



Investor Sentiment Towards the Green Bond Market in Latin America and the Caribbean

Abstract

This study explores investor sentiment towards the growing green bond market in Latin America and the Caribbean (LAC). From our survey results of institutional investors, we find institutional investors are interested in increasing their investment exposure to green bonds from the LAC region focused on funding both Nationally Determined Contributions and other green activities dependent on transparency of Use of Proceeds and data in the primary and secondary markets. These findings shed light on the current state of investor sentiment and highlight risks and opportunities pertinent LAC regional issuers, development banks, regulators, and civil society, and both LAC regional and global institutional investors. Addressing these risks and opportunities could potentially improve investor confidence and encourage greater participation in green finance, which could promote sustainable development not only in Latin America and the Caribbean, but also globally.

Keywords

Latin America and the Caribbean, Green Bonds, Institutional Investor Demand, Global Survey, Supply

1. Introduction

Measures of investor sentiment in the Latin America and the Caribbean (LAC) region for green bond issuance can be categorized into three distinct types based on the data they utilize [1].

1. The first category encompasses market-based measures, which leverage observed market data, such as prices and trading activity, to gauge sentiment.
2. The second category involves survey-based measures, which entail collecting input directly from market participants through surveys to discern their views.
3. The third category incorporates textual and media-based measures, where sentiment is extracted from various sources, including text, publications, recordings, events, and web activity.

For this research paper, a hybrid quantitative and qualitative approach was adopted from the above list and used to assess LAC investor sentiment about regional green bond issuance, utilizing both market-based and survey-based methodologies to delve into investor sentiment. This entailed analyzing observed market data and collecting direct input from market participants through surveys and interviews to derive a comprehensive understanding of their sentiments. Furthermore, the paper defined investor sentiment as the likelihood of an investor investing in a type of bond that maximizes their expected return, thereby adding a nuanced dimension to the research.

The context for this research paper is the 2015 Paris Agreement, with its Nationally Determined Contributions (NDCs), provides a framework for each country to combat climate change. Since 2015, investors have increased demand for green sovereign and sub-sovereign bonds to fund the fulfillment of these climate commitments.

Yet, the LAC market currently only represents 2% of the \$1.9 trillion global green bond market, despite the clear need to fund climate change mitigation and adaptation throughout the region.



At the same time, the LAC region with its 666 million inhabitants lags other global regions in green bond issuance when compared using per capita, see e.g. [2].

This green investment gap must be bridged to fund climate-focused initiatives in the LAC region, given the vulnerability of many of the region's inhabitants to climate change while also promoting LAC regional resilience and sustainability.

Given the material and immediate climate risks facing LAC countries, transitioning to a green economy is paramount. This green transition would not only help mitigate the impacts of climate change but also enable adaptation to a changing climate.

Thus, there is an immediate need for greater transparency and information disclosure in the LAC green bond capital markets in both the primary and secondary markets. To meet the green mandates and criteria of institutional investors, issuers in general, including LAC countries, need to provide clear and consistent descriptions of the Use of Proceeds (Up) for green bonds at a project level.

While sovereign and sub-sovereign green bonds in LAC countries cover a variety of green project categories under the Green Bond Principles [3], the selection of these categories is based on the specific needs of each country and issuer, as well as their policy and credit risk environment. Evidence now suggests that there may be a material difference in the LAC green premium, referred to as the greenium¹, within the green bond market when considering various currencies and types of issuers in the LAC region.

Nevertheless, it is not entirely evident to institutional investors whether a connection exists between the premium and the allocation of funds towards green projects, see e.g. [4]. Thus, institutional investors would benefit from improved and more transparent disclosure and replicable green bond analytics specific to LAC's sovereign and sub-sovereign green bond markets.

At the same time, the LAC region plays an important role in the global carbon cycle and planetary health within planetary boundaries, making it both a key carbon sink and source of natural capital-linked exports, [5]. The LAC region offers valuable resources for the low-carbon transition and has demonstrated clear leadership in sub-sovereign green bond issuance. Yet to increase investments from institutional investors outside of the region, the LAC region needs to improve green bond transparency and disclosure. Furthermore, educating and engaging these institutional investors directly can equip them with the necessary tools to make informed investment decisions which would result in more funding in the LAC region in the support economic, sovereign, and planetary health.

In summary, this quantitative and qualitative research based upon a survey of institutional investors and related parties identifies practical approaches and mechanisms for LAC countries and issuers to strengthen their green bond issuances while ensuring alignment with the sustainability goals embedded in their respective NDCs. The results were summarized in a matrix format, providing a confidential and anonymous snapshot of collective insights. Notably, per compliance regulations, all names and identifying information have been removed from the survey matrix to maintain confidentiality and anonymity, and to foster a transparent and collaborative research environment.

¹ Please see Section 3.1 for detailed information on greenium and its definition.



The paper is organized as follows: Section 2 offers an overview of the green bond market in selected countries. Section 3 reviews pertinent literature, while Section 4 describes the methodology of the conducted survey and presents empirical analysis results. Section 5 concludes the paper, and Section 6 provides an outlook for future research.

Supporting the need to increase green bond issuance and transparency in the LAC region, the “Assessing Sovereign Climate-related Opportunities and Risks” project[6] (the ASCOR Project) may evolve into an indispensable tool for sovereign issuers and institutional investors, providing actionable insights that can inform policy decisions and guide investment strategies. The ASCOR Project’s strength lies in its robust framework centered around three pivotal pillars: emission pathways, climate policies, and financial risks and opportunities.

Each of these pillars is subdivided into themes, incorporating a range of indicators and quantitative metrics. For example, themes encompass mitigation, adaptation, and just transition within the climate policies pillar. The first two pillars establish a comprehensive assessment of a country's performance in managing climate risk. Meanwhile, the final pillar evaluates the risks and opportunities associated with financing the transition towards achieving net-zero carbon emissions.

At the core of the ASCOR Project’s pillars is the clear role played by a country's Nationally Determined Contributions (NDC) pledges. Thus, the ASCOR Project provides an evaluation of a country's commitment to addressing climate change and offers a nuanced understanding of the risks and opportunities inherent in financing the transition to a low-carbon future. This multifaceted approach positions ASCOR as a valuable tool for stakeholders aiming to navigate the complex landscape of climate-conscious policy and investment decisions.

2. Select Country Summaries

2.1. Argentina

Label	Count	First Issuance	Average Maturity [year]	Average of Volume [\$ millions]
Green	21	17/02/2020	4.3	48
Sustainability	1	24/02/2021	3.5	20
<none>	7	07/12/2018	3.5	36

Table 1 Data on labeled bonds for Argentina. Source: Green Bond Transparency Platform [7].

Between 2019 and 2023, the sustainable debt market in Argentina registered a steady growth in the issuance of green bonds. According to a report of the National Securities Commission (Comision Nacional de Valores), cited in November 2023 by the specialized newspaper Ambito Financiero, the sustainable debt market in Argentina registered, until September 30th 2023, a total of seventy-two (72) issuances, for a total of \$1,589 million.²

Bolsas y Mercados Argentinos S.A. (BYMA), a platform that integrates the main players of the country’s stock market (www.byma.com.ar), reports the year-by-year progression of private sector green bonds emissions as follows:

- 2019: \$27,062,528

² Totals vary depending on sources used.



- 2020: \$35,160,000 and AR\$ 1,109,925,000
- 2021: \$687,436,353
- 2022: \$343,804,894 and AR\$ 10,444,956,000
- 2023: \$412,626,084 and AR\$ 7,303,116,325

The projects are mainly related to wind power and to biomass. Additionally, sub-sovereign green bonds were issued, the first being in 2017 the La Rioja Province for the Parque Arauco Wind Power Project. The bond subsequently missed a \$16 million bond payment for various reasons.

Regulators have also supported the growth of the Argentinian green bond market. The National Securities Commission and BYMA have published a guide for Social, Green and Sustainable Bonds, that includes the Green Bonds Principles. Also, the Economy Ministry has published a Sovereign Finance Framework to promote the use of sustainable debt by the public sector.

The key participants in the Argentinian green bond market have so far been renewable energy companies. The potential for growth of this sector is enormous, as is the one for biomass, given the dimensions of the agricultural sector. According to a report by the Cordoba Cereal Exchange of August 2023, 5% of sustainable debt in Argentina is related to agriculture. The same report puts Argentina in a distant fourth place in Latin America, far from the front-runner, Chile. This is significant as an outlook for the prospective growth of green bond emissions. Finally, as Argentina has been subject to significant deforestation, there are important possibilities for financing of projects associated with reforestation and soil recovery.

2.2. Brazil

Label	Count	First Issuance	Average Maturity [year]	Average of Volume [\$ millions]
Green	40	24/05/2019	9.7	82
Sustainability	2	21/01/2021	8.6	625
No label	53	14/07/2016	10.1	143

Table 2 Data on labeled bonds for Brazil. Source: Green Bond Transparency Platform [7].

Brazil's NDC target is a 53% reduction in GHG emissions by 2030 in comparison with 2005. Brazil has also targeted carbon neutrality by 2050 with overall funding focusing on improving energy, food, water, social security, and environmental safety to support a climate resilience.

Given this need, in September 2023, Brazil launched its Sovereign Sustainable Bond Framework to enable the issuance of green, social, and sustainability bonds to fund projects and programs related to their NDCs and similar goals.

On November 13, 2023, Brazil then issued it's a \$2 billion sovereign sustainable bond that increased its debt maturity while broadening its institutional investor base and funding Brazil's commitment to environmental and social sustainability.

Brazil is planning to issue more green sovereign bonds in 2024.

