

Institutionalization of the green finance market as an opportunity for the Modernization of the regional economy, and ecosystem preservation

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ABSTRACT

The green finance market, which began to emerge during the period of the well-known recession of the world stock market in 2007, has now crossed the mark of \$500 billion. The rapid development of this new type of financial instrument is determined by the desire of the population, political leaders and investment funds to more rapid (and legally facilitated) fulfilment of the obligations by the countries of the world on programs to combat climate change and environmental protection that have been adopted more than once at global climate forums, where the total amount resources, according to some experts, should be at least \$100 trillion. Currently available green finance markets in most countries of the world cannot yet fully provide affordable financing for the real sector of the export-oriented economy; this circumstance negatively affects the opportunities for their faster growth, competitiveness in the domestic and foreign arenas, and is ultimately determined by the growing shortage of foreign sources of financing during the sanctions war. The study put forward and substantiates the hypothesis of increasing the level and role of green markets in the transformation of the domestic economy as well as ecosystems during the post-coronavirus transformed world economic and financial systems.

Keywords: Green finance, Financial services, Banking sector, Green economy, Green bonds, Financial services market, Ecosystem preservation.

INTRODUCTION

The coronavirus epidemic all over the world has sufficiently cleared the ecology and the environment on the whole planet; however, as the economies of the countries return to the normal format of functioning, the ecology of these countries will begin to become polluted again, i.e. to return to the level of pollution that was in the first quarter of 2020, which is not perceived by the majority of the population as a good phenomenon. Most people on the planet have the goal to stay at the environmental conditions as they were during the quarantine period, but at the same time, the economies of the countries should again work at the same level of power as they were before the epidemic. Accordingly, to achieve this goal, it is necessary to set a task and an algorithm for its implementation to form financial support tools for enterprises of different types of economic activity, which are polluting the environment but are strategically important for economies of countries. Then, it is necessary to reduce environmental harmfulness of those enterprises through the banking sector and other entities potentially providing investment loans, but which at the moment are far from always or not always ready to make their loans to such projects.

Investors often need to convey the idea of the priority of a project, while the enterprises themselves that need these investments are not ready to make detailed requests for them. Overall, the main aim of the study was to investigate the concept of the institutionalization of the green finance market as an opportunity for the modernization of the regional economy, and ecosystem preservation. Furthermore, the prospects and possibilities of this issue are considered by the authors in this paper.

MATERIALS AND METHODS

In recent years, research works on the formation of green financial instruments, which in the future could become fundamental in the global financial system as an alternative to classical financial instruments have been developed by such authors as (Tatuev 2015b; Porfir'ev 2016; Dvoreckaya 2017; Tatuev *et al.* 2019).

It is worth highlighting among domestic research the following works elaborated in recent years and devoted to the field of reasons on formation, the boundaries of practical definition, as well as the situation and prospects for the development of green finances (Arhipova 2017; Sigaev & Dzhaksybekova 2018; Bagheri *et al.* 2020). The issues of the general influence of green financial instruments on smoothing out the perturbing negative environmental factors of the global economy depending on the economies of countries (developed and developing countries, leading countries and catching-up countries, and other forms of segmentation of countries) were considered in such works as (Dudko 2018; Nikonorov & Baraboshkina 2018; Babenkova 2019; Hmyz 2019). Publications on the role of the domestic environmental factor in world development are considered in the works (Tatuev & Kerefov 2013; Zvorykina & Semencov 2018). According to the authors of this study, these research works do not fully answer the most important question: how would the domestic financial and economic system most efficiently and fully enter this rapidly developing market so as not to incur significant expenses both during its entry into and especially in perspective. On the contrary, how to create programs for large-scale inflows into Russian economy of those world capitals, that will make our country more environmentally friendly with respect to what is now, including in such most air-polluted cities of Russia as Krasnoyarsk, Norilsk, Chelyabinsk, Cherepovets, etc. In connection with the identified shortcomings in the aforementioned works, as well as with the importance and relevance of this issue at the present stage, the following tasks (which were the research methods) were set in this paper to achieve the stated goal of the study:

- Identification of the causes for the occurrence of such a phenomenon as green finance in the global economy and as a separate section of the main financial instruments;
- Identification of regional and national differences in approaches to understanding green finance;
- The current status and growth prospects of the Russian Federation in the green finance market, formed to accelerate the construction of the Green World Economy;
- The role of quarantine measures in the world in connection with the coronavirus pandemic for the development of the global green finance market.

