JELS Journal of Economics, Law & Society

ESREIN Economic and Social Research Institute

The Rise of Green Bonds: Global Context and European Insights

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Abstract

This paper analyzes the global and European green bond markets from different perspectives. The paper uses data on green bond issues in the global and European green bond markets from 2013 to 2023. Research results show that the issuance of green and other sustainability-related revenue use bonds has increased in recent years. Europe remains the largest issuance region, accounting for over half of global issuance. Green bond issuance globally and in Europe has experienced a tumultuous couple of years after reaching record highs of USD 575 billion and USD 326 billion in 2021, respectively. In 2023, Europe's green bond issuance recovered 11% year on year to USD 341 billion. It slightly outperformed the global markets, which recorded 10% growth to reach USD 581 billion. In line with 2022, the corporate sector fueled 2023 green volume, contributing 57% of issuance. Corporate issuers in Europe are dominated mainly by the energy, utilities, automotive, transport, and building sectors, all of which have historically been dependent on fossil fuels. Analysis of the capital markets in Bosnia and Herzegovina (BiH) indicates that the green bond market exists, and it started in 2023 when the first issue of green bonds was announced by a commercial bank on the local capital market (Banja Luka Stock Exchange). The critical barriers to developing the green bond market are the lack of appropriate institutional arrangements for green bond management, the issue of minimum size, and the high transaction costs associated with issuing green bonds.

Article History

Received: June 10, 2024
Accepted: June 18, 2024
Published: June 30, 2024

Keywords

green bonds; green financing; green bond market; barriers to the development of green bonds; BiH; ESG

JEL Codes

E44; G10; O13; Q40; Q56;

How to Cite

Ibrić, M. Kozarević, E. & Mešković, A. (2024). The Rise of Green Bonds: Global Context and European Insights. *Journal of Economics, Law and Society, 1(1)*, 55-71.

1. Introduction

The EU's commitment to the objectives of the Paris Agreement and the ambitious European Green Deal requires significant investment (Kozarević & Ibrić, 2023). One of the major issues is how to finance the transition to a global low-carbon economy. Hodžić et al. (2023) suggest that green finance, or green financing, can be seen as the financing of investments that yield environmental benefits, such as reducing air, water, and soil pollution, lowering greenhouse gas emissions, enhancing energy efficiency, and mitigating and adapting to climate change. Without a global carbon pricing scheme, bond markets become central to financing these interventions (Teti et al., 2022). Green bonds – fixed-income securities explicitly designed to support climate and environmental projects – are an essential instrument of green finance. However, while the green bond market is growing rapidly, it is younger and relatively small compared to the overall bond market. Green bonds are one of the main instruments regulators and markets are considering to green the economy and the financial sector (EPRS, 2022). Regulations play a crucial role in the development of environmentally

or socially responsible instruments (Meskovic et al., 2023). As pointed out by the Organization for Economic Co-operation and Development (OECD, 2017), with banks having restricted lending capabilities and public budgets under strain in many countries, private sector sources of capital need to be engaged and so, green bonds are considered among the key instruments to mobilize private financial resources towards the progressive decarbonization of the global economy. Green bonds explicitly create a flow of funds toward projects that offer environmental benefits by combining the efforts of issuers and investors. They are expected to become a pathway by which financial market participants can fulfill their primary responsibilities toward maintaining a sustainable global environment while simultaneously pursuing investment opportunities (Santiago, 2020). Globally, the number of green bonds issued has risen explosively (Sobik, 2023).

The green bond market has experienced significant growth since its inception in 2007. By 2017, it had expanded to nearly USD 900 billion, illustrating its increasing importance in financing environmentally sustainable projects (Pawłowski, 2018). Despite this growth, the market remains relatively small compared to the challenges it aims to address and the broader traditional bond market. Significant barriers include the lack of harmonized global standards, risks of greenwashing, and perceptions of higher costs for issuers (Deschryver & de Mariz, 2020).

When examining the literature that analyzes this area (e.g., Agliardi & Agliardi, 2019; Bachelet et al.,2019; Hachenberg & Schiereck, 2018; Chiang, 2017; Flaherty et al., 2017; Moldashbayeva et al., 2021; Banga, 2018; Gianfrate & Peri, 2019; Wang & Zhi, 2016; Glomsrød & Wei, 2018; Kochetygova et al., 2016), it can be noticed that there is a research gap related to conditions influencing the development of the European green bonds market.

In emerging markets, the interest in green bonds is growing, supported by favorable market reactions on the day of issuance (Sreelakshmi & Greeshma, 2023). However, the rapid issuance of green bonds does not necessarily indicate that bond markets are becoming greener. Challenges such as weak governance frameworks limit their contribution to sustainable development (Berensmannet al., 2018).

Additionally, there is a research gap in the literature investigating the green bond market in Bosnia and Herzegovina (BiH). To fill the gap in the existing literature, this paper aims to provide a comprehensive study related to the development and barriers to the green bonds market in Europe, with a particular focus on BiH. The selection of BiH is not coincidental; it is a country facing the need for a profound decarbonization of the economy and a comprehensive energy transition.

The green bond market is gradually gaining traction in developing countries, including Bosnia and Herzegovina. This growth is driven by the need to finance sustainable development goals and environmental projects. In Bosnia and Herzegovina, as in some other developing nations, the introduction of Environmental, Social, and Governance (ESG) principles is in its early stages. However, there is increasing awareness of their importance in attracting global investors and supporting sustainable finance.

The green bond market in developing countries faces several challenges. Key barriers include the lack of appropriate institutional frameworks, high transaction costs, and issues related to the minimum size of issuances (Banga, 2018). Despite these challenges, there are significant opportunities for growth.

