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## Legal framework supporting green bond issuance in global markets

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### Abstract

Green bonds have emerged as a key financial instrument to drive investment in environmentally sustainable projects worldwide. These bonds provide a mechanism for raising capital specifically for projects that contribute to climate change mitigation, renewable energy, sustainable agriculture, and other environmentally beneficial activities. However, the development of green bond markets is heavily influenced by the legal frameworks that govern them. A robust legal framework is essential to ensure transparency, prevent green washing, and foster investor confidence.

Globally, green bond issuance is shaped by varying regulatory approaches. In Europe, the European Union's Green Bond Standard and the EU Taxonomy Regulation are instrumental in providing clear guidelines on what constitutes a "green" project. In the United States, the Securities and Exchange Commission (SEC) plays a pivotal role in ensuring the proper disclosure and certification of green bonds. Additionally, international initiatives, such as the Green Bond Principles (GBP) established by the International Capital Market Association (ICMA), provide voluntary guidelines to ensure the integrity of green bond issuance.

Despite these efforts, discrepancies in national regulations and the lack of a unified international standard pose challenges to the green bond market. As countries develop their own legal frameworks, differences in tax incentives, reporting requirements, and verification procedures can lead to inefficiencies and reduce the attractiveness of green bonds for global investors.

This paper explores the diverse legal frameworks supporting green bond issuance in global markets, examining their strengths, weaknesses, and the potential for harmonization. By identifying key regulatory trends, it aims to provide insights into how legal frameworks can enhance the credibility and growth of the green bond market, ultimately contributing to global environmental goals.

**Keywords:** Green bonds, legal framework, environmental sustainability, green bond principles, EU taxonomy, global markets, climate finance, greenwashing, regulatory standards.

### Introduction

In recent years, the urgency to address climate change and environmental degradation has led to the proliferation of innovative financial instruments aimed at mobilizing private capital for sustainable development. Among these, green bonds have gained significant traction as a mechanism to fund projects with clear environmental benefits—such as renewable energy, pollution prevention, energy efficiency, and biodiversity conservation. Unlike traditional bonds, green bonds are earmarked specifically for environmentally sustainable projects, making them a vital tool in aligning finance with climate and sustainability objectives.

The global green bond market has grown rapidly, with issuance reaching over USD 500 billion in 2023 alone. However, as the market expands, concerns about greenwashing—the practice of falsely claiming environmental benefits—have intensified. Investors are increasingly demanding greater transparency, accountability, and standardization, which can only be achieved through the establishment of robust legal and regulatory frameworks.

The development of green bond markets varies significantly across regions. The European Union (EU) has been a pioneer in implementing comprehensive regulations, such as the EU Taxonomy Regulation and the EU Green Bond Standard, to define, verify, and monitor green financial products. In contrast, the United States relies more heavily on existing securities

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laws, overseen by the Securities and Exchange Commission (SEC), which emphasize disclosure rather than prescriptive environmental standards. Meanwhile, international initiatives like the Green Bond Principles (GBP) by the International Capital Market Association (ICMA) provide voluntary frameworks that many issuers follow in the absence of binding national regulations. Despite these advancements, a major challenge lies in the lack of harmonization across jurisdictions. Disparate definitions, verification procedures, and disclosure requirements hinder cross-border investment and limit the scalability of green bonds. This fragmentation not only creates legal uncertainty but also undermines the credibility and efficiency of the green bond market.

Green bonds have increasingly become central to the transition toward low-carbon economies. As climate change poses substantial risks to economic stability and environmental health, capital markets are being leveraged to finance green projects. These debt instruments are issued to raise funds exclusively for environmentally sustainable activities. However, without clear legal frameworks, the effectiveness and credibility of green bonds are compromised due to risks like greenwashing, inconsistent definitions of "green" projects, and lack of investor protection.

## 2. Research Methodology

This research employs a qualitative, descriptive, and comparative legal research design to examine and evaluate the regulatory frameworks governing green bond issuance across global financial markets. The study adopts a doctrinal legal analysis, complemented by comparative policy analysis, and is supported by secondary empirical data from market reports, regulatory filings, and international organizations.