RESULTS AND DISCUSSION

From the middle of the 20th century, the community of developed countries began to formulate first in scientific publications, and then, closer to the end of the 60s and beginning of the 70s of the century at major global forums ideas about the damage caused to the environment by anthropogenic, primarily industrial, factor. As a result, through difficult negotiations over the past 50 years, a different approach to economic growth was formulated, i.e. through environmentally oriented economic development, if possible, i.e. given the fact that the possibilities of exploiting the resources of the Earth planet are not unlimited. Moreover, in the near future, they can reach the limit after which the irreversible catastrophic natural events for humanity will begin (Tatuev & Kerefov 2013; Mdehheb *et al.* 2020). The complexity of the negotiations arose both in connection with criticism of these decisions from developing countries, which is more difficult to go for self-restraint due to the poverty of the population who wants to at least strive for the level of prosperity of developed countries, and in connection with criticism in some of the periods by the US leadership, which believes that their country may lose world leadership by fulfilling these requirements (Bogacheva & Smorodinov 2018). The most effective and well-known documents over the past 50 years include the Kyoto and Paris climate agreements, as well as Rio and Rio + 20 UN memorandums. The main message of the last of these agreements, the Paris one, is that it is necessary to maintain the average temperature on the planet within + 2 °C in relation to the pre-industrial era. Otherwise, as experts indicate, the planet will face

an increase in environmental disasters and subsequent global warming, which could lead to a new Ice Age and the death of humanity (Evdokimova 2019). However, such agreements even require up to \$ 100 trillion in today's significant investments in developed countries of the world (Miroshnichenko & Mostovaya 2019). The modern economy until 2020, especially in developing countries of the world, was not ready to make such expenses in principle, it required the creation of completely different new tools (approaches to business) in the financial system aimed at ecological orientation (Sigaev & Dzhaksybekova 2018). The quarantine introduced in almost all countries of the world in the first half of 2020 greatly facilitated this task. According to experts, the global carbon dioxide emissions for 2020 can be reduced from 8 to 4%, i.e. 2-3 billion tons of the products. If such quarantine procedures are carried out annually, then the planet will be able to return to the previous stage of development when the apocalyptic fear of the collapse of the world due to the anthropogenic factor was not so significant, but at the same time, the world economy itself may collapse in a couple of years. So, it is necessary to search for other options for cleansing the planet's ecosystem, without regular self-restrictions in the form of total global quarantines for two to three months.

Therefore, one of the possible options, along with environmental projects progressing from the 90s of the twentieth century with state, commercial and state-commercial-private support, a green finance project has been forming since 2007 (Arhipova 2017). The most frequently mentioned of these instruments today are referred to as "green" bonds as the most promising debt securities, the proceeds from which the issuer should direct to finance projects directly related to the environment. By 2018, their market has confidently broken a barrier of \$500 billion (Tables 1 and 2).

Table 1. Total green bond issues in 2007–2018 by regions.

Region	Number of markets	Number of issuers	Issue volume (billion \$)
Africa	4	11	2
Asian-Pacific area	18	222	120
Europe	22	193	190
Supranational Issuers	—	11	66
Latin America	7	24	7
North America	3	167	137
TOTAL	54	628	522

Source: compiled by the authors based on (Arkipova 2018).

Table 2. Largest national green bond markets in 2018.

