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Unlocking trends in green bonds: Navigating opportunities and challenges for sustainable development in E7 countries

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Abstract
Green bonds have become a cornerstone of financing environmentally friendly projects and driving global sustainability. This study investigates the adoption of green bonds within emerging economies, focusing on seven emerging economies - Brazil, Indonesia, Mexico, Russia, China, India, and Turkey. Although globally, the green bond market flourishes, emerging economies face a unique set of regulatory and market hurdles hindering the growth of sustainable finance. Macroeconomic instability, underdeveloped bond markets, and lingering regulatory uncertainties act as structural impediments. Moreover, concerns like gaps in information disclosure, limited investor awareness, and the constant threat of "greenwashing" call for constant vigilance. Despite these challenges, the study reveals encouraging patterns. China has a thriving green bond market that is supported by favourable regulatory environments and attractive investor incentives. In a similar vein, tax advantages encourage investment in Mexico's green bond market, which shows promising growth. However, disparities persist across nations, with some struggling due to immature legal frameworks and policy inconsistencies. Nevertheless, the study proposes policy recommendations that can be implemented to unlock the full potential of green bonds and bolster their role in sustainable development. Encouraging policy coherence and addressing institutional barriers are essential steps in realizing this potential. By overcoming these obstacles, emerging economies can make significant contributions to global environmental goals and lay the foundation for a more sustainable future. The research provides valuable insights for policymakers, investors, and stakeholders, facilitating informed decision-making and driving the transition towards a more resilient and sustainable global economy.

Keywords: Green Bonds, E-7 Economies, Sustainable Development, Climate Finance, Environment

Introduction
The global pursuit of economic progress has frequently disregarded the importance of environmental sustainability. As nations strive for technological advancement and growth, they also grapple with the repercussions of environmental degradation, compounded by climate change (UNESCO, 2011) [42]. In response to this, the concept of sustainable economic development has emerged as a critical imperative, seeking to harmonise economic prosperity with environmental stewardship. Central to this paradigm is the notion of "greening" the economy, a concept underscored by the emergence of innovative financial instruments such as green bonds (Jin *et al*., 2020) [23]. Green bonds represent a significant departure from traditional corporate finance, earmarking funds specifically for environmentally and climate-friendly projects (Reboredo & Ugolini, 2020) [34].

In recent years, the emergence of green bonds has marked a significant paradigm shift in corporate finance. These bonds, specifically dedicated to funding climate-friendly projects such as renewable energy generation, green construction, and resource conservation, represent a proactive response to the pressing challenges posed by climate change (Flammer, 2021) [15]. However, as this sector experiences rapid growth, it faces multifaceted challenges and inquiries into companies' core objectives, the delicate balance between profitability and sustainability, and the trade-offs between economic growth and environmental protection (Gilchrist *et al*., 2021) [16].

