THE «GREEN» ECONOMY: THE SPECIFICS OF FINANCING AND SUBSIDIZING PROJECTS IN MODERN CONDITIONS

Shakizada Niyazbekova[1], Olga Brizhak[2], Eleonora Gavrilova[2], Tatiana Rastimeshina[3,4], Maria Dobrynina[3], Elena Berezhnova[5]

•

[1]Moscow Witte University, Moscow, RUSSIA
[2]Financial University under the Government of the Russian Federation, Moscow, RUSSIA
[3]National Research University of Electronic Technology, Zelenograd, RUSSIA
[4]Russian State Social University, Moscow, RUSSIA
Musa Ryskulbekov Kyrgyz Economic University, Bishkek, KYRGYZSTAN
shakizada.niyazbekova@gmail.com

Abstract

In recent years, commercial banks have been actively involved in financing projects related to the green economy, reflecting the global trend of transition to sustainable development.
Many banks are switching to electronic document management and using alternative energy sources for their operations. Despite the positive changes, banks face certain challenges. There is a risk that financing green technologies may negatively affect the performance of traditional companies. The State provides support commercial banks in the implementation of green economy projects.
The Bank of Russia and other government organizations are developing concessional lending programs that allow banks to provide loans on more favorable terms for projects aimed at sustainable development. This may include reducing capital reserve requirements for "green" projects, which makes them more attractive to banks. Commercial banks can receive subsidies to cover part of the interest rates on loans issued to finance environmentally friendly projects. This reduces the financial burden on borrowers and encourages them to implement sustainable initiatives. In some cases, Russian banks may cooperate with international financial institutions.
The implementation of green economy projects by commercial banks is not widespread enough. The successful development of green banking requires an integrated approach, including the adaptation of products, internal processes and corporate culture to new environmental standards. This study is devoted to an overview of the mechanisms and methods of stimulating and implementing green banking.

Keywords: green loans, green finance bonds, certification of green financial products, commercial banks, taxonomy of green projects

I. Introduction

Such instruments as green loans, green finance bonds and certification of green financial products serve the goals of widespread introduction of green banking financing. Green loans are becoming an important tool to support businesses striving for sustainable development and reducing their environmental footprint. Commercial banks are actively developing this area, offering a variety of products that can help both individual entrepreneurs and large companies.

The objectives of financing green economy projects are green construction, environmentally friendly transport, waste management and much more.

Banks can act as organizers of the issue of green bonds by other companies, providing consulting services and helping with the placement of securities. In order to ensure transparency and investor confidence in green financial products of banks, their certification for compliance with the principles and standards of green finance.

Non–financial reporting of clients helps banks reduce the risks of implementing green financing projects and confirm a responsible approach to the implementation of green projects.

Non–financial reporting of banks helps to: establish trust from investors and customers, assess and manage risks; comply with international standards and expectations, which helps to increase their competitiveness in the market. Large Russian banks are already actively implementing non–financial disclosure practices. They publish reports containing not only statistical data, but also information about projects, initiatives and interactions with key stakeholders. This allows them not only to meet the requirements, but also to stand out from the competition. However, a large number of commercial banks have not yet introduced the usual practice of disclosing non–financial information.

Thus, it is relevant to research and develop mechanisms and methods to stimulate and implement green banking for implementation by commercial banks, including creating incentives for private investors and financial organizations.

The purpose of this study is to study the best practices of commercial banking financing of green economy projects and to develop mechanisms and methods for stimulating and implementing green banking for implementation by commercial banks.

The objectives of this study:

– conduct benchmarking of leading countries in the field of green banking, such as Germany, Sweden and The Netherlands, in order to identify the best practices for financing environmentally sustainable projects by commercial banks;

– to investigate the impact of government support on the activity of commercial banks in the field of green banking by analyzing the effectiveness of various subsidy mechanisms and tax incentives;

– compare the volumes and dynamics of green lending in the leading countries of Russia, identifying the key factors contributing to or hindering the growth of this segment;

– to assess the degree of involvement of commercial banks in sustainable development projects through a quantitative analysis of the structure of their loan portfolio and participation in green bonds;

II. Methods and materials

The research uses information data, as well as methods of theoretical research, namely: monographic.