Empirical studies have shown that promoting green bonds in developing countries can significantly reduce CO2 emissions and support environmentally friendly projects, thereby contributing to the fight against global warming (Arshad et al., 2024). Furthermore, introducing ESG principles has been shown to positively impact firm performance in developing countries, such as those in the

ASEAN region, highlighting the potential benefits of integrating ESG criteria into financial markets (Makhdalena et al., 2023).

The following text gives an insight into the research questions that our research paper tries to answer and the research aim and objectives.

Research Question: Are there significant differences in the European green bond market structure compared to the global green bond market?

Research Aim: Global and European green bonds market analysis from different perspectives.

Research Objectives:

RQ1: Analyze and compare global and European green bond markets: This includes examining the share of the global green bond market in the total GSS+ market, comparing the value of green bond issues globally and in Europe, and analyzing the European green bond market by type of issuer and use of proceeds.

RQ2: Examine the green bond market in Bosnia and Herzegovina (BiH): This involves analyzing the emerging green bond market in BiH, identifying barriers to its development, and evaluating the significance of its growth.

Propose measures for improvement: Systematize strategies and measures to enhance the development and efficiency of the green bond market, focusing on overcoming identified barriers.

The paper is structured as follows. Section 1 provides an insight into the context of the research. Section 2 presents the data and the methodology. Section 3 illustrates the output and discusses its results. Section 4 concludes and suggests future research that could complement the present work, further developing the green bonds literature.

2. Background

The financial system is crucial to support and accelerate investment for sustainable development and decarbonizing the economy. However, the successful development of the green financial system also requires the existence of economic motives of investors (Santiago, 2020). It is not straightforward for investors to decide to invest in green projects. While, due to innovation, the cost of cleaner technologies has fallen in recent years, investors still perceive many environmentally or society-friendly projects as risky. In 2017, Schwerhoff and Sy suggested that the bulk of large-scale renewable projects must be supported through debt financing (Santiago, 2020). One of the forms of raising capital through debt is the issue of green bonds.

Europe is at the forefront of green bond issuance. Global green bond issuance started with multilateral development banks (MDBs) raising funding for climate-related projects in 2007/08. European issuers were the first to enter the nascent green bond market. In 2007, the green bond pioneer, the European Investment Bank (EIB), issued the world's first green bond, branded as a Climate Awareness Bond (CAB). ***Table 1*** lists the most important leaders among the different types of green bonds.

In practice, green and environmental, social and governance (ESG)(hence GSS+) bonds are often equated, but it is necessary to distinguish between them, which is given in ***Table 2***.

There are two basic market standards – the Green Bond Principles of the International Capital Market Association (ICMA) and the Climate Bond Standard of the Climate Bonds Initiative (CBI). The first dominates the market due to less strict requirements than the latter (EPRS, 2022). The

identification and labeling of green bonds typically follow the GBP, a set of voluntary standards established in 2014 by industry participants (including major banks such as Bank of America and BofA Securities, JP Morgan Chase & Co., Bank BNP Paribas, and HSBC Holdings plc) and non-profit organizations (Santiago, 2020). Hence, the dominant market standard is the Green Bond Principles (GBPs) (EPRS, 2022). The other most acknowledged way to identify and label a green bond is via the CBI's Climate Bonds Standard and Certification procedure. Conversely to the generality of GBP, the CBI provides some eligible criteria and a detailed green taxonomy by sector that third parties can apply to assess the qualification of a green bond (Santiago, 2020, p. 40).

Table 1: The evolution of the European green bond market

Global first	Issuer	Year
Green bond issuer	European Investment Bank*	2007
Public sector issuer	Kommunalbanken Norway	2010
Local government issuer	Île-de-France, France	2012
City issuer	City of Gothenburg, Sweden	2013
Corporate & property issuer	Vasakronan, Sweden	2013
Certified Climate Bond	Belectric Solar, UK	2014
Green covered bond	BerlinHyp, Germany	2015
Green MTN programme	Fabege, Sweden	2016
Sovereign issuer	Poland	2016

Note: *EIB is supranational and is not included in country figures.
Source: Climate Bonds Initiative (2018)

Table 2: Meaning and types of GSS+ bonds

Green bonds finance projects that have clear environmental benefits such as energy, building, or cropland efficiency.
Social bonds finance projects that create a positive social benefit such as education, housing, or health.
Sustainability bonds finance projects that combine social and environmental benefits, e.g., sustainable development goals or socially responsible investment.
Transition bonds finance projects that support the transition to net-zero. They often originate from high-polluting industries like mining, steel, and cement.
Sustainability-linked bonds (SLBs) and loans are forward-looking, performance-based instruments. The proceeds from these instruments are intended to be used for general purposes. They have coupon step-up/step-downs linked to achieving sustainability performance targets as measured against predefined key performance indicators (KPIs).

Source: Deloitte, 2023

The ICMA (2021, p. 1), within the Green Bond Principles (GBP) guidelines, describes green bonds as "any type of bond instrument where the proceeds will be exclusively applied to finance or refinance, in part or full, new and existing eligible Green Projects and aligned with the four core components of the GBP." "The main difference between green bonds and conventional ones is that unlike the latter, the funds raised with green bonds issuance have to be entirely allocated to finance or refinance environmental-related projects, assets, or business activities that deliver environmental benefits. Like traditional fixed income securities, firms can use this debt instrument to raise capital to finance their valuable investment. With a few exceptions, green bonds are also inherently similar to conventional bonds in structure" (Santiago, 2020, p. 39). ***Table 3*** summarizes the various definitions of green bonds from different authors/organizations.