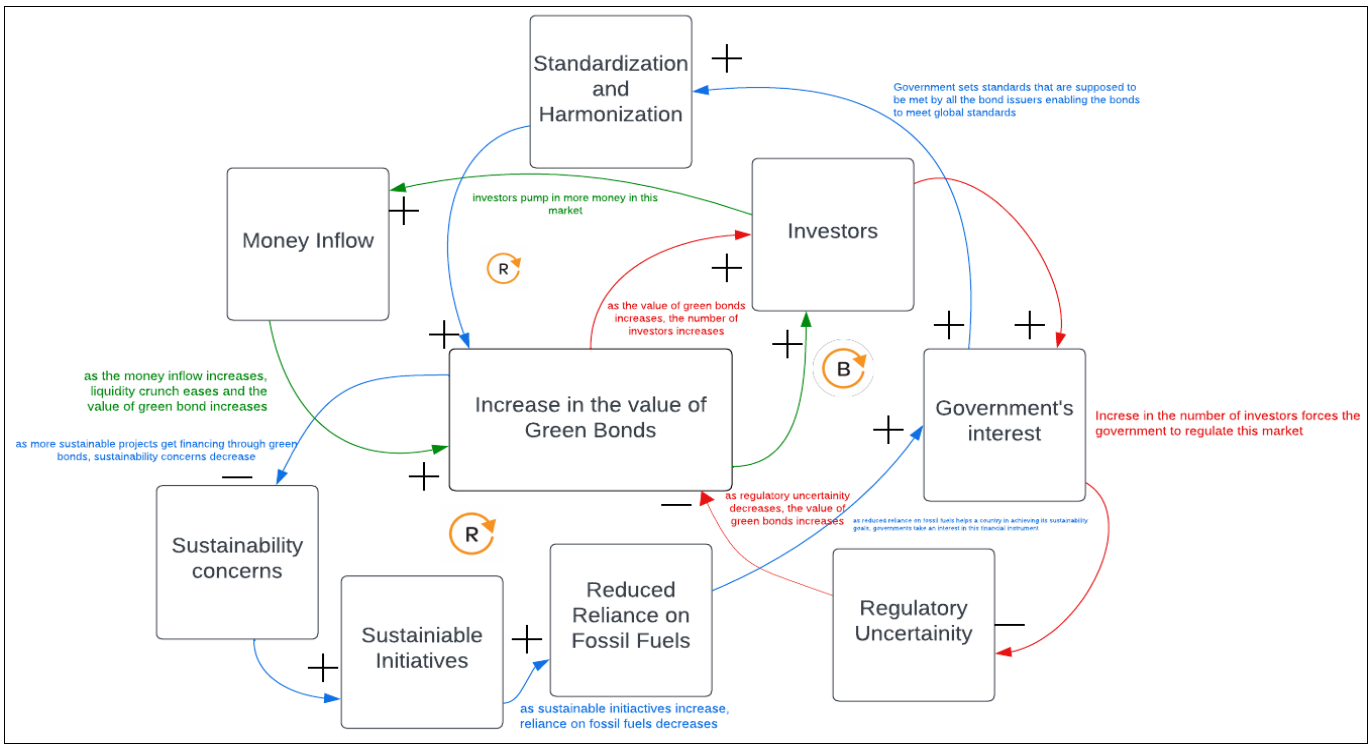
The proliferation of green bonds, alongside other bonds such as sustainability and social bonds, over the past decade underscores a broader global trend towards sustainable finance (Maltais & Nykvist, 2020) [28]. This trend is largely driven by increasing awareness and policy focus on environmental issues, particularly in regions like Europe, which are striving to meet ambitious climate targets outlined in the Paris Agreement (Fatica & Panzica, 2021) [13]. In response to these regulations, imperatives and initiatives to bolster green bond markets are gaining momentum, highlighting their significant potential for further expansion and impact (Fatica & Panzica, 2021) [13].

Governments and corporations are increasingly turning to green bonds as a means to fund environmentally friendly projects (Al Mheri & Nobanee, 2020) [2]. Despite challenges such as high transaction costs, green bonds offer solutions with long-term environmental benefits, thereby enhancing sustainable business operations (Al Mheri & Nobanee, 2020) [2].

Our research focuses on the group of seven emerging economies comprising Brazil, India, China, Indonesia, Russia, Mexico, and Turkey. These countries not only possess significant growth potential but also wield collective influence on the global stage (Monk & Perkins, 2020) [29]. Monk and Perkins reveal three pivotal factors driving the rise and spread of green bonds within these economies: proactive efforts by intermediaries and entrepreneurs, reinforcing processes like learning and legitimization, and favourable contextual developments (Monk & Perkins, 2020) [29].

Despite the promising trajectory of green bonds, challenges persist in their widespread adoption and impact (Shishlov *et al*., 2018) [39]. Government intervention may be necessary to align investments with climate objectives, a delicate balance must be struck between public support and economic viability (Shishlov *et al*., 2018) [39]. The UN Environment Report suggests that the financial system and government play a critical role in promoting green financing, which in turn affects how the public and organizations act when making investments (UNEP, 2015) [41]. The ICMA claims that they encourage openness and disclosure of all information pertaining to the issuing of green bonds. They facilitate the efficient operation of the green bond market and contribute to investors' increased confidence in the functioning of the green bond market in India (ICMA, 2023) [19]. The promotion of sustainable agricultural practices is necessary and this can be achieved through measures like effective credit support, institutional development, and other innovative initiatives (B S, 2021). Strengthening dialogue between policymakers and market stakeholders is deemed crucial for advancing sustainable development goals (Shishlov *et al*., 2018) [39].

