



Economic Policy and Financial Innovation Review

Volume 1, Issue 1 (2026)



Article Type: Document analysis (Review)

Green Bond Markets and Sustainable Economic Growth: Policy Implications for Developing Economies

Daniel Brown^{1*} **Sarah Penny²**

1. The World Bank Group, United States of America

2. Division of Monetary Affairs / Division of Financial Stability, Federal Reserve Board of Governors and CEPR, United States of America

Corresponding Author:

Daniel Brown

Article Info

Received:

6 June 2026

Revised:

5 August 2026

Accepted:

13 August 2026

DOI:

[10.67808/epfirv1i1-006-260815174624](https://doi.org/10.67808/epfirv1i1-006-260815174624)

Abstract

The green bond markets have gained and gained in significance as innovative financial instruments to mobilize funds to support sustainable development objectives. This research aims to examine the potential of green bonds to promote sustainable economic growth in developing economies from the market development, institutional and policy perspectives. It is a qualitative secondary research that examines literature, policy frameworks and sustainability reports to understand the role of green bonds in the areas of renewable energy, sustainable infrastructure, climate adaptation and financial innovation. The results suggest that although green bonds have the potential to speed up sustainable economic transition, there is a need for regulatory frameworks, institutional capacity, transparency mechanisms, and investor confidence. The study emphasizes the importance of coordinated policies on green finance, harmonised disclosure regimes and improved governance to increase market credibility. The research advances the field of sustainable finance by highlighting policy-based approaches to increasing green bond markets in developing countries.

Keywords

Green Bonds; Sustainable Finance; Sustainable Economic Growth; Developing Economies; Climate Finance; Green Investment

1. Introduction

Climate change is becoming a growing priority as the need to support economic growth grows, which has changed the global financial landscape. The challenge of developing economies is to grow their economies to enhance living standards, yet at the same time to minimize environmental degradation and build resilience to climate-related risks. While such economies need to be significantly invested in renewable energy, sustainable infrastructure, adaptation to climate change and green technologies, there are still huge financing gaps which prevent the achievement of sustainable development goals. Finance and development cooperation from traditional sources is still inadequate to finance the increasing demand for climate-related investments, which is why innovative financial mechanisms are needed that can mobilise private and institutional finance (Agliardi & Agliardi, 2019). In this context, green bond markets have become a key element of sustainable finance as they offer a framework to channel financial flows to projects with positive environmental impacts.

Green bonds are a financial innovation that brings capital market and environmental sustainability together. Green bonds differ from traditional bonds in that the proceeds are allocated to specific projects that deliver quantifiable environmental benefits such as those in renewable energy, clean transport, energy efficiency, sustainable water management and climate adaptation (Arshad et al., 2024). Global green bond markets have grown substantially in recent years and are now growing at a quicker pace, as governments, financial institutions and corporations have become more interested in making environmentally conscious decisions in their investment processes (Bernabé Argandoña et al., 2022). Green bonds offer opportunities for developing economies to diversify their sources for financing, to draw in international capital, and to help develop sustainable economic transformation over the long-run. Green bonds can play a role in both financial development and ecological sustainability by linking investors who are looking for sustainable investment opportunities with environmentally-focused projects (Bhutta et al., 2022).

Although green bonds may offer benefits, their markets in developing countries are less developed than those in advanced financial markets. However, weak regulatory environments, lack of transparency, technical skills and knowledge, lack of green certification systems, and lack of investor confidence are some of the structural and institutional challenges affecting their effectiveness (Chiesa & Barua, 2019). Comprehensiveness of green finance policies and standardized taxonomies, which define what investments can count as green, is lacking in many developing countries, giving rise to uncertainty among investors and issuers. In addition, high transaction cost, currency risk and the lack of a well-developed domestic capital market can deter potential issuers from participating in green bond markets (Flammer, 2020). The challenges point to the need for financial innovation and supportive policy environments and institutional reforms to enable the growth of green bond markets.

While there is already a substantial body of work studying the link between sustainable finance and environmental results, there are still significant research gaps that need to be addressed regarding the role of green bond markets in sustainable economic growth in developing economy contexts (Glomsrød & Wei, 2018). Previous literature has tended to focus on developed countries where the financial system is more developed, the regulatory institutions are more advanced, and investors are more active. The institutional and policy context for green bond markets to operate in developing economies has thus far received little attention. Knowledge about these conditions is crucial to the success of green bonds, as indeed the provision of capital is. But so too is the governance framework, the regulatory capacity, the credibility of the market and coordination between financial institutions and public agencies (Glomsrød & Wei, 2018).

To fill this gap, this study focuses on the role of green bond markets in supporting the sustainable development of the economy and the policy mechanisms to be developed in developing economies to foster the development of green bonds (Gyamerah & Asare, 2024). This study tackles three interconnected themes, namely the use of green bonds for sustainable economic transition, the

institutional and market obstacles to the development of green bonds, and policy interventions to enhance the impact of green bonds. The study has integrated the ideas of sustainable finance theory, institutional theory and financial development theory, and gives a full picture of the role the financial market can play in both the environment and the economy (Hunjra et al., 2023).

