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Opportunities for Using Green Bonds to Finance Environmental Projects in Developing Countries: Experience of the Republic of Kazakhstan

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Abstract:

Sustainable business development based on environmental, social, and governance principles is one of the leading trends in the financial and global community. The introduction of environmental, social, and governance principles is intended to facilitate the implementation of countries' pledges under the Paris Agreement on Climate and the achievement of the UN Sustainable Development Goals. In 2015, the Republic of Kazakhstan committed to following sustainable development goals, which made the principles of a sustainable and green economy a national priority of the 2050 Strategy. The study aims to identify the opportunities to use green bonds in Kazakhstan so as to increase the effectiveness of territorial management and the development of environmental projects. Proceeding from an expert survey, the study establishes arguments in favor of developing green bonds for the implementation of environmental projects in Kazakhstan, outlines the main hindrances to the advance of green bonds in the country, and lists the conditions required for further proliferation of the use of green bonds. The authors argue that the active use of green bonds can be facilitated by knowledge exchange, capacity building, and state support (especially in analyzing the economy of Kazakhstan) for the development of the market for green bonds, as well as state encouragement of private investors to green investment.

Keywords: green bonds; sustainable development goals; green investments; environmental projects; green stock exchange.

JEL Classification: F64; O13; P18; Q01.

Introduction

An instrument that has now become one of the most innovative and ever-more popular in debt financing for the development of green technologies and for mobilizing capital for environmental projects are green bonds (GBs) (Tsenina *et al.* 2022, 63).

In 2007, the Intergovernmental Panel on Climate Change published a report that put a special emphasis on the problem of global warming. This prompted a group of Swedish pension funds to invest their savings in environmental projects that would contribute to solving these issues (Agliardi and Agliardi 2019, 608). The effort was later joined by the Swedish bank SEB, which saw an opportunity to implement this idea (simultaneously reducing risks for investors and making a positive impact on the environment) through the World Bank (WB) (European Commission *et al.* 2020), which had already had experience in investing in environmental projects. In 2008, the WB issued the first GB, thereby creating a new tool for investors to finance environmental projects (Ehlers and Packer 2017, 89).

In the Republic of Kazakhstan, GBs are only beginning to be actively used. In this light, it is worth paying special attention to the opportunities this instrument presents, the hindrances to its implementation, and the key conditions for its further proliferation in Kazakhstan and other countries where it is relatively new and under-researched.

1. Literature Review

The various issuers of GBs (international financial institutions (IBRD and IFC, part of the WB group, EIB), national development banks (KfW), leading global corporations, various financial institutions, public authorities, and local governments (Gianfrate and Peri 2019, 127)), as well as specialists in the field, still lack consensus on the definition of GBs (Ehlers and Packer 2017, 89).

According to the Principles of Responsible Investment, the most commonly used is the definition of climate-aligned bonds, the proceeds of which are used in whole or in part to finance projects aimed at creating low-carbon and climate-resilient infrastructure (Bezpalov *et al.* 2020, 84; European Commission *et al.* 2016).

The financial authorities of China have offered their own definition of GBs, according to which, GBs include securities issued by financial institutions with legal entity status for the purpose of supporting green industries and repayment of principal and interest payments as agreed upon by the parties concerned (Lin and Hong 2021).

Per the Environmental Code of the Republic of Kazakhstan (entered into force on July 1, 2021), a GB is a fixed-income debt instrument for raising money to finance the implementation of green projects (The Code of the Republic of Kazakhstan 2021).

On the whole, a GB can be considered a debt security whose issuance raises funds for projects that result in adaptation to or mitigation of climate change. For instance, GBs can provide a lower-cost source of financing/refinancing than traditional bank loans (Cheong and Choi 2020, 175).

Researchers classify GBs depending on the formation of financial flows (Table 1) and the area of financing (project content) (Table 2).