2.3. Chile

Chile emerged as a trailblazer in 2019 by becoming the first sovereign issuer of green bonds in the LAC region. The introduction of green bonds was strategically aligned with a broader climate mitigation strategy and served as a pivotal instrument in the country's pursuit of



narrowing fiscal deficits and transitioning toward a low-carbon economy. The Chilean Ministry of Finance (MoF) meticulously developed a Green Bond Framework in May 2019, outlining the MoF's obligations as an issuer and providing transparency to investors navigating the nascent and evolving standards of the green bond asset class.

Label	Count	First Issuance	Average Maturity [year]	Average of Volume [\$ millions]
Green	9	04/04/2017	19.7	585
Sustainability	4	15/04/2021	19.8	1,375
No label	8	18/04/2018	15.4	818

Table 3 Data on labeled bonds for Chile. Source: Green Bond Transparency Platform [7].

A distinctive feature of Chile's green bond issuance process involved carefully selecting and certifying eligible projects, primarily in sectors such as clean transportation, renewable energy, water management, and green buildings. These projects, certified by the MoF in collaboration with the Budget Office and other ministries, not only bolstered the country's commitment to sustainability but also laid the groundwork for issuing green bonds.

Marketing these green bonds to investors required a strategic approach, considering the novelty of the asset class. Investors, gradually acclimating to this emerging financial instrument, sought assurance regarding the issuer's climate credentials. To establish credibility, the MoF consistently updated investors on its progress within the domestic Environmental, Social, and Governance (ESG) landscape.

Chile's foray into green bonds proved financially advantageous, as these bonds were issued at exceptionally low yields with negative issue premiums, surpassing secondary market pricing. The issuance demonstrated the country's commitment to sustainability and showcased a cost-effective approach, with investors, particularly those with ESG mandates, demonstrating a heightened willingness to pay. The trading dynamics underscore this trend, as some of Chile's green bonds have consistently traded at lower interest rates than their regular counterparts, as depicted in the accompanying figure. The success of Chile's sovereign green bonds facilitated financing for the climate agenda and contributed to a more diverse and expansive investor base, enhancing the overall resilience and sustainability of the fiscal strategy.

2.4. Colombia

Label	Active flag	Count	First Issuance	Average Maturity [year]	Average of Volume [\$ millions]
Green	Yes	6	13/08/2020	5.58	173.7
Green	No	7	09/08/2017	3.86	37.2

Table 4 Data on labeled bonds for Colombia. Source: Refinitiv.

The Republic of Colombia launched the first government wide LAC taxonomy in April 2022, the Taxonomía Verde de Colombia. The taxonomy targets interoperability with other global taxonomies, including the EU Taxonomy.

In 2022, the Republic of Colombia issued a \$200 million sovereign green bond that was a 'twin bond'. A 'twin bond' means that each green bond is paired with a similar conventional bond with the same maturity with which it can be exchanged. This improves liquidity for the sovereign green bond.

In March 2024, as an example of market sentiment, Banco Finandina's \$30 million green bond was 6.9 times oversubscribed. Banco Finandina is the first B Certified corporation in Colombia.

2.5. Mexico



The green bond market was born in Mexico in 2015 when Nacional Financiera, an important Mexican development bank, issued its first green bond for USD500M in the international markets. Since then, another 16 organizations in the country have issued green bonds for a total amount of USD11.2BN. The market has grown to achieve USD1.6BN in issuances per year in 2023. There are now almost US4BN outstanding according to the green indicator by Bloomberg.

Label	Count	First Issuance	Average Maturity [year]	Average of Volume [\$ millions]
Green	8	05/11/2015	5.4	141
Sustainability	14	19/09/2017	6.7	229
<none>	3	28/06/2017	16.0	419

Table 5 Data on labeled bonds for Mexico. Source: Green Bond Transparency Platform [7].

Most issuances in Mexico have been carried out mostly by the government in terms of volume (roughly 64%) and the rest by the corporate sector. The market has lately migrated to Sustainable bonds.

In Mexico, the reporting criteria for green bonds has played a crucial role in ensuring green bond integrity in Mexico. The country adheres to voluntary Green Bonds Principles MX, established by the Mexican Stock Exchange and aligned with international standards. This framework sets clear guidelines on project selection, use of proceeds, and reporting, providing investors with confidence in the environmental impact of their investments. While the principles and guidelines provide recommendations and standards for transparent and accurate reporting on the use of funds, there is no legal obligation requiring green bond issuers to provide specific reports. However, many issuers choose to do so to demonstrate their commitment to sustainability and accountability to investors and the general public.

Key players in the green bond market include national and state development banks, energy companies, and corporations seeking sustainable financing solutions.

While the green bond market has steadily grown in Mexico, much more could be done, in particular if SDGs are to be achieved. For example, investors often rely on the reputation and ultimate paying ability of the issuers rather than on the repayment ability of the green projects bonds finance. Nafin (Nacional Financiera, Mexico’s development bank) has experienced investors requesting to know if the repayments would ultimately be borne out of general Nafin revenues.

From a macro perspective, bond issuers could be more motivated to issue green bonds if the risks considered and their repayments were tied to their green projects financed. This is because green projects have lower regulatory risks and should consequently carry lower yields. However, issuers repay green bonds from their organization’s balance sheet (at least at the beginning before the green projects provide a return) and do not necessarily enjoy lower yields because they are being evaluated on the basis of the risks of their entire balance sheet. Financial solutions that allow lower green risks to translate into lower yields for the issuers could help foster a larger green bond market (e.g. phased capital deployment for investors or partial bond guaranties).

Ultimately, the green bond market serves as a steppingstone towards a more sustainable financial system. While it is crucial to continue promoting green bonds, the goal should be to integrate sustainability principles into all debt instruments. This shift would ensure that every investment contributes to a greener, more resilient future for Mexico.

3. Literature Review



This section discusses studies that delve into the exploration of investor sentiment. It encompasses a diverse array of studies, incorporating both theoretical frameworks and empirical investigations. Theoretical studies contribute conceptual insights into the psychological and emotional factors influencing investor decisions. In parallel, empirical research draws upon real-world data and statistical analyses to offer practical insights, contributing to a comprehensive understanding of investor sentiment within financial markets.

3.1. Greenium

A bond may sometimes be issued with a higher price, and thus have a lower yield, than outstanding debt. The bond will price inside its own yield curve. This is known as a new issue concession; when present in a green bond, Climate Bonds has termed it “greenium” [8]. This is an excellent outcome for any issuer because it pays less to fund its green bond than its secondary market vanilla debt.

From an investor perspective, there is no fundamental difference between a green and a conventional bond. Green bonds ranking pari-passu with similar bonds have no additional rights for the underlying project. Hence, a green premium should be considered as a market anomaly.

According to [9], the H1 2023 iteration assessed more than 110 green bonds, totaling a combined volume of \$124.6 billion, marking it as the most substantial semi-annual sample to date. Moreover, [9] suggests that green bonds undergo more significant spread tightening during the pricing process compared to conventional bonds, observed across both U.S. dollar- and euro-denominated loans. The authors of [10] undertook a comparative analysis involving a selection of analogous green and conventional bonds. Their investigation revealed that green bonds exhibited a marginal tendency to trade at narrower spreads in comparison to conventional bonds issued by the identical entity. For the year 2022, [11] reported an increase in the average greenium from -4.6 basis points to -7.2 basis points by the year's end, as calculated on a rolling average, secondary market data basis.

We [12] analyzed a sample of 89 matched green and conventional bonds and found that institutional green bond issuers such as sovereigns, local governments, and supnationals face a greenium.

Based on yield curves, [9] found nine Sustainability-linked bonds (SLB) that none of them priced inside their secondary market yield curves. This is unsurprising, given the current market backdrop. Further in the study, the analysis of the green bond market revealed that for euro bonds, investors were willing to pay more for green deals when the label was combined with the highest credit quality during H1.

Finally, studies find that greenium is not static over time, see e.g. [13], [11], and fluctuating in its orientation (positive or negative) . As the frequency and magnitude of bond issuance grow, there will be more evidence to assess the sustainability of bond greenium and its limiting factors. Market participants should be cognizant of the natural non-stationarity of the data, which gives rise to econometric issues when calculating and forecasting greenium.

3.1.1. Primary Market

The study in [14] identifies three principal findings, revealing noteworthy patterns in the green bond market. The study finds a significant four basis points greenium for green bonds with heightened greenness, which increases to 5.3 basis points with external review, emphasizing the critical role of credibility at both bond and issuer levels. Their research further indicates a



growing significance of the greenium for bank-issued green bonds over time, and consistently observes a greenium for green bonds from alternative energy firms throughout the study period. Notably, the study attributes the heightened greenium on bank-issued green bonds to increased demand from retail investors, offering insights into market dynamics.

We [15] conducted an empirical analysis to examine the relationship between corporate debt issuers' ESG disclosure scores, sourced from Bloomberg as a proxy for corporate reputation, and the cost of debt financing measured by the coupon rate at bond issuance in primary markets. The research suggests that companies with higher ESG scores may enjoy a reduction in borrowing costs. The authors highlight the influence of country- and sector-specific circumstances on the correlation between ESG practices and a company's reputation. This encompasses macroeconomic and financial factors, as well as the prevailing ESG standards within each country. The primary contention is that robust ESG practices have the potential to enhance a company's reputation and alter market perceptions of its business model. It has been suggested that companies that demonstrate greater transparency and disclosure in their ESG reporting may experience a reduction in their capital costs. This, in turn, could impact the perceptions of investors and creditors with regards to their reputation, potentially influencing their borrowing costs.

3.1.2. Secondary Market

They [16] define the green premium in the secondary market as the yield difference between green and non-green bonds, adjusting for liquidity discrepancies. To eliminate any unobservable disparities between green and non-green bonds, the study employs a matching methodology to create synthetic conventional bonds. When examining a dataset that includes bonds issued by various entities denominated in USD and EUR, it was found that green bonds have a slightly lower premium of 2 basis points compared to similar conventional bonds, see [16].

