is the Draft Measures on Security

Assessment of Cross-Border Data Transfer. Under the Cybersecurity Law, “critical information infrastructure operators” are required to undergo security assessments, while the Draft Measures extend this obligation to “network operators.” Thus, network operators in China are classified as critical infrastructure operators, which makes the interpretation of such infrastructure very broad. Formally guided by the goals of ensuring security in cyberspace, China has introduced significant legal restrictions on cross-border data flows.

In addition to these requirements that apply to data flows in general, in order to “ensure public security and facilitate access to data by regulators,” China has also introduced data localization requirements for specific sectors, including health information [Hu, Gong, Yang, 2022], credit files [Order No 631, 2013], personal information collected by commercial banks [NRF, 2020], organizations that operate navigation and mapping services [Si, Cai, 2021], on-line taxi platforms [Interim Administrative Measures, 2016], and online bicycle sharing operators [Yang, 2020], as well as in relation to information constituting state secrets [Cadwalader, 2011].

The Cybersecurity Law has addressed the governance and security of digital data, but other types of data have remained outside the regulation perimeter. The Data Security Law has filled this gap, as it covers all types of data (including both electronic and non-electronic data) and covers the full cycle of operations with them [Data Security Law, 2021]. Unlike the Cybersecurity Law, which only governs digital data, the scope of the Data Security Law also extends to non-electronic data. In addition, while both laws provide for the possibility of being applied to illegal activities abroad, sanctions under the Cybersecurity Law are limited to cases of exporting personal data collected in China, importing “illegal” data from abroad, and actions that seriously compromise the security of China’s critical information infrastructure. Under the Data Security Law, any overseas data processing activities that endanger China’s national security, the public interest, or the legitimate rights of any person or entity are illegal. Thus, the Data Security Law is based on a more comprehensive approach, providing very broad grounds for its enforcement.

The term “national security” is very often mentioned in the Data Security Law in comparison with “privacy protection.” Thus, it seems that strengthening national security is a key factor behind the adoption of the law. Under the Data Security Law, for the first time, the Chinese government has established a centralized classification system based on the level of data importance. Data relating to national security, the national economy, social welfare, and critical public interests are considered as core data and operations with them are subject to more stringent verification. The Chinese government is currently preparing the publication of national, regional, and departmental catalogues with a classification guide to ensure greater control over core data processing activities.

As for data exports, it seems that the main purpose of China’s regime is to counter the Clarifying Lawful Overseas Use of Data (CLOUD) Act adopted in the United States in 2018. The CLOUD Act allows U.S. law enforcement agencies to request access to electronic data, regardless of the country in which they are stored. However, under the Cybersecurity Law of 2016, exports of personal data and sensitive data stored using critical information infrastructure in China is subject to security assessments. This measure is reinforced by the Data Security Law, which also provides that companies that fail to comply can be fined up to 10 million yuan (about \$1.5 million), and face suspension of their activities or closure.

To complete the formation of the Chinese data regulatory framework, it was necessary to adopt legislation directly related to personal data. On 20 August 2021, the Personal Information Protection Law (PIPL) of the People’s Republic of China (PRC) was adopted, with key aspects very similar to the European model embodied in the General Data Protection Regulation (GDPR) [PIPL, 2021]. The law provides for a definition of personal information, explains the

legal basis for personal data processing, establishes obligations and responsibilities of processors, and provides for strict data localization requirements to protect Chinese interests in cross-border personal information transfers. Although the PIPL is similar to the European Union's (EU) GDPR, there are some differences and additional requirements in Chinese law.

The PIPL provides for extraterritorial jurisdiction under certain circumstances. Three cases have been identified when extraterritorial jurisdiction may apply, including when the purpose of the data processing is providing goods or services to individuals in China, "analysis" or "assessment" of Chinese citizens' behaviour, or other purposes provided for by other regulatory legal acts [PIPL, art. 3]. A processor that plans to transfer personal information to organizations outside China must provide individuals with specific information about the transfer and obtain separate consent for this, take necessary measures to ensure that foreign recipients provide the same level of information protection as established in accordance with the PIPL, and conduct an impact assessment regarding personal information protection.