### Objective of this study

#### This paper aims to:

- Examine the legal and regulatory frameworks underpinning green bond issuance across key global markets.
- Identify commonalities and discrepancies in legal approaches.
- Assess how regulatory frameworks impact market development, investor confidence, and the mitigation of greenwashing.
- Propose pathways for harmonizing global standards to support the growth and integrity of the green bond market.

## 2.1 Research Design

### The study is structured around three core components

1. **Descriptive Analysis:** This involves mapping existing legal frameworks, guidelines, and market practices across multiple jurisdictions, focusing primarily on the European Union, the United States, China, and selected emerging markets (e.g., India, Brazil, South Africa).
2. **Comparative Legal Analysis:** The paper compares legal instruments and institutional mechanisms across jurisdictions to identify convergences, divergences, and gaps in regulatory approaches to green bond issuance.
3. **Normative Evaluation:** The study evaluates the effectiveness of these frameworks in promoting environmental integrity, investor confidence, and

market efficiency, particularly in the context of preventing greenwashing and supporting climate-aligned investments.

## 2.2 Data Sources

**The research is based on secondary data sources, including:**

### Legislation and Regulatory Documents

- EU Taxonomy Regulation, EU Green Bond Standard (EU-GBS)
- U.S. SEC disclosure requirements and guidance
- China's Green Bond Endorsed Project Catalogue
- India's SEBI Green Bond Guidelines
- Various national sustainable finance taxonomies

### Voluntary Frameworks and Standards

- Green Bond Principles (ICMA)
- Climate Bonds Standard (Climate Bonds Initiative)
- ISO 14030 Green Debt Instruments standard
- IPSF Common Ground Taxonomy

### Reports and Market Data

- Climate Bonds Initiative (CBI) Annual Reports
- OECD, IMF, and World Bank publications
- Market analytics from Bloomberg, Moody's, and S&P
- Academic journal articles and legal commentaries

## 2.3 Jurisdiction Selection Criteria

Jurisdictions included in this study were selected based on the following criteria:

- **Market Size and Influence:** Jurisdictions with significant green bond issuance (e.g., EU, U.S., China).
- **Regulatory Innovation:** Jurisdictions that have introduced notable legal instruments (e.g., EU Taxonomy).
- **Emerging Market Inclusion:** Countries that have launched sovereign or sub-sovereign green bond programs or are actively developing green finance legislation (e.g., India, South Africa, Nigeria).

## 2.4 Analytical Tools

The study employs the following tools for analysis:

- **Legal Textual Analysis:** Dissecting the language, intent, and scope of legislative and policy documents.
- **Comparative Matrix:** A tabulated comparative framework was developed to systematically compare jurisdictions based on:
  - Legal definition of "green" or sustainable activities
  - Disclosure and reporting requirements
  - Use-of-proceeds rules
  - Verification and certification mechanisms
  - Enforcement and liability provisions

## Correlation Analysis

A correlation table is constructed in the analysis section to explore relationships between the robustness of legal frameworks and key market indicators, such as green bond issuance volume, investor participation, and incidence of greenwashing controversies.

## 2.5 Limitations of the Study

- **Data Availability:** Not all jurisdictions have publicly

available legal texts or uniform data on green bond performance, particularly in emerging markets.

- **Subjectivity in Qualitative Assessment:** While the legal evaluation uses objective criteria, interpretation of regulatory effectiveness can vary based on stakeholder perspective.
- **Dynamic Regulatory Environment:** The regulatory landscape is evolving rapidly, meaning the findings reflect a snapshot as of early 2025.

## 2.6 Ethical Considerations

This study is based entirely on publicly accessible legal and institutional sources and does not involve human participants or confidential data. Therefore, no ethical clearance was required. All data sources are appropriately cited to maintain academic integrity.