Country	Volume of issues, bln. \$	Market share, %	Number of issuers
USA	34	20	63
PRC	31	18	69
France	14	8	12
Germany	7	5	14
Netherlands	4	4	6
Total	90	57	164

Source: compiled by the authors based on (Arkipova 2016).

According to OECD estimates, the green bond market could grow to 4.7–5.6 trillion US dollars by 2035, and the annual output will reach 620-720 billion US dollars. Of course, relation to such forecasts should be more than sceptical; often even short-term forecasts do not stand the test of time. For example, a number of experts predicted in 2017 that the green bond market in the world would grow to \$250 billion, but this indicator over the indicated period of time did not even reach \$170 billion, less than 4% higher than the same indicator in 2017 (Bezsmertnaya 2019). The issue of the impact of green emissions practices on the financial situation and image of issuing companies remains debatable; authors even from advanced economies formulate that issuing green bonds involves a number of additional costs, including the payment of remuneration to third-party certification organizations and annual examinations of auditors (Vlasov 2016).

At the same time, if we analyze this market extensively, taking into account financial instruments such as green loans, green indexes, green ETFs, REIT's, YieldCo's, then its amount has already reached about \$8 trillion by 2019. It is worth mentioning that as to these amounts, there are always questions about the methodology for determining what green finance is and what is not. In most cases, it is customary to understand green finance as such procedures of real or financial investment that help to build a green economy, and in part the zero-waste economy, bioeconomics, and sustainable development economics, i.e. investments in various kinds of wind generators, solar panels, electric cars, etc. (Nikonorov 2017). The attitude begins a little more complicated when it comes to hydroelectric power plants, especially large nuclear power plants, not to mention the environmentally friendly technologies of coal-fired power plants, but all these technologies can also be arguably attributed to technologies useful for building - if not particularly a green economy – but at least sustainable development economics (Tatuev *et al.* 2015).

The situation is complicated when it comes to the railway and public urban electrified rail transport. For example, according to official statistics in China, from the second half of 2013 to the second half of 2017 the number of green credits issued by major banking institutions of China in dollar terms almost doubled from \$0.7 to almost \$1.2 trillion, of which the leading areas are: green transport - a little over a third of the total lending, and renewable energy – one-fifth. At the same time, the first direction refers primarily to electric transport of railways and urban vehicles, and the second - projects of hydropower, wind and solar energy. In 2015, green lending in China accounted for almost a tenth of the total lending issued by leading credit institutions of the country, with an annual average growth rate of over 15% over these 4 years (Nikonorov & Baraboshkina 2018)

The People's Republic of China argues its position that this transport ultimately reduces the level of carbon dioxide emissions into the atmosphere in the country, which means it is also eco-oriented, even if the electricity for this transport is generated at coal-fired power plants, and using classical technologies, without in-depth eco-processing of coal according to the latest innovative developments (Steblyanskaya *et al.* 2019).

The composition of the main issuers of green bonds presented in tables 1 and 2 is not fully commensurate today with the top ten countries - the main polluters by carbon dioxide for 2014 and 2018 presented in Table 3.

Table 3. Carbon dioxide emissions from the 10 major polluting countries in 2014 and 2018 (CO₂ emissions in megatons per year and share in % of total emissions).

№	Country	2018		2014	
		million tons / year	%	million tons / year	%
1	PRC	9428	27,8	10290	28,5
2	USA	5145	15,2	5254	14,5
3	India	2479	7,3	2238	6,2
4	Russia	1550	4,6	1705	4,7
5	Japan	1148	3,4	1214	3,4
6	Germany	725	2,1	720	3,0
7	Republic of Korea	697	2	587	1,6
8	Iran	657	1,9	649	1,8
9	Saudi Arabia	571	1,7	601	1,7
10	Canada	550	1,6	537	1,5
	TOTAL	22950	67,9	23795	66,9

Source: compiled by the authors based on (Tatuev *et al.* 2019).