Chinese law provides for localization requirements. Operators or organizations that process a large amount of personal information (when the amount of personal data processed reaches certain thresholds set by the relevant government agency) are obliged to store personal information in China. If such personal information needs to be transferred overseas, the organization must undergo a security assessment by the Cyberspace Administration of China (CAC) and other relevant authorities. A similar requirement also applies if the processor falls under the definition of "critical information infrastructure operator."

In other cases of cross-border transfer, the law allows choosing one of the following options: passing the security assessment organized by the relevant government authority (CAC) (similar to critical information infrastructure operators and cases of processing large amounts of personal information), obtaining a personal information protection certificate from professional institutions recognized by CAC, concluding an agreement with a foreign personal information recipient in accordance with the standardized contract form provided by CAC that specifies the rights and obligations of both parties, or fulfilling other conditions established by laws, administrative regulations, or the relevant government authority [PIPL, art. 38].

Analysis of China's legal acts regulating data flows shows they are aimed at protecting the country's digital sovereignty and ensuring cybersecurity. Since the Chinese model for regulating cross-border data flows is based on the central role of cybersecurity in national security, it is quite restrictive [Lee, 2018; Liu, 2019]. Localization requirements and restrictions on transferring data to other countries indicate that the Chinese government seeks to maximize digital sovereignty and minimize the possibility of foreign interference, which is a distinctive feature of the PRC's approach compared to other countries analyzed. At the same time, China provides an example of a restrictive approach, which, combined with strategic state intervention in the economy, has helped stimulate domestic digital market growth and ensure the global reach of large national technology companies. Given the need to further expand these companies' activities, including international ones, economic aspects have become more and more important in data regulation policy over time (even though initially the main goal of regulating cross-border data flows in China was to ensure national security).

China is currently finalizing a national data governance and protection system that requires certain conditions to be met for cross-border data transfer, including a security assessment by government agencies, and establishes localization requirements—all critical information infrastructure operators, understood very broadly, and personal information processors must store personal information they collect locally.

At the same time, economic interests tend to soften China's official position regarding free data flows and convergence in approaches with other countries, including BRICS partners, despite the previously introduced restrictions. Thus, the PIPL expressly states that the

PRC government will strive to conclude international agreements on personal data transfers and mutual recognition of standards for personal information protection [PIPL, art. 12]. In 2020, the Chinese government announced its readiness to allow cross-border data flows in the Hainan Free Trade Zone [Lu, 2020]. The Chinese authorities also noted the importance of international coordination in the field of data security and recognized that local data storage requirements cannot be considered universal for all countries. Experts agree that a key reason for a shift in China's data flow policy is the desire to strengthen the digital dimension of economic projects, in particular within the One Belt One Road Initiative (OBOR)—the Digital Silk Road launched in 2015 [Liu, 2020].

India

Despite its large population and the rapid increase in access to telecommunications networks, as well as numerous national companies in the telecommunications industry, India has not yet adopted special legislation to govern data flows, including their cross-border movement. However, a comprehensive data regulation is currently under discussion and is expected to be adopted in the near future.

Based on the interpretation adopted by the Supreme Court of India in 2017, the right to life of Indian citizens includes the right to privacy, including data and privacy protection [Committee of Experts on Data Protection, 2018]. Shortly after this announcement, a special committee was established, chaired by former Supreme Court Justice B.N. Srikrishna, which presented a report on the need for new data protection legislation along with a draft Personal Data Protection Bill. The bill was aimed at regulating the flow and use of personal data and the activities of various entities processing personal data; protecting the fundamental rights of persons whose data is being processed; establishing a regulatory framework for accountability, data processing, and cross-border transfers; and providing legal protection in case of violations. It also proposed to establish the Data Protection Authority to reach these objectives. The 2018 bill was slightly revised before being submitted for consideration and is currently awaiting approval in the Indian Parliament as the 2019 Personal Data Protection (PDP) Bill [PDR Bill, 2019].