III. Literature review

A lot of research has been devoted to green banking in a wide range of areas, including those that are the focus of this study.

Thus, emphasize that a significant amount of financial resources is needed to promote green projects, in which banks play a key role, acting as active participants in financing projects.

This includes the creation of a "green" banking system that unites various financial institutions, such as "green" banks and development banks. An important aspect is the need to regulate banking activities, including "green" financing, which should be supported by government politicians and banking regulators. This allows you to direct financial flows to sustainable projects and minimize environmental risks.

Some authors notes that Russia, as a participant in the international environmental agenda, should actively develop the green finance market, taking into account international standards and practices [2-14]. The paper points to the underdevelopment of the Russian financial market and the lack of active participation in international organizations, which may hinder this process. Success in the field of green finance can lead to attracting foreign investment and improving the country's reputation in the international arena.

Zaitseva [1], emphasize that banks, being financial intermediaries, cannot stay away from the implementation of ESG projects. However, a full understanding of the importance of the ESG agenda in the banking sector has not yet been achieved. The main factors slowing down development include the poor quality of information for analyzing borrowers.

IV. Results and discussion

The study showed that benchmarking of leading countries in the field of green banking, such as Germany, Sweden and the Netherlands represent a valuable area of research that can enrich Russian banking practice with the best global approaches.

However, despite their successes, the adaptation of this experience to the Russian economy it is associated with a number of challenges due to the peculiarities of the national context.

Germany, one of the largest economies in Europe, has demonstrated outstanding results in the field of green banking, especially in the framework of energy efficiency and renewable energy development programs. The main driver here is government support, expressed in large–scale subsidy programs, guarantees and benefits that make financing green projects more attractive to commercial banks. An important aspect is the participation of such large institutions as KfW Bankengruppe, which not only provides financial support, but also actively participates in the development of sustainable development strategies. This approach minimizes risks for banks and entrepreneurs, providing a high degree of confidence in the return on investment.

At the same time, the adaptation of the German green banking model presents certain difficulties for Russia. One of the key obstacles is the insufficient level of government support and subsidies for green projects, as well as the relatively weak development of renewable energy infrastructure. Unlike Germany, where a significant part of electricity is produced by wind and solar, in Russia the energy sector is still dominated by traditional hydrocarbons.

However, on the other hand, there is potential for growth in this segment, given Russia's rich natural resources, which can be used to transition to more sustainable energy supply models.

Sweden, being one of the most environmentally oriented countries, is actively developing green banking practices. Sweden is a leader in green bond issuance, which helps to raise significant funds to finance sustainable projects. Adapting the Swedish experience in Russia may also face certain difficulties. Firstly, the Russian green bond market is at the stage of formation, and the volume of issues is still significantly behind its Western counterparts. Secondly, the level of awareness and acceptance of ESG principles among Russian companies and banks remains low. Although interest in sustainability is growing, many companies still view ESG as an additional burden rather than an opportunity to create long–term value. Nevertheless, taking into account global trends and the growing interest of investors in sustainable financing, the introduction of ESG factors into Russian banking may become a strategically important area.

The Netherlands, in turn, demonstrates an innovative approach to green banking, actively developing new financial instruments and mechanisms, such as public–private partnerships. Dutch banks cooperate extensively with international financial institutions, which allows them to borrow best practices and integrate them into the national banking system. An important area is the financing of sustainable agriculture and water resources management, which corresponds to the natural and economic conditions of the country.

For Russia, where agriculture and water resources also play an important role, the experience of the Netherlands is of particular value. However, it should be borne in mind that the adaptation

of these practices requires significant institutional changes and the development of new mechanisms for interaction between the state, banks and the private sector. Moreover, unlike the Netherlands, Russia faces problems of regional inequality, which can make it difficult to scale successful projects throughout the country. For example, successful green finance models in Central Russia may not be as effective in Siberia or the Far East. In the East, where the infrastructure is much less developed.

