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GREEN BOND STANDARDS AS A WAY TO REDUCE INFORMATION ASYMMETRY

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ABSTRACT

The purpose of the article. The purpose of the article is to systematize knowledge in the field of green bond standards as well as to examine the differences between the most popular of them. The aim is to question whether the requirements of individual standards actually reduce information asymmetry on the part of investors in the market.

Methodology. The texts of five most popular green bond standards in the world were analyzed and were compared with each other, outlining five most important categories in the context of information asymmetry. The work contains the comparison of the standards and identifies the differences between them.

Results of the research. The results of the research can be summarized as follows. The conducted research allowed for the identification of differences between individual standards and the assessment of whether these differences have a significant impact on the asymmetry of information in the green bond market. The study results show that green bond standards are not an ideal way to reduce negative effects of information asymmetry in the market. The study shows a need to standardize the requirements for issuers who want to have a certificate that is an actual confirmation of high-quality green bonds in order to eliminate information asymmetry in the market.

Keywords: green bonds, green bond market, sustainable finance, green bond standards, information asymmetry.

JEL Class: G14, O16, Q50.

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Green Bond Standards as a Way to Reduce Information Asymmetry

Green bonds, which are one of the most recent financial instruments, continue to gain in importance (Bjorkholm & Lehner, 2021). There is a lot of interest in the market, both from institutional and individual investors. This is due, among other things, to the increased awareness of the need for sustainable development (Pham, 2016). The ecological aspect of the investment is important for the investors. They value proper spending of the green bond proceeds they invested in (Cortellini & Panetta, 2021). The problem arises when verifying the obligations of the issuers of the aforementioned financial instruments. The need to increase the transparency of green bond issues and the way in which the proceeds are used has prompted many organizations to create guidelines for issuers. This has led to the emergence of numerous different regulations on the global market.

The intention of green bond standards, which were undoubtedly aimed at reducing the negative effects of information asymmetry, is questionable, given a current number of standards that differ from each other. The problem of the multitude of regulations has already been noticed, resulting in the latest EU Green Bond Standard, which came into force at the end of 2024. However, it should be noted that from a global market perspective, this is another set of recommendations that issuers may or may not adhere to.

From the perspective of an investor deciding to buy green bonds, or any other sustainable bonds, due to their sustainable purpose, the differences between the standards met by issuers are of considerable importance. It is primarily about a possibility of verifying whether the invested funds were used in accordance with the assumptions of the purchased security.

The aim of the work is to systemize knowledge on the requirements included in the green bond standards and to examine the differences between the most popular of them. In addition, an attempt is made to answer the question of what potential differences between standards may mean for investors in the context of information asymmetry in the market for bonds related to sustainable development. A hypothesis that could be formulated is that differences between standards met by issues, by influencing the quality of the instruments, also affect the risk of an investment for an investor, which is currently difficult to measure.

The further part of the paper is structured as follows. First, the literature on green bonds as an investor choice is reviewed. The following sections analyze the most important, currently used sustainable bond standards with a focus on green bonds and identify differences between them. In addition, threats that may result from the identified differences are proposed. The paper ends with a summary.

Green Bonds as an Investor's Choice

There are several types of bonds related to sustainable development. The first and most popular are green bonds. Due to their specific nature it is worth emphasizing that they stand out from classic

bonds in terms of the purpose of their issue, which should be partial or full financing or refinancing of ecological investment projects (Sobik, 2023). Green bonds are a way for issuers to obtain funds for the implementation of specific green investments for the company (Ślażyńska-Kluczek, 2022), while for investors they are an instrument that, in addition to profit, enables a positive, real impact on the environment. Owing to the mentioned feature, green bonds are undoubtedly characterized by targeted financing. It is worth noting, however, that despite the purpose of issuing green bonds, their issuance itself is not a useful indicator of a company's efforts to adopt a more sustainable business model (Prokop & Muller, 2023).

Among other types of debt instruments with targeted financing, social bonds or sustainable bonds should be mentioned. The second ones are a combination of the two previously mentionned, if the subject of financing is taken into account. Climate bonds are also remarkable, the proceeds from which should be used by issuers to implement projects or assets for the climate. Non-targeted financing is characterized for sustainability-linked bonds (SLBs), which gain increasing popularity thanks to the greater flexibility for the issuer. The proceeds from them do not have to be used for a specific purpose. In SLBs case, the issuer undertakes to implement certain goals related to the sustainable development of the company, which is measured using established KPIs (Zioło et al., 2021).