The PDP Bill, introduced in the Indian Parliament by the Ministry of Electronics and Information Technology on 11 December 2019, is largely modelled after the EU's GDPR. It applies to personal data processed in India by the Government of India, any company or legal entity registered in India, and foreign companies dealing with personal data of Indian individuals (for example, dealing with data of Indian citizens outside the country), subject to certain requirements. These requirements provide for extraterritorial application of the act if the processing of data by foreign companies, regardless of their physical presence in India, is connected with "any business carried on in India or any systematic offering of goods or services to data principals within India; or profiling data principals within India" [Ibid.].

The bill provides for the creation of the Data Protection Authority (DPA), which is entrusted with broad rule-making, administrative, and quasi-judicial functions. Its functions are similar to that of the European Data Protection Board.

The bill imposes obligations on data fiduciaries ("those who, alone or in conjunction with others, determine the purpose and means of processing of personal data"), including providing data principals with detailed notice prior to data collection and obtaining their consent; processing data only for a clear, specific, and legitimate purposes and in a fair and reasonable manner; retaining data only until the purpose of the collection is achieved; and taking steps to ensure transparency and accountability.

The bill establishes different localization rules for different categories of personal data. Data localization requirements are identified within a three-level structure. Restrictions on

transfers (localization requirements) do not apply to personal data in general but are imposed on “sensitive personal data” and “critical personal data.” Sensitive personal data may be transferred abroad for processing if the individual has expressly consented to this and subject to certain additional conditions, but it still must be stored in India [PDR Bill, 2019]. Sensitive personal data includes “such personal data which may reveal, be related to, or constitute: financial data; health data; official identifier; sexual orientation; biometric data; genetic data; transgender status; caste or tribe; religious and political belief or affiliation; and any other data” specified by the Government of India in consultation with the DPA and the regulator in the specific sector [Ibid.]. Critical personal data, in general, cannot be transferred outside of India and is processed only within the country. However, to a limited extent, regulators plan to allow the transfer of such data to other countries or organizations, although the specific mechanism is not specified in the bill. Critical personal data is defined as “such personal data as may be notified by the Central Government to be the critical personal data” [Ibid.].

A key motivation for including localization requirements in the proposed regulation appears to be the protection of Indian economic interests by ensuring that local digital data is primarily used to develop domestic digital companies (so-called “data champions”), thereby limiting “data colonialism” by large technology companies [Hicks, 2019; Mint, 2019]. In addition to protecting economic interests, India’s restrictive approach to regulating cross-border data flows is based on various advantages of data localization to ensure effective regulatory oversight and enforce domestic laws. For example, Indian regulations require all payment system providers to store data relating to such systems locally (even if such data are processed abroad) so that the Reserve Bank of India can “have unfettered supervisory access to data stored with these system providers as also with their service providers / intermediaries/ third party vendors and other entities in the payment ecosystem” [Reserve Bank of India, 2018]. Similarly, in the context of personal data protection, the Srikrishna Committee report noted that the “effective application” of the Indian PDP Bill “will invariably require data to be stored locally within India, and this would mean that such a requirement, where applicable, would limit the possibility of cross-border data transfers.” At the same time, data localization requirements, in addition to their legal and regulatory advantages, are in line with the logic of domestic economic development policy: if more data can be stored in India, this will lead to improvements in domestic digital infrastructure for new digital technologies such as artificial intelligence and the Internet of things [PRS Legislative Research, n.d.].

In general, the PDP Bill is to a large extent based on the EU’s GDPR. However, the specifics of the Indian approach to digital economy development based on supporting “national champions” predetermined a number of differences that characterize India’s policy as more protectionist. The key difference is India’s planned introduction of localization requirements.