Following the fact that the previous definitions give a general overview of green bonds, the different types of green bonds are specified in more detail according to different observation criteria. In

the GBP, ICMA (2021) lists four types of green bonds:

- Standard green use of proceeds bonds (a standard recourse to the issuer debt obligation aligned with the GBP);
- Green revenue bond (a non-recourse-to-the-issuer debt obligation aligned with the GBP in which the credit exposure in the bond is to the pledged cash flows of the revenue streams, fees, taxes, etc., and whose use of proceeds go to related or unrelated green project(s));
- Green project bond (a project bond for a single or multiple green project(s) for which the investor has direct exposure to the risk of the project(s) with or without potential recourse to the issuer and that is aligned with the GBP), and
- Green securitized bond (collateralized by one or more specific green project/s).

Table 3: Various definitions of green bond(s)

Definition	Author(s)/organization
"A debt security issued to raise capital specifically to support climate-related environmental projects."	World Bank, 2015, p. 9
"Green finance is finance for achieving economic growth while reducing pollution and greenhouse gas emissions, minimizing waste and improving efficiency in the use of natural resources."	OECD, 2023, p. 14
"Green bonds are fixed fundraising funds that are reserved for fundraising specifically for climate and environmental projects for sustainability purposes."	Niyazbekova, 2021, p.1
"Green bonds are fixed income securities issued by capital raising entities to fund their environmentally friendly projects, such as renewable energy, sustainable water management, pollution prevention, climate change adaptation and so on."	Tang & Zang, 2020, p. 101427
„Green bonds are a financial instrument financing pro-ecological, sustainable or climate-related projects without any possible damages to the environment and the climate. In order to qualify as 'green', bonds must meet specific standards that are respected worldwide".	Sobik, 2023, pp. 287-303

Source: Authors' compilation.

Relevant research papers and reports from European and global perspectives were analyzed to determine the important determinants for developing vibrant green bond markets in Europe. During the examination process, the authors used the method of observation, analysis of source material, and a method of deduction, as aligned with Frydrych (2021).

According to Banga (2018, p. 17-32), King (2017, pp. 1645-1653), and Santiago (2020, p. 47), the development of the green bond market arguably stems from the consequences of unconventional monetary policies implemented by the world's major central banks in the aftermath of the 2008 financial crisis. The failure of monetary authorities to achieve economic recovery through accommodative monetary policies has resulted in low interest rates and a hunger for yield, especially in advanced economies. Consequently, institutional investors, such as pension funds and insurance companies, are coming under pressure to find ways of making their savings products more attractive and reduce the rising costs of pension provision in the face of falling real interest rates. Such pressure has led many institutional investors to look for new investment opportunities such as green financing and

the low-carbon transition that also match their investment horizons. As one of the major market players in the fixed-income markets, institutional investors have realized that sustainable investing can preserve wealth and provide reliable revenue streams while reducing equity market volatility. This increased sustainability call and climate awareness, matched with the low-interest rate environment prevailing in most developed countries, have led institutional investors to recognize green bonds as an appealing portfolio diversification instrument.

Since the EIB issued its first green bond in 2007, the green bond market has kept expanding and becoming a well-defined area of the fixed-income markets. The evolution and growth of this market over the last few years confirm the high potential of this new financial instrument. Therefore, in the continuation of the paper, the market of green bonds was analyzed from different perspectives.

3. Research methodology

This study uses descriptive statistics to analyze the green bond market. Our analysis focuses on green bonds, comparing their structures and performance in the global and European markets. Specifically, we examine the share of the global green bond market within the total Green, Social, and Sustainability (GSS+) bond market and compare the value of green bond issuances globally and within Europe. Additionally, we analyze the European green bond market by the type of issuer and the use of proceeds, and we will also focus on the emerging green bond market in Bosnia and Herzegovina (BiH). The analysis aims to identify barriers to developing the green bond market in BiH, assess the significance of market development, and propose measures to improve the market. Through this structured approach, we aim to provide a comprehensive understanding of the green bond market's dynamics and the challenges faced in developing regions. Furthermore, we will employ methods of analysis and deduction to conclude the collected data, ensuring a thorough examination of the market trends and challenges.

Cumulative data for the European and global green bond market from 2013 to 2023 were used to analyze the green bond market. The amounts for Bosnia and Herzegovina will be measured in BAM, while the data for the European area will be measured in USD, referring to Climate Bonds Initiative (2018). The data were collected from the following sources: Climate Bonds Initiative (CBI), Institute for Energy Economics and Financial Analysis (IEEFA), Organization for Economic Co-operation and Development (OECD), Bloomberg, S&P Global Ratings, and Banja Luka Stock Exchange (BLSE). Secondary data will be collected from these sources to conduct the analysis.

4. Results and discussion

The global market for sustainability-related use-of-proceeds bonds, including green, social, and sustainability bonds, has seen remarkable growth in recent years. Green bonds, in particular, have dominated this market, driven by the urgent need to address climate issues. This chapter analyzes the share of green bonds within the total GSS+ market, exploring the trends and underlying factors contributing to their prominence.

4.1. Global and European green bonds market analysis

4.1.1. Analysis of the share of the global green bond market in the total GSS+ market

Issuance of green and other types of sustainability-related use-of-proceeds bonds has surged in the past few years. A recent CBI analysis found that most of the volume has been from green bonds. However, social and sustainability bonds have also seen notable increases in recent years (Deloitte,

2023, p. 7) (see ***Table 4***).