From an investor perspective, green bonds offer unique advantages in bridging the gap between lengthy green projects and short-term investment perspectives. Their divisibility, fungibility, standardisation, and provision of fixed income make them attractive investment vehicles for aligning portfolio objectives with long-term sustainability goals (Demary & Neligan, 2019) [7].



(**Source:** Author's Observations)

The "greenium" associated with green bonds varies depending on market conditions. For instance, regulatory uncertainty may deter investor interest, but government intervention can instil confidence and attract investment. Additionally, as sustainability becomes a more pressing concern, demand for financing in this sector rises, leading to increased issuance of green bonds. This cyclical pattern drives growth within the sector as a whole.

While the market for green bonds in emerging countries is still developing, there is a growing interest from investors looking to support sustainable projects in these regions. One of the initiatives was undertaken by the International Finance Corporation (IFC), a World Bank Group member, invested 325 million US dollars to establish the Green

Cornerstone Bond Fund (IFC-Amundi Joint Report, 2023) [21-22] in order to purchase green bonds produced in emerging nations.

By investing in green bonds issued by emerging market entities, investors can not only invest in sustainable financing options but also benefit from potential financial returns. As awareness of environmental issues continues to grow worldwide, green bonds in emerging countries are expected to play an increasingly important role in driving sustainable development and combating climate change. Despite the promising trajectory of green bonds in the E7 markets, challenges persist in their widespread adoption and impact. Our research identifies key barriers to their proliferation and assesses the role of policy in fostering the growth of green bond markets. By providing useful insights, we aim to facilitate recommendations among policymakers, investors, and stakeholders, accelerating the transition towards a more sustainable and resilient future.

Literature Review

Green finance, as defined by the IFC in 2009 [20], encompasses investment instruments aimed at fostering social equity, environmental preservation, and economic prosperity (IFC, 2009) [20]. Various green finance options exist, including green credit (loans), which provide short to medium-term financial support for startups, small enterprises, and multinational organisations to develop eco-friendly products and technologies (Díaz-García *et al*., 2015) [8]. Long-term green investment accounts, offered by banks, facilitate the accumulation of funds to support sustainable investments in agriculture and other environmentally impactful sectors (He *et al*., 2015) [18]. Additionally, carbon finance products contribute to emissions reduction by financing projects such as biogas plants, solar panels, and waste disposal facilities, thereby mitigating greenhouse gas emissions (Esposito *et al*., 2018) [12].

For institutional investors like pension funds and insurance companies, green bonds represent a financial innovation aimed at promoting environment-friendly investment options. They enhance liquidity in infrastructure assets, potentially increasing sustainable infrastructure investments from institutional investors (Bhattacharya *et al*., 2015; OECD, 2015) [4, 31]. While green bonds play a crucial role in sustainable development, their market remains nascent, primarily dominated by affluent nations. The growing urgency to transition towards sustainable energy requires a significant influx of capital, with green financing instruments expected to facilitate this transition. Green bonds have seen substantial growth, reaching a $1.5 trillion market by H2-2021, with both corporate and sovereign issuers participating. The adoption of market-driven labelling frameworks has fostered transparency, and initiatives by regulators and policymakers are expected to further promote green bonds. Despite their potential, challenges remain, especially in sectors with unclear paths to decarbonization, leading to the emergence of alternative labels like Sustainability Bonds and Sustainability-Linked Bonds/Loans (SLB/SLL) to broaden financing options. These instruments, particularly relevant for the energy sector, offer financial incentives tied to decarbonization targets, yet face challenges such as heterogeneous key performance indicators and the lack of sector benchmarks (Maino, 2022) [27]. Dwivedy and Sharma's research explores the emergence and impact of green bonds, financing climate-friendly projects. They delve into their increasing popularity, termed the "green bond boom," and evaluate their financial and environmental effectiveness (Dwivedy & Sharma, 2023) [10]. Alamgir and Cheng's study examines the direct impact of green bonds on emissions and renewable energy, spanning globally. They offer valuable insights for future sustainability strategies and policy-making, suggesting green bonds' potential to finance environmentally sustainable projects (Alamgir & Cheng, 2023) [1]. Although the market for green bonds has expanded over the past ten years, it has not yet reached its full potential (Wiśniewski & Zieliński, 2019) [44]. According to Ehlers and Packer (2017) [11], the increased demand for these bonds demonstrates investors' involvement in and support of environmentally friendly projects. However, challenges like greenwashing persist due to the lack of standardization. To address financial barriers hindering green finance in their countries, governments should incentivize private investment and central banks should harmonize standards, promoting investor confidence through credible certification systems (Ntsama *et al*., 2021, & Bužinskė & Stankevičienė, 2023) [30, 5].