The approach prescribed in the draft PDP Bill (localization requirements depending on the category of personal data) is also proposed to be used in relation to non-personal data. The draft National E-Commerce Policy [Government of India, 2019] provides for data localization measures. The report of the Committee of Experts on Non-Personal Data, established by the Ministry of Electronics and Information Technology, recommended the introduction of data localization requirements for certain categories of non-personal data, similar to those envisaged in the PDP Bill. Thus, sensitive non-personal data can be transferred outside the country, but will have to be stored in India, and critical non-personal data can only be stored and processed locally [Committee of Experts on Non-Personal Data, 2020].

Some commentators believe that in recent years the Indian government has moved from minimal oversight of cybersecurity and data security to over-control. In particular, due to the vagueness of some concepts, concerns have been raised about the potentially “excessive” powers granted to the Government of India under the PDP Bill. Most of the criticism is related to

localization requirements. The PDP Bill, similar to the National E-Commerce Policy titled “Indian Data for India’s Growth,” explicitly highlights the country’s commitment to the development of its digital sector using data to drive national companies’ growth. Unlike developed countries, the Indian government seems to believe that implementation of such an approach is impossible without data localization measures. Accordingly, the Personal Data Protection Bill assumes that copies of sensitive personal data will be stored in India, and the cross-border transfer of critical personal data will be almost completely prohibited.

Given the broad scope of the definition of sensitive personal data, the proposed bill imposes a greater compliance burden on companies compared to the current legal regime (currently data can be transferred to any country provided that the transfer is necessary to fulfil an existing contract and the principal has consented to such transfer) [Ministry of Communications and Information Technology, 2011, rule 7]. In addition, there is an opinion that the Government of India will treat any data as critical personal data, since this term is not clearly defined in the PDP Bill [2019]. At the same time, cross-border transfer of non-critical personal data will also be possible only in limited circumstances to countries for which the government expressly allows such transfers (adequacy approach), pursuant to intra-group data transfer schemes approved by the government, when explicit consent is given by the data principal, or based on a need for any specific purpose determined by the regulatory body [Ibid.].

Thus, several important issues regarding enforcement aspects and their impact on data flows regulation in India remain unclear. In the near future, the Government of India is most likely to pass the PDP Bill approved by the joint parliamentary committee. After its entry into force, the scope of data localization requirements and other norms that are not clearly defined and will be applied based on the regulator’s decisions will become clear. Accordingly, potential for India’s cooperation on data regulation issues with other BRICS countries will become clearer.

Brazil

Currently, Brazil’s main regulation on data flows is the Personal Data Protection Law (Lei Geral de Proteção de Dados Pessoais, LGPD). It was adopted in 2018, entered into force in 2020, and in 2021 liability for violation of its provisions became effective. The law systematizes and unifies the Brazilian legal framework, which consists of more than 40 different legislative acts in the field of data governance, replacing some provisions of existing laws and supplementing others. The law provides for the regulation of personal data processing, including by digital means, by a natural person or legal entity under public or private law, with the aim of protecting fundamental rights to freedom and privacy and free personal development [LGPD, 2018].

Based on the text of the law, several types of data with different regulation regimes can be identified. Personal data means data that allows identifying a natural person directly or indirectly. This type of data is understood quite broadly, without further explanation. Personal data is subject to regulation under the LGPD. Confidential data are data with processing possible only after obtaining the express consent of the data principal and for a specific purpose. The LGPD determines that, without express consent, the processing of such data is only possible when the information is necessary in situations related to a legal obligation, public policy, preservation of human life and physical integrity, for preserving health privacy, and fraud prevention. Sensitive data reveals a person’s racial or ethnic origin, religious or philosophical beliefs, political opinions, trade union membership, genetic information, biometrics, or information about a person’s health or sex life. The processing of sensitive personal data is carried out only in the following situations: with the specific and explicit consent of data principal or his/her legal representative, for specific purposes, or without the consent of data principal, when it is