The study makes various contributions to the existing literature. First, it builds on the previous discussion on sustainable finance, by focusing on the specific opportunities and challenges of creating green bond ecosystems in developing economies. Second, it emphasizes the role of policy frameworks, regulatory requirements and institutional capability to be key drivers of the success of green bond markets. Third, it offers hands-on policy guidance for policy makers, financial regulators and market actors aiming to boost sustainable finance systems. This analysis reveals that green bond markets are not just environmental financing products, but tools that can be used to achieve inclusive, resilient and sustainable economic development.

Based on this, the study seeks to answer the following research questions:

RQ1: How do green bond markets contribute to sustainable economic growth in developing economies?

RQ2: What institutional and market barriers limit green bond market development in developing countries?

RQ3: What policy interventions can enhance green bond adoption and effectiveness in supporting sustainable development?

The study's findings answer these questions, and sheds light on the link between sustainable finance innovations and economic development, while also offering policy guidance to bolster green bond markets as tools for long-term sustainable development.

2. Literature Review and Theoretical Framework

2.1 Conceptual Understanding of Green Bonds

Green bonds are an important part of sustainable finance, offering financial tools that link investment with environment. Green bonds are intended to

generate funds that are dedicated to projects with positive environmental impacts, such as renewable energy projects; sustainable transportation systems; preventing pollution; increasing energy efficiency and adapting to climate change; and other environmental projects. Green bond is characterized by its commitment that the proceeds from green bond issues are dedicated to specific green projects and by reporting and verification systems, which further help to increase transparency and accountability. This is one of the distinguishing features of green bonds relative to traditional financial products and makes them an important link between the financial markets and sustainability goals.

Green bonds are part of a wider reorientation of the financial systems worldwide towards sustainability issues in investment decisions. Environmental, social and governance (ESG) investment strategies have enabled financial institutions and investors to look at the financial and environmental, and social, impacts of their investments. In this regard, green bonds offer investors the possibility to invest in climate initiatives without compromising on financial certainty (Nanayakkara & Colombage, 2019). They are especially relevant for developing economies as they can bring new funding for sustainable investments in infrastructure and help shift dependence on scarce public financing.

International sustainable commitments like global climate agreements and sustainable development frameworks have also played a role in the growth of green bond markets. Increasingly, governments and financial institutions recognise the need for significant financial resources to meet climate targets, which is beyond the scope of government budgets. Green bonds are thus a market-based solution which can unlock domestic and international funds for investments in sustainability. However, the success of green bonds relies, crucially, on the institutional framework, regulatory framework, and market confidence, especially in less developed economies where financial markets could have structural constraints.

2.2 Green Bonds and Sustainable Economic Growth

There are several economic and environmental avenues to consider in explaining the ties between

green bond markets and sustainable economic growth. Firstly, green bonds promote economic growth by encouraging investments in the economy's productive sectors with future-oriented development. Sustainable investments in renewable energy, sustainable infrastructure and clean technologies generate economic opportunities, foster innovation and help to use resources more efficiently. Green bonds can play a role in structural economic transformation and lowering dependence on carbon-intensive development models by channelling funds into green industries (Ning et al., 2023).

Secondly, green bonds are a means to build climate resilience by funding climate vulnerability reduction projects. Frequently, developing economies are vulnerable to climate challenges such as extreme climate events, water insecurity and climate disruption in the agricultural sector. Green bond financing can enable adaptation projects in climate smart urban development, sustainable agriculture and resilient infrastructure. The investments safeguard economic assets and contribute to the stability of long-term development.

Thirdly, green bonds can help promote financial market development by creating new investment products and increasing the number of institutional investors. The growth of the green bond markets can help diversify the financial system by offering more green bond investment opportunity for pension funds, insurance companies, commercial banks and international investors. More robust financial markets can improve capital allocation efficiency and thereby contribute to other aspects of economic development (Nneka et al., 2022).

But green bonds are not just a given for sustainable economic growth. The viability of green bond markets depends on the quality of the projects being financed, the transparency of reporting environmental impacts, and the strength of institutional governance of markets. If there is no effective greenwashing prevention system in place, green bonds could have to be monitored. Thus, it is vital to have effective regulatory structures and accountability systems in place to ensure that green bond markets will indeed promote sustainable development.

2.3 Theoretical Foundations

Sustainable Finance Theory

The theory of sustainable finance is the main cornerstone in understanding the green bond markets. The view is that financial systems should not only take into account the potential for financial gain, but also environmental and social issues. Sustainable finance focuses on the responsible allocation of finance to finance activities that support or create sustainable economic, environmental, and social benefits over the long-term (Pham & Nguyen, 2022). In this context, green bonds are a tool that enables financial markets to promote sustainable development goals. They make it possible for people to invest their money according to their environment-friendly goals and also for companies to raise capital for environmentally-sound initiatives. Sustainable finance theory recognizes the significance of designing finance that is sustainable in developing economies, which is a system that can facilitate economic development without increasing environmental risks.