## 3. Review of Literature

The growing urgency of climate change has elevated the role of green finance as a critical mechanism in achieving global environmental objectives. Green bonds—market-based debt instruments designed to finance environmentally beneficial projects—are increasingly studied from legal, economic, and institutional perspectives. The literature provides insight into the evolution, structure, performance, challenges, and governance of the green bond market, emphasizing the need for a robust legal framework to ensure sustainability integrity and investor protection.

### 3.1 Evolution and Institutionalization of Green Bonds

Scholars note the green bond market began as a small, development-focused financial tool and evolved into a sophisticated segment of global capital markets. According to Baker *et al.* (2018) <sup>[6]</sup>, the rapid institutionalization of green bonds is partly due to their alignment with the values of ESG-focused investors and the ability to demonstrate corporate social responsibility. Flammer (2021) <sup>[4]</sup> finds that green bond issuance is associated with improved environmental performance and stakeholder trust, especially when externally certified.

### 3.2 Sovereign Green Bonds and Policy Signaling

An emerging area in the literature is the role of sovereign green bonds in signaling national commitment to sustainable development. Countries such as France, Germany, Nigeria, and Chile have issued sovereign green bonds, which scholars like Stubbington and Tame (2020) <sup>[15]</sup> argue serve as benchmarks for domestic markets and promote local green finance ecosystems. Sovereign issuance is also considered a policy signaling tool that reflects alignment with international climate commitments, such as the Paris Agreement and UN Sustainable Development Goals (SDGs).

### 3.3 ESG Integration and Investor Demand

The integration of Environmental, Social, and Governance (ESG) criteria into investment decision-making has been another catalyst for green bond growth. According to Boffo and Patalano (2020) <sup>[8]</sup>, institutional investors are increasingly embedding ESG strategies, which has led to increased demand for sustainable financial instruments. However, inconsistencies in ESG ratings and lack of regulatory alignment have raised concerns about comparability and reliability.

## 3.4 Climate Finance Architecture and Multilateral Influence

Global climate finance architecture also shapes green bond frameworks. Institutions such as the World Bank, International Monetary Fund (IMF), and United Nations Environment Programme Finance Initiative (UNEP FI) have published guidelines and technical assistance programs to help countries develop green bond markets. The IMF (2021) <sup>[9]</sup> emphasizes the importance of green bonds in mobilizing climate finance, especially in emerging economies, but warns of legal and institutional capacity gaps that may hinder adoption. The Network for Greening the Financial System (NGFS), composed of central banks and financial regulators, has advocated for mandatory climate-related financial disclosures and scenario analysis, pushing the integration of sustainability into financial regulation (NGFS, 2022) <sup>[11]</sup>. This aligns with academic calls for more formalized policy interventions to ensure systemic climate risk management (Battiston *et al.*, 2017) <sup>[7]</sup>.

## 3.5 Legal Uncertainty and the Greenwashing Problem

Legal scholars stress the risks posed by ambiguous definitions of what constitutes a "green" investment. Lack of legally binding standards can enable greenwashing, whereby issuers misrepresent the environmental benefits of their bonds. According to Preclík (2020) <sup>[12]</sup>, legal enforceability of green claims remains limited in most jurisdictions. Standard-setting initiatives like the EU Taxonomy aim to mitigate this by creating legally binding definitions of sustainable activities, but international adoption remains uneven. Greenwashing erodes investor trust and weakens the environmental impact of green finance. Research by Li *et al.* (2021) <sup>[10]</sup> demonstrates that third-party certification reduces information asymmetry and enhances investor confidence, but only when supported by legal accountability mechanisms.

## 3.6 Toward Harmonization of Global Standards

Several studies advocate for the convergence of green bond standards globally. Reichelt (2010) <sup>[13]</sup> emphasizes the importance of a common framework to reduce compliance costs and facilitate international investment. The International Platform on Sustainable Finance (IPSF) and the Common Ground Taxonomy, jointly developed by the EU and China, are highlighted in recent literature as promising steps toward harmonization (IPSF, 2022).

