Greening Sovereign Debt: Explaining the Rise of Green Bond Issuances*

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Abstract

Over $2.3 trillion in green and sustainable bonds have been issued by the public sector globally, reflecting the rise of innovative financial instruments aimed at addressing climate change. Yet patterns of sovereign issuance remain uneven, and countries with the most ambitious climate policies are not always the most active in green bond markets. What explains these dynamics? This paper investigates the drivers of sovereign green and sustainable bond issuance across both OECD and non-OECD countries. Using quantitative analysis, we find that indicators of willingness and ability to pay—such as income level and creditworthiness—are the strongest predictors of issuance, suggesting parallels with conventional plain-vanilla sovereign debt products. However, we also find that increasing domestic attention to climate change, proxied by the passage of climate legislation, is positively associated with issuance. To better understand government motivations, we draw on elite interviews with officials and analyze country-level materials such as bond prospectuses and green finance frameworks. These qualitative insights also highlight the conditional nature of bond "greenness"—that is, while some governments issue substantively green bonds aligned with broader climate agendas, others adopt green labeling primarily as a strategic signaling or market development tool. Taken together, our findings contribute to the political economy of climate finance by highlighting how green bond issuance reflects both the financial constraints and strategic priorities of sovereigns, offering a supply-side perspective that links national climate policymaking to broader transformations in global debt markets and state-led environmental governance.

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1 Introduction

Amid rising global investment needs for climate action, sovereign green bonds have become a key innovation in how states mobilize capital for sustainable development. These debt instruments, earmarked for environmentally beneficial projects, are gaining traction as governments seek to meet climate goals while navigating complex fiscal constraints. But the rise of these bonds is not only about funding the green transition; it also offers a compelling lens through which to examine how states strategically manage their borrowing needs in an era marked by heightened financial volatility and competing policy priorities. This paper investigates the political and economic dynamics driving sovereign green bond issuance, revealing how states use these instruments to balance climate ambition and financial flexibility.

To provide some context, addressing climate change requires the mobilization of trillions of dollars, fueling a market for financial instruments like thematic bonds designed to fund projects related to climate change mitigation and environmental protection. These bonds include green, social, sustainability, and sustainability-linked varieties. Green, social, and sustainability bonds are "use-of-proceeds" instruments, with funds earmarked for specific projects aimed at achieving environmental or social objectives. In contrast, sustainability-linked bonds (SLBs) do not allocate funds to specific projects but instead tie the issuer's obligations to achieving predefined sustainability-related performance targets, with financial consequences for failure to meet those targets (Babic, 2024; Caldecott, 2022).[1]

The European Investment Bank (EIB) issued what is largely considered the first green bond in 2007, raising 0.9 billion USD for a fixed-income instrument called the Climate Awareness Bond (Cortellini and Panetta, 2021). And while initial issuers were largely international financial institutions (IFIs) or corporations, sovereign issuance has steadily grown. According to the Bloomberg MSCI Green Bond Index, green bonds issued by governments increased from 7% of the total market value in 2017 to over 20% by 2023 with a record 35 countries issuing sustainable sovereign bonds for a total of 169 billion USD that year (Mastouri et al., 2023).

Many countries have issued green bonds, including Germany, Indonesia, Fiji, and Mexico.

[1] We use the term "green bond" throughout the paper to refer to any labeled bonds pertaining to environmental and climate objectives. This includes use-of-proceeds green, sustainable, and transition bonds along withe SLBs.

Poland was the first country to issue a sovereign green bond in 2016 while countries like Australia and Japan only issued their first government green bonds as of 2024 (Burgess, 2024; Fujita, 2024). France is the largest single issuer of green bonds, with more than 18% of the country's debt labeled as green (Chouhan and Harrison, 2024). The French government has expressed a commitment to climate action, so one may expect that support for climate change mitigation and environmental protection dictates which countries are most likely to utilize such financial instruments. However, the data presents a more complex picture. For example, despite being the first sovereign issuer, Poland lags behind most European Union (EU) countries in climate policy and was the only state to oppose the European Green Deal. Mexico and Nigeria are also issuers of green bonds, despite their status as fossil fuel exporters.