Today, there are a few medium- and long-term environmental projects that are potential candidates for bond market financing, such as climate change mitigation and adaptation projects that meet the GB eligibility criteria:

- climate change mitigation projects: installation of solar and wind power plants (Banga 2019, 17); financing of advanced technologies that contribute to a significant reduction in greenhouse gas (GHG) emissions (Deschryver and de Mariz 2020); reconstruction of power plants and transmission facilities to reduce GHG emissions (Febi *et al.* 2018, 53); improving transportation efficiency, including fuel switching and the development of public transportation (Bachelet *et al.* 2019); waste management (methane emissions) and the construction of energy efficient buildings (Hachenberg and Schiereck 2018, 371); reduction of carbon emissions through reforestation and combating deforestation (Laurent and Riyanti 2021, 734; Martirosyan *et al.* 2022, 151);
- projects to adapt to the effects of climate change: protection against flooding (including reforestation and regulation of runoff from the drainage basin area) (Wulandari *et al.* 2018, 53); improving food safety and implementing stress-resistant agricultural systems (Zerbib 2019, 39); sustainable management of forest resources and avoiding deforestation (Jin *et al.* 2022).

The goal of the present study is to explore opportunities for the development of GBs in Kazakhstan so as to improve the efficiency of territorial management and the development of environmental projects.

Table 1. Classification of GBs by financial flows (Dorfleitner *et al.* 2021, 797; Nanayakkara and Colombage 2019, 4425)

No.	GB type	Characteristic
1	standard	a standard debt instrument with the right of claim by the issuer
2	income-proven	without the right of recourse to the issuer, the credit risk is tied to monetary receipts, which are the subject of security at the expense of income, remuneration, taxes, etc.
3	project	with or without the right of recourse to the issuer, directed to finance one or more environmental projects, for which the investor bears direct credit risk associated with investment in the project
4	securitized	debt securities secured by one or more projects, including secured bonds, asset-backed securities – mortgage-backed securities

Table 2. Classification of GBs by areas of financing (Agliardi and Agliardi 2019, 608; Reboredo 2018, 38)

No.	GB type	Characteristic
1	Sustainable Bonds	funds are directed to social or environmental impact projects that align with the global sustainable development goals
2	Blue Bonds	fund projects in the field of fisheries and aquatic ecosystems preservation
3	Forest Bonds	fund projects related to reforestation
4	Social Bonds	fund social projects (affordable housing for people with limited financial means)
5	Rhino Impact Bonds	fund measures to protect biological species
6	Environmental Impact Bonds	fund green drainage infrastructure projects and responses to climate change

Research objectives:

- to identify arguments in favor of the development of GBs in Kazakhstan for the implementation of environmental projects;
- to determine the main hindrances to the development of GBs in Kazakhstan;
- to define conditions for further proliferation of GBs in Kazakhstan.

2. Methods

The study was conducted in 2021 in three stages with the support of the Narxoz University, Kazakh University of Technology and Business, and Innovative University of Eurasia.

At the first stage of the study (February-April 2021), an analysis of the scientific literature on the problem of research was conducted. At the second stage (May-June 2021), an online expert survey was administered to collect expert opinions on the issues under study. At the third stage (September-October 2021), the information obtained from experts was processed and expert ranking was carried out, followed by the calculation of the weight of expert opinions.

The methods deployed in the research process include:

- analysis of scientific literature on the problem of the development of GB in the world to improve the effectiveness of territorial management and the development of environmental projects;
- an expert survey, whose results were used to identify arguments in favor of the development of GBs in Kazakhstan for the realization of environmental projects, the main barriers to the spread of GBs in Kazakhstan, and the conditions for further dissemination of GBs in the country.

The expert survey was conducted via email. The sample included 48 experts, among which 17 were employees of the Department of Environmental Protection and Nature Management of the city of Nur-Sultan, 26 were employees of the Kazakhstan Stock Exchange (KASE) stock exchange, which lists GBs in Kazakhstan, and five were faculty members of the Narxoz University and the Kazakh University of Technology and Business in the Finance specialty. All survey participants were informed of the purpose of the survey and of the organizers' intent to publish its results in a summarized form.

The experts were asked to express their views on arguments for the development of GBs for the implementation of environmental projects, the main obstacles to the development of GBs, and conditions for the further spread of GBs in Kazakhstan. The responses were to be given online via email. After the collection and processing of expert opinions, the experts were sent a second email with a request to rank the opinions collected from them earlier.

The consistency of expert opinions was assessed via Kendall's Coefficient of Concordance (W). The concordance coefficient was determined using the SPSS software product.