The urgency of climate change necessitates a transition to a green economy. Climate finance markets, exemplified by green bonds, fund low-carbon projects and align with environmental mandates. Weber and Saravade explore the growth and impact of the green bond market, addressing challenges and advocating for standardisation. They provide policy recommendations for regulators, governments, and issuers to ensure market sustainability and effectiveness in mitigating climate change risks (Weber & Saravade, 2019) [43]. Gilchrist, Yu and Zhong review the challenges and opportunities in green finance. They examine issues like inconsistent assessments of corporate greenness and data availability. Positive outcomes from pressuring companies to invest in green activities are acknowledged, but challenges in defining 'green' and addressing endogeneity persist (Gilchrist *et al*., 2021) [16]. Monk and Perkins address the dearth of knowledge on environmentally oriented financial products and examine factors shaping the emergence of green bonds. They emphasize integrating different conceptual approaches for understanding financial innovation and highlight the role of public and non-state actors in catalyzing supply and demand (Monk & Perkins, 2020) [29]. Challenges like organisational arrangements and transaction costs hinder their effectiveness. Addressing these limitations is essential for green bonds to significantly aid sustainability (Al Mheri & Nobanee, 2020) [2]. While green bonds are designated for green initiatives and have characteristics that make them different from conventional bonds, investors can still reduce their direct exposure to project risks by utilising the access to issuer's complete balance sheet (Maltais & Nykvist, 2020) [28]. However, when compared to conventional bonds, the yield of green bonds is comparatively lower. Yet, due to their sustainable nature, green bonds are growing in demand. Shishlov, Moren and Cochran delve into opportunities and hurdles in the green bond market, stressing the need for environmental integrity and enhanced impact. Challenges include defining 'greenness' and ensuring reliability of information. Governments may intervene to provide guidance or regulations. Additionally, efforts to stimulate a net increase in green investments through green bonds face hurdles,

suggesting potential need for targeted public support aligned with climate objectives. Broad dialogue between stakeholders is deemed crucial for market enhancement (Shishlov *et al*., 2018) [39].

The existing literature has emphasised the importance of green bonds all over the world but the development of green bonds in E7 countries are still in their infancy. The rate of green bonds is influenced by a number of factors. For example, the issuance of green bonds raises the issuer's credit rating, which lowers the capital cost of the bonds. This emphasises that green bonds can help increase the value of a firm. This study seeks to bridge the gap by identifying the challenges hindering the growth of green bonds in E7 countries

Emerging nations are getting closer to financial stability. But as they have developed, their ecological footprints have grown, making the industries of the E7 countries more competitive in the low-carbon market. Therefore, in order to protect the environment, it is crucial to determine the elements that influence a nation's ecological footprint (EF) (Liu *et al*., 2022) [26].

This study aims to add to the body of existing literature by providing a thorough analysis that is unique to the E7 nations in the context of bond formation. The reasons impeding competitiveness will continue to change as countries negotiate the benefits and constraints presented by the growth of green bonds; therefore, more study in this field is crucial for sustainable development and well-informed policymaking.

Current Status of Green Bonds in E7 Countries

Green Financing plays a crucial role in building a climate-resilient nation by investing in projects that result in environmental benefits. Green bonds are one of the most significant growth opportunities in the emerging capital markets today. The green bonds were first issued by the European Investment Bank and the World Bank in 2007 and since then their issuance has demonstrated significant increased growth (Elena & Aleksei). Currently, the demand for green bonds is high among the investors as they focus on earning returns with the objective of maintaining goodwill.