Despite many types of debt instruments related to sustainable development, green bonds are perceived as a key debt instrument in financing the transformation to low-emission economies (OECD, 2017). The green bond market is still developing. In the literature, one can also find the term that this market is even booming (Wang et al., 2022). This is attributed to both the available supply and the increasing demand in the global market.

Investors who decide to buy green bonds pay attention to the sustainable purpose of the supported investment (Maltais & Nykvist, 2020). Considering the awareness of the occurrence of the so-called greenium (green premium), which is most often manifested by a lower coupon compared to conventional bonds with the same other parameters (Loffler et al., 2021), it can be noted that investors buying green bonds pay more attention to the purpose of the issue rather than to the profit. The issuers that are most popular among institutional investors acquiring green bonds are companies related to low-emission construction, renewable energy sources and low-emission transport (Samgiorgi & Schopohl, 2021). According to Sangiorgi and Schopohl, in the European Union, which, alongside the USA and China, is one of the three largest green bond markets in the world, there is a strong, unmet demand for green bonds, especially those issued in non-financial sectors.

One of the factors that discourage investors from investing or deciding to sell their green bonds is poor and unclear reporting on how the proceeds from the bonds issued are allocated by the company (Gyura, 2020). Transparent use of funds obtained through the issue of the discussed bonds is important for investors. This is confirmed also by Kovacevic et al. (2023), according to which investors require lower returns when they are well-informed about a bonds' environmental goals (Kovacevic et al., 2023). Appropriate and transparent use of proceeds for environmentally friendly projects by issuers can lead to

more favorable financing terms for them. Also, according to empirical studies (Lu et al., 2010), investors expect a higher rate of return on bonds in the case of greater information asymmetry. This means that despite the greenium, which is manifested by lower interest rates, the costs for issuers can be even lower if they appropriately reduce the information asymmetry on the part of investors willing to purchase their green bonds. According to Okafor et al. (2024), the level of a greenium is also dependent on the use of proceeds. These results again confirm that with the appropriate allocation of funds and greater transparency of the issuer's activities, investors can accept a lower rate of return.

It is worth noting that transparency and assurance of investment sustainability not only affect the widely discussed green bonds, but also all debt instruments and loans. Pohl et al. (2023) show that sustainability-linked loans (SLLs) offer more favorable financing costs for borrowers when issued by bank syndicates that uphold high environmental standards. The results obtained by Wang & Wang (2022) show that strong ESG practices and their transparency increase the likelihood of green bond issuance by listed companies and enable them to issue a higher volume of the mentioned instruments.

Based on the above-mentioned studies, it should be summarized that from the investor's perspective, an inherent feature and risk of investing in green bonds is transparency and the flow of information on the suppositions of the issue, i.e., the use of proceeds. As the studies show, increased transparency, so lower information asymmetry, is desired by investors, but at the same time beneficial for issuers, who can thus reduce the cost of obtaining capital.

Green Bond Standards

With the intention of reducing information asymmetry on the part of investors who value the sustainability of their investments, the basic step is to introduce transparency and procedures the issuer follows before, during and after the issue (Laskowska, 2017). There is also a need to limit greenwashing (Andenas & Heidemann, 2023). It is crucial to create a mechanism to ensure the credibility of green bonds. The tool for both is an external verification and an assessment of the sustainable development of companies participating in the issuance of these instruments (Keitel & Oner, 2023).

Green bond standards are sets of recommendations for the issuer, which aim to increase the transparency of the issue. First, it is about proving that the proceeds from the issue are used for the declared purposes and in a specific manner, e.g., within the time frame guaranteed at the time of an issue. In some cases, if the conditions of the standard are met, issuers can receive a certificate confirming the compliance of the issue with the standard of the selected organization, which is a proof of high quality of the instruments. Such a certificate increases the attractiveness of green bonds from the perspective of an investor who values sustainable goals and transparency of the issue. This is a common way around the world to reduce the negative effects of information asymmetry between issuers and investors (Bachelet et al., 2019). The certificate should be a confirmation of meeting high standards.

Following the recommendations included in the standards is expensive for the issuer. It requires not only money allocated, for example, for the opinion of an independent auditor (second party opinion), but also organizational effort related to the management of the proceeds and reporting (Flammer, 2021).