necessary for: the fulfillment of a legal or regulatory obligation by data controller; joint processing of data when this is necessary for the public administration to comply with public policy requirements provided for in laws or regulations; research conducted by a research organization, while ensuring the anonymization of sensitive personal data; regular exercise of rights, including under a contract and within the framework of judicial, administrative, and arbitration procedures; protecting the life or physical security of data principal or a third party; protection of health, exclusively within the framework of a procedure carried out by medical professionals, health services, or sanitary authorities; ensuring fraud prevention and security of the data principal; and identification or authentication of registration in electronic systems. Public data processing must take into account the purpose, good faith, and public interest that justify data accessibility [Ministry of Citizenship, n.d.].

The law applies to any data processing operation carried out by a natural or legal person under public or private law, regardless of the means, the country in which its headquarters is located, or the country in which the data is located, provided that the processing is carried out in Brazil, processing activities are aimed at offering or providing goods or services or at processing data of natural persons located in Brazil, or the personal data being processed was collected in Brazil. Thus, similar to other norms considered, the Brazilian law provides for extraterritorial application.

Concrete definitions of the terms “data controller” and “data processor” are not provided in the text of the law. The National Agency for the Protection of Personal Data (ANPD), established by this law, is responsible for clarifying the statuses and issuing relevant instructions. The lack of definitions and explanations creates legal uncertainty in the early stages of the law’s enforcement, since the recently established ANPD (its creation was delayed, including due to the initial veto of the president and then the pandemic) has not yet issued the required instructions.

The Brazilian law permits cross-border personal data transfers only in the following cases: to countries or international organizations that provide a level of personal data protection that is adequate to the LGPD provisions; when a controller offers guarantees of and proves compliance with the principles and respect for the rights of data principal and the data protection regime provided for by this law, in the form of special contractual clauses for a specific transfer, standard contractual clauses, binding corporate rules, and regularly issued certificates and codes of conduct; when the transfer is necessary for international legal cooperation between state intelligence, investigative, and prosecutorial bodies, in accordance with international law principles; when the transfer is necessary to protect the life or physical security of the data principal or a third party; when national authorities authorize the transfer; when the transfer is part of an obligation in the framework of international cooperation; when the transfer is necessary to carry out public policies; and when the data principal has given his/her specific and expressed consent to the transfer, being previously informed about the international nature of the transfer.

The level of data protection in a foreign country or international organization is assessed by Brazilian national authorities, which take into account general and sectoral legislation in force in the destination country or international organization, the nature of data, compliance with the general principles of personal data protection and respect for the rights of data principals provided for by the LGPD, adoption of security measures provided for by Brazilian regulations, availability of judicial and institutional guarantees for the observance of rights related to the protection of personal data, and other specific circumstances of the transfer.

Six of the eight mechanisms for approving cross-border data transfers require decisions by the ANPD. This supervisory body is at the formation stage. The five ANPD directors were appointed by President Bolsonaro and took office on 6 November 2020. The ANPD has also hired 19 out of 31 employees it can under the presidential Executive Order 10.474/2020. It remains unclear how long it will take to assess, establish, and approve data transfer mechanisms

as provided for in the law. At the moment, companies can use only two data transfer mechanisms—specific and clear consent or the need to perform a contract.