The performance of green bonds in the secondary market varies significantly across countries [17]. In Colombia, the yields of green bonds are similar to those of conventional bonds, while in Hungary, the turnover of green bonds is low, similar to that of conventional bonds. Fiji has recorded minimal secondary market activity for its green bond, with only one transaction.

Meanwhile, Mexico's SDG bonds outperform other benchmarks in terms of liquidity. Thailand's sustainability bond continues to maintain adequate liquidity in the secondary market. Similarly, the Philippines' 25-year maturity U.S. dollar-denominated sustainability bond has experienced an upward trajectory in secondary rates since issuance, reaching 5.15% or 96 basis points above the original coupon as of June 2022. It is important to note that the observed differences in liquidity are not necessarily tied to the nature of the instrument (green or conventional). Factors such as institutional investor composition and supply and demand imbalances can significantly impact liquidity. For instance, green bonds may exhibit lower trading activity if they attract more institutional investors with buy-and-hold strategies. It is worth noting that Colombia's twin bond mechanism, which is designed to ensure liquidity for green bonds, provides an interesting case study in this context.

3.2. Theoretical approaches

Several studies attempt to analyze investor sentiment from a rational perspective. This section presents a selection of these studies along with their results and conclusions.

The theoretical literature on the pricing of green bonds mostly argues that there should be a price premium for green bonds. Using asset pricing frameworks with green investor preferences, [18] and [19] show that green assets have lower expected returns (higher prices)



because investors enjoy holding these assets (green preference), and green assets provide a hedge against climate risks. Similar arguments are made by [2].

In contrast to prior studies, the model presented by [20] accommodates both positive and nonexistent green bond premiums, aligning better with varied empirical evidence. The model attributes the greenium's presence to transition risks, green bond issuing costs, and greenwashing costs. Importantly, it does not rely on assuming a non-financial green preference by investors to explain the premium for green bonds, enhancing its flexibility and robustness.

Likewise, a study conducted by [19] reveals a significant three-fund separation phenomenon in portfolio holdings. This finding demonstrates the importance of considering ESG factors in investment decisions. It is evident that investors with strong Environmental, Social, and Governance (ESG) preferences have portfolios with a clear green bias that differs from the market portfolio, while those with weaker ESG inclinations have a noticeable brown bias. Under conditions of diminished risk aversion, these tendencies are significantly amplified. Strong ESG preferences result in lower expected returns, particularly when both low-risk aversion and average ESG preferences are high. However, in order to maintain alignment with their preferred portfolios, investors with strong ESG preferences are willing to sacrifice a lower magnitude of return than that expected by their risk preferences. The model was confidently extended to incorporate climate risk, resulting in a clear four-fund separation. A climate-hedging portfolio with a green bias was introduced as a fourth fund.

The guidance provided by [21] is invaluable for policymakers and environmental investors. Policymakers must improve their risk emergency measures, including providing clear green criteria and establishing a price stability mechanism, to respond more quickly to extreme events like the COVID-19 outbreak. The green bond and carbon markets pose a significant challenge for regulators as they strive to ensure the steady development of these markets, but they are also major information receivers in the green finance system. To ensure effective regulation of green bond and carbon markets, examining the impact of other green finance markets is essential. Robust regulations for environmental, social, and governance information disclosure are crucial, as the ESG market plays a vital role in transmitting information within the green finance system. It is important to note that climate policies significantly impact the spillovers among green finance markets. In this way, climate policymakers must strengthen policy transparency and formulate rational policies to reduce abnormal volatility in green finance markets.

Environmental investors must strengthen their awareness of green finance markets and focus on extreme events to adjust their portfolio strategy promptly and effectively. The COVID-19 outbreak has further intensified the linkage between green bonds and other green finance markets, underscoring the critical importance of green bonds in portfolio hedging and risk diversification. Adopting an ESG investment philosophy is crucial for evaluating the performance of financial assets and minimizing investment losses due to risk contagion. ESG stocks promote eco-friendliness and act as transmitters to other sustainable assets, making them a wise investment choice. Evaluating investor sentiment is crucial for understanding the transmission of information among green finance markets. This is especially important for participants in green resource markets when making investment decisions, see e.g. [21]. Highlighting the lasting impact of green bonds on stock market dynamics, studies acknowledge constraints like data challenges in mainland China's less mature market, see e.g., and advocate for future research exploring mature market contexts or mixed methods approaches. Additionally, the ongoing debate surrounding the reliability of abnormal stock price volatility as an indicator of sentiment sparks anticipation for advancements in universally accepted measurement methods. In this way, [22] underscores the need for continued inquiry into the multifaceted realm of green bonds and their implications for investor sentiment.



On the other hand, [23] examines the relationship between a composite energy policy diversity metric and the issuance of green bonds across seventy countries from 1991 to 2021, utilizing data from the International Monetary Fund (IMF). This study incorporates a spectrum of economic, environmental, and institutional factors to elucidate the multifaceted determinants shaping this relationship. Diversified energy policies are crucial in promoting a balanced and sustainable energy production approach while mitigating the risks associated with relying solely on one energy source. Thus, strategic diversification is a proactive measure proposed to mitigate potential perturbations, given the inherent risks of a monocentric energy strategy, such as susceptibility to price volatility, supply shortages, and environmental exigencies. Diversification is crucial in green finance to mitigate risks and enhance the investment environment for renewable energy initiatives, see e.g. [23].

A country's appeal to investors in alternative energy sectors is strongly correlated with the diversification of its energy policies. Countries that adopt diversified energy strategies offer a more secure and attractive investment environment in the field of green finance. This crucially drives the broader shift towards a more sustainable and resilient global energy paradigm.

The empirical observations found by [24] and [25] assert a nuanced distinction, highlighting that the influence of price pressure originating from capital overflow is notably more subdued on liquid bonds than their illiquid counterparts. It is observed that the interplay between equity investor sentiment and the dynamics of both contemporaneous and subsequent bond returns manifests with particular prominence within the subset of illiquid bonds within the no-overinvestment cohort. This discernment adds a layer of granularity to understanding the intricate dynamics between market sentiment, liquidity, and investment strategies. In this line, the empirical findings found by [26] support the assertion that the issuance of green bonds significantly contributes to the objective of reducing fossil fuel consumption.

Considering the speculative factors, it becomes apparent that among them, only Economic Policy Uncertainty (EPU) and the Volatility Index (VIX) exert a substantial influence on green bond returns, see e.g. [27]. In contrast, investor sentiment exhibits no discernible impact across all quantiles. This observation underscores the distinct responsiveness of the green bond market, emphasizing a heightened sensitivity to institutional and overarching market uncertainties over the perceived sentiments of individuals. Furthermore, the prognostic efficacy of both EPU and VIX extends uniformly across various market states, aligning with insights articulated by [28], which highlight the significant role of uncertainty indices in shaping green bond returns. However, a caveat is acknowledged, indicating that the magnitude and persistence of this relationship exhibit variations contingent upon distinct market states.

The authors of [29] find that the US market and volatility proxies do not lead to a regime switch involving sentiment as long as bond index returns are concerned. These findings are robust regardless of the introduction of dynamic models and additional variables.

4. Empirical Analysis

While the mathematical approaches discussed in Section 3.2 provide an analysis of rational investor behavior, this section presents the results of a survey designed to measure investor sentiment from an empirical study. The questions were selected in order to meet the criteria of objectivity, reliability, and validity.

4.1. Goal of this Survey

The primary goal of this survey is to systematically assess and understand investor sentiment towards the green bond market in LAC. The specific objectives include:



1. **Measure Investor Awareness:** Evaluate the level of awareness among investors regarding the concept and purpose of green bonds. Determine if investors know these financial instruments' environmental and sustainable aspects.
2. **Assess Investor Knowledge:** Gauge the depth of investor knowledge regarding the green bond market in LAC. Identify whether investors are informed about the available investment opportunities, associated risks, and potential returns.
3. **Explore Investor Attitudes:** Investigate the attitudes and perspectives of investors towards environmental sustainability as a factor in their decision-making process. Understand if investors prioritize sustainability and if they consider climate-related factors when making investment decisions.
4. **Understand Investment Preferences:** Explore the preferences of investors concerning green investments. Determine how much the "green" aspect influences their investment choices and whether they are more inclined to support projects contributing to environmental sustainability.
5. **Identify Barriers and Challenges:** Recognize any perceived barriers or challenges investors may face in entering or expanding their involvement in the green bond market. This includes understanding potential concerns, risks, or regulatory obstacles.
6. **Evaluate Regulatory Influence:** Examine the impact of regulatory frameworks and policies on investors' decisions to engage in the green bond market. Understand the role of government regulations in shaping investor sentiment and influencing investment behavior.

By achieving these objectives, the survey aims to provide a comprehensive understanding of investor sentiment towards the green bond market in LAC. The findings will not only benefit investors in making informed decisions but also contribute valuable insights to policymakers, financial institutions, and other stakeholders in the region.

4.2. Methodology

The survey consisted of 42 questions and was distributed through common communication channels such as e-mail invitations. It was strategically designed to generate data series suitable for longitudinal studies, enabling the assessment of benchmarks, growth, and change over time. The questionnaire included a variety of question types, including multiple-choice, Likert scale, and free-text questions.

Thematically, the survey was structured into seven sections, each addressing specific areas of interest. These sections included:

- **Demographics:** Gather information about the background and characteristics of the respondents, providing context for the analysis.
- **Green Bonds in LAC:** Focus on understanding respondents' perspectives, knowledge, and sentiments regarding the green bond market within the LAC context.
- **Sustainable Development and Investment Decisions:** Explore the correlation between sustainable development goals and the participants' decision-making processes in their investment strategies.
- **Climate Risk and Investment Decisions:** Investigate how respondents factor climate-related risks into their investment decisions, reflecting the growing importance of climate considerations in financial planning.
- **ESG and Investment Decisions:** Examine integrating Environmental, Social, and Governance factors into investment choices, gauging the relevance of ethical and sustainable considerations in decision-making.
- **Sovereign and Sub-Sovereign Debt and Investment Decisions:** Focus on respondents' perspectives on government debt and its impact on their investment decisions, capturing insights into sovereign and sub-sovereign debt considerations.