Country	First Issue	Issued by
Brazil	€ 500 million	BRF S/A
China	USD 300 million	ABC
India	5 Billion INR	YES Bank
Indonesia	USD 150 million	OCBC NISP Bank
Mexico	USD 165 million	FIRA
Russia	RUB 250 million	RSB KHMAO LLC
Turkey	USD 300 million	TSKB

(**Source:** World Bank)

As of the most recent assessment, the status of green bonds in the Emerging 7 (E7) economies-comprising Brazil, China, India, Indonesia, Mexico, Russia, and Turkey-reflects a growing trend towards sustainable finance, albeit with variations in adoption and implementation across different countries.

Brazil: Brazil, with its rich biodiversity and environmental challenges, has seen efforts to leverage green bonds to finance projects aimed at conservation and sustainable development. The Brazilian Green Bonds market is the largest in Latin America with the issue of both domestic and international green, transition and sustainable bonds worth USD 9 million approximately as of September 2019 (GIZ, 2020) [17].

The Brazilian economy has demonstrated a positive growth trend with the country recording the year 2019 with the issue of 16 bonds, thus raising USD 3.1 million. Even during the pandemic, 13 bonds were issued which further display the strong yet stable position of its market. The Brazilian Development Bank has been playing a predominant role by extending credit facilities for the acquisition of sustainable goods and services. Its green finance market has prospects for growth as the country has benefited from the increased supply of its financial resources and this can further reduce operating costs and mitigate risks (GIZ, 2020) [17].

China: China, in particular, has established itself as a global leader in green bond issuance, with robust regulatory frameworks and a growing investor base. Among the E7 nations, China is the leading country in green bonds issuance because of its government's strong vision to develop a green financing system. The Chinese Green Bond Market is the second largest and the fastest growing market in the world, particularly, because of its highest volume of green bond issuances (CBI 2022, (Organization for Economic Cooperation and Development (OECD), 2023) [33].

As per the IFC's Emerging Market Green Bonds Report 2023, China is the only country among the E7 countries to increase the issuance of green bonds in its domestic market and thus, has been dominating the overall emerging market since over a decade (IFC-Amundi Joint Report, 2023) [21-22]. According to CCDC Research, in 2019, China issued labelled green bonds amounting to RMB 386.2 billion in both the domestic and international market and by the end of the year, the china's domestic green bond market had a total outstanding amount of RMB 977.2 billion. Because of China's significant global position, there was a rapid expansion in its green bond market thus facilitating investments in its energy and transport sectors and paved the way for it to become a low carbon green economy (Lin Lin & Hong, 2022) [25].

India: India stands out as a leader in the issuance of green bonds among the E7 economies. It has made significant strides in promoting green finance and integrating sustainability into its economic agenda. Globally, India ranked as the 8th highest issuer country of green bonds in the year 2017 though it's position fell to 12 in the year 2018 due to economic events. Despite this, there was a significant increase in the quarterly domestic issues and were only negatively impacted due to the macroeconomic factors. In the initial stages of the green bond market, private issuers led the market growth and later, in 2017, public issuers overtook the same as the public issuances rose to USD 3 billion compared to the USD 2 billion private issuance, thus indicating the transition to a publicly-driven market (Saravade & Weber, 2020) [37].

India has witnessed an uptick in green bond issuance, supported by government initiatives and increasing investor interest (IFC-Amundi Joint Report, 2023) [21-22]. The cumulative total issuances in the Indian Green Bond Market stood at USD 7.827 billion between 2015-2017. Though this market faces various challenges such as higher transaction limit, issuer participation, greenwashing which requires market standards and ecosystem, reporting costs resulting from SEBI's disclosure guidelines etc. (Saravade & Weber, 2020) [37].

Indonesia: Indonesia, while facing unique environmental and economic challenges, has started to explore opportunities in green finance. It has demonstrated a commitment to sustainable development, albeit with varying degrees of progress in the issuance of green bonds. The Finance Ministry, GoI, made a provision to put the proceeds of 2018 Green Sukuk amounting to USD1.25 billion exclusively in eligible green projects which would be selected on the basis of Green Bond and Green Sukuk Framework. Efforts in Indonesia have focused on addressing environmental issues such as deforestation and biodiversity conservation (UNDP Indonesia, 2018) [40].