Further, information obtained from the expert survey was processed to calculate the weights of expert opinions.

3. Results

Despite some skeptical statements made by the interviewed experts about the low profitability of GBs or the unreliability of mechanisms for monitoring the effectiveness of the use of the attracted investment, among the key arguments in favor of this financial tool were the following (Table 3).

Table 3. Arguments in favor of the development of GB in for the implementation of environmental projects

No.	Arguments in favor of the development of GB in Kazakhstan	%*	Rank	Weight
1	targeted use of the funds (in environmental programs and projects) raised from the issuance of GBs	79%	1	0.34
2	provision of an additional source of green financing in addition to bank lending and equity financing, as well as lines of credit	67%	2	0.23
3	provision of more long-term funding for environmental projects, especially in cases when there is demand for investment, but the supply of long-term bank credits is limited	60%	3	0.16
4	enabling bond issuers to channel bond proceeds into environmental projects, thereby strengthening their reputations	54%	4	0.11
5	improvement of issuers' environmental risk management process due to their commitment to disclosing environmental information	48%	5	0.09
6	provision of a green class of assets for investors, especially long-term and responsible investors, and opportunities for bond investors to engage with issuers on sustainability issues	42%	6	0.07

Note: compiled based on the expert survey; *percentage of expert mentions; the value of the concordance coefficient W = 0.79 ($p < 0.01$), which indicates the consistency of expert opinions

Based on the expert survey, the main obstacles to the development of GB in Kazakhstan were identified (Table 4).

Table 4. Key impediments to the development of GB in Kazakhstan

No.	Impediments to the development of GB in Kazakhstan	%*	Rank	Weight
1	Insufficient awareness of national investors about the benefits of GB and the existing international practice in using this financial instrument	73%	1	0.36
2	GB compliance costs	65%	2	0.24
3	Small number of national green investors	58%	3	0.17
4	Insufficient availability of national ratings, indices, and listing of GBs	50%	4	0.13
5	Difficulties for international investors to enter the national financial market	40%	5	0.10

Note: compiled based on the expert survey; *percentage of expert mentions; the value of the concordance coefficient W = 0.84 ($p < 0.01$), which indicates the consistency of expert opinions

Further expansion of the use of GBs in the stock market of Kazakhstan, according to the surveyed experts, is possible under the following conditions (Table 5).

Table 5. Conditions for further spread of GBs in Kazakhstan

No.	Conditions for further spread of GBs in Kazakhstan	%*	Rank	Weight
1	Development of local GB markets	76%	1	0.41
2	Lower risk premium, simplified audit and reporting	62%	2	0.26
3	Improved awareness of the advantages of GBs	56%	3	0.15
4	Further attraction of local investors to the GBs market	48%	4	0.12
5	Promotion of international cooperation to attract investments in GBs	42%	5	0.06

Note: compiled based on the expert survey; *percentage of expert mentions; the value of the concordance coefficient W = 0.81 ($p < 0.01$), which indicates the consistency of expert opinions.

4. Discussion

4.1. National Peculiarities of the Development of GBs

Noting among the main hindrances to the proper development and expansion of GBs (Table 4) the insufficient awareness of national investors about the advantages of GBs and the existing international practice of their use,

the experts especially emphasized the lack of knowledge about current practices at the international level and the lack of understanding of the potential benefits of the GB market by the country's politicians, regulators, potential bond issuers, and investors. The results of our study, we believe, can be supplemented by the results obtained by J.C. Reboredo (2018), which suggest that the main condition for bonds to be marked as green is a clear set of GB criteria and the associated information disclosure requirements.

Listing GB compliance costs as one of the barriers to the development of GBs in Kazakhstan, the experts point out that GB status verification and monitoring of the issuers' use of profits for green purposes are mainly performed by the providers of a second opinion or a third-party, whose relatively high prices for obtaining a guarantee pose a hurdle for smaller issuers. Researchers (Dorfleitner *et al.* 2021, 797) also cite the high costs of managing disclosure requirements (Dokholyan *et al.* 2022, 597). Such a situation is observed mainly in developing markets, yet the costs can grow lower as the scale and awareness increase.