- **Green Bonds and Investment Decisions:** Explore the specific relationship between green bonds and investment choices, delving deeper into the factors influencing respondents' decisions to engage with these financial instruments.

This division allows for a systematic exploration of diverse dimensions related to investment and sustainability, providing a comprehensive view of the respondents' attitudes and behaviors across various thematic areas. The survey asks these same questions in the latter portions of the study.

4.3. Survey Responses

Survey responses were collected over approximately six months, from October 2023 to March 2024. The survey focuses on green bond issuance and proceeds allocation within the LAC region, although respondents are of global origin. Reflecting this global reach, the outreach efforts of this study were designed to capture responses from different geographic locations. The distribution of responses by country is shown visually in **Figure 1**.

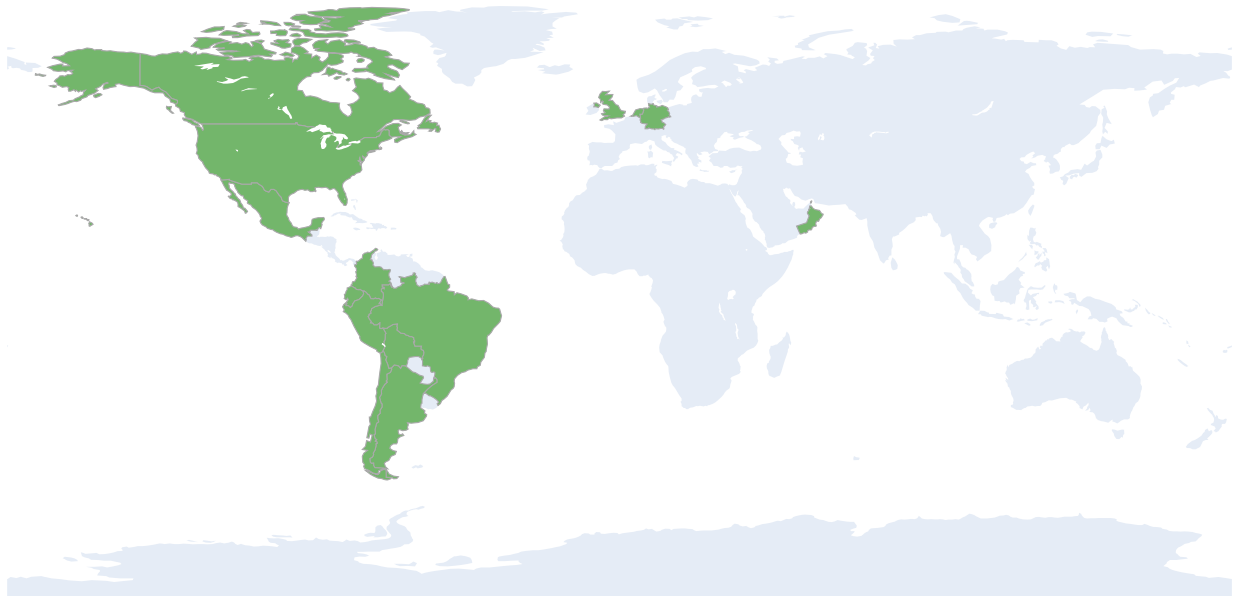


Figure 1 Geographic distribution of the survey participants, with a notable focus on the Americas. Nevertheless, data was gathered from other regions, such as Europe and Asia.

Table 6 displays the distribution of responses across various geographical regions. The survey primarily centers its focus on the LAC (Latin America and the Caribbean) region, which is appropriate given the survey's objectives. However, it is important to note that capital flows internationally, and consequently, projects financed within the LAC region often receive funding from sources outside of LAC. As a result, the survey includes a significant representation from North America, reflecting the cross-border nature of capital allocation.

Moreover, responses from European and Asian regions were also collected, indicating a broader global perspective captured within the survey data. This diverse geographical representation enhances the comprehensiveness and applicability of the survey findings to a wider range of stakeholders and contexts beyond the LAC region.



Region	Responses
North America	30
Central America	4
South America	24
Europa	4
Asia	4
TOTAL	66

Table 6 Presented is the total number of responses across different geographical regions.

Figure 2 displays the sector distribution of survey participants, revealing that the "Financials" sector constitutes the majority of respondents. Within this sector, the largest contingent is comprised of individuals affiliated with "Asset Management and Custody Banks," indicating a significant presence in the survey responses. Next are respondents associated with "Financial Exchanges and Data" and "Investment Banking and Brokerage".

Furthermore, representatives from the "Industrials" sector are exclusively focused on the sub-sector of "Research and Consulting Services." This sector exhibits a notable proficiency in the investment of green bonds. Respondents from this sector possess significant knowledge and experience in sustainable finance and environmentally responsible investment strategies, contributing valuable insights to the survey findings.

The category labeled "Other" encompasses responses from academia and higher education, providing a perspective from current research on green bonds. This inclusion underscores the interdisciplinary nature of the survey and the diverse backgrounds contributing to its findings.

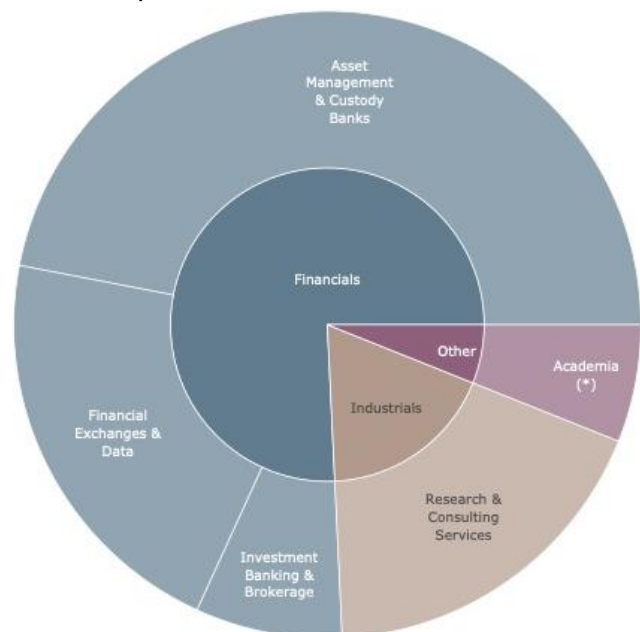


Figure 2 Sector distribution of survey participants categorized according to the Global Industry Classification Standard (GICS).

(*) Note that "Academia" is not a GICS category.

4.4. Results of the Survey

In this section, the results obtained from the survey are presented and analyzed. This analysis aims to provide a comprehensive understanding of investor perceptions and attitudes, highlighting important factors such as confidence levels, risk perceptions, and influencing factors in investment decisions. Overall, this section serves as a crucial component of the study, offering empirical evidence and insights that contribute to a deeper understanding of investor sentiment towards green bonds in this specific context.

4.4.1. Status of the Implementation of Corporate Sustainability Policies

In this subsection, a close examination is conducted of the current state of implementation of corporate sustainability policies. Through detailed analysis and evaluation, a comprehensive



understanding is sought of the extent to which these policies have been integrated into corporate practices and strategies.

Figure 3 shows two heatmaps that provide a visual representation of the correlation between the existence of two key components: a corporate sustainability policy and a sustainable investing policy (left panel), as well as the presence of a dedicated oversight function (right panel).

First, it is worth noting that a significant proportion of respondents, namely 61%, reported successful implementation of a corporate sustainability policy within their organization. Conversely, 30% of respondents indicated that they either do not have a current policy in place or that preparations for such a policy are underway but not yet fully implemented. It's important to note that this latter category was aggregated to provide a holistic representation of the prevailing state among respondents at the time of the survey. This nuanced breakdown underscores the different stages of adoption and implementation of corporate sustainability policies among respondents and provides valuable insights into the landscape of corporate sustainability practices.

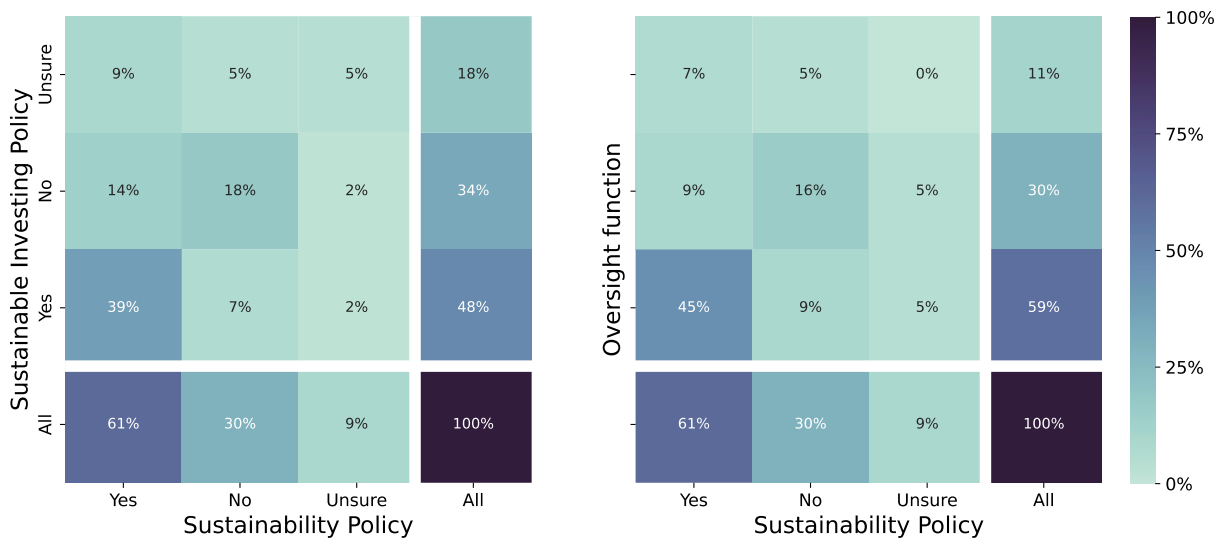


Figure 3 The heatmaps show the correlation between the existence of both a corporate sustainability policy and a sustainable investing policy (left) and a dedicated oversight function (right).