Given this complex landscape of green bond issuance, we argue that political economy considerations determine which countries are likely to pursue innovative green financing instruments. The literature on sovereign finance emphasizes investor perceptions of willingness and ability to pay as key determinants for market access. And, as green bonds are primarily a revenue raising tool for governments, we argue that the same predictors of vanilla bond issuance on the primary markets should also explain green bond issuance — namely regime type and macroeconomic fundamentals. Secondly, we expect that countries with more ambitious climate policy agendas and with higher vulnerability to climate change should issue more, and, conditional on issuance, more binding, green bonds than other countries. Finally, given the unique costs associated with issuing green debt, we also expect that bureaucratic capacity is likely to be a key constraint.

To test this argument, we employ a mixed methods approach. First, we analyze the full universe of sovereign green bonds from the first government issuance in 2016 through 2023. Our findings suggest that green bond issuance largely parallels conventional bond issuance, reinforcing the idea that green finance primarily functions as a revenue-generating tool for governments. Evidence on the relationship between "greenness" and green bond issuance is mixed—while countries tend to issue green bonds in the years following the passage of new climate legislation, we find no clear positive relationship with the broader regulatory environment. There is some indication that countries more reliant on fossil fuels are less likely to issue green bonds, though we find no significant association with other environmental outcomes such as carbon emissions.

To further explore the underlying mechanisms—specifically, the role of climate interests and bureaucratic capacity — we analyze green bond prospectuses and corresponding country-level frameworks. Additionally, we conduct semi-structured interviews with policymakers from leading green bond-issuing countries to gain deeper insight into these dynamics.

This paper makes a number of contributions to the literature. First, these findings contribute to research on the political economy of climate change by examining how governments finance their national climate priorities, an increasingly urgent question given the scale of investment required for both mitigation and adaptation (Meckling et al., 2022). We highlight the role of sovereign-led financing strategies—specifically, the issuance of green bonds—as a tool for mobilizing resources, in contrast to other work that emphasizes international aid (Gaikwad et al., 2025; Graham and Serdaru, 2020). As governments seek to meet their climate commitments amid fiscal constraints, understanding the incentives and constraints shaping green bond issuance provides insight into how states integrate environmental priorities into their broader economic strategies. In doing so, we add another piece to the puzzle for understanding variation in national climate priorities (see e.g., Aklin and Urpelainen, 2013; Allan and Nahm, 2025; Colgan et al., 2021; Finnegan, 2022; Genovese and Tvinnereim, 2019), especially as it relates to innovative policy instruments (Sabel and Victor, 2022).

We also contribute to the study of sovereign finance by situating green bonds within the evolving landscape of global debt markets, emphasizing the strategic choices that governments make (Ballard-Rosa et al., 2021, 2022; Mosley and Rosendorff, 2023). Emerging markets and developing countries (EMDCs) are increasingly central to this discussion, not only as key issuers of sovereign debt but also as focal points in debates over debt sustainability, restructuring, and climate-linked financial instruments (Bunte, 2019; Cormier and Naqvi, 2023; Zeitz, 2024). The role of China—both as a major creditor and as a leader in domestic green finance—further complicates the politics of sovereign borrowing, raising questions about how green bonds interact with broader trends in development finance, including debt forgiveness and alternative lending models (Ferry, 2023; Ferry and Zeitz, 2024; Kaplan, 2021). By exploring how sovereign green bonds fit into these shifting dynamics, our paper connects climate finance to the geopolitics of global sovereign debt.

Finally, to our knowledge, this is the first systematic supply-side analysis of sovereign green bond issuance. Most of the existing literature on green bonds focuses on pricing and the existence of a "greenium" (for a review of the literature see e.g., Baker et al., 2022a; Cortellini and Panetta, 2021), or considers the influence of governments on private sector issuance (Chiesa and Barua, 2019; Lin, 2024; Tolliver et al., 2020). We build on existing work, providing a supply-side explanation for government issuance of green bonds, bringing attention to the political and economic factors driving governments to issue green bonds in the first place. By placing green bonds in the broader context of sovereign bond markets, we shed light on how governments navigate trade-offs between financial credibility, climate commitments, and domestic political constraints. Another key contribution of our study is the comprehensive data collection of green bond prospectuses and frameworks, offering new insights into how governments justify and structure their green bond programs.

The remainder of the paper proceeds as follows. First, we provide a landscape of green sovereign bonds. Then, we offer a theory of sovereign green finance, drawing on existing literature on government borrowing. We then describe our data and empirical approach before presenting preliminary analysis that supports our main hypotheses. Finally, we share our early findings from the document analysis and elite interviews[2] to further develop our understanding of the key mechanisms driving sovereign green bond issuance.