The interviewed experts also suggest that a necessary condition to ensure sufficient demand is the presence of prominent green institutional investors having experience in investing in green assets. In Kazakhstan, these investors are very few (Kaldiyarov *et al.* 2021, 56). Furthermore, since institutional investors disclose very limited information about their practices of integrating environmental, social, and governance (ESG) factors in their investment strategies, as well as due to the lack of opportunities to estimate environmental costs/benefits of investments, the question of profit comes to the fore. As accurately noted by one of the experts (Tengiz, an employee of the KASE stock exchange, 9 years of experience), "For some investors, it becomes unimportant in which sectors their investments will be directed – 'green' or 'dirty'".

In addition, we should clarify that the lack of GB ratings, indices, and listings owes to the fact that green ratings, by providing estimates of the environmental benefits of the use of bond proceeds, can reduce GB funding costs (European Commission *et al.* 2016). Indices help identify and assess high-quality GBs and thus can help reduce their funding costs (Banga 2019, 17). Finally, listing on exchanges is another way to increase demand for GBs (Nanayakkara and Colombage 2019, 4425).

In the meantime, even large global green investors can have problems accessing local markets (Agliardi and Agliardi 2019, 608). One complication is differences in the definition of GBs and disclosure requirements, which may cause higher transaction costs since bonds considered green in one market cannot be automatically recognized as such by leading foreign investors (Agliardi and Agliardi 2019, 608; Yerkinbayeva *et al.* 2022, 115).

Analyzing the conditions for the further spread of GBs in Kazakhstan (Table 5), the experts pointed to the fact that public institutions and associations, financial entities, and other market participants can promote GBs, raising awareness about their advantages. In addition, the demonstrative issuance of GBs can encourage investors and issuers to use this instrument and form the GB market.

Furthermore, if appealed to by Kazakhstan's authorities interested in the development of local currency bond markets, international financial organizations and development banks, as indicated by O. Laurent and R.S. Riyanti (2021), can support and develop the country's GB market by collecting data and sharing knowledge.

Another condition for further development of GBs in Kazakhstan, as suggested by the experts, is lower risk premiums and simplified audit and reporting. Government institutions and development banks, as part of their mandates, can propose additional measures to reduce risk premiums, thereby helping to develop qualified second opinion or third party assurance providers, and provide mobile sponsor support for GB verification (e.g., by covering part of the cost) (Hachenberg and Schiereck 2018, 371) and instruction on information disclosure and reporting.

In the discussion of the practical experience of implementing GBs to attract investment funds, only two of the most prominent projects in Kazakhstan are noted.

1. In November 2020, the KASE listed the first issue of GBs of the Asian Development Bank in the amount of 14 billion tenges, of which 10.1 billion tenges (circulation term – 2.21 years, rate – 10.10%) was allocated for investment projects aimed at reducing GHG emissions into the atmosphere and 3.9 billion tenges (circulation term – 1.95 years, rate – 10.12%) – for funding the bank's own projects for adaptation to climate change and the mitigation of its consequences in Kazakhstan.

2. In September 2021, KASE listed the GBs of the Eurasian Development Bank GB amounting to 20 billion tenges (circulation term – 3 years, rate – 10.50%) intended to finance green projects implemented in Kazakhstan.

4.2. Global Development of the GB Market

International cooperation to attract investment in GBs can be built upon bilateral cooperation between the various GB markets, in which market participants can discuss various GB validity term options (Deschryver and de Mariz 2020; Serikbaeva *et al.* 2019, 935).

We proceed from the condition that GBs are a regulated instrument subject to the same norms of securities market regulation and financial regulation as other bonds that are traded on an organized securities market with a fixed income (Dokholyan *et al.* 2022, 597). In this respect, a number of countries, for instance, China, have developed specialized normative-legal frameworks and principles governing the issuance of GBs. In December 2015, China published its guidelines on GB issuance (Lin and Hong 2021), and in January 2016, the Securities and Exchange Board of India (SEBI) approved its GB issuance and listing disclosure requirements (Nanayakkara and Colombage 2019, 4425). These steps marked the launch of national currency GB markets in two of the largest developing countries.

At the same time, several GB indices were created to track their efficiency and contribute to the formalization of what is considered green. GB indices determine whether the bonds belong to the green category using the established methodology. The organizations that calculate GB indices act as certifying institutions (Bank of America Merrill Lynch, Barclays MSCI, Moody's, S&P, and others). Each of these organizations uses its own methodology to choose the index components (Wulandari *et al.* 2018, 53).