It is important to take into account that the successful adaptation of international practices requires an integrated approach, including not only the borrowing of specific financial instruments, but also the creation of an appropriate institutional environment, raising awareness and adoption of ESG principles, as well as the development of public partnerships with the private sector. In this context, the role of the state becomes key, since it is it that is able to set the vector of development and provide the necessary conditions for the growth of green banking in Russia. Fig.1 schematically shows the role of a commercial bank in the field of sustainable development.

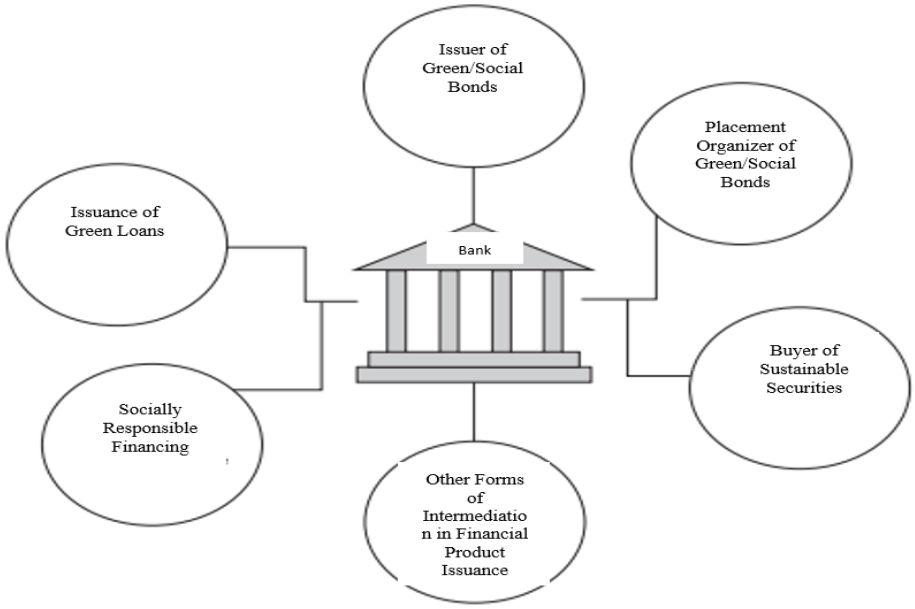

Figure 1: *The role of a commercial bank in the field of sustainable development*.
Source: Zaitseva I.G., Maksimov I.A. Trends in the development of esg–activity of banks // Economics and management. 2022. No.12. URL: https://cyberleninka.ru/article/n/tendentsii–razvitiya–esg–deyatelnosti–bankov (date of application: 08/24/2024).

To quantify the impact of green finance on the financial results of commercial banks, a model based on regression analysis is proposed, which takes into account the volumes of green loans issued and green bonds issued in different countries. The main estimation method is multiple linear regression, where dependent variables (ROA, ROE, profit) will be modeled depending on independent variables.

The general formula of the model:

$$Y_i - \beta_0 + \beta_1 * X_{1i} + \beta_2 * X_{2i} + \beta_3 * X_{3i} + \epsilon_i \quad (1)$$

where,
$Y_i -$ depend variable (e.g., ROA);
X_{1i} – volume of green loans issued;
$X_{2i} -$ volume of green bonds issued;
$X_{3i} -$ share of green financing in the total loan portfolio;
$\beta_0,\ \beta_1, \beta_2, \beta_3 -$ regression coefficients;
$\epsilon_i -$ random error.

The obtained regression coefficients will allow us to assess how changes in the volume of green financing affect the financial results of banks. For example, a positive and significant value of the β1 coefficient will mean that an increase in the volume of green loans contributes to an increase in the profitability of the bank's assets. Control variables can be added to the model, such as the total assets of the bank, interest rates, and the economic situation in the country, in order to take into account external factors that can also affect financial results. After evaluating the model, hypotheses about the importance of green finance for banks' financial performance can be tested.