From the comparison made, we can conclude that over the past 4 years the share of pollution from carbon dioxide emissions of the top ten countries in the total world emissions has slightly increased, and the total emissions decreased by almost 845 million tons. Of the top ten, only India and South Korea showed tangible growth, by 250

and 110 million tons, respectively, the rest of the countries showed either a significant decrease in this indicator or a very small increase by a small percentage. China looks especially impressive in this matter, which during these years showed the increase in the gross product not less than in the 2000s in absolute terms while having significant reductions in CO₂ emissions. This shows that the country was really able to pass onto the green growth track, like other countries with high levels of GDP.

We would like to believe that in the near future India, as well as that number of third world countries, including Africa, where in the coming years there is planned a significant increase in industrial production and the construction of infrastructure facilities, including power generation facilities frequently using coal-fired power plants. Time will tell what this picture will look like according to the results of 2020, in the first half of which the emissions of CO₂ have radically decreased in most countries of this first ten. This will include indicators of which countries are most able to emerge from the coronavirus pandemic and re-integrate into the flows of the new international trade system. Of course, the formation of the green investment market took place not only to combat climate change, i.e. through the reduction by countries of absolute indicators of carbon dioxide production, but also for environmental protection, including the introduction of treatment facilities for water, air, soil, ground and above-ground surfaces, as well as other types of work aimed at improving the territories of countries and water interstate territories (Vantrang 2016). Finally, we can talk about loans with the aim of investing in standards and mechanisms for building a green economy such as solar and wind power generators, bio (gas) reactors, biomedical and environmental technologies, etc. (Harin 2012).

The procedure for issuing green bonds is in many respects similar in itself to the procedure for issuing ordinary bonds, but their issuance is accompanied by specific actions such as obtaining an external opinion on the compliance of funded projects with "green" ones. Third-party opinion can be obtained in various forms: verification by a third-party organization, certification of Climate Bonds Initiative; the arrangement of rating for the securities according to methods developed by leading rating agencies of the world (Bezsmertnaya 2019). These procedures naturally cause additional time and financial expenses, which are assumed to be covered by discounts for issuers issuing these "green" securities, and which, in comparison with ordinary bonds, average from 2 to 18 per cent of the price, depending on location, where these papers fall under the initial sale. It is worth noting that, both in matters of the classical financial system and in matters of green finance, regional differences already exist and will undoubtedly increase in the future. And if the People's Republic of China does not yet formulate the ideology of "green finance with Chinese characteristics" (Steblyanskaya, *et al.* 2019), generally assuming identical models for building a green financial market with the Western world, then the Islamic world formulates their specifics in the construction of their green financial market. So, as S. Yu. Babenkova formulates in her work, "Green" Sukuk is a type of investment permitted by the Sharia and carried out, among other things, for the development of renewable energy sources or other environmental projects aimed at protecting the environment. Due to the continuing decline in world hydrocarbon prices and climate change, the renewable energy market has great potential for allocating Sharia-compliant funds. Green Sukuk is based on environmental assets.

In general, the Green Sukuk is built on the financing principles supported by the Sharia as a social and ethically responsible financial instrument. These facts aroused interest in this tool in the international financial market since it is considered as a relatively ideal option for financing large and environmentally important infrastructure projects" (Babenkova 2019). And in this case, we are not talking about any theorizing. For example, literally two years ago, Indonesia sold the sovereign five-year Green Sukuk worth \$1.25 billion, which became the first sovereign Green Sukuk in the world and was valued with a yield of 3.75% and the direction of attracted finance to such "green" projects as the development of renewable energy sources in the country. The entire Islamic finance market today is about 2 trillion \$. This gives great prospects for growth of the "Green" Sukuk, which is currently gaining no less popularity in the Islamic world than the formation of a green economy with the specifics of Sharia law in the countries and regions where the Islamic world is focal and fully-fledged. It will be difficult to say whether Russia will similarly try to promote the program of its "sovereign" systems of green finance, because it is not yet clear whether it is planned to give an active start to this market in Russia by directive or indicative-institutional measures. It is very difficult to idealize green bonds with a commercial component.