Table 4: Green and other types of sustainability-related bond global issuance volume, 2019-2023 (in billion USD)

Bill. USD	Green bond	Social bond	Sustainability bond	Sustainability-linked bond	Transition bond	Total
2019	265	19	53	4	1	342
2020	308	170	137	9	3	627
2021	570	221	200	97	4	1092
2022	523	175	151	77	4	930
2023	575	181	159	66	3	984

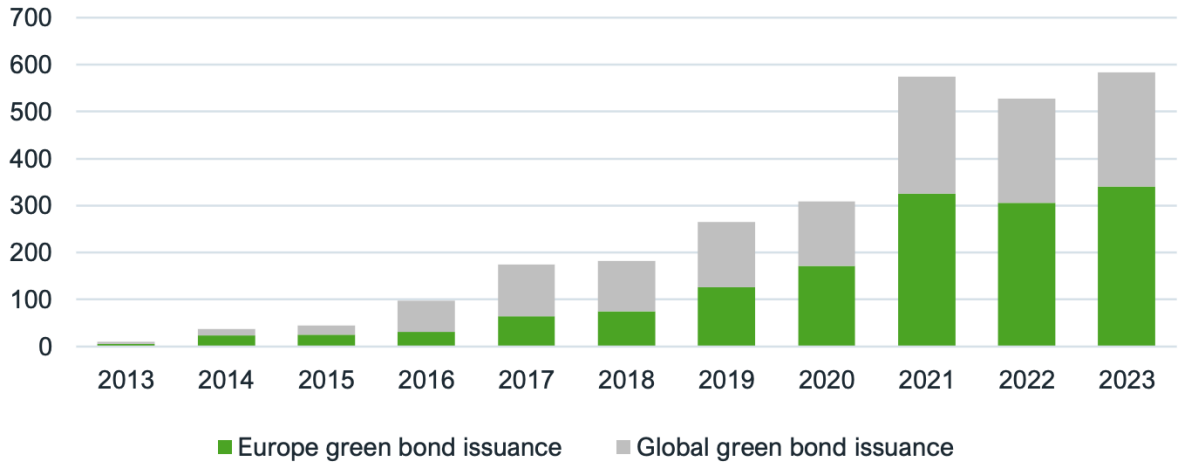
Source: S&P Global Ratings, 2024, p. 8

The prevalence of green bonds may be linked to the market's perceived climate issues as more urgent than social ones, as represented by many international initiatives such as the Glasgow Financial Alliance for Net Zero or the Paris Agreement. Moreover, climate-related action can be more easily priced if compared to social issues since, in the climate-related action field, there are straightforward metrics and impact indicators, such as reduction of greenhouse gas emissions and reduction of the risk of adverse impact of current climate conditions on economic activities (OECD, 2023).

4.1.2. Comparison of global and European green bond markets by issue value

Green bond issuance globally and in Europe has experienced a tumultuous couple of years after reaching record highs of USD 575 billion and USD 326 billion in 2021, respectively. Global issuances dropped 8% in 2022 amid tightened macroeconomic conditions, while Europe saw a milder decrease at 6%. In 2023, Europe's green bond issuance recovered 11% year on year to USD 341 billion. It slightly outperformed the global markets, which recorded 10% growth to reach USD 581 billion. Both surpassed 2021 levels, as illustrated in ***Figure 1***.

Figure 1: Europe green bond issuance vs. global green bond issuance (in billion USD)



Source: IEEFA, 2024, p. 7

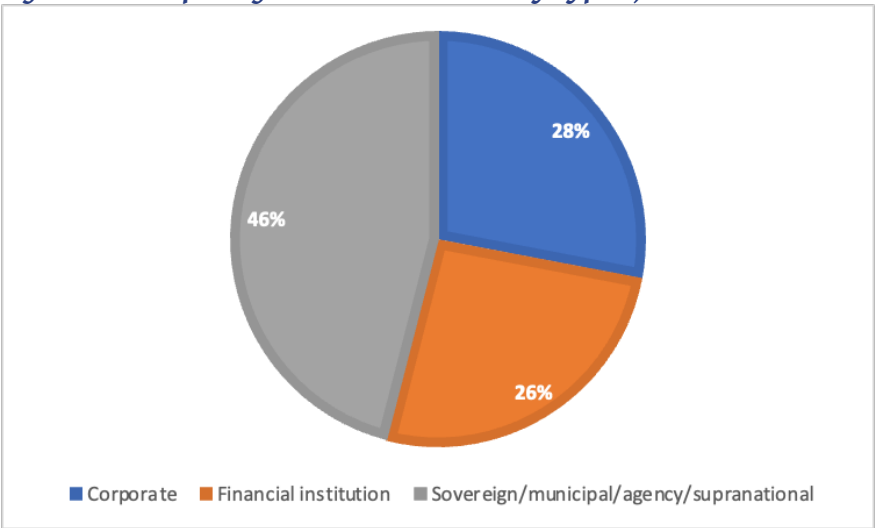
Europe remains the largest issuance region, accounting for more than half of global issuance, and is the focus of this paper. Europe's recent outperformance compared to other regions has reinforced

its position as a continued driving force in the global market.