Also, based on the model, it is possible to make forecasts and assess how an increase in green financing may affect the bank's future results. It is important to keep in mind that the volume of green loans and bonds in Russia is still small compared to other countries, which may reduce the importance of regression coefficients. However, as the green banking sector grows, the model may become an important tool for evaluating the effectiveness of such investments and developing strategies for Russian commercial banks. In order to ensure the rapid growth of the green banking sector, state support for the activity of commercial banks in the field of green banking is necessary, including various mechanisms of subsidies and tax incentives.

Financial institutions are facing new challenges and requirements, and the effectiveness of various subsidy mechanisms and tax incentives is becoming a determining factor for the successful integration of green finance principles into the banking sector. One of the main instruments of government support is subsidizing interest rates on green loans. In a number of countries, such as Germany and France, this mechanism has proven to be highly effective.

In turn, this makes such projects more attractive to commercial banks, reducing their risks and increasing their potential profitability. An example of the successful implementation of this approach is the program implemented in Germany through KfW Bankengruppe, which provides subsidies and guarantees to green projects. Tax incentives are another important mechanism of state support that can stimulate the development of green banking. In countries such as Sweden and the Netherlands, tax incentives are provided not only to enterprises implementing green projects, but also to banks actively involved in financing such initiatives.

However, at the moment their use remains limited, which reduces the motivation of banks to participate in green projects. The introduction of systemic tax incentives for banks supporting sustainable development could It would significantly increase their interest in expanding green lending and issuing green bonds. This, in turn, would create conditions for increasing investments in projects aimed at environmental modernization and reducing the carbon footprint.

Despite the obvious advantages of government support, it must be borne in mind that its effectiveness depends not only on the scale of subsidies and benefits, but also on the quality of program implementation. It is important to ensure transparency and accessibility of support mechanisms so that they really contribute to the growth of green banking, and do not create additional barriers for commercial banks.

The development of green lending in the world today is determined by many factors that differ in their importance and impact on the financial results of banks and the economy as a whole.

Comparing the volumes and dynamics of green lending in leading countries such as Germany, Sweden and the Netherlands with the situation in Russia allows not only to assess the current state of affairs. Such criteria include institutional support, the development of a regulatory framework, the level of awareness of the importance of ESG principles.

Over the past decades, Germany, Sweden and The Netherlands has consistently strengthened its position in the field of green lending, which has led to significant successes in this area. In Germany, the volume of green loans annually shows steady growth exceeding 15–20%.

Which, through state–owned banks such as KfW, provides subsidies and guarantees for green projects, the development of renewable energy sources and sustainable construction. This allows banks to reduce their risks and attract more customers interested in sustainable development. In Sweden, the dynamics of green lending is also impressive, with an annual

increase of 12–18 %, and the share of green loans in the total loan portfolio of Swedish banks is 10–12 %.

This was achieved through the active integration of ESG principles into banking practice and government support in the form of tax incentives and special financing programs. The Netherlands shows similar results, with green lending growing at 10–15% per year and significant investment in projects related to sustainable agriculture and water management. At the same time, the Russian green lending market lags far behind its Western counterparts. The volume of green loans in Russia is less than 1% of the total loan portfolio of banks, and the growth rate remains modest, ranging from 5–7 % per year.

These indicators indicate a significant lag, which requires an analysis of the factors hindering the growth of green lending in the country. One of the key barriers is insufficient institutional support. While in In Germany and Sweden, state–owned banks play an active role in stimulating green lending, while such mechanisms have not yet become widespread in Russia. The availability of subsidy programs is limited and access to them is difficult, which constrains banks' interest in this segment. Another important factor is the regulatory framework. Leading countries have long developed and implemented clear standards and taxonomies for green projects, which ensures transparency and reduces risks for market participants.

In Russia, such a regulatory framework is still being formed, and the lack of clear criteria creates uncertainty for both banks and investors. This leads to the fact that banks are afraid to participate in green lending due to high risks and uncertain prospects for return on investment. In addition, the level of awareness about the importance of ESG principles in Russia remains low. In Germany and Sweden, environmental responsibility and sustainable development have long been an integral part of banks' corporate culture and strategy. In these countries, customers and investors are aware of the importance of sustainable development and require banks to meet high standards. In Russia ESG principles are still perceived as additional requirements rather than an opportunity to create long–term value. This hinders the development of green lending, as demand for such products remains limited.