Currently, there are many standards and sets of recommendations for several types of sustainable bonds on the global market created by various entities. Investors can decide to purchase the financial instruments also based on ratings or invest through investment funds focusing on green bonds in their portfolios. Issuers may also decide to obtain a second party opinion on the proper use of proceeds, for example, from auditing firms. In recent years, countries and individual companies have often decided to publish so-called frameworks, which define their recommendations for the issue of green bonds and the flow of information related to the issue. Examples include the frameworks published by countries such as Australia, India, Brazil as well as Italy. Among the companies, PKO Bank Polski, Nordea and Volkswagen Financial Services AG can be mentionned. Despite the multitude of different types of indicators and documents, green bond standards remain the most popular means of confirmation of green bond issuance.

Table 1

The world's most popular sustainable bond standards

Name of the standard	The entity responsible for the standard	Year of establishment
Green Bond Principles (GBP)	International Capital Market Association (ICMA)	2014
Sustainability Bond Guidelines (SBG)	International Capital Market Association (ICMA)	2015
Climate Bond Standard	Climate Bond Initiative (CBI)	2015
China Green Bond Endorsed Project Catalogue	People’s Bank of China (PBOC)	2015
Social Bond Principles (SBP)	International Capital Market Association (ICMA)	2017
ASEAN Green Bond Standards	ASEAN Capital Market Forum (ACMF)	2017
ASEAN Social Bond Standards	ASEAN Capital Market Forum (ACMF)	2018
ASEAN Sustainability Bond Standards	ASEAN Capital Market Forum (ACMF)	2018
Sustainability-Linked Bond Principles	International Capital Market Association (ICMA)	2020
ASEAN Sustainability-Linked Bond Standards	ASEAN Capital Market Forum (ACMF)	2022
EU Green Bond Standard	EU Commission	2023

Source: own elaboration.

Table 1 lists the most important sustainable bond standards in the world, along with the organizations that create them and the year of their creation.

The standards, except for the ASEAN's and European ones, have been updated several times. As can be observed from the data in Table 1, initiatives aimed at increasing transparency of emissions are not new to the global market. Nevertheless, they are constantly being improved and expanded.

The first set of recommendations for green bond issuers was the Green Bond Principles (GBP) document created by ICMA in 2014. Since then, it has been updated several times and expanded to Sustainability Bond Guidelines (SBG) in 2015 and the Social Bond Principles (SBP) in 2017. The GBP document is divided into four areas of guidance:

- use of proceeds from the green bond issue;
- process of assessing and selecting projects to be financed;
- management of the proceeds;
- reporting on the use of the proceeds (ICMA, 2021).

ICMA recommends that issuers create a document confirming that a given green bond issue complies with the ICMA principles. The document, called the Green Bond Framework, should be made available to interested investors. Depending on the type of bond, the principles apply to green, social or sustainable ones. ICMA accepts different types of projects as the subject of financing or refinancing based on the bond issue.

ICMA has also created a strand for SLBs which, given the differences between these bonds and targeted financing instruments, consists of the following parts:

- selection of KPIs;
- calibration of Sustainability Performance Targets;
- bond characteristic;
- reporting;
- verification (ICMA, 2024).

Another standard that has been disseminated around the world is the Climate Bond Standard created by the CBI in 2015. The requirements are divided in a more detailed way than in the case of documents created by ICMA. Recommendations for issuer's actions before and after the issue are described in detail. Additionally, the creators of the standard devote attention to projects that can be qualified for debt financing, but also, within the taxonomy created by CBI. Ecological economic activity is also defined.

The ASEAN Green Bond Standards, ASEAN Social Bond Standards, ASEAN Sustainable Bond Standards, as well as ASEAN Sustainability-Linked Bond Standards, were created on the basis of GBP, SBP, SBG and SLBs Principles, therefore they mostly overlap. What distinguishes ASEAN requirements from classic ICMA standards is the criterion of origin from one of the member countries

or the requirement to implement a sustainable project in the territory of one of the countries of the Association of South-East Asian Nations.