GB assessment is performed by the methodology of rating agencies. For example, the methodology of the Moody's rating agency employs five factors for GB assessment: organization and use of revenues, disclosure of revenue use, revenue management and ongoing reporting, and disclosure of project financing. Some agencies (Barclays, S&P) have developed methodologies to assess and rank the environmental impacts of GB-funded projects (Jin *et al.* 2020). GBs can be assessed by an independent third party in two stages: before and after their issuance. Among the main evaluators is the Center for International Climate and Environmental Research (CICERO, Norway), which first issued an expert assessment (second opinion) for the first issue of the WB GBs in 2007 (Tolliver *et al.* 2019).

The GB market is developing through the creation of a separate green stock exchange, a separate green section, or a list of GB. According to the CBI, several foreign stock exchanges are engaged in GB issues. The first green issue on the Luxembourg Stock Exchange, for example, was implemented in 2007. In October 2016, the Luxembourg Green Exchange platform was spun off (Banga 2019, 17). On the London Stock Exchange, the first GB issue was performed in 2012, and in July 2015, a separate green segment was created (Bachelet *et al.* 2019). The Oslo Stock Exchange in January 2015 became the world's first exchange with its own GB list (Deschryver and de Mariz 2020). The Oslo, London, Shanghai, Taiwan, and Johannesburg stock exchanges have set up separate GB sections. The Australian and Hong Kong Stock Exchanges and the New York Stock Exchange also have GB issues, but no dedicated GB sections.

Currently, the leading role in the issuance of marked GB belongs to the international development banks – EIB, IBRD, and IFC, as well as the Asian Development Bank. However, the circle of the largest issuers of GB has started to be joined by national development banks (KfW), the world's leading corporations (Toyota, Electricite de France, GDF Suez), and state (municipal) bodies (Febi *et al.* 2018, 53).

In Kazakhstan, the GB market is underdeveloped, although the Agency for Regulation and Development of the Financial Market of Kazakhstan plans to make changes to the legislation, under which the procedure and conditions for the recognition of GBs will be defined. An authorized environmental authority has developed and implemented a green taxonomy to classify environmental projects to be financed through GBs (Yerkinbayeva *et al.* 2021, 1335). Amendments to the "Business Road Map 2025" provide for subsidizing interest rates on loans for the implementation of environmental projects and a coupon rate on GBs (issue up to 7 billion tenges, coupon rate – 7%, subsidy period – 5 years) (Decree of the Government of the Republic of Kazakhstan 2021).

That said, the bond market, which now provides about a third of all corporate financing worldwide, does not play a significant role in green finance (Chernysheva *et al.* 2021, 15). Today, only about 1% of bonds issued worldwide are labeled green (Agliardi and Agliardi 2019, 608). The potential for expansion of the GB market will become substantial if the market and institutional problems restraining its development are addressed (Dudin *et al.* 2016, 53; Zhao *et al.* 2020, 451). For example, an OECD quantitative analysis examining the potential for bond markets to finance energy investments estimates that bonds in low-carbon investments, such as renewable energy development, energy efficiency measures, and low-carbon sectors of the economy, have the potential to issue up to about $20 billion annually before 2030 in markets such as China, Japan, the EU, and the US (Nanayakkara and Colombage 2019, 4425).

The demand for GBs is growing every year, but there are several issues that still hinder the faster growth of the GB market. Among them is the lack of trust (Banga 2019, 17), which requires the verification of unified international standardization norms and a GB certification mechanism.

As a result of our research, we conclude that the overall development of the GB market can be attained under five conditions. These conditions are: 1) combination of the environmental and economic policy goals and the formation of a policy of strategic green investment to achieve the global sustainable development goals and compliance with the Paris Agreement; 2) further development, improvement, and implementation of voluntary green investment principles and assessment of progress in the green capital market; 3) formation/expansion (a growing number of countries and financial institutions) of platforms for GB market development; 4) development of local (regional) GB markets, as well as the formation and implementation of effective tools and mechanisms to attract foreign direct investment; 5) exchange of knowledge regarding GB practices (their main risks) in order to develop the capacities of market participants.