In Sweden and the Netherlands, tax incentives and other financial instruments create additional incentives for banks interested in developing green finance. There are practically no such benefits in Russia, which reduces the motivation of banks to participate in green projects.

Global trends in sustainable development, international commitments to reduce carbon emissions and growing investor interest in sustainable projects create prerequisites for the activation of this segment. The introduction of successful practices from other countries, the adaptation of the regulatory framework, increased government support and increased awareness of the importance of ESG principles can be key factors contributing to the growth of green lending in Russia. Thus, a comparative analysis of the volumes and dynamics of green lending in leading countries and Russia shows that the successes of most countries in this area are achieved thanks to a well–structured system of institutional support, a developed regulatory framework, a high level of awareness of the importance of ESG principles and the availability of economic incentives. In Russia, on the contrary, insufficient government support, a weak regulatory framework, a low level of acceptance of ESG principles and a lack of significant economic incentives are the main barriers. The growth rate of green loans – an analysis of changes in the volume of green loans in dynamics allows us to assess how actively the bank is expanding its sustainable financing programs. Sustained growth indicates a strategic focus on sustainable development. The analysis requires collecting the following data: the total volume of the bank's loan portfolio, the volume of green loans issued, the volume and number of green bond issues

Green Lending Engagement Index (IGC):

$$IGC = \frac{Volume\ of\ green\ loans}{Total\ volume\ of\ the\ loan\ portfolio} \quad (2)$$

Green Credit Growth Index (GRI):

$$GRI = \frac{Volume\ of\ green\ loans\ for\ the\ current\ year}{Volume\ of\ green\ loans\ for\ the\ previous\ year} - 1 \quad (3)$$

Green Bond Engagement Index (IGO): $\text{IGO} = \frac{\text{Volume of participation in green bonds}}{\text{Total volume of the bond portfolio}}$ (4)

Strategic Commitment Index (CSI):

$$CSI = \frac{IGC+IGO}{2} \quad (5)$$

This composite index combines green lending engagement and green bonds, providing an overview of the bank's strategic commitment to sustainable development. The obtained values of the indicators can be used for a comparative analysis of banks. Higher index values indicate a greater degree of involvement of the bank in sustainable development projects development.

The results can be presented in the form of ratings, which will highlight the leaders and outsiders in the field of green finance. The methodology can be used both for internal evaluation of banks and for comparative analysis at the industry level. If applied at the level of the entire banking system, it is possible to create aggregated indices reflecting general trends in sustainable financing. This data can be useful for both regulators and investors interested in sustainable development. The methodology for analyzing green finance should include both retrospective and forward–looking approaches.

The forward–looking approach includes modeling the future growth of green lending based on current trends and evaluating possible market development scenarios. This approach will make it possible to determine which measures can stimulate an increase in the share of "green" loans in the loan portfolio and how actively banks are ready to support the transition to sustainable development. An equally important aspect of the engagement assessment is the analysis of the participation of Russian banks in the issuance of "green" bonds. Green bonds are debt instruments designed to finance environmentally sustainable projects. Participation in the issuance of such bonds indicates that the bank not only supports sustainable development at the lending level, but also actively participates in raising capital for the implementation of environmental initiatives through the capital market.

It is important to note that participation in the issue of green bonds can be either direct, when the bank itself acts as an issuer, or indirect, when the bank supports the issue of third parties by providing guarantees or acting as an organizer of the issue. To quantify the involvement of Russian banks in green bonds, it is necessary to analyze the structure of their investment portfolio and determine what share green bonds occupy in it. Thus, for a comprehensive assessment, it is necessary to analyze not only the volume of bond issuance, but also the structure of the use of borrowed funds. It is also interesting to consider the degree of involvement of Russian banks in international partnerships and projects related to sustainable development. Within the framework of such projects, banks can not only improve their skills in the field of green finance, but also gain access to best practices and technologies that can be adapted for use in the Russian market. This is especially important in the context of the growing global trend towards increased regulation and accountability in the field of sustainable development.