Secondly, the analysis reveals the correlation between the corporate sustainability policy and the presence of an existing sustainable investing policy. Among all respondents, 39% reported the coexistence of both policies, while 18% indicated the absence of either policy. Notably, 7% reported having a sustainable investing policy without an accompanying corporate sustainability policy. This discrepancy may be attributed to the diverse strategies adopted by corporations in aligning their sustainability initiatives with investment practices.

Finally, the analysis reveals the correlation between the existence of a corporate sustainability policy and the presence of a dedicated oversight function tasked with monitoring responsible investment, sustainability and climate risk. Of all respondents, 45% reported having both a corporate sustainability policy and an oversight function, while 16% reported having neither. Interestingly, 9% reported having an oversight function without an accompanying corporate sustainability policy.

4.4.2. Role of Client's Mandates



One question in the survey sought to determine if participants' sustainable investment policies were influenced by their clients' mandates and allowed for free-text answers. In the following, the responses are summarized. This exploration reveals the intricate interplay between external and internal influences guiding the development and implementation of sustainable investment strategies.

Firstly, the presence of stakeholder pressure emerges as a significant driver, indicating that firms are responsive to the expectations and demands of various stakeholders, including investors, customers, employees, and advocacy groups. This suggests a growing recognition within the financial industry of the importance of sustainability and ethical considerations, driven by heightened awareness and scrutiny from diverse stakeholders.

Secondly, the influence of regulatory mandates is evident, with some firms already complying with existing regulations while others anticipate future regulatory requirements. This underscores the role of government policy in shaping sustainable investment practices, as regulatory frameworks continue to evolve to address ESG considerations in financial decision-making.

Thirdly, the alignment with client mandates underscores the importance of catering to specific preferences and values of investors. For instance, firms adhering to vegan philosophies or other ethical criteria demonstrate a commitment to meeting the unique demands of their clientele, reflecting a broader trend towards personalized and socially responsible investment solutions.

Moreover, internal mandates and firm requirements play a crucial role in shaping sustainable investing policies, indicating a proactive approach by some firms in integrating sustainability principles into their organizational ethos. This suggests that sustainability is increasingly viewed not only as a regulatory compliance issue but also as a strategic imperative and competitive advantage for firms seeking to differentiate themselves in the market.

Additionally, the mixture of client-directed and firm-driven requirements highlights the collaborative nature of sustainable investment decision-making, where both client preferences and internal values are considered in formulating investment strategies. This collaborative approach underscores the importance of transparency, communication, and alignment of interests between firms and their clients in achieving sustainable investment objectives.

Overall, the comprehensive analysis of these responses provides valuable insights into the complex landscape of sustainable investing in the financial sector, offering a rich area for academic inquiry. By examining the interplay between regulatory, market, and organizational factors, researchers can deepen their understanding of the dynamics shaping sustainable investment practices and contribute to the advancement of knowledge in this increasingly important field.

4.4.3. Use of ESG Scores

The integration of climate or broader Environmental, Social, and Governance (ESG) considerations into investment and lending decisions is a multifaceted process that begins with the utilization of metrics. These metrics serve as numerical indicators, offering insights into the various ESG and climate-related risks and exposures associated with potential investments or lending activities. Scores and ratings stand out as the predominant methods adopted by investors and lenders alike to assess the performance of companies in relation to broader ESG issues.



Notably, scores and ratings provide a standardized framework for evaluating sustainability performance, allowing for consistent comparisons across companies and industries. In this context, several prominent data providers play a crucial role in furnishing investors and lenders with comprehensive ESG information and analysis. These include well-known entities such as Bloomberg [30], LSEG [31], MSCI [32], Sustainalytics [33], and Vigeo Eiris [34], among many others.

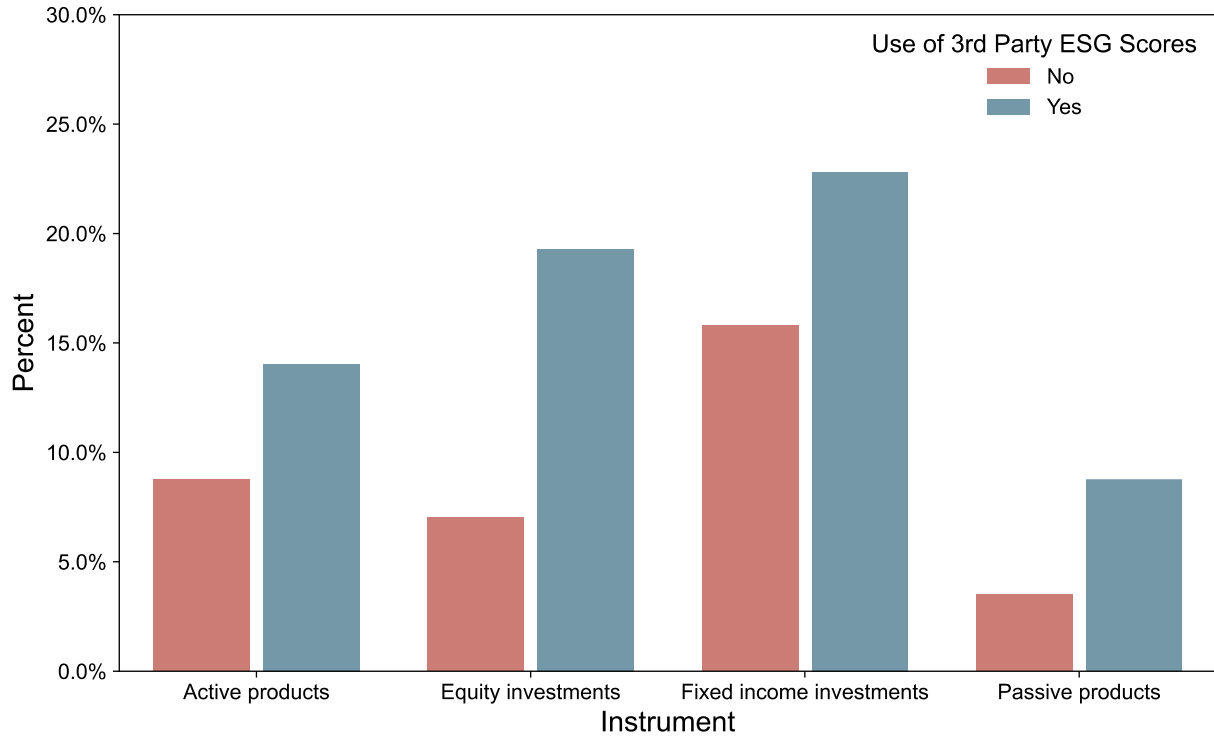


Figure 4 Figure shows how relevant third-party ESG scores are to investors. The data reveals that investors across all categories attach importance to the use of ESG scores in their decision-making processes.

As shown in Figure 4, the availability of data from third-party providers underscores the growing importance of standardized metrics in the evaluation of sustainability performance. By offering a diverse range of services and insights, these data providers facilitate informed decision-making processes for investors and lenders seeking to integrate ESG considerations into their investment strategies and risk assessments. Thus, the utilization of metrics, scores, and ratings provided by third-party data providers forms a foundational step in the broader effort to promote sustainable and responsible investment practices across the financial landscape.

4.4.4. Fixed Income Assessment

When evaluating fixed income investments, investors look beyond financial metrics and consider the broader political environment and economic development of the issuer's jurisdiction. This includes factors such as political stability, regulatory frameworks, and economic indicators like GDP growth, inflation rates, and forecasted tax receipts. Understanding these contextual factors is essential for assessing the overall risk profile and potential returns of fixed income securities.