In the context of emerging economies, Naidoo and Kapotwe (2021) <sup>[16]</sup> argue that while voluntary international standards help to establish initial credibility, sustainable market growth requires local legal infrastructure and regulatory ownership. This is echoed by the World Bank (2022) <sup>[17]</sup>, which calls for capacity-building support for regulators in low-income countries. There is also growing interest in integrating green bonds into broader sustainable finance taxonomies that include social and transition bonds. Sanderson and Forsythe (2022) <sup>[14]</sup> propose a tiered regulatory approach that balances flexibility with enforcement to promote innovation while maintaining credibility.

## 4. Analysis

The analysis explores how legal frameworks across jurisdictions shape the structure, credibility, and effectiveness of green bond markets. It assesses regulatory

rigor, consistency, and the presence of enforcement mechanisms. The analysis draws on the comparative legal frameworks of the European Union (EU), United States (U.S.), China, India, and selected emerging markets, and evaluates them against market outcomes such as bond issuance volume, investor participation, and environmental impact.

4.1 Legal Framework Strength vs. Green Bond Market Maturity

**European Union:** The EU has arguably the most advanced and prescriptive green finance regulatory architecture. The EU Taxonomy Regulation and the forthcoming EU Green Bond Standard (EU-GBS) establish legally binding definitions of sustainability, mandatory disclosures, and third-party verification. These instruments have created a high-trust environment and helped position the EU as the global leader in green bond issuance, accounting for over 40% of global issuance as of 2024.

United States

The U.S. lacks a centralized legal definition of green bonds. Regulation is driven by the Securities and Exchange Commission (SEC), which enforces general securities laws regarding transparency and anti-fraud provisions. Although the green bond market is large (second only to the EU), it relies heavily on voluntary standards (e.g., ICMA GBP) and market-based verification (e.g., Moody’s Green Bond Assessment), which introduces inconsistencies and a higher risk of greenwashing.

**China:** China was one of the first countries to develop a government-endorsed green bond catalogue, which excludes certain fossil fuel-related projects in its latest revisions. The People’s Bank of China and China Securities Regulatory Commission provide oversight. However, the alignment of China’s taxonomy with international norms is still in progress. China’s green bond market is largely domestic-focused and partially insulated from international scrutiny.

**India:** India’s regulatory framework, led by the Securities and Exchange Board of India (SEBI), includes Green Bond Guidelines (2017) and alignment with the International Financial Services Centres Authority (IFSCA). Despite these efforts, India lacks a taxonomy aligned with science-based climate targets. However, sovereign green bond issuance in 2023-2024 signals strong policy intent.

Emerging Markets (e.g., Nigeria, Brazil, South Africa)

Emerging markets face capacity constraints but are engaging in green bond issuance with support from multilateral institutions (e.g., World Bank, IFC). Legal frameworks are generally less developed, relying on international principles (ICMA GBP, CBI Standards) and donor-driven technical support.

4.2 Correlation Analysis

The following table presents a qualitative correlation between the strength of legal frameworks and key market indicators:

Table 1: Comparative Analysis of Green Bond Regulatory Frameworks and Market Confidence Across Jurisdictions (2023)

Jurisdiction	Legal Framework Strength	Use of Taxonomy	Third-party Verification	Volume of Issuance (2023, USD bn)	Greenwashing Risk	Investor Confidence
EU	Very High	Yes	Mandatory (EU-GBS)	\$500+	Low	Very High
U.S.	Moderate	No	Voluntary	\$350	Medium	High
China	High (domestic focus)	Yes	Mixed	\$200	Medium	Moderate
India	Moderate	No	Voluntary	\$15	Medium	Growing
Nigeria/Brazil/SA	Low-Moderate	No	Donor-supported	<\$5	High	Low-Moderate

4.3 The Role of Voluntary vs. Mandatory Regulation

Voluntary frameworks like the Green Bond Principles (GBP) and Climate Bonds Standard (CBS) have catalyzed early market development but fall short in enforcement. According to ICMA (2023) [5], over 85% of global green bonds align with the GBP, but without legal accountability, alignment does not ensure environmental integrity. Conversely, legally binding frameworks (e.g., EU Taxonomy) embed obligations into national law, enabling enforceability and reducing greenwashing.