Conclusion

The results of the study reveal that the primary advantages of GB issuance in the conditions of Kazakhstan are the targeted nature of the use of attracted investment (in environmental projects and programs), the provision of a more long-term source of funding for environmental projects, and improvement of the issuers' reputation and their environmental risk management process.

These are some barriers to the development of GBs in Kazakhstan. Among them are the lack of awareness among Kazakh investors about the benefits of GBs and the current global practice of their use, the costs of compliance with GB requirements, and the shortage of Kazakh investors, national ratings, indices, and listings of GBs.

To overcome the outlined hindrances, the following conditions need to be met: further expansion of the GB market in Kazakhstan, lower risk premiums, simplified audit and reporting, greater awareness of stock market participants about the benefits of GB, the attraction of Kazakhstan investors to the GB market, and facilitation of international cooperation in order to attract investment in GBs.

Among the limitations of our study is a rather limited sample of experts both in the quantitative and qualitative sense, since it does not cover first-hand participants in the GB market – investors and issuers.

A prospect for further research is an analysis of the possibilities to form public policy for the development of the GB market.

References

[1] Agliardi, E., and Agliardi, R. 2019. EDE Financing environmentally-sustainable projects with green bonds. *Environment and Development Economics,* 24(SI6): 608-23. DOI:https://doi.org/10.1017/S1355770X19000020

[2] Bachelet, M.J., Becchetti, L. and Manfredonia, S. 2019. The green bonds premium buzzle: The role of issuer characteristics and third-party verification. *Sustainability,* 11(4): 1098. DOI:https://doi.org/10.3390/su11041098

[3] Banga, J. 2019. The green bond market: A potential source of climate finance for developing countries. *Journal of Sustainable Finance and Investment,* 9(1): 17-32. DOI:https://doi.org/10.1080/20430795.2018.1498617

[4] Bezpalov, V.V., *et al.* 2020. PR support in strategic investor relations at retail companies. *Journal of Advanced Pharmacy Education and Research,* 10(2): 84-90

[5] Cheong, C., and Choi, J. 2020. Green bonds: A survey. *Journal of Derivatives and Quantitative Studies,* 28(4): 175-89. DOI: https://doi.org/10.1108/jdqs-09-2020-0024

[6] Chernysheva, A., Dobrova, K. Dobrova, E. and Kuznetsova, V. 2021. Transformation of economic interests in the context of the multipolar world order formation. *Economic Annals-XXI,* 192(7-8(2): 15-25. DOI:https://doi.org/10.21003/ea.V192-02

[7] Deschryver, P., and de Mariz, F. 2020. What future for the green bond market? How can policymakers, companies, and investors unlock the potential of the green bond market? *Journal of Risk and Financial Management,* 13(3): 61. DOI: https://doi.org/10.3390/jrfm13030061

[8] Dokholyan, S., *et al.* 2022. Influence of management automation on managerial decision-making in the agro-industrial complex. *International Journal of Advanced Computer Science and Applications,* 13(6): 597-603. DOI: http://dx.doi.org/10.14569/IJACSA.2022.0130672

[9] Dorfleitner, G., Utz, S. and Zhang, R. 2021. The pricing of green bonds: External reviews and the shades of green. *Review of Managerial Science,* 16: 797-834. DOI: https://doi.org/10.1007/s11846-021-00458-9

[10] Dudin, M.N., *et al.* 2016. Methodology of analysis and assessment of risks of the operation and development of industrial enterprises. *Quality - Access to Success*, 17(153): 53-9.

[11] Ehlers, T., and Packer, F. 2017. Green bond finance and certification. *BIS Quarterly Review,* September 2017: 89-104.