2 Landscape of Green Sovereign Bonds

This section presents a set of stylized facts about the issuance of green bonds, focusing on the broader trends and characteristics defining the market. While green bonds have been issued by a range of actors, including corporations and local governments, we focus on sovereign issuers.

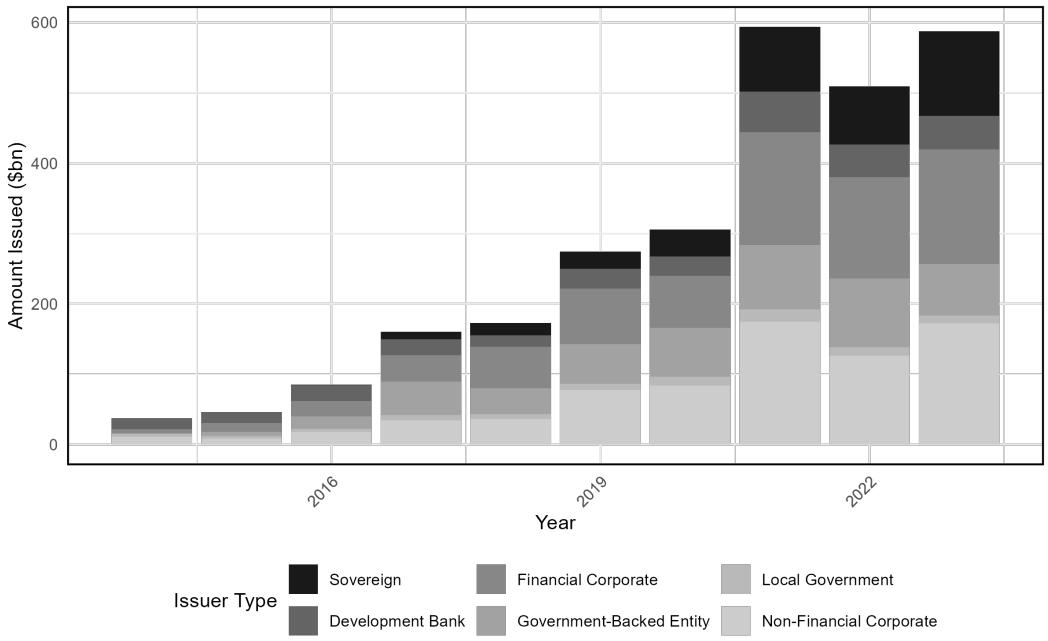
2.1 Overview of the market

The first green bonds were issued by the European Investment Bank in 2007 with its Climate Awareness Bond, and by the World Bank in 2008 with its labeled green bond (EIB, 2023; World

[2]Interviews are ongoing.

Bank, 2022). Initially, the public green bond market was primarily driven by local governments and public enterprises who issued bonds to fund specific environmentally friendly projects such as water quality improvement or pollution clean-ups (OECD, 2023). As demonstrated in Figure 1, sovereigns were late to the market. Poland and France becoming the first sovereign issuers of green bonds in 2016. Fiji was the first developing country to issue a sovereign green bond, officially launched at COP23 in Bonn in 2017, with advising support from the World Bank and the Government of Australia.[3] Chile then led the way in 2022 as the first country to issue a sustainability-linked bond.

Figure 1: Total Green Bond Issuance by Issuer Type



Note: This plot refers to the total issued amount of green bonds in billions USD by issuer type. Source: Climate Bonds Initiative.

Sovereign green bonds resemble vanilla government bonds, with the addition of a specific "green" purpose associated with the use of proceeds. Green bonds typically price on, or near, the yield curve of plain vanilla government bonds, based on the sovereign risk rating rather than the underlying return of investment on the projects. Green bonds are regularly oversubscribed and there is suggestive evidence that they may attract a pricing premium, referred to as a "greenium,"

[3] "Guidance for Sovereign Green Bond Issuers: With Lessons from Fiji's First Emerging Economy Sovereign Green Bond," International Finance Corporation (IFC).

compared to vanilla bonds but data is inconclusive. Green bonds also have benefits in that they offer exposure to a different investor base, and may provide a platform for governments to advance their reputation for climate action. There is also evidence that sovereign issuances may help encourage corporate and financial sector green bond development (Cheng et al., 2024). Still, green bonds do have higher transaction costs than vanilla bonds, requiring a policy framework, monitoring systems, and external verifications.