Banks that actively implement ESG principles in their activities have a higher ability to adapt to changing market conditions. Therefore, in order to increase the involvement of Russian banks in sustainable development projects, it is necessary not only to expand credit programs and issue green bonds, but also to invest in the development of internal competencies and corporate culture focused on the principles of sustainable development. Thus, a quantitative analysis of the loan portfolio structure and participation in green bonds allows a deeper understanding of the degree of involvement of Russian commercial banks in sustainable development projects. This, in turn, opens up opportunities for further development of this segment and integration of the principles of sustainable development into banking activities on a long–term basis.

This will not only attract capital to finance environmentally significant projects, but also strengthen the bank's reputation as a sustainable financial institution. The implementation of a monitoring and reporting system for green projects will ensure transparency of the bank's activities and strengthen the trust of investors and customers. In addition, providing technical assistance and advice to clients on sustainable development issues will help them better understand the requirements of green finance and increase their willingness to participate in such projects. It is necessary to adapt international standards of green finance to Russian conditions, taking into account the specifics of the national market. At the same time, it is necessary to actively raise awareness and train the bank's staff on sustainable development issues, which will allow banks to work more effectively with environmentally significant projects. An important aspect is also the introduction of tax incentives for clients implementing projects in the field of sustainable development. This may include benefits and subsidies that will help make green finance more affordable. The active involvement of private investors and the expansion of cooperation with government support programs are also important elements of the strategy for adapting international best practices.

V. Conclusion

Supporting the development of infrastructure for green finance, including project verification and certification systems, will also be an important step towards strengthening the position of Russian banks in this area. Participation in educational and information campaigns on sustainable development issues will help banks not only strengthen their reputation, but also raise public awareness of the benefits of green financing. It is also important to develop non–financial disclosure practices, including sustainability indicators, which will allow banks to meet international standards and investor expectations.

Thus, green projects and Green Banking in Russia are at the stage of formation, which is manifested in the relatively low share of green loans and bonds in the total portfolio of commercial banks. Nevertheless, global trends and international commitments stimulate the growth of interest in sustainable financing, which creates prerequisites for the accelerated development of this segment.

References

[1] Zaitseva I.G., Maksimov I.A. Trends in the development of esg–activity of banks // Economics and management. 2022. No.12. URL: https://cyberleninka.ru/article/n/tendentsii–razvitiya–esg–deyatelnosti–bankov (date of application: 08/24/2024).

[2] Zakiryanov, B.K., et al. Development of Rural Green Tourism of Regions of Kazakhstan. Environmental Footprints and Eco–Design of Products and Processes, 2022, pp. 33–38 DOI:10.1007/978–981–19–1125–5_2

[3] Moldashbayeva, L., et al. Green bonds – A tool for financing green projects in countries. E3S Web of Conferences, 2021, 244, 10060 DOI:10.1051/e3sconf/202124410060

[4] Troyanskaya, M., et al. Instruments for financing and investing the green economy in the country's environmental projects. E3S Web of Conferences, 2021, 244, 10054 DOI:10.1051/e3sconf/202124410054

[5] Jazykbayeva, B., et al. The Growth of green finance at the global level in the context of sustainable economic development. E3S Web of Conferences, 2021, 244, 10058 DOI:10.1051/e3sconf/202124410058

[6] Abramova M., Varzin V. et al. Features of the mechanism for implementing sustainable development through the green economy. E3S Web of Conf., 402 (2023) 08030 DOI: 10.1051/e3sconf/202340208030

[7] Zverkova A., et al. Features of the "Green" strategies for the development of banks. E3S Web of Conf., 402 (2023) 08029 DOI: 10.1051/e3sconf/202340208029

[8] Antonenko A.P. Ideological foundations of a new stage in the development of civilization // Bulletin of the S.Y. Witte Moscow University. Series 2: Legal Sciences. – 2021. – № 3 (29). – Pp. 5–8. doi: 10.21777/2587–9472–2021–3–5–8