Institutional Theory

Theoretically, institutional theory provides an understanding of the effects of formal regulations, governance systems and organisational practices on the evolution of financial markets. The theory is that an institutional setting that defines rules, reduces uncertainty and enhances the confidence of stakeholders is a prerequisite for the market's development.

In the context of green bonds, the main points of institutional theory are related to the government's policy and the regulatory environment, the certification and reporting structures. Investor perception of lower risk and greater transparency in the Developing Economy with solid institution, making it possible to attract investment for green projects (Phung Thanh, 2022). Weak institutions, on the other hand, can reduce the market process by introducing uncertainty and the number of investors.

Financial Development Theory

Theories of financial development emphasize financial innovations and the growth of markets as key to economic growth. Effective financial systems encourage the raising of funds mobilization and the efficient allocation of resources and productive

investment, from this angle. Green bonds are an instrument of financial innovation, which opens a new space to the capital markets and a new niche for sustainable investment.

The theory of financial development suggests that enhancing green bond markets can facilitate access to capital and help drive economic modernization in developing economies (Saha & Maji, 2023). But these benefits have to be further achieved through financial infrastructure, regulatory capacity and market participation.

2.4 Green Bond Market Development in Developing Economies

The green bond market in developing economies is vastly different to the market in advanced economies, having a different financial capacity as well as a different degree of institutional maturity and policy environment. Developed countries often have well-established markets, well-experienced investors, and regulations, while in developing countries, investors have little sustainability experience, there are no regulations and markets are shallow.

But, in the context of developing countries, some have been more interested in increasing the volume of green bond issuance for the purpose of sustainable development. Government green bonds, also referred to as sovereign green bonds, are becoming an important tool for the private sector to access international finance for climate action and to communicate a government's dedication towards environmental objectives. Similarly, green bond offerings are an emerging area of interest for financial institutions and corporations, who wish to benefit from sustainable projects and investors who value sustainability (Sinha et al., 2021).

However, there is need for coordinated policy action to achieve broad scale green bonds adoption. Governments should establish institutional capacity to monitor environmental impacts, establish classification processes and develop frameworks in order to establish reliable and secure green finance systems. International cooperation and technical assistance are also key to facilitate the development of effective green bond ecosystems by developing countries.

Overall, the literature suggests that green bonds have

great potential to facilitate sustainable economic development, yet effectiveness hinges on the interplay between financial innovation, institutional quality, and policy effectiveness. To develop strategies to support developing economies to use green bond markets to facilitate sustainable transformation, it is essential to have a full picture of these factors.

3. Methodology

3.1 Research Design

This study was conducted following secondary data that used the qualitative secondary research design for analysing the linkage between green bond markets and sustainable economic growth in developing economies. The research methodology was selected due to the study's aim of connecting theories, academic research and policy related outcomes on the role of green financial instruments for sustainable development. The study did not collect primary data, but followed a broad methodology in analysing the academic literature and existing institutional reports and policy documents to identify key trends, challenges and policy mechanisms that impact the development of the green bond market.

The qualitative research design enabled a holistic perspective of the complex interactions between the financial innovation, regulation institutions, sustainability objectives, and the economic development outcomes. Various factors affect the green bond markets, such as economic, institutional and governance factors, so flexibility in analyzing these factors is important, which is addressed by using a qualitative approach. The study focused on developing economies which have market conditions, institutional capacity and policy environment very different to the advanced financial system.

3.2 Data Sources and Literature Selection

Secondary data gathered from various reliable sources, including academic peer reviewed articles, and reports from international organizations, financial market analysis and policy documents on sustainable finance. The academic literature was gathered through research papers available on the different research platforms for academic studies on green bonds, sustainable finance, climate finance, financial development and economic growth.

Further, information from international institutions and sustainability organisations was reviewed to enhance the understanding of relevant and practical aspects of global green bond market trends and policy developments.

The sources chosen centred on research into green bonds as a source of funding for sustainable projects, challenges facing market development and policy approaches taken by developing nations. In order to reflect the current development of green finance, preference was given to the most recent literature, with some foundational studies also taken into account to ensure the conceptual underpinning of the studies.

The selection of publications was determined by the inclusion criteria, which were publications directly

addressing one or more of the following themes: green bond market development, sustainable economic growth, climate finance mechanisms, regulatory frameworks, investment barriers, policy interventions. Only those studies that addressed financial instruments which were not directly related to each other or studies that were exclusively developed economies with no transferable implications were excluded.