4.1.3. Analysis of the European green bond market by type of issuers

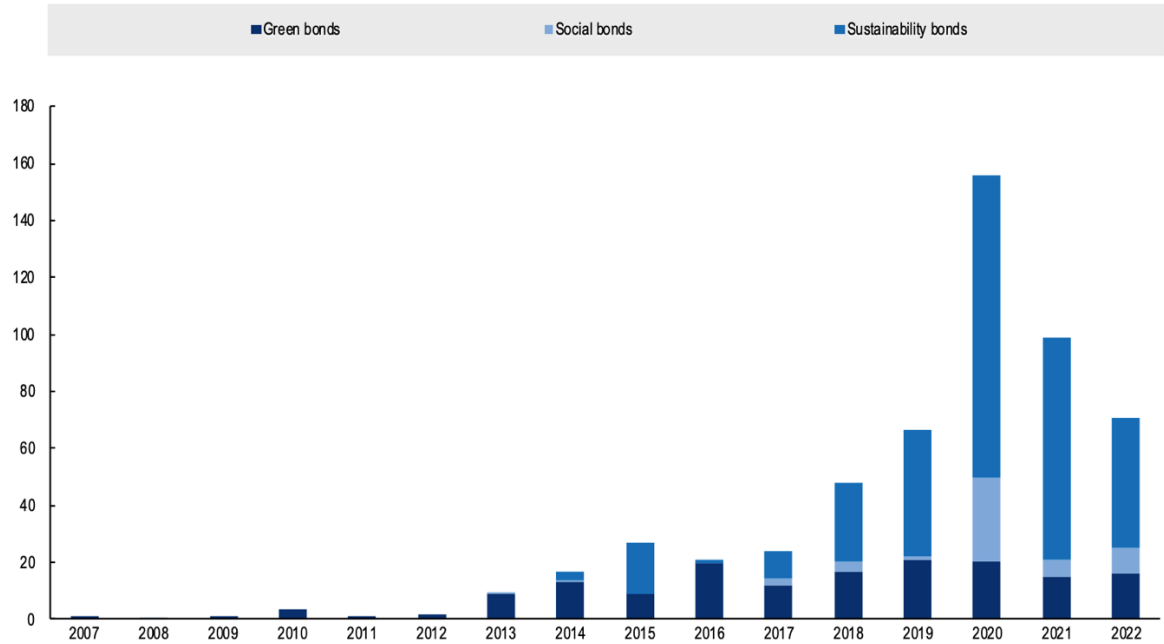
Long-term structural green bond growth will likely be driven by all broad issuer types, as achieving climate goals requires all market participants to act. Given the size of the climate funding gap, a sustainable share of the investment must come from private finance. However, the role of public finance will remain vital as a catalyst. This is illustrated in ***Figure 2***, where the dominance of the public sector in the issuance of green bonds in Europe can be seen in 2023.

Figure 2: European green bond issuance by type of issuers in 2023



Source: IEEFA, 2024, p. 8.

Figure 3: MDBs GSS bonds issuance, 2007-2022 (in billion USD)



Source: OECD, 2023, p. 14.

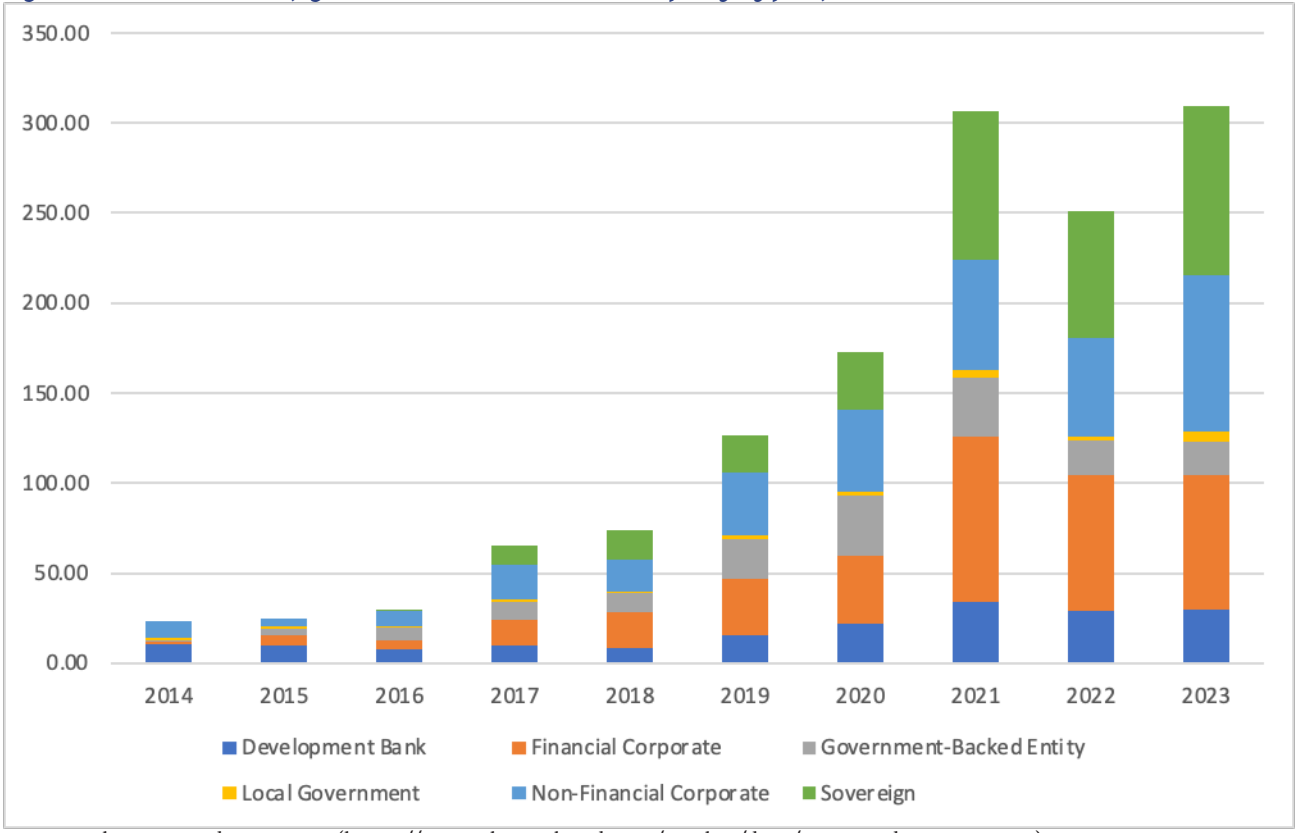
According to the OECD report (2023, p.14), in the green bonds market, MDBs were the sole issuers until 2012. From a conceptual point of view, MDBs have played a multifaceted role in the green, social, and sustainability bond market. GSS bond issuance by MDBs has grown consistently over

the years, while market shares have greatly varied mainly because of the different types of issuers entering the market. MDBs now comprise a small share of the green bonds market, dominated by corporates. At the same time, they still make up a significant fraction of recent social and sustainability bonds issuances, as these two market segments are still in an early stage of development. Volumes confirm the substantial role of MDBs in GSS markets. ***Figure 3*** shows self-reported GSS bond issuance of multilateral development banks in 2022 adjusted USD billions (OECD, 2023).