4.4 Taxonomy Convergence and International Cooperation

The International Platform on Sustainable Finance (IPSF) and the Common Ground Taxonomy (EU-China initiative) represent global efforts to harmonize green definitions. Their partial convergence of taxonomies shows promise but also highlights challenges—such as political economy constraints, different energy transition pathways, and varying national priorities.

4.5 Challenges and Risks Identified

- **Fragmentation:** National differences in definitions,

disclosures, and verification lead to confusion and higher compliance costs.

- **Greenwashing:** Jurisdictions without strict regulation are more prone to environmental mislabeling.
- **Lack of Enforcement:** Even when guidelines exist, many are non-binding, leading to weak implementation.
- **Data Transparency:** Inconsistent reporting formats and lack of impact verification limit investor insight.

4.6 Opportunities for Legal Harmonization

The study identifies several avenues for enhancing the global legal framework for green bonds:

- **Adopt core universal standards** for definitions, verification, and impact reporting.
- **Enhance international cooperation** through multilateral institutions and financial standard-setting bodies.
- **Support capacity building** in emerging markets to improve legal infrastructure.
- **Mandate climate-related disclosures** across all financial markets (as supported by the Task Force on Climate-related Financial Disclosures - TCFD and NGFS).

## 5. Findings

The analysis of global legal frameworks for green bond issuance has led to several key findings:

### 5.1 Strong Legal Frameworks Foster Market Confidence

Countries with well-defined, legally binding green finance regulations—particularly the EU—exhibit higher levels of green bond issuance and investor participation. Mandatory taxonomies, disclosure rules, and verification mechanisms significantly reduce greenwashing risk and enhance market credibility.

### 5.2 Fragmentation Undermines Global Market Efficiency

The absence of a harmonized international legal standard leads to inconsistencies across jurisdictions. Divergences in green definitions, reporting protocols, and certification requirements increase compliance costs and create barriers to cross-border investment.

### 5.3 Voluntary Standards Are Crucial but Insufficient

Initiatives like the Green Bond Principles (ICMA) and Climate Bonds Standard (CBI) have played an essential role in initiating market growth. However, their lack of legal enforceability limits their effectiveness in curbing greenwashing and ensuring impact alignment.

### 5.4 Emerging Markets Face Structural and Institutional Challenges

While several emerging markets are engaging in green bond issuance, they often lack the legal infrastructure, technical capacity, and investor protections required to sustain long-term market development. These jurisdictions are highly dependent on multilateral technical assistance and voluntary frameworks.

### 5.5 International Coordination Is Improving but Slow

Efforts such as the EU-China Common Ground Taxonomy and the International Platform on Sustainable Finance (IPSF) show progress in standard alignment, but political, economic, and developmental differences remain significant obstacles to universal legal convergence.

## 6. Conclusion

Green bonds are a vital financial instrument for channeling capital toward environmental sustainability and climate action. However, the credibility and growth of this market depend heavily on the strength and coherence of legal frameworks that govern issuance, verification, and reporting.

This study finds that jurisdictions with robust legal structures—characterized by enforceable taxonomies, mandatory disclosures, and third-party certification—demonstrate greater investor confidence, reduced green washing, and higher volumes of issuance. Conversely, fragmented or voluntary-only approaches, while important during early market formation, pose systemic risks as green finance becomes mainstream.

A critical takeaway is the need for harmonized international legal standards that strike a balance between flexibility and enforceability. Cross-border cooperation, multilateral institutional support, and legal convergence around definitions and reporting norms are essential to unlocking

the full potential of green bonds in advancing global environmental objectives.

Ultimately, as the climate crisis intensifies, the role of legal frameworks in green finance will become even more central. Policymakers, regulators, and international organizations must collaborate to build a transparent, accountable, and universally credible green bond ecosystem. As the green bond market continues to grow, a balance must be struck between flexibility for innovation and the legal certainty required to protect environmental integrity and investor interests. Policymakers and financial institutions must work collaboratively to establish a globally trusted legal foundation for sustainable finance.

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