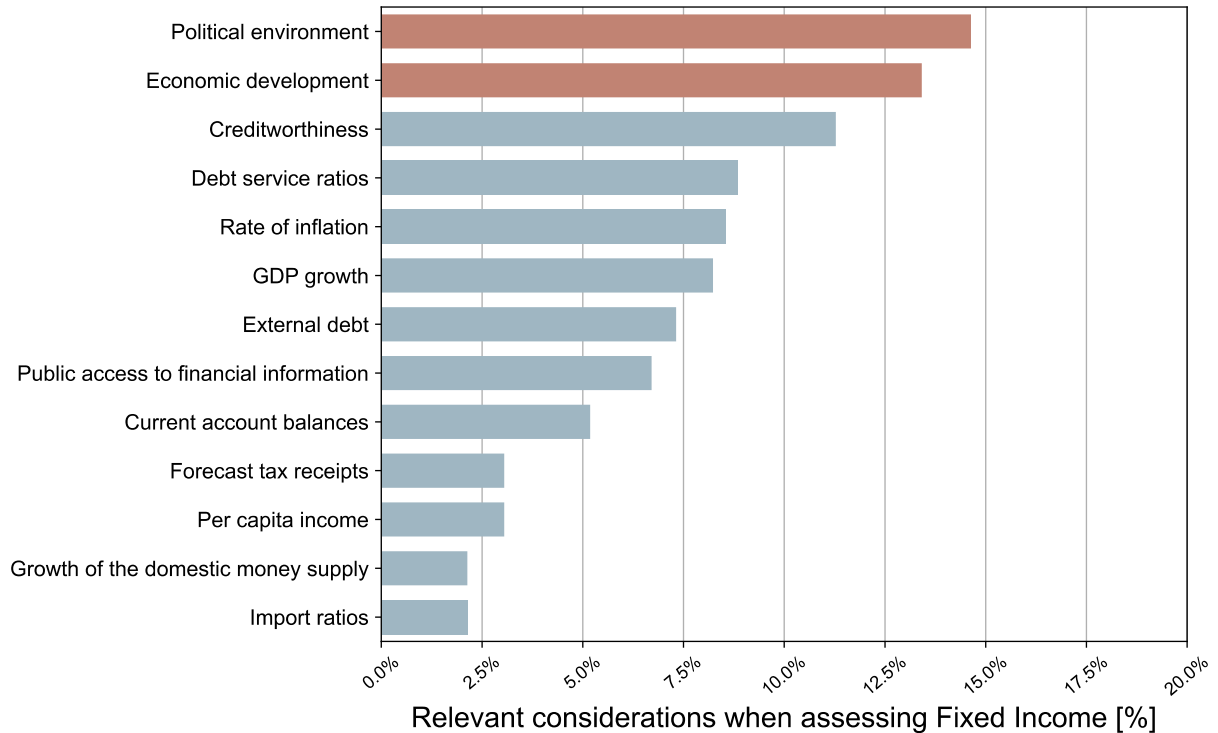


Figure 5 This figure outlines the key factors that are considered by investors when evaluating fixed income instruments, highlighted are the leading two factors. Political environment and economic development have been rated as most important, as opposed to domestic money supply growth rates and import ratios.

Figure 5 shows that the political environment has the most significant impact on fixed income investments for the survey participants, as political stability or instability can affect economic policies, regulatory frameworks, and directly impacts investor confidence. Changes in government leadership, geopolitical tensions, or social unrest may introduce uncertainty into the investment landscape, potentially impacting bond prices and yields.

Similarly, economic development plays a crucial role in fixed income assessment. A country's economic performance, growth prospects, inflation rates, and employment levels can all influence the creditworthiness of issuers and the overall health of the fixed income market. Strong economic fundamentals typically bode well for fixed income investments, while economic downturns or recessions may increase default risks and volatility.

4.4.5. Investment decision

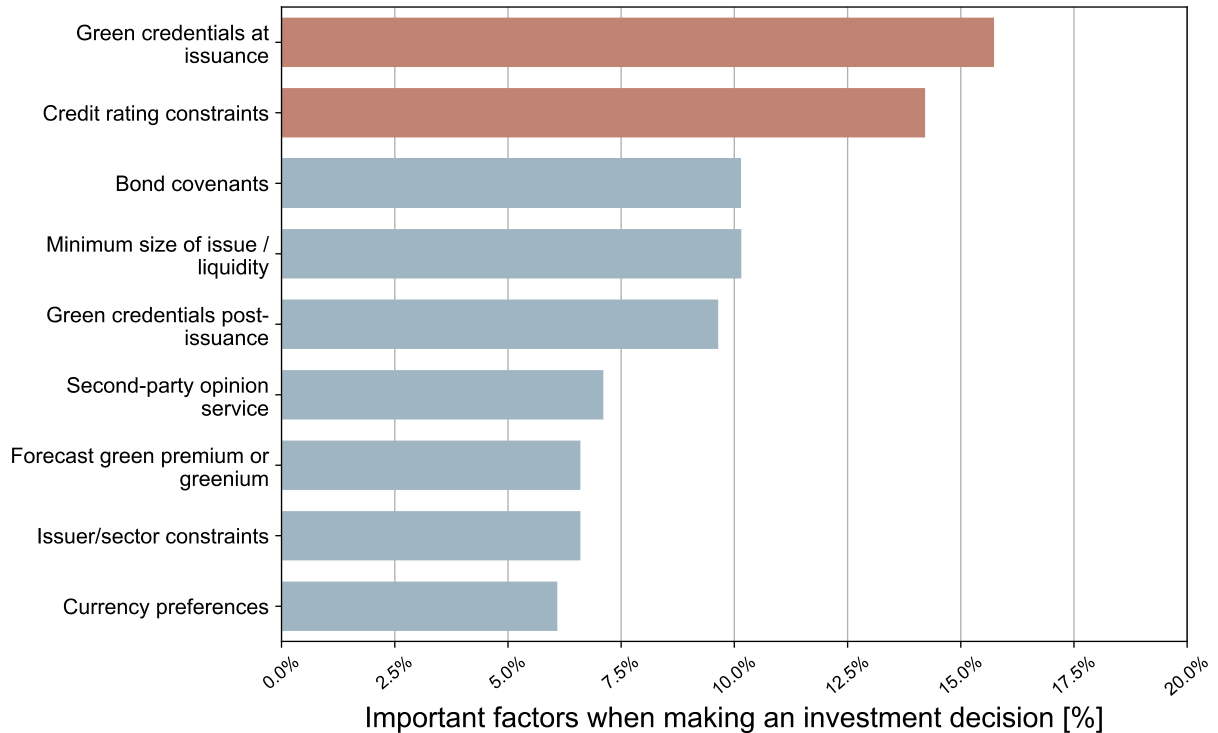


Figure 6 This figure highlights the factors that matter most to investors when making investment decisions. It emphasizes the significance of both green credentials at issuance and credit ratings as the most important considerations.

The green credentials of an investment, particularly at issuance, have garnered increasing attention in recent years. Figure 6 confirms this trend, as green credentials scored highest in our survey. Investors are increasingly prioritizing environmentally sustainable projects and companies, seeking opportunities to align their investment portfolios with their ESG (Environmental, Social, and Governance) principles. Investments with strong green credentials, such as green bonds or projects with a clear commitment to sustainability, are perceived favorably by investors looking to support environmentally responsible initiatives.

Credit rating also holds substantial importance in investment decision-making. A high credit rating signifies the issuer's strong financial health and ability to meet its financial obligations, thereby reducing the risk of default. Investors often rely on credit ratings provided by reputable credit rating agencies to assess the creditworthiness of issuers and make informed investment decisions.

In contrast, currency preferences typically do not play a significant role in investment decisions, particularly in globally diversified portfolios. While fluctuations in exchange rates can impact returns, investors often prioritize other factors, such as environmental sustainability and creditworthiness, when making investment decisions.

4.4.6. Investment in (Sub-) Sovereign Debt



Assessing (Sub-) Sovereign Debt by NDC (Nationally Determined Contributions) involves evaluating the fiscal implications of a country's climate commitments outlined in its NDCs. These commitments are crucial components of international climate agreements like the Paris Agreement, where countries pledge to reduce greenhouse gas emissions and enhance resilience to climate change. Incorporating NDCs into the assessment of (sub-) sovereign debt entails analyzing how climate policies and investments affect a government's fiscal position, debt sustainability, and creditworthiness. This assessment may include estimating the costs of climate mitigation and adaptation measures, evaluating potential revenue streams from green finance mechanisms, and assessing risks associated with climate-related disasters. By integrating NDC considerations into debt analysis, policymakers, investors, and financial institutions can better understand the long-term fiscal implications of climate action and make informed decisions to support sustainable development pathways.

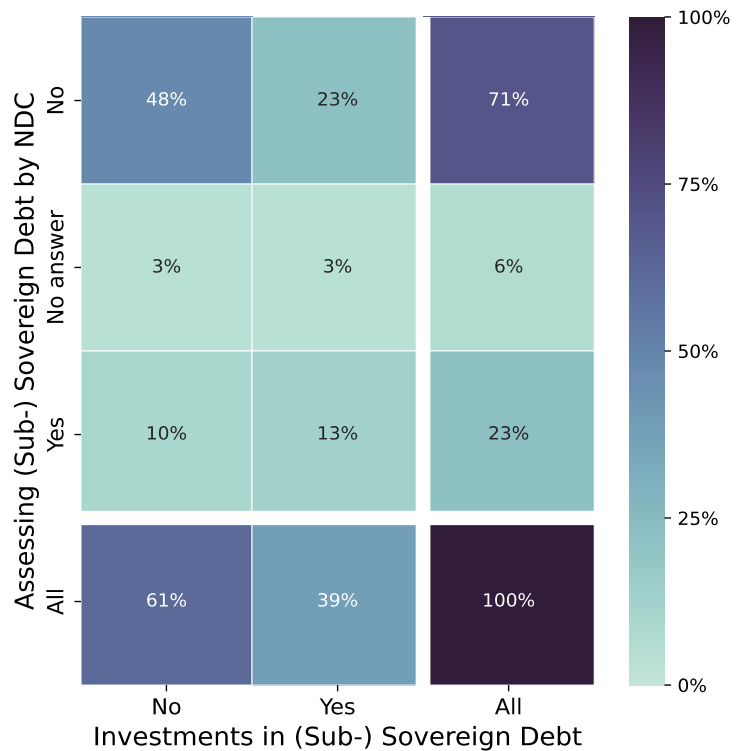


Figure 7 The heatmap illustrates the relationship between investment in sub- and/or sovereign debt (x-axis) and whether National Determined Contributions are assessed when making investment decisions (y-axis).

According to the survey responses, see Figure 7, 61% of all respondents reported that they do not invest in sub- and/or sovereign debt, with 10% of this group indicating that they assess NDCs. Conversely, 39% of respondents reported investing in sub- and/or sovereign debt, with only 13% of this group considering NDCs in their assessments. The take home statement is that there is key opportunity to engage directly with institutional investors showing them how LAC green bonds could be added into their investable universe.