Mexico: Mexico, being the most developed Latin American economies, has shown promising developments in the green bond market by transforming to a low carbon and climate resilient economy in recent years. It has made strides in renewable energy and environmental conservation, reflected in the issuance of green bonds to support these initiatives (Organization for Economic Cooperation and Development (OECD), 2023) [33]. The first green bond was issued in the year 2015 to fund wind energy generation projects in Mexico (Lovells 2019). The sovereign issues of GSS Bond have resulted in strong market growth in Mexico. The Mexican Green Bonds Market reported the outstanding volume in the green bond issues to USD 6.6 billion as of September 2017 (Organization for Economic Cooperation and Development (OECD), 2023) [33].

This market has benefited immensely because of a stable political environment and favourable macroeconomic factors and thus is viewed as liquid and profitable. However, there lies a number of challenges which need to be tackled effectively in order to facilitate the mainstreaming of the green bonds. Measures such as development of comprehensive climate finance strategy, enhancement of policy incentives and transparency, building conducive policies etc. would further increase opportunities and result in the growth of its financial market at a faster pace (SEB, 2018) [38].

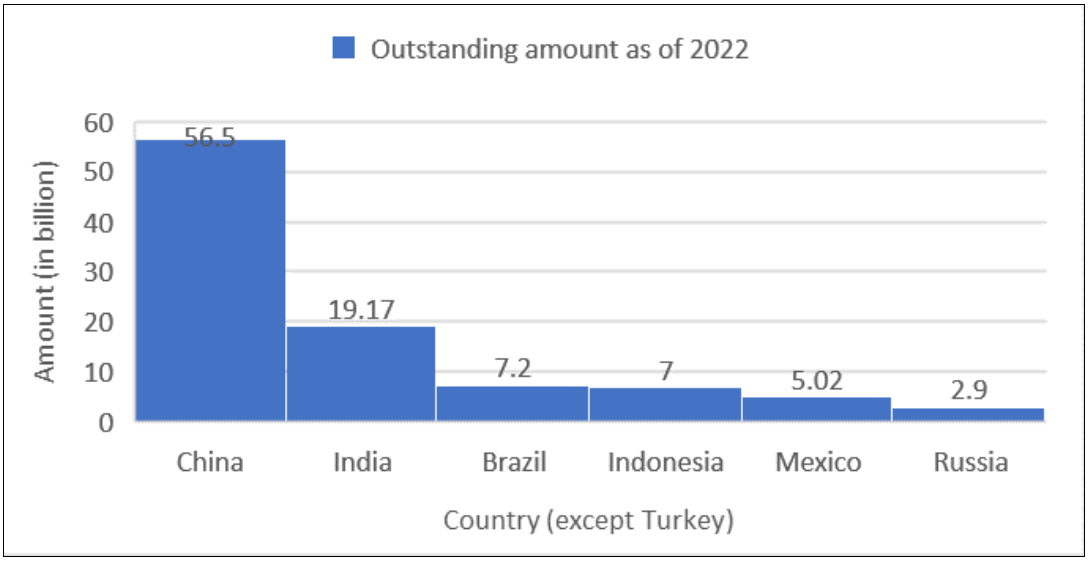
Russia: Russia, with its vast natural resources and complex economic landscape, has shown limited activity in green bond issuance compared to other E7 economies. The first issue of Green Bonds took place in the year 2018 when RSB KHMAO LLC listed its bonds on the Moscow Stock Exchange with the purpose of creating a landfill for the processing of MSW (Koniagina, 2023) [24].

In order to develop the green bonds market, the Russian government has taken various initiatives such as developing national standards for green financing, setting up a support system to assist the issuers and holders of these bonds etc. It has also set-up a subsidy program as a part of its budget 2020 and allocated RUB 3 million to stimulate new issuers to enter the green bond market. Green financing has established itself as a noticeable trend in the Russian economy, and the competitiveness of green projects is growing rapidly, as is the demand for them. Hence, there are emerging signs of interest in green finance, driven by increasing awareness of environmental challenges and the need for sustainable development (Koniagina, 2023) [24].