As ***Figure 3*** shows, green bonds were issued more frequently by MDBs than their social counterparts. The main reasons can be attributed to the more extended existence of the green bond market than social bonds. General and MDBs' social bond issuance increased rapidly during the COVID-19 pandemic because of emergency needs for economic support in distressed times. It is now consolidating its presence in GSS bond issuer's balance sheets regardless of Covid-19 (OECD, 2023). MDBs can pool capital to green projects and provide credibility and anchor support to other green or sustainable bond issuers, especially in emerging markets and developing economies.

Indeed, a market pioneered by large development banks came from issuers different than multilateral development banks. Consequently, an even broader group of investors started being attracted by green bonds, such as asset managers, pension funds, companies, foundations, and religious organizations (IEEFA, 2024). Between 2010 and 2014, USD 57.9 billion in labeled green bonds were issued globally, with USD 36.6 billion just in 2014. It was the first year with prominent corporate participation, representing 33% of 2014's total issuance. From 2014 onwards, the green bond market experienced significant growth, as Santiago (2020) noted. This can be seen in ***Figure 4***, where the volume of emissions by type of issuers in Europe is shown.

Figure 4: The volume of green bond issuance in Europe by type of issuers (in billion USD)



Source: Climate Bonds Initiative (https://www.climatebonds.net/market/data/, Accessed: May 25, 2024)

Consistent with trends observed in 2022, the corporate sector drove the green volume in 2023, contributing to 57% of the total issuance. Non-financial corporate issuers contributed 29% of the 2023 market share spread over 692 aligned green instruments, amassing USD 171.8 billion. Financial

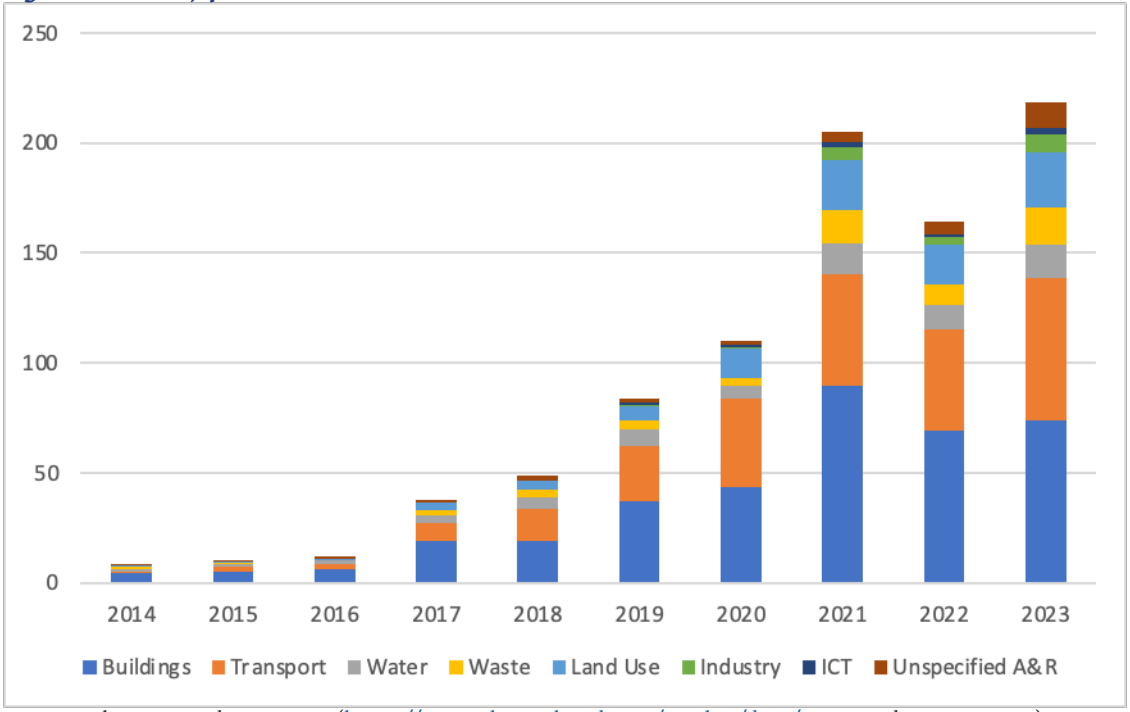
corporates emerged as the second-largest issuer type with a 28% share of aligned green volumes. Sovereigns will likely continue issuing green bonds to fund their intervention and incentive subsidies, research and development support, public infrastructure and building decarbonization, and other expenditures to achieve their Nationally Determined Contributions. For example, the governments of France, Germany, the UK, and Italy were among the top 10 global green bond issuers in 2023, and are among the top 10 globally of all time.