In the future, the approach chosen by the ANPD will determine the cross-border data transfer regime. There are several models in the world that can be examined to choose the best one for Brazil. Alternatively, Brazil could develop its own governance model. The ANPD could consider the “EU plus” approach for determining the adequacy of protection in certain jurisdictions, as Israel and Colombia have done, or choose the UK model, delegating such decisions to data controllers. The ANPD may also recognize the existing EU standard contractual clauses (SCCs) and binding corporate rules (BCRs) or simply require contractual safeguards to provide adequate protection, as Canada has done. It can also initiate the issue of certificates or codes of conduct—through participating in the Asia-Pacific Economic Cooperation (APEC) Cross Border Privacy Rules (CBPR) System [APEC, n.d.] or working with local associations to recognize codes of conduct and expand their scope by appointing third party certifiers [IAPP, 2020]. Establishing rules for cross-border data transfers is one of the priorities of the ANPD for the next two years, so its first decisions are expected by the end of this year or in early 2023 [ANPD, 2021]. To the moment, the ANPD has launched international cooperation with the EU and the UK. In April 2021, the agency took part in the UK-Brazil Digital and Cyber Dialogue 2021 to share experiences and discuss international data flows governance issues. In addition, ANPD members took part in the Data Protection Academy project organized by the University of Maastricht as part of the cooperation between the ANPD and the European Commission [Neerer, 2021].

The Brazilian data protection law was largely modelled after the EU’s GDPR. These two legal acts are very similar: in fact, their principles coincide, extraterritoriality is implied, and similar rights are guaranteed to data principals. The cross-border data transfer provisions in Brazilian law are also similar to the GDPR. The differences between the two laws are minor. An important factor of this is Brazil’s accession to the Organization for Economic Co-operation and Development (OECD) and its desire to develop domestic legislation in line with the OECD approaches. At the same time, the EU and the OECD cooperate closely, and many principles and recommendations proposed by the OECD are reflected in the EU’s legal framework.

In its current form, the LGPD does not impose localization requirements, and experts assess it as restrictive, but not prohibitive. For example, the United Nations Conference on Trade and Development (UNCTAD) in its report placed Brazil in the category of countries with a conditional data transfer regime, assessed the conditions for data transfer as quite strict, and the approach itself as prescriptive [2021]. However, various political forces, mainly from the left of the political spectrum, seek to either amend the LGPD to tighten its conditions, or introduce new, more restrictive laws.

In general, Brazil’s political system is competitive, diverse, and relatively balanced. Left-wing parties and their representatives are in favour of greater restrictions in data flows governance, and support localization and “landing” of companies. They are particularly concerned about the de facto dominance of some companies and platforms, which creates conditions for undermining competition and violating citizens’ rights. Right-wing and centre parties oppose localization, but still advocate for certain rules. They are interested in the effective implementation of the LGPD and progressive development of the ANPD to establish a harmonious data governance framework. The outcomes of presidential and parliamentary elections will greatly affect data regulation developments. Given the relative equality of support to the two options, there may be stagnation since neither side will be able to gain the necessary majority to ensure the adoption of their initiatives as laws. The president has more power to issue decrees, so presidential elections are more likely to affect the governance regime compared to parliamentary ones. Lula’s victory would most likely lead to strengthening Brazil’s identity as a developing

country, a representative of the Global South, an active participant in South-South cooperation, and an important BRICS actor. One can expect increased restrictions on cross-border data flows and the adoption of “landing” and localization requirements, as this is in line with the left parties’ agenda. Regardless of the election results, regulators will focus on addressing the risks posed by digital platforms, especially those with a dominant position in the digital services market. Bolsonaro’s victory would most likely preserve the current approach, which combines the absence of localization requirements with acknowledging the need to restrict data flows in certain cases.

In general, Brazil’s position could contribute to successful BRICS cooperation on data governance. There are no visible contradictions between Brazil and other BRICS members, as it recognizes the right of each jurisdiction to establish its own requirements and rules and notes that data flow restrictions may inevitably arise. Requirements for jurisdictions to recognize their data protection regimes as adequate do not include political components or values. Brazilian regulation is soft compared to China or even Russia and the policy develops rather by inertia, but certain political forces advocate for stricter requirements, including localization.

South Africa

The legal framework for data governance in South Africa is currently being established. The need to adapt national legislation to the new circumstances is highlighted by the growth in the number of Internet users in the country since 2000, which has accelerated significantly during the coronavirus pandemic, and the increasing demand for electronic communication and digital commerce tools.