3.3 Analytical Approach

Data from the literature were analysed using thematic analysis for the detection of a theme and relationships among themes. The analysis process consisted of structuring the current evidence into themes that are linked to the development of

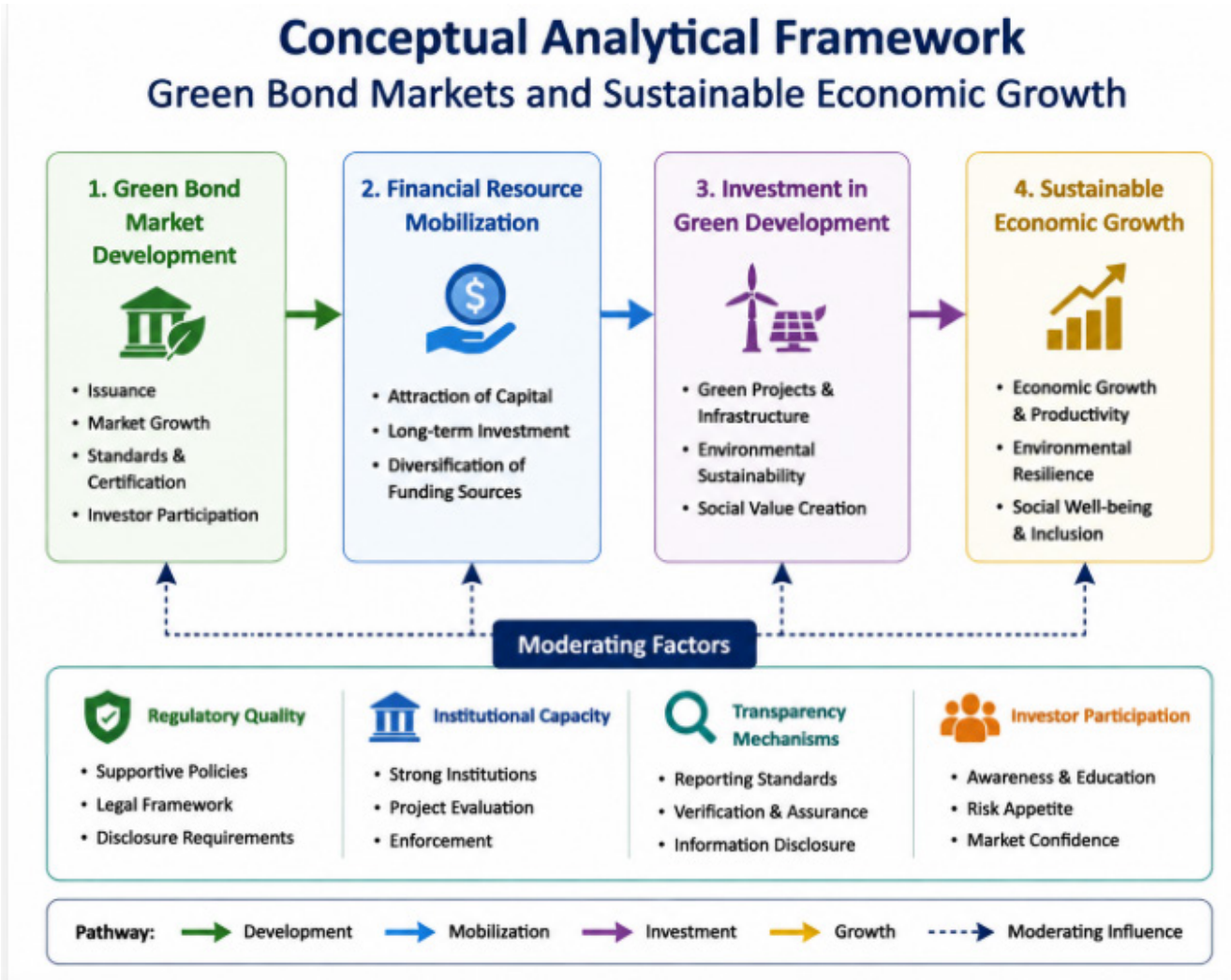


Figure 1. Conceptual Analytical Framework

green bonds and sustainable economic results. The five main analytical themes were defined: Green bonds' role in sustainable growth; challenges in market development; institutional and regulatory constraints; policy support tools; and opportunities for future growth in the developing economy.

Thematic analysis facilitated the comparison of perspectives from the literature which helped to identify commonality and differences in the research and policy work of others. A detailed study of the correlation of institutional quality, regulatory development, investor confidence and financial markets conditions and functioning of green bond markets was conducted.

3.4 Conceptual Analytical Framework

The study adopted a conceptual framework derived from the literature reviewed that demonstrates the effects of the green bond markets on sustainable economic growth in developing economies. The framework suggested the pathway of green bond market development as a medium to link financial resource mobilization and green development. Green bonds help to attract capital to environmental projects to create economic, environmental and social value.

Several moderating factors were also mentioned in the framework that influence the relationship between green bonds and sustainable economic development included the role of the quality of regulation, institutions' capacity, transparency mechanisms, and investors' participation. These factors govern if green bond markets are going to be able to create real sustainability outcomes.