Corporate issues in Europe are dominated mainly by the energy, utilities, automotive, transport, and building sectors, which have been dependent on fossil fuels. Despite still navigating the current high-interest rate environment, corporate issuers will continue to require financing to support their environmental strategies and energy transition plans. Financial institutions, especially banks, act as both issuers and arrangers of green bonds. They are expanding their green financing capabilities to channel private capital toward net-zero goals, partly supported by issuing green bonds themselves. Increasing pressure on financial institutions to decarbonize their facilitated emissions – beyond financed emissions – will also incentivize them to increase their green capital market underwriting capabilities and advisory services to help corporate issuers implement green financing strategies (IEEFA, 2024). This will support the overall growth of the green bond market.

4.1.4. Analysis of the European green bond market according to use of proceeds

Investment in low-carbon buildings and energy efficiency projects continued to be the most common green projects financed by the utilization of the bond proceeds. However, this sector declined in 2022 compared to 2021, followed by growth in 2023. Investment in the transport sector was the second most important item after investment in buildings and energy efficiency, and among the less important were water, waste, land use, industry, ICT, and unspecified A&R (see ***Figure 5***).

Figure 5: Use of proceeds (in billion USD)



Source: Climate Bonds Initiative (https://www.climatebonds.net/market/data/, Accessed: May 25, 2024)

4.2. Green bond market in BiH

The green bond market in BiH can be said to be emerging. It started in 2023, when the first issue of green bonds was announced on the local capital market. Viewed from the perspective of previous

analyses, the issue of green bonds on the BiH capital market represents an issue by a private institution from the financial sector and specifically has the characteristic of "ESG bonds." Therefore, green bonds issued by financial institutions are the only type of green bonds on the BiH capital market.

The first financial institution in the Western Balkans region that announced a public call for registration and payment of the first issue of green (more precisely, ESG) bonds on the local (Banja Luka) stock exchange is Naša Banka ad Banja Luka in October 2023. The expected effects were the strengthening and dispersion of the credit portfolio, as well as the strengthening of the bank's position in the financial services market in general, as well as meeting the needs of clients in the BiH market, as well as the application of ESG principles in the bank's operations. Naša banka and Banja Luka realized two issues of green bonds; the issues' terms are listed in the following two tables, ***Table 5*** and ***Table 6***.

Table 5: Conditions for the first issue of green (ESG) bonds of Naša banka ad Banja Luka

Characteristic	Explanation
Number of issued bonds	70,000
Individual face value	100.00 BAM
Total face value	7,000,000.00 BAM
Issue currency	BAM
It will be due	7 (seven) years
Method of payment of principal and interest	In the first two years, only interest will be paid semi-annually (grace period). After that, the principal and interest will be paid in equal semi-annual annuities for the remaining five years.
The amount of the interest rate	5.15%
Deadline for payment of principal and interest	Suppose the Validator, after the performed validation, determines that the Issuer has met the objectives stipulated in the Decision on the first issue of ESG bonds through a public offer. In that case, the interest rate will not change until the maturity of the first issue of ESG bonds, i.e., it will be 5.15% on an annual basis. Suppose the Validator, after the performed validation, determines that the Issuer has not met the goals stipulated in the Decision on the first issue of ESG bonds through a public offering. In that case, the interest rate is increased by 0.20 percentage points, that is, from the next annuity (from the eighth annuity) it will be 5.35% until the maturity of the first issue of ESG bonds.

Source: https://cms.blberza.com/api/files/cms2/docver/107983/files/NA%c5%a0A%20BANKA_Jedinstveni%20prospekt%20prve%20emisije%20ESG%20obveznica_f.pdf, Accessed: May 18, 2024

The issuer will place the funds collected through this bond issue for the approval of loans for products related to sustainable development, i.e., as a priority with the reduction of CO2 emissions, and, in connection with this, two credit products are planned that will be financed with the funds collected through this issue:

- Long-term loan for financing products that result in the reduction of CO2 emissions for individuals and
- Long-term loan for financing products that result in the reduction of CO2 emissions for legal entities.

The purpose of these loans is, among other things, related to the purchase of heat pumps, solar

panels, and electric cars, as well as all other purposes that lead to the reduction of CO2 emissions, with the possibility of refinancing invoices for fixed assets and equipment paid for a maximum of 12 months from the date of credit application. The expected effects are the strengthening and dispersion of the credit portfolio, as well as the strengthening of the bank's capital position to realize the projected growth of the bank, the strengthening of the issuer's position on the market of financial services in general, meeting the needs of clients processed by the issuer on the market of BiH, as well as involvement in the application of ESG principles into the issuer's operations.

Table 6: Conditions for the second issue of green (ESG) bonds by Naša Banka ad Banja Luka

Characteristic	Explanation
Number of issued bonds	42,000
Individual face value	100.00 BAM
Total face value	4,200,000.00 BAM
Issue currency	BAM
It will be due	7 (seven) years
Method of payment of principal and interest	In the initial period of the first five years, only interest will be paid semi-annually (grace period). After that, the principal and interest will be paid in equal semiannual annuities for the remaining two years.
The amount of the interest rate	5.25%
Deadline for payment of principal and interest	Suppose the Validator, after the validation, determines that the Issuer has met the CO2 reduction goal stipulated in the Decision on the second issue of ESG bonds. In that case, the interest rate will not change until the maturity of the second issue of ESG bonds, i.e., it will be 5.25% annually. Suppose the Validator, after the validation, determines that the Issuer has not met the CO2 reduction goal stipulated in the Decision on the second issue of ESG bonds. In that case, the interest rate is increased by 0.20 percentage points, i.e., from the next annuity (from the eighth annuity), it will be 5.45 % until the maturity of the second issue of ESG bonds.