[12] European Commission, Directorate-General for Environment, Cochu, A., C. Glenting, D. Hogg, I. Georgiev, J. Skolina, F. Elsinger, M. Jespersen, R. Agster, S. Fawkes, and T. Chowdury. 2016. *Study on the potential of green bond finance for resource-efficient investments*. Luxembourg: Publications Office of the European Union. DOI: https://doi.org/10.2779/234777

[13] European Commission, Joint Research Centre, Fatica, S., and R. Panzica. 2020. *Green bond as a tool against climate change?* Luxembourg: Publications Office of the European Union, 26 p. DOI:https://doi.org/10.2760/24092

[14] Febi, W., Schäfer, D., Stephan, A. and Sun, C. 2018. The impact of liquidity risk on the yield spread of green bonds. *Finance Research Letters,* 27: 53-9. DOI: https://doi.org/10.1016/j.frl.2018.02.025

[15] Gianfrate, G., and Peri, M.2019. The green advantage: Exploring the convenience of issuing green bonds. *Journal of Cleaner Production,* 219: 127-35.

[16] Hachenberg, B., and Schiereck, D. 2018. Are green bonds priced diferently from conventional bonds? *Journal of Asset Management,* 19(6): 371-83. DOI: https://doi.org/10.1057/s41260-018-0088-5

[17] Jin, J., Han, L., Wu, L. and Zeng, H. 2020. The hedging effect of green bonds on carbon market risk. *International Review of Financial Analysis,* 71: 101509. DOI: https://doi.org/10.1016/j.irfa.2020.101509

[18] Kaldiyarov, D., *et al.* 2021. Sustainable development of rural areas. Assessment of the investment appeal of the region. *Journal of Environmental Management and Tourism,* 12(1): 56-63. DOI:https://doi.org/10.14505/jemt.v12.1(49).05

[19] Laurent, O., and Riyanti, R.S. 2021. Determinants of green bond premium in the ASEAN market amidst the COVID-19 pandemic. *Jurnal Keuangan dan Perbankan,* 25(4): 734-53.

[20] Lin, L., and Hong, Y. 2021. *Developing a green bonds market: The case of China*. European Business Organization Law Review. DOI: http://dx.doi.org/10.2139/ssrn.3880280

[21] Martirosyan, A.V., Ilyushin, Y.V. and Afanaseva, O.V. 2022. Development of a distributed mathematical model and control system for reducing pollution risk in mineral water aquifer systems. *Water,* 14(2): 151. DOI: https://doi.org/10.3390/w14020151

[22] Nanayakkara, M., and Colombage, S. 2019. Do investors in green bond market pay a premium? Global evidence. *Applied Economics,* 51(40): 4425-37.

[23] Reboredo, J.C. 2018. Green bond and financial markets: Co-movement, diversification and price spillover effects. *Energy Economics,* 74: 38-50. DOI: https://doi.org/10.1016/j.eneco.2018.05.030

[24] Serikbaeva, G.G., Bektanov, B. and Bekturganova, A. 2019. Sources of attracting investments in technological innovation projects to ensure the sustainable development of rural areas. *Journal of Environmental Management and Tourism,* 10(4): 935-41.

[25] Tolliver, C., Keeley, A.R. and Managi, S.2019. Green bonds for the Paris agreement and sustainable development goals. *Environmental Research Letters,* 14(6): 064009. DOI: https://doi.org/10.1088/1748-9326/ab1118

[26] Tsenina, E.V., *et al.* 2022. Cluster analysis of the expenditures for environmental and technological innovations in sustainable development policy formation. *Journal of Environmental Management and Tourism,* 13(1): 63-74.

[27] Wulandari, F., Schäfer, D. Stephan, A. and Suna, C. 2018. The impact of liquidity risk on the yield spread of green bonds. *Finance Research Letters,* 27: 53-9.

[28] Yerkinbayeva, L., *et al.* 2021. Legal regulation of Kazakhstan's transition to the green economy. *Journal of Environmental Management and Tourism,* 12(5): 1335-1342.

[29] Yerkinbayeva, L., *et al.* 2022. Digitalization of environmental information in the Republic of Kazakhstan: Issues of legal regulation. *Journal of Environmental Management and Tourism,* 13(1): 115-27.

[30] Zerbib, O.D. 2019. The efect of pro-environmental preferences on bond prices: Evidence from green bonds. *The Journal of Banking and Finance,* 98: 39-60.

[31] Zhao, C.P., Gukasyan, G., Bezpalov, V. and Prasolov, V. 2020. Development of modern standards for energy efficiency of industrial enterprises within the European Union policy. *International Journal of Energy Economics and Policy,* 10(6): 451-9.