3.5 Methodological Limitations

The study identified several limitations such as, while the secondary qualitative analysis provides useful information on patterns and implications for policy, it has its own set of drawbacks. Findings were reliant on available and quality literature and institutional reports. The overall level of generalizability of the conclusions may also vary based on the national context, regulatory and market maturity. Future research can be complemented with empirical analysis, country-level green bond issuance data,

economic indicators, and comparative case studies, among other options, to complement these findings. Overall, the methodology was a structured way to examine the role of green bond markets in relation to sustainable economic development, and highlighted the policy measures to be implemented to improve green finance ecosystem in developing economies.

4. Results & Analytical Findings

4.1 Current Status of Green Bond Markets in Developing Economies

The review of the literature and policy documents revealed that the green bond market has grown significantly worldwide, but unevenly in developing economies. The increasing demand for climate finance, global sustainable development goals and investor interest in green investment opportunities has been driving the growth of these markets. Green bonds are increasingly emerging as a financing option for climate adaptation, sustainable infrastructure and renewable energy, and have been acknowledged by the developing economies. However, the markets for green bonds are not yet fully developed, large, or successful, because of various reasons, including differences in the development of financial systems, institutions, and regulatory preparedness.

Results revealed that there is significant financing gap in developing economies for sustainable development goals. Private funding sources and green bonds can complement each other to generate private financing. It is increasingly governments, development banks, corporations and financial institutions which have joined in the issuance of green bonds to raise domestic and global funds. Sovereign green bonds have taken special significance as they show the government's dedication to sustainability and establish standards for the issuance of corporate and financial sector green bonds (Taghizadeh-Hesary et al., 2021).

The analysis found that, however, the majority of developing economies are at an early stage of development of the green bond market. There is still a lack of awareness among investors and inadequate market infrastructure and sustainability standards. Better financial system development and regulatory framework have helped countries attract green

investment more successfully, while those with less financial system development and good regulatory framework have encountered challenges in building trustworthy green finance ecosystems.

Table 1. Characteristics of Green Bond Markets in Developing Economies

Dimension	Key Characteristics	Implications for Sustainable Growth
Issuer Participation	Governments, banks, corporations, development institutions	Expands financing sources for sustainable projects
Main Investment Areas	Renewable energy, transportation, infrastructure, climate adaptation	Supports low-carbon economic transformation
Market Development Level	Uneven across developing economies	Creates differences in green investment capacity
Regulatory Environment	Varies from advanced frameworks to limited standards	Influences investor confidence and market credibility
International Support	Climate funds, development agencies, technical assistance	Improves capacity and market accessibility

4.2 Contribution of Green Bonds to Sustainable Economic Growth

This section will outline how Green Bonds can contribute to sustainable economic development.

The results revealed that the establishment of green bond markets is not in isolation from sustainable economic growth, but there is a multi-layered and interdependent relationship between the two. First, green bonds can help to mobilise capital by introducing financial infrastructure for investments in the green economy. Public budget and domestic financial resources may be constrained in developing economies and green bonds may provide another financing tool for large-scale projects – essential for sustainable development.

The support of the growth of renewable energy is one of the major benefits of green bonds. Green bond investments may help to catalyze the shift away from fossil fuels to cleaner, greener energy sources. Green bond investments can help reduce emissions, as well as help to promote energy security, technological innovation and job creation.

Secondly, green bonds promote sustainable infrastructure investments. Large investment is required on infrastructure for a fast-growing

population and urbanisation in developing economies. Green bonds can be used for transport infrastructure, green buildings, water resources and climate resilience projects, both private and public, to finance them. These investments help enhance environmental sustainability and economic productivity (Tolliver et al., 2019).

Finally, green bonds spur financial innovation and contribute to the uptake of sustainable financial products. With the growth of the green bond markets, more investors are able to be engaged in the markets, diversify the financial sector, and strengthen the bond between finance and sustainability.

The results also showed that the governance is important for green bonds to achieve economic benefits. If not accompanied by the adequate monitoring and verification systems, green bonds can fall short of achieving environmental goals. Hence, transparency, reporting and impact assessment process are still crucial elements to the successful Green Bond markets.

4.3 Barriers to Green Bond Market Expansion

While green bonds showed great promise, the results showed that there are some obstacles to the

development of the green bond market in developing economies. One of the most important constraints was regulatory issues. In many countries there is a big gap in comprehensive green finance policies, green taxonomies and mandatory disclosure frameworks. Various regulatory limitations make it difficult to know exactly what is expected of investors, and it raises the question of the authenticity of green bonds.

Financial constraints are also a limiting factor for market expansion. Preparation, certification and monitoring of the green bond is usually more stringent than of a normal bond. The developing economies with smaller financial markets may fail to draw the requisite investor demand, especially if the domestic institutional investors are not able to take part in

the market. Furthermore, foreign investors might be less inclined to invest in emerging green bond markets in the presence of exchange rate volatility and macroeconomic instability (Tolliver et al., 2020a). Institutional constraints are also a limitation for market development. The key elements for building successful green bond markets are technical expertise, environmental assessment ability and monitoring systems. A problem in many developing countries is the absence of qualified people to evaluate green projects and to measure the environmental effects. Poor institutional coordination between government departments, financial regulators and the market also can reduce market efficiency.