4.4.7. Financed sectors through Green Bonds

Green bonds serve as a vital financial instrument for mobilizing capital towards projects and initiatives that promote environmental sustainability and combat climate change. This subsection examines the specific sectors that receive funding from the proceeds of the bonds.

One of the prominent sectors financed through green bonds is renewable energy, see e.g. [35]. These bonds support the development and deployment of clean energy technologies such as solar, wind, hydroelectric, and geothermal power generation. By investing in renewable energy projects, green bonds help reduce reliance on fossil fuels and promote the transition to a low-carbon energy system.

Green bonds also provide a mechanism to finance a range of initiatives in the agricultural sector, which are crucial for promoting sustainability and resilience in food production systems. These initiatives encompass a variety of projects aimed at enhancing agricultural practices, mitigating climate change impacts, and fostering environmental stewardship. Another focus



area for green bonds in agriculture is the promotion of sustainable farming practices. This involves investments in technologies, training programs, and infrastructure to support farmers in adopting environmentally-friendly approaches such as organic farming, agroforestry, and integrated pest management. By reducing reliance on chemical inputs, minimizing soil erosion, and enhancing biodiversity on farms, these practices contribute to long-term agricultural sustainability.

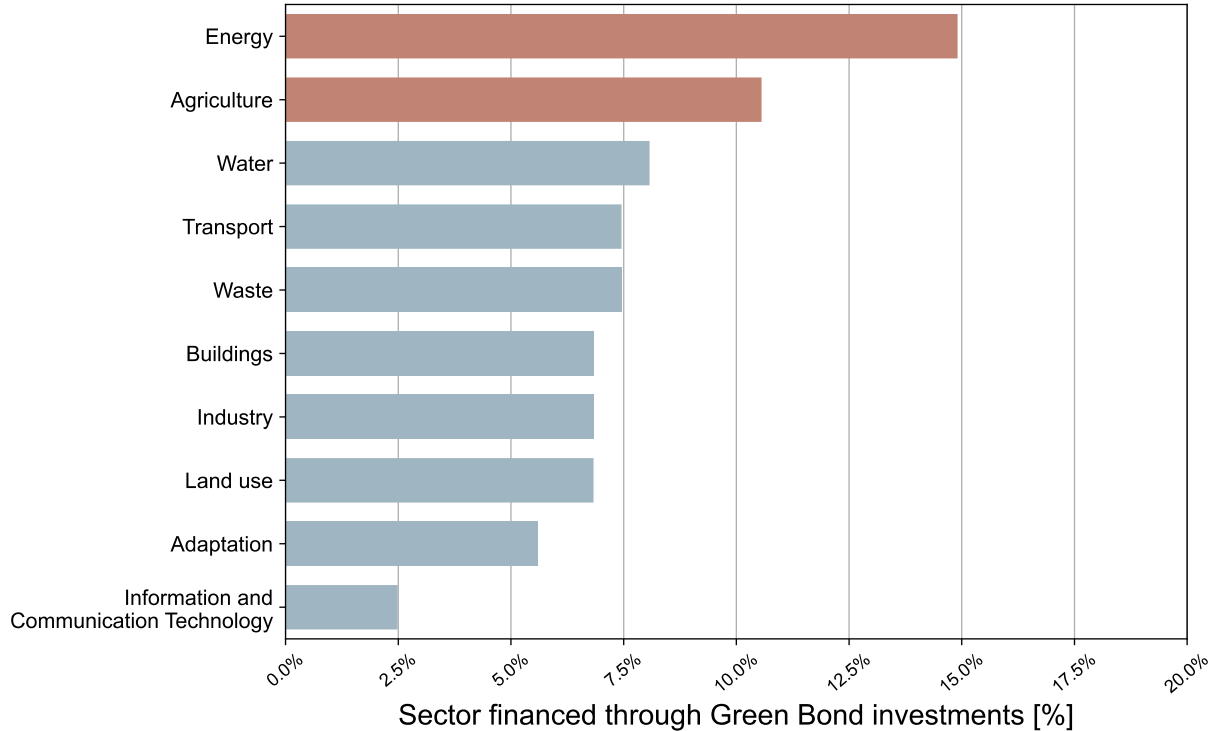


Figure 8 The figure illustrates sectors financed by green bonds, providing insights into capital allocation for environmental sustainability. Common sectors include renewable energy, agriculture, and sustainable transportation.

Our survey respondents underscore the predominance of renewable energy and agriculture as key sectors benefiting from green bond financing, reflecting the emphasis on sustainability and climate-related initiatives, see Figure 8. Renewable energy projects, including solar and wind power generation, receive significant funding due to their pivotal role in reducing carbon emissions and advancing the transition to clean energy sources. Agriculture emerges as another prominent sector financed by green bonds, emphasizing the importance of sustainable farming practices and food security in the context of environmental sustainability.

However, our findings also highlight a comparatively lower allocation of funds to the information and communication technology (ICT) sector through green bonds. Despite the potential for ICT solutions to contribute to environmental sustainability and efficiency improvements, the level of financing in this sector appears to be relatively limited within the context of green bond investments.

Overall, these insights offer valuable perspectives on the sectoral distribution of green bond financing, informing stakeholders about prevailing priorities and areas of focus for sustainable investment initiatives.

4.4.8. Attractive Factors for Investors



This subsection focuses on the factors that investors find particularly attractive and that influence their investment decisions. It provides a detailed examination of the various attributes or considerations that investors find particularly attractive or compelling when evaluating investment opportunities.

In this survey, participants highlighted the key role of certification, see Figure 9. In addition, participants emphasized the importance of increasing issuer transparency in providing comprehensive information on the environmental impacts of projects financed by green bonds. Transparent disclosure allows investors to assess the environmental performance of bond issuers and make informed investment decisions in line with their sustainability objectives.

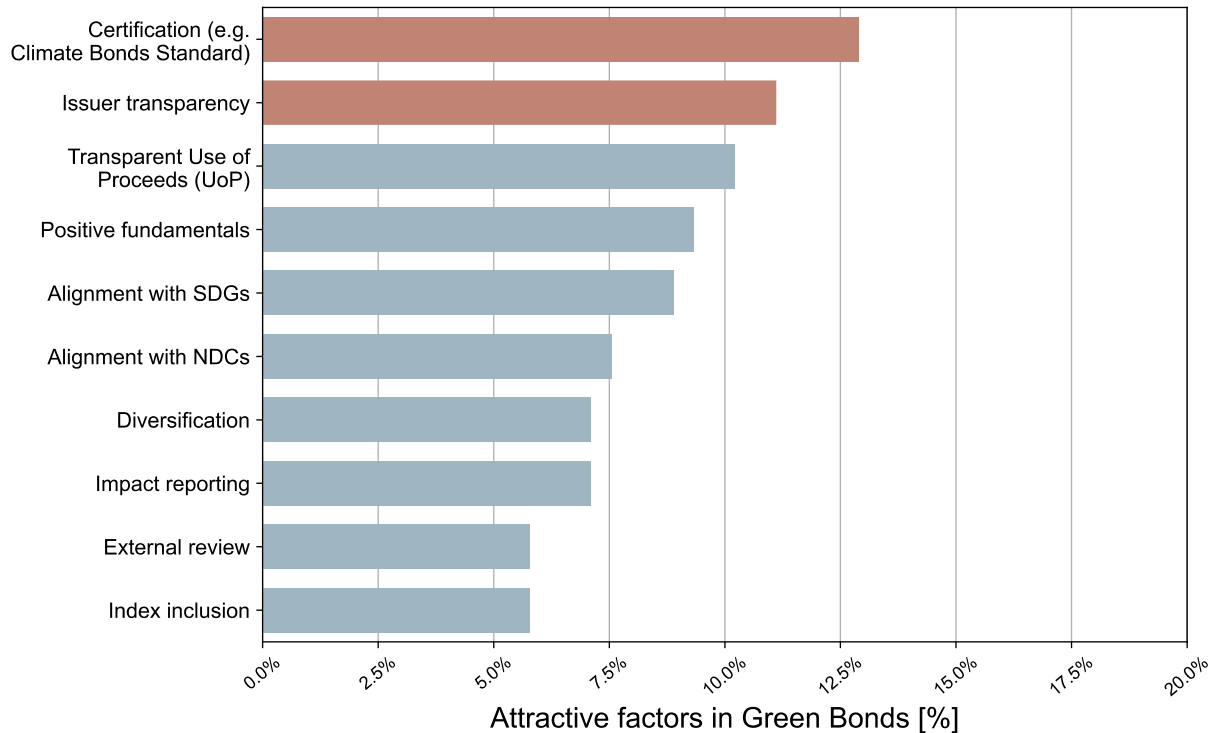


Figure 9 This figure highlights factors that are attractive to investors in green bonds: Certifications like Climate Bonds Initiative (CBI), issuer transparency, and dedicated use of proceeds contribute to investor confidence and their sustainability alignment. External review and index inclusion are perceived as less significant.

4.5. Discussion

While acknowledging the limited number of participants in this survey, it is imperative to recognize that this cohort effectively encapsulates a cross-section of industry stakeholders within and beyond sustainable financial markets. The deliberate selection of participants spans a diverse spectrum of actors within the financial landscape, ensuring representation from various segments and perspectives.

This strategic approach to participant inclusion is designed to achieve a comprehensive understanding of the subject matter by incorporating voices from different corners of the industry. The diverse composition of participants, including those from sustainable financial markets and their counterparts in conventional financial domains, enriches the survey's findings with a multifaceted lens. It allows for insights into various industry players' perspectives, attitudes, and practices, contributing to a more holistic and nuanced analysis.



While the participant size may be constrained, the methodological emphasis on diversity positions the survey as a valuable instrument for obtaining a cross-sectional view that reflects the heterogeneous nature of the broader financial landscape. The intentional inclusion of industry players from both sustainable and traditional financial sectors enhances the survey's applicability and ensures its findings reflect the broader industry dynamics.