The Protection of Personal Information Act (POPIA) signed in 2013 is the main one in this legal framework. Given the fundamental nature of the proposed changes in the activities of public authorities and private companies, its entry into force took eight years. The provisions of the law entered into force in stages, and some of them were revised after the adoption of the 2020 Cybersecurity Act. In addition, the provisions regarding reporting by private companies provided for a one-year transitional period, and therefore POPIA only became effective in practice from July 2021.

Based on the basic principles of South African data policy, the main responsibilities of data operators include compliance with the requirements for ensuring the legality and openness of operations with data, as well as their security. POPIA requires all organizations involved in personal data processing to appoint a person responsible for compliance with personal data regulations and submit relevant information to the national regulator. By default, this task is assigned to companies’ executive directors. According to POPIA, data operators should submit internal regulations to ensure security of processed data for consideration by the national regulator. In case of violation of data integrity and security, operators are obliged to submit information about the incident to competent authorities within 72 hours.

POPIA applies to data operators that are registered legal entities in South Africa. The extraterritoriality of the act is manifested if the data controller is not registered in South Africa but uses automatic and/or non-automatic data processing tools for data collected in South Africa. An exception is made for operators who only transmit data through the territory of South Africa and whose activities are not related to data collection and processing in the country. Unlike the laws of other BRICS countries discussed above, POPIA does not apply to the activities of companies that are registered in foreign jurisdictions but offer goods or services to consumers in South Africa.

According to the act, the transfer of personal information to a third party outside of South Africa is prohibited except for certain cases. One such case is if the data recipient outside of

South Africa is committed to comply with corporate rules or agreements that provide for a sufficiently high level of data protection that meet the following requirements: effectively support the principles of rational data processing, which are substantially similar to the conditions for lawful processing of personal information relating data principal, which is an individual or, where applicable, a legal entity;² are substantially consistent with the content of the act regarding the onward personal information transfer from the recipient to a third party located abroad.³ Other cases include those in which the data principal has consented to the transfer of information, the transfer of information is necessary for the fulfillment of contractual obligations between data principal and the responsible party or for the implementation of pre-contractual measures taken in response to the request of data principal, the transfer is necessary for the conclusion or performance of a contract concluded for the benefit of data principal between the responsible party and a third party, the data transfer is carried out in the interests of the data principal, obtaining the consent of the data principal for data transfer does not seem appropriate, and if there are no obvious grounds for assuming that the data principal could refuse to transfer the data concerned.

Thus, South African law does not establish requirements for digital data localization, but the transfer is still conditional. The requirement for localization can likely be strengthened in the process of implementing the Draft National Data and Cloud Policy proposed in 2021 [Republic of South Africa, 2021].

Over the past few years, South Africa has made significant progress in the development of national data governance. The benefits created by the development of digital and data processing technologies have become an impetus for the development of relevant national legislation. The second equally important factor is cybersecurity. The adoption of the Cybercrimes and Cybersecurity Act and the entry into force of all the POPIA provisions made it possible to resolve several important regulatory issues—conditions for data transfer to operators located abroad were specified, the powers of the national regulator in terms of monitoring local data operators were defined, and offences related to the violation of data privacy were determined. Nevertheless, on several issues, there is a need for further decision-making at the state level.

First, the issue of formalizing data localization requirements has not been addressed, although such requirements are organically combined with POPIA requirements. Lack of resources needed to enforce this solution locally leads to the absence of such requirements, which could both reduce the attractiveness of the South African market for foreign data companies and create additional difficulties for national operators. The need to store user information locally is highlighted as a priority area of work in the Draft National Data and Cloud Policy. Thus, in the near future relevant proposals are likely to be presented as draft laws.