Since their inception, labeled bonds have experienced rapid growth. The public sector market alone is estimated to be worth 1.65 trillion USD, comprising about a third of total labeled bond issuances, with green bonds representing roughly 60% of the public sector's labeled bonds (World Bank, 2024). The market reach its peak in 2021, as issuances declined in 2022 and 2023, largely due to tighter credit cycles and low global liquidity driven by rising interest rates since early 2022. These challenging financial conditions, along with the high debt burdens many countries face, may have made the issuance of labeled or green bonds a lower priority for some governments, as they navigate difficulties in refinancing.

The structure of green bonds largely resembles that of conventional bonds, with similar risk-return profiles in the fixed-income market (Banga, 2019). Studies show a correlation between the yield to maturity of green bonds and conventional bonds. This means that "demand" for green bonds exists — that is, investors have an appetite for green bonds because such investments do not necessarily threaten returns. Thus, "the supply side seems to drive the market...yet remains short of demand."(Barua and Chiesa, 2019, p. 1134) Growing attention to climate change both from investors and country governments has contributed to the growth of environmental and climate-related financial instruments, especially in the wake of the Paris Agreement.

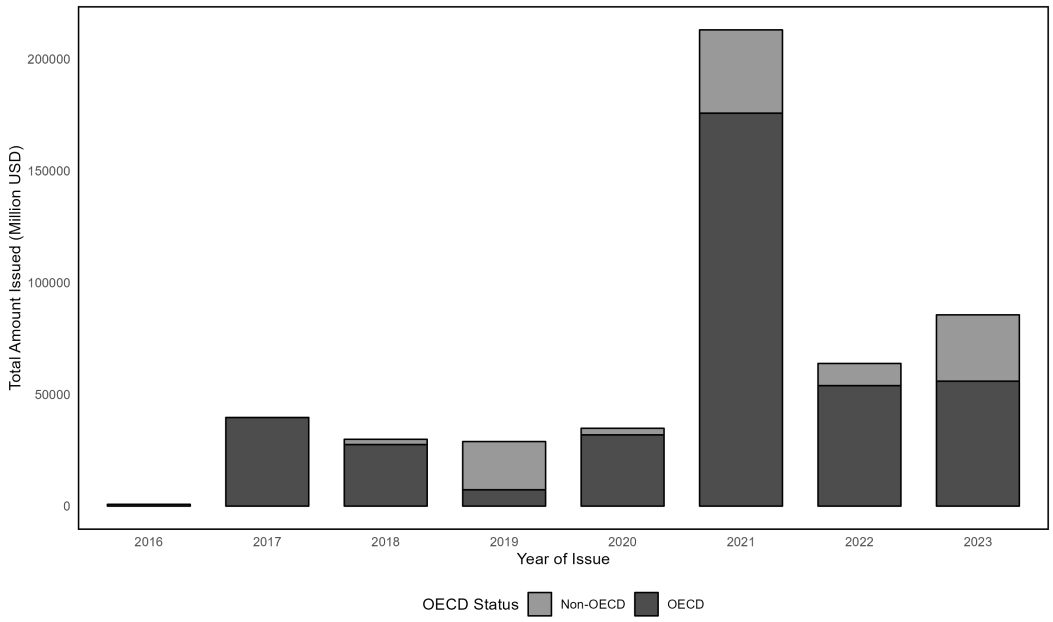
2.2 Who issues green bonds?

To examine trends in sovereign green bond issuance, we utilize Bloomberg data. Bloomberg relies on bond prospectuses, frameworks like the International Capital Markets Association (ICMA) Green Bond Principles, and issuer disclosures to tag bonds as "green," "sustainable," "sustainability-linked," or "transition," regularly updating its database to reflect new issuances. For our analysis, we include all sovereign bonds marked under these categories, referring to them

collectively as "green bonds."[4]

The largest issuers of green bonds are mostly developed economies, as demonstrated by Figure 2, which shows the total amount of sovereign green bonds issued in each year for both OECD and non-OECD countries. We observe a peak in sovereign issuance in 2021, followed by lower but steady levels in 2022 and 2023. This was partially driven by some countries, especially EU members, who committed themselves to increase fiscal spending towards the green transition and aimed at financing post-COVID pandemic response via green bonds (Cheng et al., 2022). The share of non-OECD county issuance also increases over time.[5]

Figure 2: Total Amount of Sovereign Green Bond Issuance by Year



Note: This plot refers to the total issued amount of green bonds in millions USD. Source: Bloomberg.