Barrier Category	Major Challenges	Required Policy Responses
Regulatory Barriers	Lack of green taxonomy, weak disclosure standards	Establish national green finance frameworks
Financial Barriers	High issuance costs, limited investors, currency risks	Provide incentives and risk-sharing mechanisms
Institutional Barriers	Limited technical expertise and monitoring capacity	Strengthen institutional capabilities
Market Barriers	Low awareness and limited demand	Promote investor education and market development
Governance Barriers	Risks of greenwashing and weak accountability	Introduce verification and reporting standards

4.4 Policy Mechanisms for Strengthening Green Bond Markets

Consequently, there is a need to strengthen green bond markets through policy measures. Therefore, policy measures to strengthen green bond markets are needed.

The results showed that policy measures are key to promoting green bonds in developing countries. Government needs to be more focused on developing clear and transparent green investment regulatory frameworks with clear rules and transparency of the bond lifecycle. National green taxonomies can add more credibility to the markets as they provide a uniform benchmark for market issuers and investors.

Public sector involvement was another factor that helped develop early markets. The participation of the private sector could be encouraged and investment risks reduced by means of sovereign green bonds, guarantees and public-private partnerships. Governments can send signals to encourage investors to invest in sustainable projects in their own country and out of their country (Tolliver et al., 2020b). International cooperation is also a key instrument to further develop green bond ecosystems. To build effective green finance markets in developing economies, technical support, financial resources and institutional capacity building can be required. Cooperation with international financial institutions

can result in a greater understanding of markets, enhanced regulatory capacity, and increased access to new sources of global climate finance.

The overall results presented that the green bond market has the potential to contribute to SDG 8 and SDG 16 in developing economies if coordinated and adequate policy action, institutional development and good governance is provided.

5. Discussion

5.1 The Role of Policy Institutions in Green Bond Market Development

This phase will examine how policy institutions can facilitate the growth of the green bond market. The role of policy institutions in the development of the green bond market will be explored. The results indicated that policy institutions play a role of vital importance in the success and size of green bond markets in developing countries. However, Green bonds are a new instrument for the mobilization of sustainable finance and will require strong regulatory frameworks, institutional coordination and capacity to regulate the market. Green bond markets are different from the markets of financial products in that they must be classified as 'green', measured for environmental impact, and verified for transparency with more mechanisms. Governments and regulatory bodies are thus important players in setting the conditions to improve the credibility and investment confidence in markets (Zhao et al., 2022).

A favorable institutional climate supports the operation of financial markets, reduces uncertainty and improves information in financial markets. Sustainable investment is more facilitated in developing economies by clear green finance strategies, consistent reporting and monitoring systems. However, inadequate institutional frameworks may hinder the growth of markets as a result of increased transaction costs and market credibility concerns. The discussion thus highlights the fact that the development of green bonds is a matter of not only financial markets, but governance and policy as well.

5.2 Implications for Developing Economies

Green bond markets are growing and offer substantial opportunities to developing economies to move towards sustainable economic transition. Economic growth has been primarily dependent on traditional development models that have been based on polluting industries that consume a lot of resources. Countries have an alternative, they can issue green bonds for a project, including protection of the environment and economic development.

The results indicate that green bonds can play a role in achieving wider development goals through an enhancement of infrastructure quality, transition to renewable energy and technological innovation. Funds raised from the green bond can lead to job creation, strengthen energy security and increase the resilience against risks from climate change. Especially these results are important in developing countries, which are increasingly environmentally sensitive in the process of economic development (Tu et al., 2020).

The advantages of green bond markets, however, rely on effective and efficient mechanisms of implementation which governments and financial institutions need to be able to establish. More isn't enough – it's time to think about how to create the kinds of green bonds that matter. In developing countries, project funding should be linked to an environmental value that can be quantified and towards long-term economic goals. The need for good governance structures and clear reporting and continuous assessment of environmental impacts.

5.3 Theoretical Contributions

The study draws on the existing theories on the growth of the green bond market, such as sustainable finance theory, institutional theory and financial development theory. The literature on the green bonds has been directed towards the green bond as a financial instrument for environmental investments. This study contributes to this discussion by analysing the effect of broader institutional and governance conditions on the success of green bonds.

The results confirm the view from a sustainable finance perspective that, if there are suitable incentives and accountability mechanisms, financial markets can help achieve environmental goals. Green bonds are an important link between investment decisions and sustainability goals and are a tool of

financial innovations in order to make development “climate friendly” (Ugbam et al., 2023).

The study emphasizes the pivotal role of the quality of regulation and governance capacity at the institutional level for the meaningfulness of green bond markets. Well-developed institutions help to lessen market uncertainty, increase transparency, and help to boost investor confidence. Thus, institutional development is needed to achieve sustainable finance (Ye & Rasoulinezhad, 2023).