[32] Decree of the Government of the Republic of Kazakhstan of October 13, 2021 No. 736 “On amendments and additions to the Resolution of the Government of the Republic of Kazakhstan of December 24, 2019 No. 968 ‘On the approval of the State program for the support and development of business ‘Business Road Map-2025’ and of December 31, 2019 No. 1060 ‘On some measures of state support for private entrepreneurship’”. Available at: https://primeminister.kz/ru/decisions/20102021-736

[33] The Code of the Republic of Kazakhstan of January 2, 2021 No. 400-VI "Environmental Code of the Republic of Kazakhstan". Available at: https://adilet.zan.kz/rus/docs/K2100000400

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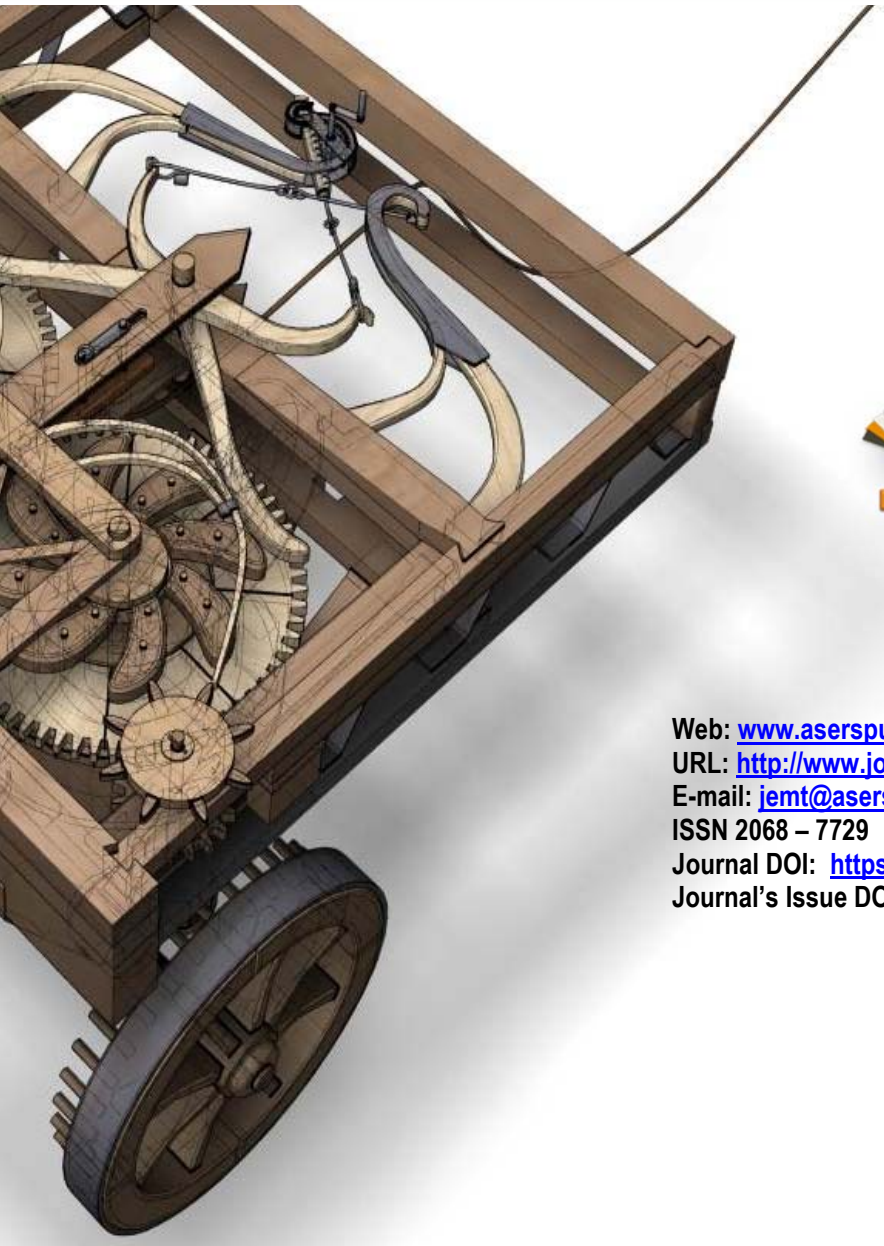

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