Second, South Africa's cautious position toward international agreements on data governance may result from a lack of available competencies or trained workforce, as well as resources for its formation, to fulfil obligations on ensuring personal data security at the international level, as required, for example, by the African Union Convention on Cyber Security and Personal Data Protection. The case of negotiations on e-commerce within the World Trade Organization (WTO) supports this idea—Indian and South African positions focus on the expected negative consequences of lifting protectionist restrictions in e-commerce for digital industries in developing countries, which will face competition with more advanced foreign information technology giants, having both a technological base and relevant competencies. Maintaining

² It should be noted that there are no other comments regarding the semantic content of the “principles of rational data processing” in POPIA. Some experts indicate there are eight basic principles of data processing. See for example: <https://www.popiact-compliance.co.za/popia-information/17-conditions-for-lawful-processing-of-personal-information>

³ The text of the law does not specify what is meant by these provisions.

restrictions should therefore allow developing countries to catch up with developed ones without putting their emerging industries at risk.

Third, along with the lack of resources, there are some shortcomings in the institutional environment. The powers to control implementation of relevant laws are distributed among various bodies—for example, compliance with certain POPIA provisions is controlled by the national regulator, while the police are responsible for monitoring compliance with other regulations, also acting as the operator of a special coordination centre involved in monitoring cyber incidents and, in some cases, as a platform for interaction with foreign authorities on combating cybercrime. At the same time, a legal gap remains that allows foreign actors, in exceptional cases which are not specified in the law, to bypass this coordination centre and directly interact with the responsible representatives of the country's judiciary, which according to some experts, can be considered as a violation of state sovereignty.

Finally, to date insufficient data have been accumulated regarding the effectiveness of the adopted regulatory measures in practice. The Cybercrimes and Cybersecurity Act came into force in December 2021, while the abovementioned coordination centre on cyber incidents is still being prepared for launch in 2022. POPIA fully entered into force in 2021, therefore, to date the actual experience of compliance by national data operators with the requirements for enforcing personal data protection plans agreed by the state regulator is less than one year. The real impact of the measures discussed is yet to be assessed in the coming years.

Conclusion: Potential for BRICS Cooperation

The analysis shows that four BRICS countries differ in terms of regulatory approaches to data, primarily regarding restrictions on their cross-border flows. The main difference is that China and India use or plan to apply a restrictive or binding approach, which implies data localization requirements. Brazil and South Africa currently use a prescriptive approach, implying conditionality of cross-border data transfers and different requirements for those willing to export personal data.

China pursues an expansionist strategy that reflects the logic of its domestic regulation models. The state control data governance model (which may also be called the cyber sovereignty model) aims to support the entry of national digital and telecommunications companies into developing countries' markets, including in the framework of the One Belt One Road initiative [Erie, Streinz, 2021]. The approaches of other countries are more focused on development using domestic resources. India relies on a protectionist approach to data governance aimed at supporting domestic companies; in Brazil there is a political struggle between free data flows and localization proponents, and each group claims to protect the national interests; and South Africa, similar to India, declares supporting "national champions" through proper data governance as a priority in its Draft National Data and Cloud Policy [Industrial Development Think Tank, 2019].

Thus, despite some differences, there is a potential for convergence in BRICS approaches based on the common idea of supporting domestic digital sectors. Cooperation within BRICS is also important as the digital platforms from the U.S. and other western countries strive to build digital markets in their own interests, and these countries' governments seek to support their companies through appropriate regulation of cross-border data flows.

The basis for a feasible, inclusive multilateral governance is an agreement on convergence of data regulation while maintaining sovereignty, which, to varying degrees, is stated as a goal by all countries considered. The consensus on data protection in this case may primarily concern the level of protection rather than regulatory practices, without introducing conditionality or

localization requirements, and just defining basic cooperation and interaction principles for relevant government bodies [Heseleva, Ramos, Ichilevici de Oliveira, 2020].

Accordingly, within BRICS cooperation could primarily address mutual recognition of regulatory norms as corresponding to a certain universal level of protection to ensure proper cross-border data transfers, with a possible further expansion to other aspects of data governance.

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