Source: https://cms.blberza.com/api/files/cms2/docver/108596/files/Jedinstveni%20prospekt%20druge%20emisije%20obveznica.pdf, Accessed: May 18, 2024

By raising funds through the issuance of ESG bonds, the issuer wishes to perform optimal liquidity management by providing stable and long-term sources of financing in local currency, as well as to ensure further diversification of sources of funds for its business, while also wishing to make its contribution to the development of the capital market in BiH entity of Republic of Srpska and to contribute to the reduction of CO2 emissions. Therefore, the issuance of green bonds will represent sources of financing for other market participants. Moreover, credit institutions' issuance of green bonds encourages the development of green financing practices and other green financial instruments. This is where the role of banks as critical suppliers of capital changes under the conditions of a bank-centric financial system, like the one present in BiH (Ibrić, 2024It is precisely this bank-centricity that shows us that bank products, in the form of loans, are the most common source of financing for the economy, i.e., corporate sector, while issues of corporate bonds in BiH are very little represented on the capital market.[1]

4.3. Barriers to the green bonds market development – the case of BiH

Obstacles to the development of the green bond market, problems for issuers and investors, and

1 https://www.ekapija.com/en/news/4658799/green-bonds-have-arrived-on-the-bih-market-what-are-they-for,

issues in the external review market exist. According to Sobik (2023), barriers to the development of the green bond market can be divided into two groups: institutional barriers (institutional barriers) and market barriers, as shown in ***Table 7.***

Table 7: Primary barriers to the green bonds market development

Institutional barriers	Market barriers
The lack of a unified standard for issuing green bonds	The small size of emissions
A uniform standard for reporting to investors	Currency risk
Legal risk	High transaction costs
Regulatory uncertainty and political instability regarding energy and climate policy	

Source: Banga (2018, p. 20) & Sobik (2023, p. 297)

In addition to the barriers to the development of the green bond market (barriers to the green bond market development), the European Commission states that a barrier is related to a lack of investable projects and assets. Furthermore, it is considered that these barriers can lead to consequences such as (EPRS, 2022):

- Potential future market disruption from greenwashing,
- Note enough high-quality green bonds being issued compared to market demand,
- There is a risk that not enough investment will be channelled toward projects with a substantial impact.

Considering the expected growth of the green bond market, these vulnerabilities are also likely to grow. They may increase the risk of high-impact/visible greenwashing incidents creating severe reputational problems. The bond market in Bosnia and Herzegovina is still relatively small compared to Western Europe. Nevertheless, there is space for development following the development of the BiH financial market and economy in the coming years. The lack of appropriate institutional arrangements for green bond management, the issue of minimum size, and high transaction costs associated with issuing green bonds are the key barriers to the development of green bonds in developing countries.

4.4. The importance of the development of the green bond market

Some authors (e.g., Tang & Zhang, 2018; Santiago,2020) argue that from the issuers' perspective, green bonds can expand the breadth of ownership, enlarge their investor base, and potentially obtain a lower cost of capital and longer tenor compared with straight conventional bonds. For investors, green bonds may satisfy their green mandate and boost their ESG score. The green label makes it simple for institutional investors, who have increasingly made climate change commitments, to identify green investment. Bonds are also appropriate vehicles to tap into their extensive capital holdings at scale. For example, green bonds, primarily to finance infrastructure, can offer long-term maturities, being a good fit with institutional investors' long-term liabilities and allowing asset-liability matching.

5. Concluding remarks and recommendations

This study analyzes the European green bond market from various perspectives. Issuance of green and other types of sustainability-related use-of-proceeds bonds has surged in the past few years. A

Accessed: May 26, 2024

recent CBI analysis has found that most of the volume comes from green bonds, although social and sustainability bonds have also noted increases in recent years.

Europe remains the largest issuance region, accounting for over half of global issuance. Green bond issuance globally and in Europe has experienced a tumultuous couple of years after reaching record highs of USD 575 billion and USD 326 billion in 2021, respectively. Global issuances dropped 8% in 2022 amid tightened macroeconomic conditions, while Europe registered a milder decrease at 6%. In 2023, Europe's green bond issuance recovered 11% year on year to USD 341 billion. It slightly outperformed the global markets, which recorded 10% growth to reach USD 581 billion. Long-term structural green bond growth will likely be driven by all broad issuer types, as achieving climate goals requires all market participants to act. Consistent with trends observed in 2022, the corporate sector drove the green volume in 2023, contributing to 57% of the total issuance. Non-financial corporate issuers contributed 29% of the 2023 market share spread over 692. Financial corporates emerged as the second-largest issuer type with a 28% share of aligned green volumes. Sovereigns will likely continue issuing green bonds to fund their intervention and incentive subsidies, research and development support, public infrastructure and building decarbonization, and other expenditures to achieve their nationally determined contributions. Corporate issuers in Europe are dominated mainly by the energy, utilities, automotive, transport, and building sectors, all of which have historically been dependent on fossil fuels.

Analysis of the capital markets in BiH indicates that the green bond market is emerging, and it started in 2023, when the first issue of green bonds was announced on the local capital market (i.e., Banja Luka Stock Exchange). Given that a commercial bank participated in both issues of green bonds, green bonds issued by a financial institution are the only type of green bond on BiH's capital markets. The value of issues on the green bond market in BiH was BAM 11.2 million.

The lack of appropriate institutional arrangements for green bond management, the issue of minimum size, and the high transaction costs associated with issuing green bonds are the key barriers to developing green bonds in developing countries. To cope with these challenges, referring to research findings from Bang (2018, pp. 30-32), we suggest the use of multilateral and national development banks as intermediary institutions for managing local green bonds. Furthermore, local governments are required to provide local green bond issuers with guarantees aimed at covering the transaction costs associated with green bond issuance.

Declarations

The authors have no relevant financial or non-financial interests to disclose. The data are available upon a reasonable request from the corresponding author.

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