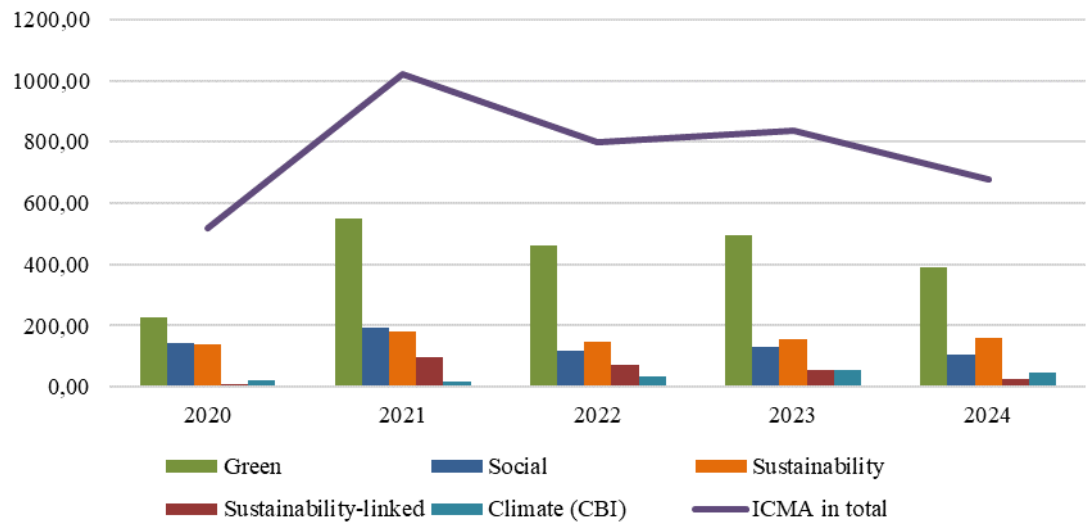
Another of the analyzed green bond standards was created in 2015 by the People's Bank of China (PBOC) in agreement with the Chinese Central Bank, China Securities & Regulatory Commission (CSRC) and the National Development and Reform Commission (NDRC). China Green Bond Endorsed Project Catalogue focuses on precisely defining the areas of activity and defining projects that can be financed with green bonds. The standard differs significantly in its structure from all others, and the emphasis is placed solely on the categorization of investment projects.

The EU Green Bond Standard created by the European Commission is the latest green bond standard on the global market. It was created to unify recommendations in the European Union member states, which have begun to create their own recommendations based on the standards issued by ICMA and CBI. It is worth noting that, as it was in the case of the previously mentioned standards, compliance with those are not mandatory, but instead they serve as guidelines.

The main providers of green bond certificates publish data on issues with their certificates. The values of issues with ICMA and CBI certificates are presented in Figure 1.

Figure 1

ICMA and CBI certified sustainable bonds issuance January 2020 – October 2024 (in bn USD)



Source: own elaboration based on: Market analytics – ICMA (2024) and Market Data – CBI (2024).

It should be noted that due to access only to aggregated data for bonds provided by ICMA in 2024, the numerical values for bonds with their certificate cover the period from the beginning of the year to October. However, in the case of data provided by CBI, the emission values are provided until the end of August 2024, which can cause some discrepancies in the last of the presented years. In addition, some issues with CBI certificate are classified as confidential, making the data on the size of the issue unavailable, so they are omitted from the figure. Despite this, it can be undoubtedly stated that

certifications created by ICMA are more popular in the world. As for other standards for bonds related to sustainable development, the EU Green Bond Standard has been in force since December 2024, therefore there is no data on such issues. ASEAN also provides data, but it has been omitted as it is available up to 2022 at the latest. However, due to their specific geographical location, the ASEAN standards probably constitute the smallest share among the issues discussed. It would be very interesting to compare data from China against the ICMA standards, as China is one of the world leaders in green bond issuance (Lin & Hong, 2022). However, they are unpublished although certainly the value of issuance does not necessarily match the value of certified issuance.

Based on Figure 1, it is also evident that despite the documented growth of the green bond market, and more broadly, sustainable development bonds, this does not directly translate into a significant increase in the issuance value of the certificates under discussion.

Differences Between Green Bond Standards

For the comparison, standards for green projects will be used, as the differences between them, social, sustainable and sustainability-linked projects result from the nature of the instruments and not only from differences in the approach of the standard providers.