The study shows that from a financial development perspective, green bonds can help in diversifying the financial markets and mobilising capital. Green bonds can drive positive change in the financial system and emphasise the importance of sustainable economic dimensions through providing new investments opportunities.

5.4 Policy Implications

The results have a number of implications for policy makers in financial institutions, governments and regulators in developing countries. Policymakers should establish comprehensive green finance systems, adopting a national green taxonomy, disclosure rules, and certification systems and building on them. These are steps which can contribute to greater transparency and reduce concerns about “green washing” in the market.

Second, governments could contribute to market confidence by encouraging governments and other public sector issuers to launch green bonds to attract private investment. Public guarantees and risk-sharing mechanisms can lower the investment barriers and foster more involvement by domestic and foreign financial institutions (Wahidin et al., 2021).

Third, building institutional capacity through enhancing technical capacities in the areas of sustainable finance, environmental assessment, and project monitoring in developing economies. To achieve measurable sustainability outcomes, strong institutions are needed to enable effective functioning of green bond markets.

Finally, international cooperation should be increased in the form of technical assistance, knowledge sharing, and climate finance arrangements. This partnership can help in helping developing nations to overcome some of the limitations of the market and

drive the path to sustainable economic development. In general, the dialogue is focused on the need to combine financial, institutional and political approaches to realize the full potential of green bond markets.

6. Conclusion

Green bond markets are new financial markets that have been developed to support sustainable economic growth and attract capital for sustainable investment. This work proved that green bonds are a tool to support renewable energy, sustainable infrastructure, climate resilience and innovation in financial markets for developing economies. However, the effectiveness of the measures is still limited because of regulatory weaknesses, lack of institutional capacity, lack of transparency in the markets and investor uncertainties. The study found that policy and regulatory frameworks must be supportive of green bond markets, good governance is essential to green bond markets, and green finance measures must be standardized to deliver tangible sustainability benefits. The building economy should enhance their regulatory system and encourage the use of public–private partnerships, increase their financial capacity and international cooperative efforts to realize the full potential of green finance. In conclusion, green bonds are a promising tool for integration of environmental sustainability with the economic development goals and to promote a transition towards resilient and inclusive growth.

Declarations

Author Contributions

The authors were responsible for the conceptualization, research design, methodology development, data collection, data analysis, interpretation of findings, manuscript preparation, critical revision, and final approval of the submitted version.

Funding

The author received no external funding, financial support, or grants for the research, authorship, and publication of this manuscript.

Conflict of Interest

The author declares that there are no conflicts of interest, financial or otherwise, that could have influenced the research design, data analysis, interpretation of findings, or preparation of this manuscript.

Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request, subject to ethical and confidentiality restrictions.

Acknowledgements

The author acknowledges all participants who contributed their valuable time and insights to this research. The author also appreciates the institutional support provided during the research process.

References

- Agliardi, E., & Agliardi, R. (2019). Financing environmentally-sustainable projects with green bonds. *Environment and Development Economics*, 24(6), 608-623. <https://doi.org/10.1017/S1355770X19000020>
- Arshad, A., Parveen, S., & Mir, F. N. (2024). The role of green bonds in reducing CO2 emissions: a case of developing countries. *Journal of Economic and Administrative Sciences*, 42(2), 300-313. <https://doi.org/10.1108/jeas-09-2023-0242>
- Bernabé Argandoña, L. C., Cruz Rambaud, S., & López Pascual, J. (2022). The Impact of Sustainable Bond Issuances in the Economic Growth of the Latin American and Caribbean Countries. *Sustainability*, 14(8), 4693. <https://www.mdpi.com/2071-1050/14/8/4693>
- Bhutta, U. S., Tariq, A., Farrukh, M., Raza, A., & Iqbal, M. K. (2022). Green bonds for sustainable development: Review of literature on development and impact of green bonds. *Technological Forecasting and Social Change*, 175, 121378. <https://doi.org/https://doi.org/10.1016/j.techfore.2021.121378>
- Chiesa, M., & Barua, S. (2019). The surge of impact borrowing: the magnitude and determinants of green bond supply and its heterogeneity across markets. *Journal of Sustainable Finance & Investment*, 9(2), 138-161. <https://doi.org/10.1080/20430795.2018.1550993>
- Flammer, C. (2020). Green Bonds: Effectiveness and Implications for Public Policy. *Environmental and Energy Policy and the Economy*, 1, 95-128. <https://doi.org/doi:10.1086/706794>
- Glomsrød, S., & Wei, T. (2018). Business as unusual: The implications of fossil divestment and green bonds for financial flows, economic growth and energy market. *Energy for Sustainable Development*, 44, 1-10. <https://doi.org/https://doi.org/10.1016/j.esd.2018.02.005>
- Gyamerah, S. A., & Asare, C. (2024). The impacts of global economic policy uncertainty on green bond returns: A systematic literature review. *Heliyon*, 10(3). <https://doi.org/10.1016/j.heliyon.2024.e25076>
- Hunjra, A. I., Hassan, M. K., Zaid, Y. B., & Managi, S. (2023). Nexus between green finance, environmental degradation, and sustainable development: Evidence from developing countries. *Resources Policy*, 81, 103371. <https://doi.org/https://doi.org/10.1016/j.resourpol.2023.103371>
- Nanayakkara, M., & Colombage, S. (2019). Do investors in Green Bond market pay a premium? Global evidence. *Applied Economics*, 51(40), 4425-4437. <https://doi.org/10.1080/00036846.2019.1591611>
- Ning, Y., Cherian, J., Sial, M. S., Álvarez-Otero, S., Comite, U., & Zia-Ud-Din, M. (2023). Green bond as a new determinant of sustainable green financing, energy efficiency investment, and economic growth: a global perspective. *Environmental Science and Pollution Research*, 30(22), 61324-61339. <https://doi.org/10.1007/s11356-021-18454-7>