As Arkhipova formulates, "interest (in green bonds) is caused more by a realization of the need for environmental-friendly projects, rather than their investment attractiveness because in terms of yield, green bonds are less profitable than ordinary ones etc.; the yield to maturity of the former is mostly below 3%. According to some

estimates, the yield on bonds with an average duration of five years is within the range from 1.6 to 1.86%. Therefore, from an economic point of view, the acquisition of standard bonds is considered more appropriate” (Arhipova 2018). There are other negative factors that are currently affecting the fact that these bonds are still not effective in selling; in particular, “besides low yield, many green bonds seem to be more risky.

In particular, they note the liquidity risk inherent in these securities. So, due to the fact that the green bond market is small enough, it is often difficult to enter or close a position (in other words, to buy or sell a security at the right time and at the desired price)”; and also there are “additional transaction costs”. “In addition to limited supply of securities, it is difficult to enter the market for private investors. The main buyers of green bonds are institutional investors and investment companies, which have the opportunity to purchase securities immediately in large blocks. In connection with this, a convenient and profitable investment tool for private investors was exchange and mutual funds of green bonds”, etc. Formulations at official platforms that Russia needs to enter the Green Finance market began to appear only in 2016, when the world market for these instruments had already exceeded the \$200 billion level. The possibility to lawfully register green bonds at the state level discussed in the Russian Federation since 2018. The impetus for this was that a number of Russian companies expressed the availability of their potential to issue such instruments to the financial market. In the first quarter of 2020, when the domestic financial market collapsed once again, it is probably difficult to talk about some breakthrough from the existing almost zero mark, including due to the fact that the stock market in Russia was never important enough (unlike lending and borrowing), and due to the fact that sanction wars with Western countries (where there are significant amounts of free financial resources for financial investment) continue, which means that potential investments from those countries to Russia are still significantly limited. However, at the same time, there are year by year increasing various formats of interactions with China, which, as can be seen from the indicators in Table 1, is today one of the important players in this market. It is also worth repeating that the global green finance market began to form during a sharp collapse of the financial market in 2007, so the Russian leadership can repeat the lessons of recent history in studying the practice of those years. The existing projects for introducing green finance in recent years, in particular, the construction of a waste processing plant in the Nefteyugansk district of the Khanty-Mansi Autonomous Okrug-Yugra, as well as the design of sewage treatment plants from Gazpromneft-Omsk Oil Refinery JSC may become a kind of business case for the current period to identify bottlenecks in modern Russian realities of capital construction. Even for these companies, the implementation of these tools continues to be debatable, first of all, on the issues of the final profitability of the project, which so far does not seem to be anything attractive.

These projects themselves require taking into account the possibilities of using various options for issuing bonds, as well as the formulated “responsibility” profiles of a company and the need to support it. However, despite the aforementioned radical institutional and financial and economic lag of Russia from a large number of countries in the field of formation and development of the green finance market, our country continues to remain among the leading ones in environmental safety issues concerning the adoption of basic interstate decisions on significant environmental projects.

Therefore, in the opinion of the authors of this publication, green finance mechanisms with the participation of active global investment players should begin to be actively implemented one way or another in the coming years, even if financial sanctions against Russian enterprises on world exchanges would remain for a very long period. The coronavirus pandemic itself may become an important stimulant for this shock. According to statistics, for April, 2020, there occurred a decrease in airborne contaminants in cities with a population of over one million in the Urals Federal District in the range from 20 to 35%. Undoubtedly, similar things should happen in those month in other most polluted cities of the country, such as Krasnoyarsk, Cherepovets, Moscow and others.