Turkey: Turkey's economy is growing at a rapid pace since the last two decades and hence it has been featured as the fastest growing economy in the G20 (IFC 2023) [21-22]. Despite the increased growth, the Turkish economy is facing troubles resulting from inflation, political affiliation of its central bank and this has had a direct impact on the sustainable bonds market due to the prevalence of risk and unnecessary extension of time frames (IFC, 2023) [21-22].

To reduce the adverse impacts of the climate crisis, Turkey is engaged in international efforts to reduce climate change and greenhouse gas emissions and hence its first green bond was issued by Industrial Development Bank of Turkey in the year 2016 that amounted USD 300 Million and was fourteen times oversubscribed (IFC, 2023) [21-22]. Moreover, it started the usage of green bonds to finance energy efficiency. However, these bonds are less popular in Turkey because their issuance does not provide any tax benefits to investors and thus there is a need to incentivise the same (ŞAKAR1, 2019) [36].

Overall, while the status of green bonds in the E7 economies varies, there is a clear trend towards embracing sustainable finance and leveraging green bonds to fund environmentally beneficial projects. Challenges remain, including the need for stronger regulatory frameworks, investor education, and project pipeline development. However, with continued commitment from governments, investors, and other stakeholders, the green bond market in the E7 economies is expected to continue its growth trajectory, contributing to both economic development and environmental sustainability.



***Source*:** Various (World Bank, CBI, Fitch Report, ADB, UNDP, BoR)

Fig 1: Cumulative amount in green bonds

Note: Due to data unavailability, the graph does not showcase the outstanding amount of green bonds in Turkey as of 2022.

The global green bond market is expanding rapidly. From the year 2015 to 2018, green bond issuance worldwide has nearly quadrupled - rising from US$ 37 billion to US$ 136 billion (FPRI). Globally, the issue of green bonds fell in 2022 by 13 per cent but still out-performed the broader debt market which fell by 26 per cent. The emerging market greenium widened from 4.7 basic points on an average in 2021 to 7 basic points in 2022.In the same year, China surpassed the US and Germany to become the largest green bond issuer (IFC-Amundi Joint Report, 2023) [21-22].

With the increase in the social demand for green investments, the above countries will need to adapt as international markets are becoming more sophisticated. In case the financial markets of these nations fail to comply with this new reality then they might lose a window of opportunity (GIZ, 2020) [17].

Challenges

Fluctuating Market Dynamics: The green bond market experiences fluctuations in its relationship with equity markets, which can pose challenges for investors and issuers alike. Despite the potential benefits, such as diversification and attracting ethical investors, the inconsistency in pricing, highlighted by conflicting evidence on the existence of a "greenium," creates uncertainty. Additionally, certification costs and reporting requirements further compound the challenge of navigating these market dynamics, emphasising the need for greater stability and clarity in green bond investments (Ren *et al*., 2023) [35].

Market Obstacles: Green product promotion is impeded by high transaction costs and liquidity constraints. The identification and tracking of green investments are made more difficult by the lack of available information. In order to guarantee the sustainability of financial activities and accelerate the shift to sustainable finance, it will be imperative to overcome these obstacles (Doran & Tanner, 2019) [9].

Information Gap: Despite their enthusiasm, investors in green ventures find it difficult to obtain consistent and trustworthy information. The environmental impact of a green bond cannot be quantified by a single, widely recognized criteria (Filkova *et al*., 2019) [14]. This makes evaluating an issuers' overall ESG performance and comparing investments challenging.

Limited Capacity: The ability of financial institutions to completely adopt green bonds is hampered by a number of problems. Smaller organisations might not have the resources and technological know-how to manage green bonds well (Banga, 2019) [3]. Furthermore, the issuance of green bonds may be impeded by uncertain economic scenarios and the need for issuers, particularly those in rising economies like China and India, to increase their capacity.