[9] Archimandritova A.V., Suptelo N.P. Bulletin of the S.Y. Witte Moscow University. Series 1: Economics and Management. – 2022. – 1 (40). 85–94. doi: 10.21777/2587– 554X–2022–1–85–94

[10] Baburin S.N. Bulletin of the S.Y. Witte Moscow University. Series 2: Legal Sciences.– 2019. – 4 (22). – 6–12. doi: 10.21777/2587–9472–2019–4–6–12

[11] Berstembayeva, R., et al. (2024). The impact of the green economy on the sustainable development of Kazakhstan. In *BIO Web of Conferences* (Vol. 116, p. 07040). EDP Sciences.

[12] Bunevich K.G., Gorbacheva T.A. «Green» trends in the development of the world financial system // Bulletin of the S.Y. Witte Moscow University. Series 1: Economics and Management. – 2022. – № 1 (40). – Pp. 52–60. doi: 10.21777/2587–554X–2022–1–52–60

[13] Burykin, E.S.: Bulletin of the S.Y. Witte Moscow University. Series 1: Economics and Management. 4(35), 81–86 (2020). https://doi.org/10.21777/2587–554X2020–4–81–86

[14] Gavrilova E.N. «Green» financing in Russia: specifics, basic tools, problems of development // Bulletin of the S.Y. Witte Moscow University. Series 1: Economics and Management. – 2020. – № 2 (33). – Pp. 48–54. doi: 10.21777/2587–554X–2020–2–48–54

[15] Zubets A.Zh. State policy of support and directions of development of the transport industry of the Russian Federation // Bulletin of the S.Y. Witte Moscow University. Series 1: Economics and Management. – 2019. – № 3 (30). – Pp. 28–34. doi: 10.21777/2587–554X–2019–3–28–34

[16] Zueva, I.A. On the development of the method of analysis and evaluation of the socioeconomic development of regions. Bulletin of the S.Y. Witte Moscow University. Series 1: Economics and Management. – 2017. – № 4 (23). Pp. 27–36. doi:10.21777/2587–9472–2017–4–27–36

[17] Zverkova A., et al. Features of the "Green" strategies for the development of banks. E3S Web of Conf., 402 (2023) 08029 DOI: 10.1051/e3sconf/202340208029

[18] Gladkov I.. World economic evolution: trends at the present stage // Economic and socio-humanitarian studies. 2023. No. 4 (40). pp. 6-15. https://doi.org/10.24151/2409-1073-2023-4-6-15 EDN: QVLHPH.

[19] Varavin Ye.V., Makovetsky M.Y., Komarova A.S. The problems of ensuring the transition to circular economy // Economics and Management. – 2022. – № 1 (40). – P. 42-51. doi: 10.21777/2587-554X-2022-1-42-51

[20] Suptelo N.P., Dolgikh I.M. Foreign experience of using the mechanism public-private partnerships in the electric power industry // Economics and Management. – 2021. – № 1 (36). – P. 15-22. doi: 10.21777/2587-554X-2021-1-15-22

[21] Tsvetkov V.Ya., Kozlov A.V. The algorithm of subsidiary metaheuristics // Education Resources and Technologies. – 2022. – № 4 (41). – p. 65-71. doi: 10.21777/2500-2112-2022-4-65-71

[22] Zinovyeva, I. S., Savin, A. G., Brizhak, O. V., & Shchinova, R. A. (2020). Natural management of a modern region: Assessment of effectiveness and perspectives of improvement. *Growth poles of the global economy: Emergence, changes and future perspectives*, 717-723.

[23] Brizhak, O. V., & Ermolenko, A. A. (2018). Strategical aspects of building-in the corporative capital into the russian economy. *Economics of Contemporary Russia*, (3), 48-61.

[24] Polyakov, R., & Brizhak, O. (2023, February). Industrial Clusters and the Process of Their Self-organization. In *International conference Ecosystems without borders* (pp. 60-72). Cham: Springer Nature Switzerland.