- Nneka, U. J., Ngong, C. A., Ugoada, O. A., & Onwumere, J. U. J. (2022). Effect of bond market development on economic growth of selected developing countries. *Journal of Economic and Administrative Sciences*, 41(1), 132-148. <https://doi.org/10.1108/jeas-01-2022-0015>
- Pham, L., & Nguyen, C. P. (2022). How do stock, oil, and economic policy uncertainty influence the green bond market? *Finance Research Letters*, 45, 102128. <https://doi.org/https://doi.org/10.1016/j.frl.2021.102128>
- Phung Thanh, Q. (2022). Economic effects of green bond market development in Asian economies. *The Journal of Risk Finance*, 23(5), 480-497. <https://doi.org/10.1108/jrf-08-2022-0216>
- Saha, R., & Maji, S. G. (2023). Do green bonds reduce CO2 emissions? Evidence from developed and developing nations. *International Journal of Emerging Markets*, 20(7), 2913-2934. <https://doi.org/10.1108/ijoem-05-2023-0765>
- Sinha, A., Mishra, S., Sharif, A., & Yarovaya, L. (2021). Does green financing help to improve environmental & social responsibility? Designing SDG framework through advanced quantile modelling. *Journal of Environmental Management*, 292, 112751. <https://doi.org/https://doi.org/10.1016/j.jenvman.2021.112751>
- Taghizadeh-Hesary, F., Yoshino, N., & Phoumin, H. (2021). Analyzing the Characteristics of Green Bond Markets to Facilitate Green Finance in the Post-COVID-19 World. *Sustainability*, 13(10), 5719. <https://www.mdpi.com/2071-1050/13/10/5719>
- Tolliver, C., Keeley, A. R., & Managi, S. (2019). Green bonds for the Paris agreement and sustainable development goals. *Environmental Research Letters*, 14(6), 064009. <https://doi.org/10.1088/1748-9326/ab1118>
- Tolliver, C., Keeley, A. R., & Managi, S. (2020a). Drivers of green bond market growth: The importance of Nationally Determined Contributions to the Paris Agreement and implications for sustainability. *Journal of Cleaner Production*, 244, 118643. <https://doi.org/https://doi.org/10.1016/j.jclepro.2019.118643>
- Tolliver, C., Keeley, A. R., & Managi, S. (2020b). Policy targets behind green bonds for renewable energy: Do climate commitments matter? *Technological Forecasting and Social Change*, 157, 120051. <https://doi.org/https://doi.org/10.1016/j.techfore.2020.120051>
- Tu, C. A., Rasoulinezhad, E., & Sarker, T. (2020). Investigating solutions for the development of a green bond market: Evidence from analytic hierarchy process. *Finance Research Letters*, 34, 101457. <https://doi.org/https://doi.org/10.1016/j.frl.2020.101457>
- Ugbam, C. O., Ngong, C. A., Abner, I. P., & Ibe, G. I. (2023). Bond market development and economic growth nexus in developing countries: a GMM approach. *Journal of Economic and Administrative Sciences*, 41(5), 1962-1976. <https://doi.org/10.1108/jeas-07-2023-0183>
- Wahidin, D., Akimov, A., & Roca, E. (2021). The impact of bond market development on economic growth before and after the global financial crisis: Evidence from developed and developing countries. *International Review of Financial Analysis*, 77, 101865. <https://doi.org/https://doi.org/10.1016/j.irfa.2021.101865>
- Ye, X., & Rasoulinezhad, E. (2023). Assessment of impacts of green bonds on renewable energy utilization efficiency. *Renewable Energy*, 202, 626-633. <https://doi.org/https://doi.org/10.1016/j.renene.2022.11.124>
- Zhao, L., Chau, K. Y., Tran, T. K., Sadiq, M., Xuyen, N. T. M., & Phan, T. T. H. (2022). Enhancing green economic recovery through green bonds financing and energy efficiency investments. *Economic Analysis and Policy*, 76, 488-501. <https://doi.org/https://doi.org/10.1016/j.eap.2022.08.019>