5. Conclusion

The survey's key finding underscores a remarkable surge in investor interest in financial instruments characterized by increased transparency.

This interest stems from the conviction that transparency can be attained by implementing standardized reporting practices. The finding emphasizes the growing demand among investors for comprehensive and standardized information, which assists them in making well-informed investment decisions.

The study also acknowledges the influence of issuer reputation in shaping the investment strategies of surveyed investors. The recognition of the significant impact of issuer reputation underscores the critical importance of effective reputation management for financial entities. Investors consider the credibility and standing of issuers as crucial factors in their decision-making processes. A positive reputation can contribute to attracting and retaining investment.

The survey reveals an interesting trend – institutional investors would like to increase their exposure to investment-grade, LAC region green bonds with transparent Use of Proceeds. This institutional investor sentiment towards investing the LAC region indicates an increasing awareness and alignment with ethical, social, and environmental considerations. This observation highlights the evolving landscape of investor priorities, reflecting a preference for investments that align with broader values and principles beyond traditional financial metrics.

6. Outlook

The current study offers a static cross-sectional analysis that could be repeated for robust longitudinal studies, capturing a specific temporal snapshot of prevailing investor sentiments. However, it is imperative to underscore the survey's inherent design for iterative applications in the future. This design is conceived with the foresight that the issuer base may undergo modifications, potentially encompassing a diverse array of individual market issuers and extending its geographic reach to various regions.

This intentional adaptability positions the survey as a methodologically robust instrument capable of elucidating longitudinal trends and insights over successive survey iterations. Such an approach is foundational for generating comparative datasets, thereby facilitating a nuanced understanding of evolving patterns, trends, and potential shifts in investor sentiment. This strategic flexibility enhances the survey's utility as a longitudinal tool, suitable for delineating benchmarks and discerning alterations in investor attitudes within and across distinct market segments and geographical locales.

The survey emerges as an academically rigorous instrument by accommodating prospective changes in participant demographics and expanding its geographic scope. This adaptability ensures the ongoing relevance and applicability of the survey's findings, rendering it a dynamic and comprehensive resource for scholars and stakeholders keen on unraveling the intricate dynamics of investor sentiment concerning financial instruments and responsible investment practices.

7. Bibliography



- [1] G. Zhou, "Measuring Investor Sentiment," *Annual Review of Financial Economics*, vol. 10, no. 1, pp. 239-259, 2018.
- [2] M. Baker, D. Bergstresser, G. Serafeim and J. Wurgler, "Financing the response to Climate Change: The Pricing and Ownership of U.S. Green Bonds," *NBER WORKING PAPER SERIES*, vol. Working Paper, no. 25194, 2018.
- [3] International Capital Market Association, "Green Bond Principles," 2022.
- [4] J. Kapraun, C. Latino, C. Scheins and C. Schlag, "(In)-Credibly Green: Which Bonds Trade at a Green Bond Premium?," *Proceedings of Paris December 2019 Finance Meeting*, 2021.
- [5] A. Pinzón, N. Robins, M. McLuckie and G. Thoumi, "The sovereign transition to sustainability: Understanding the dependence of sovereign debt on nature," *Grantham Research Institute on Climate Change and the Environment and Planet Tracker*, 2020.
- [6] Principles for Responsible Investment (PRI), "The ASCOR Project: Assessing Sovereign Climate-related Opportunities and Risks," 21 May 2021. [Online]. Available: <https://www.unpri.org/news-and-events/the-ascor-project-assessing-sovereign-climate-related-opportunities-and-risks/7681.article>. [Accessed 22 Feb 2024].
- [7] Inter-American Development Bank, "Bonds," Inter-American Development Bank, [Online]. Available: <https://www.greenbondtransparency.com/bonds/>. [Accessed 23 Feb 2024].
- [8] Climate Bonds Initiative, "Greenium Remains Visible in Latest Pricing Study," 16 Sep 2021. [Online]. Available: <https://www.climatebonds.net/2021/09/greenium-remains-visible-latest-pricing-study>. [Accessed 22 Feb 2024].
- [9] Climate Bonds Initiative, "Green Bond Pricing in the Primary Market: H1 (Q1-Q2) 2023," *Report*, 2023.
- [10] B. Hachenberg and D. Schierek, "Are green bonds priced differently from conventional bonds?," *Journal of Asset Management*, vol. 19, no. 6, pp. 371-383, 2018.
- [11] International Finance Corporation (IFC) and Amundi Asset Management, "Emerging Market Green Bonds," *Joint Report*, 2023.
- [12] M. J. Bachelet, L. Becchetti and S. Manfredonia, "The Green Bonds Premium Puzzle: The Role of Issuer Characteristics and Third-Party Verification," *Sustainability*, vol. 11, no. 4, 2019.
- [13] S. Meyer and K. Henide, "Searching for 'Greenium': Evidence of a green pricing premium in the secondary Euro-denominated investment grade corporate bond market," *S&P Global Whitepaper, IHS Markit*, 2020.
- [14] A. Pietsch and D. Salakhova, "Pricing of green bonds: drivers and dynamics of the greenium," *ECB, Working Paper Series*, vol. No 2728, 2022.
- [15] G. Núñez Reyes, H. Velloso, H. J. Lehedé, F. Da Silva and L. Poveda, "ESG disclosure, corporate reputation and financing costs: evidence from Latin America and the Caribbean," *Naciones Unidas Comisión Económica para América Latina y el Caribe (CEPAL)*, 2023.
- [16] O. D. Zerbib, "Is There a Green Bond Premium? The yield differential between green and conventional bonds," *Journal of Banking and Finance*, vol. 98, pp. 39-60, 2019.
- [17] T. W. Bank, "Sovereign Green, Social, and Sustainability Bonds: Unlocking the Potential for Emerging Markets and Developing Economies," *Report*, 2022.
- [18] L. H. Pedersen, S. Fitzgibbons and L. Pomorsky, "Responsible investing: The ESG-efficient frontier," *Journal of Financial Economics*, vol. 142, no. 2, pp. 572-597, 2021.



- [19] L. Pástor, R. F. Stambaugh and L. A. Taylor, "Sustainable investing in equilibrium," *Journal of Financial Economics*, vol. 142, no. 2, pp. 550-571, 2021.
- [20] Y. Gao and J. M. Schmittmann, "Green Bond Pricing and Greenwashing under Asymmetric Information," *IMF Working Papers*, no. WP/22/246, 2022.
- [21] R. Wu and B.-Y. Liu, "Do climate policy uncertainty and investor sentiment drive the dynamic spillovers among green finance markets?," *Journal of Environmental Management*, vol. 347, 2023.
- [22] X. Chen, O. Weber and V. Saravade, "Does It Pay to Issue Green? An Institutional Comparison of Mainland China and Hong Kong's Stock Markets Toward Green Bonds," *Frontiers in Psychology*, vol. 13, 2022.
- [23] C. Mertzanis, "Energy policy diversity and green bond issuance around the world," *Energy Economics*, vol. 128, 2023.
- [24] M. W. Brandt and K. A. Kavajecz, "Price Discovery in the U.S. Treasury Market: The Impact of Orderflow and Liquidity on the Yield Curve," *Journal of Finance*, vol. 59, no. 6, pp. 2623-2654, 2004.
- [25] W. Chen, "Equity investor sentiment and bond market reaction: Test of overinvestment and capital flow hypotheses," *Journal of Financial Markets*, vol. 55, 2021.
- [26] L. Huang, Z. Kuo, J. Wang and Y. Zhu, "Examining the interplay of green bonds and fossil fuel markets: The influence of investor sentiments," *Resources Policy*, vol. 86, 2023.
- [27] A. B. Oluwasegun, E. J. Abakah, J. A. Oliyide and L. A. Gil-Alana, "Factors behind the performance of green bond markets," *International Review of Economics and Finance*, vol. 88, pp. 92-106, 2023.
- [28] L. Pham and C. P. Nguyen, "How do stock, oil, and economic policy uncertainty influence the green bond market?," *Finance Research Letters*, vol. 45, 2022.
- [29] J. Piñeiro-Chousa, M. Á. L. L. -C. López-Cabarcos and A. Šević, "Green bond market and Sentiment: Is there a switching Behaviour?," *Journal of Business Research*, vol. 141, pp. 520-527, 2022.
- [30] Bloomberg Professional Services, "Insight-driven ESG work is built on high-quality data," Bloomberg Finance L.P., [Online]. Available: <https://www.bloomberg.com/professional/product/esg-data/>. [Accessed 26 Feb 2024].
- [31] LSEG Data & Analytics, "Environmental, Social and Corporate Governance - ESG," LSEG, [Online]. Available: <https://www.lseg.com/en/data-analytics/financial-data/company-data/esg-data>. [Accessed 26 Feb 2024].
- [32] MSCI, "ESG Ratings," MSCI Inc., [Online]. Available: <https://www.msci.com/our-solutions/esg-investing/esg-ratings>. [Accessed 26 Feb 2024].
- [33] Sustainalytics, "Company ESG Risk Ratings," Sustainalytics, [Online]. Available: <https://www.sustainalytics.com/esg-ratings>. [Accessed 26 Feb 2024].
- [34] Moody's, "ESG Risk," Moody's Investors Service, Inc., [Online]. Available: https://www.moody.com/web/en/us/capabilities/esg-risk.html?cid=ppc-gglds-16722&gad_source=1&gclid=CjwKCAiAivGuBhBEEiwAWiFmYeQcv8vMKwobxKW F6AKGFFGb77JzRitq-DD5FWiV-j8J5UObLjTbOBoCdt0QAvD_BwE&gclsrc=aw.ds. [Accessed 26 Feb 2024].
- [35] Climate Bonds Initiative, "Sustainable Debt - Global State of the Market," *Report 2022*, 2022.