Table 2

Main features of green bond standards

Name of the standard	Definition of green bond	Scope of financed projects	Management of proceeds	Reporting	External opinion
Green Bond Principles (GBP)	"Any type of bond instrument where the proceeds or an equivalent amount will be exclusively applied to finance or re-finance, in part or in full, new and/or existing eligible green project".	10 project categories that are assessed under 5 environmental objectives: climate change mitigation, climate change adaptation, biodiversity, natural resource conservation as well as pollution prevention and control.	The proceeds from bonds under the standard, or their equivalent, should be tracked in a dedicated account or portfolio, following the issuer's internal policies. While the green bonds remain outstanding, the balance of the monitored net proceeds must be periodically adjusted to reflect the ongoing allocation of funds to green projects during that period.	Issuers must regularly update investors on the use of funds, providing annual reports until the proceeds are fully allocated. These reports should list the projects funded, with brief descriptions, amounts allocated and expected impacts. Additionally, issuers should promptly report any significant events.	External opinion is recommended but not mandatory.

ASEAN Green Bond Standards	"Bonds and sukuk where the proceeds will be exclusively applied to finance or re-finance, in part or in full, new and/or existing eligible green projects".	Projects similar to those in GBP with the disclaimer that the list is not exhaustive.	Same as for GBP.	Same as for GBP.	Same as for GBP.
Climate Bond Standard	"Any debt instrument that meets the CBS requirements".	Projects divided into 6 groups: energy, transport, natural capital, buildings, industry and waste.	Net proceeds from debt instruments should be recorded in a separate account, portfolio or otherwise identified in the issuer's funds. As long as the green bonds are outstanding, the balance of monitored net proceeds must be adjusted periodically in line with the current use of funds for specific projects and assets.	Issuers are required to file annual reports, which are updated within 12 to 24 months from the date of issue of the debt instrument to its maturity date.	External opinion is mandatory and should be performed by a qualified entity. Its result should be a prepared verification report.
EU Green Bond Standard	European Green Bonds are bonds whose proceeds are used in line with or contribute to the environmental objectives set out in the Paris Agreement.	"Economic activities that have a lasting positive impact on the environment"	Issuers should allocate the entire proceeds of their European Green Bonds before the maturity date of each series of those bonds, while having the possibility to deduct issuance costs directly related to the issuance of the bonds.	The issuers should create "annual allocation reports that the related environmentally sustainable assets meet the applicable technical screening criteria".	The opinion of an external auditor approved by ESMA is mandatory.
China Green Bond Endorsed Project Catalogue	No information.	Projects from 6 sectors divided into over 150 programs with detailed descriptions are accepted.	No information.	No information.	External opinion is recommended but not mandatory.

Source: own elaboration based on: Green Bond Principles (2021), ASEAN Green Bond Standards (2018), Climate Bond Standard (2023), Regulation (EU) 2023/2631 of the European Parliament, Green Bond Endorsed Project Catalogue (2021).

The most restrictive for issuers, and therefore the safest for investors, is the standard offered by the CBI. In addition to the list of activities that can be financed under the issue covered by certification, issuers are required to have an external opinion and a report prepared on its basis. It is worth noting that the standard does not only apply to bonds, but to all debt instruments, which distinguishes it from the others. Thanks to the taxonomy developed by CBI, the framework of projects that can be financed with certified emissions is assessed quite strictly (Kultys-Grabowska, 2023). This brings many advantages and an entire integrated system of recommendations for companies, but it can also limit them.

The next most restrictive standard is the European Union standard, as the opinion from external auditor that is approved by ESMA is also mandatory. The basic difference between the EU Green Bond Standard and the others is the lack of a list of activities covered by financing. This has been presented in a general way, which does not raise any major concerns of the author. A significant disadvantage of this standard is that it is not mandatory for issuers in the European Union. Considering a growing number of mandatory regulations for companies in the EU related to sustainable development such as EU Taxonomy, Sustainable Finance Disclosure Regulation (SFDR) and work on transparency of ESG ratings (Malecki, 2023), introducing a mandatory EU Green Bond Standard for issuers would not seem to be a far-fetched move. In practice, it may turn out to be another standard that issuers may or may not decide to adopt. It is worth noting that due to the requirement for an external opinion issued by entities accepted by ESMA, it may be at a disadvantage with regards to competing standards due to the potentially higher costs of obtaining opinions from specific entities. According to Pyka (2023), the EU Green Bond Standard is not only not entirely well-designed, but even distorts the natural competition in the market of existing standards offered by market organizations.