The spring quarantine in Russia did what the environmental protection measures carried out in previous years of the last decade could not do ecology. Now, as the responsible persons in the regions formulate, they must somehow try to preserve this phenomenon in the coming period, when the economies of countries and regions gradually begin to return to the previous growth rates of their gross domestic products.

To resolve this situation, which may lead, among other things, to building in Russia of not only a competitive green finance market, but also a competitive green economy with high-quality efficient green growth (not subsidized subsequently by the state, but generating profit and budget revenues from taxation), the authors formulated the following recommendations:

- the issue of long-term high-margin green bonds, the purpose of which is to create a green biologically dependent growth of the Russian economy, will allow the leadership of the Russian Federation to show the world community its importance in the overall construction of the Green World Economy; these bonds should be accessible for easy acquisition, including via the Internet in electronic form, both by individuals and legal entities, both residents and non-residents of the Russian Federation, both Russian citizens and foreigners,
- the benchmark for preferential lending by the banking sector of the Russian Federation in the grant interstate sphere is radically reoriented to organizations engaged in or having short- and medium-term development plans and programs to promote Russian environmentally-oriented products, both according to environmental criteria that are presented both by world standards and by national standards of the leading importing countries of our country (Tatuev 2015a).

CONCLUSION

The development and implementation of new financial support tools for the development of the green economy in Russia is undoubtedly an important point for continuing the accelerated development of the Concept of Sustainable Development of the Russian Federation introduced in 2015 until 2030.

However, these days the more important point in the implementation of such programs, according to the authors of this study, is the implementation by financial institutions of Russia of platforms for private, commercial, and public-private initiatives in financial investment to support green investment projects, which have great prospects for successfully building RF Green Economy.

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صنعتی سازی بازار تأمین مالی سبز به عنوان فرصتی برای مدرنیزاسیون اقتصاد منطقه‌ای و حفاظت از اکوسیستم

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(تاریخ دریافت: ۹۹/۰۴/۱۶ تاریخ پذیرش: ۹۹/۰۹/۰۱)

چکیده

بازار تأمین مالی سبز، که در طی رکود بازار بورس جهان در ۲۰۰۷ ظهور کرد، اکنون ارزش آن از ۵۰۰ میلیارد دلار فراتر رفته است. توسعه‌ی سریع این نوع ابزار تأمین مالی، تحت تأثیر تمایل جمعیت، رهبران سیاسی و صندوق‌های سرمایه‌گذاری برای عمل به تعهدات قانونی توسط کشورهای جهان در برنامه‌های مبارزه با تغییر اقلیم و حفاظت زیست‌محیطی است که در انجمن‌های اقلیم جهانی مطرح شده بود و در آن منابع کل، بر طبق تخمین برخی کارشناسان حداقل ۱۰۰ تریلیون دلار است. در حال حاضر، بازارهای مالی سبز در بیشتر کشورهای جهان، بودجه‌ی کافی را برای بخش اقتصاد صادرات محور فراهم نمی‌کند. این وضعیت اثر منفی روی فرصت‌های رشد سریع، افزایش قدرت رقابتی در عرصه‌های داخلی و خارجی داشته و در نهایت تحت تأثیر کمبود روز افزون منابع سرمایه‌گذاری خارجی در طی جنگ تحریم‌ها قرار می‌گیرد. این مطالعه، فرضیه‌ی افزایش سطح و نقش بازارهای سبز در تحول اقتصاد داخلی و نیز اکوسیستم‌ها را در طی اقتصاد جهانی و نظام‌های مالی متحول شده‌ی پسا کرونا تأیید می‌کند.

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Bibliographic information of this paper for citing:

Azidovich Tatuev, A., Mikhailovich Kosenok, S., Nikolaevna Kiseleva, N., Vladimirovna Makar, S., Alexandrovich Sklyarenko, S 2020, Institutionalization of the green finance market as an opportunity for the Modernization of the regional economy, and ecosystem preservation, Caspian Journal of Environmental Sciences, 18: 437-446

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