Solutions and Opportunities

Collaborative solutions are essential to improving market harmonisation and transparency in green bond programs (Chugan *et al*., 2017) [6]. In order to create a single market strategy, donors must work together to standardise financial instruments, promote blended finance structures, and facilitate information sharing. Promoting green bond investments requires an understanding of the elements that affect investor mood, particularly in emerging nations where weather occurrences play a significant role. The market can be further strengthened by encouraging consolidation efforts in areas with a high number of small-scale projects and by using early-stage funding methods to create strong project pipelines. Supporting issuers requires offering extensive assistance programs that cover the pre-issuance, investment, and post-issuance stages. Improving market infrastructure entails educating the government about the advantages of green bonds, endorsing the accreditation and education of regional external reviewers, and fortifying regional financial institutions through the development of strong local currency bond markets (OECD, 2021) [32]. Corporate treasurers are increasingly considering green bonds to diversify and attract investors for eco-friendly projects, per the latest Climate Bond Initiative report. Despite conflicting evidence on the existence of a "greenium," issuers benefit from improved environmental ratings and reduced carbon

emissions post-issuance (Flammer, 2021) [15]. Standardisation requires the creation of internationally comparable but locally applicable green bond frameworks as well as cooperative efforts to define key performance indicators for reporting and impact assessment. Furthermore, for impact measurement to be effective, alignment with green bond standards and principles must be met (Demary & Neligan, 2019) [7].

Green bonds offer various benefits for both issuers and investors. For issuers, these bonds provide a platform to communicate sustainability strategies, enhance relationships with debt providers, and create internal synergies between financial and sustainability departments. They also facilitate access to a wider pool of lenders, diversifying investor bases and stabilising funding sources, particularly crucial during market downturns. Additionally, the issuance process fosters sustainability awareness within organisations. For investors, green bonds offer better information for impact investments, aiding in developing informed investment strategies and risk assessment while promoting transparency and communication between issuers and investors. Green bonds play a crucial role in facilitating long-term climate strategies for institutional investors, such as pension funds and insurance companies, by providing valuable information on environmental impacts and use of proceeds. They enable investors to match responsible investment objectives with environmentally friendly projects, fostering market growth and improving capital allocation. Moreover, green bonds help responsible investors diversify restricted investment portfolios, contributing to systemic benefits like improved knowledge on ESG issues and indirect support for low-carbon transitions. This necessitates a holistic approach from policymakers and stakeholders to ensure market sustainability and meaningful impact (Shishlov *et al*., 2018) [39].

Conclusion

Our research underscores the pivotal role of green bonds in driving sustainable development, particularly within emerging economies, with a specific focus on the E7 nations: Brazil, China, India, Indonesia, Mexico, Russia, and Turkey. Despite the global momentum towards sustainable finance, emerging economies face distinct challenges, including regulatory uncertainties, underdeveloped bond markets, and limited investor awareness. Promising trends are emerging, including China's flourishing green bond market supported by favourable regulations and India's capital market, which has the potential to develop a robust infrastructure. Indian banks must continue to act as catalysts for change, focusing on the three P's: People, Planet, and Profit (B S, 2021). However, disparities between nations persist, underscoring the importance of cohesive policy frameworks and institutional reforms. We advocate collaborative strategies to unlock the full potential of green bonds. This includes coordinated market development efforts, standardised ESG data collection frameworks, and a nuanced understanding of investor sentiments, particularly in weather-sensitive emerging markets. Recommendations for donors emphasise strategic investment and issuance support, tailored financial instruments, and enhanced market infrastructure. Standardisation efforts aim to establish globally aligned yet locally relevant frameworks, along with robust impact measurement mechanisms. In the context of the E7 economies, distinct trends emerge. While China and India lead in green bond issuance, Brazil and Mexico show promise, driven by renewable energy initiatives. Indonesia and Turkey are exploring opportunities in green finance, while Russia exhibits nascent interest amidst complex economic dynamics. Despite variations, a collective shift towards sustainable finance is evident, with green bonds serving as catalysts for environmental progress and economic resilience. This study underscores the transformative potential of green bonds in fostering sustainable development across emerging economies. By addressing regulatory hurdles, fostering investor confidence, and promoting market harmonisation, stakeholders can leverage green bonds to advance environmental objectives while unlocking new avenues for economic growth. Through concerted efforts and collaborative partnerships, the E7 economies can navigate the transition towards a more sustainable and prosperous future.

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