GBP is characterized by the lack of a requirement for an opinion from a qualified auditor, it is only recommended. This leads to discrepancies in meeting the requirements between individual issuers with the same certificate. ICMA publishes second party opinions that have been obtained for issues, which can be a distinction for investors between issuers that meet all the recommendations of the standard and the ones that follow just some selected. However, this discrepancy still raises doubts, especially since the costs of obtaining such an opinion rather encourage companies to meet only the mandatory requirements of the standard. The list of projects that can be financed is quite extensive, as in other standards, but at the same time flexible, which gives issuers more options. Requirements for handling proceeds and reporting do not differ significantly from the perspective of an investor compared to the Climate Bond Standard.

The author expresses doubts about the justification for creating all ASEAN standards, which are a faithful copy of the standards offered by ICMA with the only additional requirement regarding the geographical scope of the investment or issuer. In addition to classic bonds, the standard also includes sukuk, which distinguishes it from the others. It should be noted that including sukuk in the standard is an appreciated move which could also be implemented by other providers. Hovewer, the organization could have provided ICMA standards as recommended for issuers in the region and only added its

"stamp" at the request of issuers with a certificate of the standard and meeting the geographical requirement. The introduction of own standards by international organizations differing in detail definitely does not lead to a reduction in information asymmetry but introduces additional information noise that can be used by dishonest issuers.

The Chinese catalog differs from other standards. Its structure is completely different. While the list of accepted projects is extensive, there are no requirements for issuers. Due to its completely different structure, the standard should not introduce information noise into the market in China. The project list is a good solution that can work in parallel with international standards in China. Since the list in question is extensive and detailed, as in the case of CBI's standard, it may, but does not have to, constitute certain restrictions for issuers. If investors only care about the green scope of the project without going into details of holding proceeds, the standard is sufficient.

Conclusions

Green bond standards, and more broadly, standards for sustainable debt instruments, represent a valuable initiative in the global market, as evidenced by the growing number being developed. Nevertheless, the total value of bond issues with ICMA certificates has not increased noticeably since 2021. Issues with CBI certificates look a bit better in this regard, but these are still small increases. There are currently many standards for sustainable debt instruments on the global market. Including the Climate Bond Standard among green standards, there are five of them in the world. Additionally, there are a total of four standards for sustainable, social bonds and SLBs.

The multitude of standards is partly because organizations such as the EU or ASEAN or one of the largest countries issuing green bonds in the world – China, want to have their own standard. Such a vast number of standards, which can additionally be divided from green to social, sustainable and sustainability-linked, is not entirely justified and helpful for the investors. This introduces information noise and only partially reduces information asymmetry, which was the original goal of the standards discussed. In the author's opinion, both the EU standard and the ASEAN standards should be mandatory for issuers in specific geographical regions, or the above-mentioned international organizations should indicate to issuers which private standards they honor.

Answering the question posed in the introduction to the paper, differences between standards can have a negative impact on both issuers and investors. The issuers may be tempted to choose a standard with lighter requirements for the purpose of manipulation or may be exposed to higher costs of issue and proceeds management when choosing a different standard. From the perspective of investors, the certificate, which was supposed to be a guarantee of "quality" and the possibility of quick verification of the issue and the issuer, brings more problems than one might expect. Investors who want to make a responsible investment having a choice of issuers with different certificates are forced to delve into the differences between them and the texts of recommendations for issuers.

According to the author, the practice that, to some extent, solves the problem of the opacity of standards and differences between them is ESG ratings. However, their use raises questions about the sense of the existence of standards, which now are not an ideal solution. Moreover, the methodology for calculating ratings differs between providers. An intermediate solution could be a new classification scale created for investors based on the assessment of reporting, ratings and the type of green bond standards.

The paper summarizes the current standards and shows the most important differences between them. It complements the current literature focusing only on determining the restrictiveness or the detailed description of only the standards from CBI, ICMA or EU Commission. This theoretical study can be a basis for further empirical research. It will undoubtedly be worth investigating the competitiveness of the EU Green Bond Standard with the ICMA and CBI standards in the European Union in the coming years. Moreover, an interesting direction of empirical research would be the analysis of potential differences in the valuation and demand of individual investor groups for bonds depending on the standard they meet. One could also look for the impact of meeting selected standards on the costs of obtaining financing through the issue of green bonds.

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