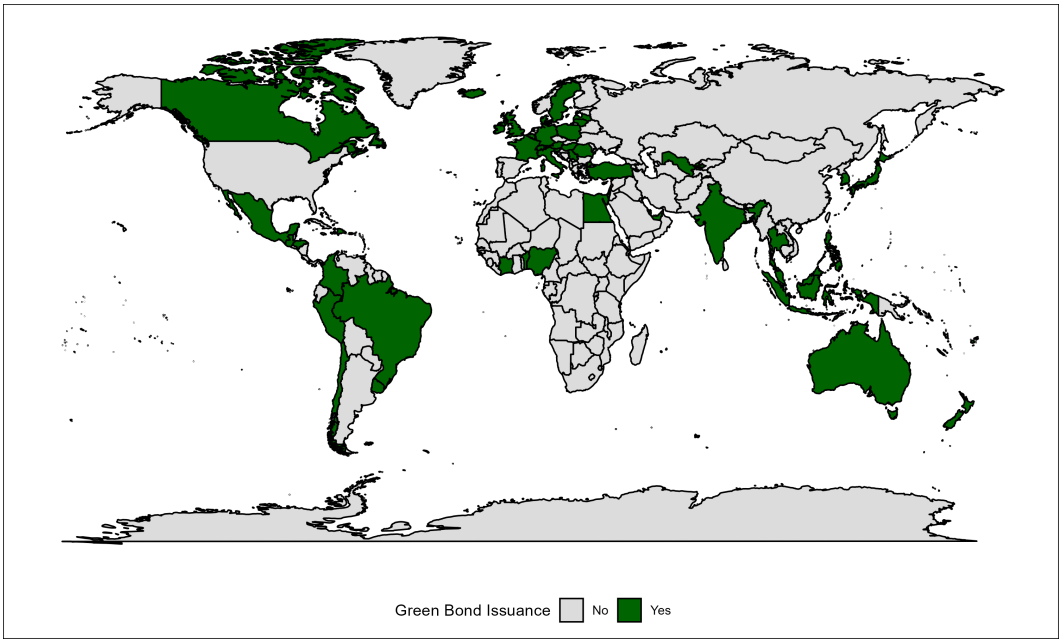
While much of the bond issuance is concentrated in a few main countries, labeled bonds are growing in importance across the globe. Figure 3 captures all the countries that have issued green or sustainable bonds. Countries shaded in green have issued at least one such bond, while those in grey have issued no green bonds as of December 31 2023. A few patterns emerge. First,

[4]This is commonly done by analysts. For example, CBI groups these together for analysis, collectively referring to the "sovereign GSS+ bond club," to denote sovereigns who issue green, sustainability, sustainability-linked, or even social bonds. We do not include social bonds for our analysis.

[5]The share of total issuances (and not the amount issued) being issued by OECD member states between 2016 and 2023 is 41% in our dataset.

there is regional concentration of bond issuance among a few key South American countries, central and eastern Europe, and South Asia. Overall, Europe has been the largest source of green sovereign debt, with 22 total issuers. There have been just a few green bonds issued in Africa, indicating the potential for growth. Notably, there are also a number of OECD countries that have *not* issued any green bonds, including the United States.

Figure 3: Countries that Issued Sovereign Green Bonds



Note: Green shaded countries refers to jurisdictions that issued green or sustainable bonds through 2023. Countries that are shaded in grey have not issued a green bond as of December 31 2023. Source: Bloomberg.

According to the Climate Bonds Initiative, 33 countries issued green and sustainability bonds in 2023, with Brazil becoming the 50th country to issue any such bonds with a $2 billion deal in November 2023.[6] Other countries that issued debut bonds in 2023 included Sharjah (UAE), Cyprus, India, Turkey and Israel. While outside our formal analysis, this diversification in the types of countries issuing green bonds has grown. For example, Japan, Romania, Cote d'Ivoire, and the Dominican Republic all priced debut green and sustainable bonds in 2024.[7] Then, notably, in 2025, Saudi Arabia issued a sovereign green Euro bond[8] while China debuted a

[6] "Sustainable Debt Global State of the Market 2023," Climate Bonds Initiative. https://www.climatebonds.net/files/reports/cbi_sotm23_02h.pdf

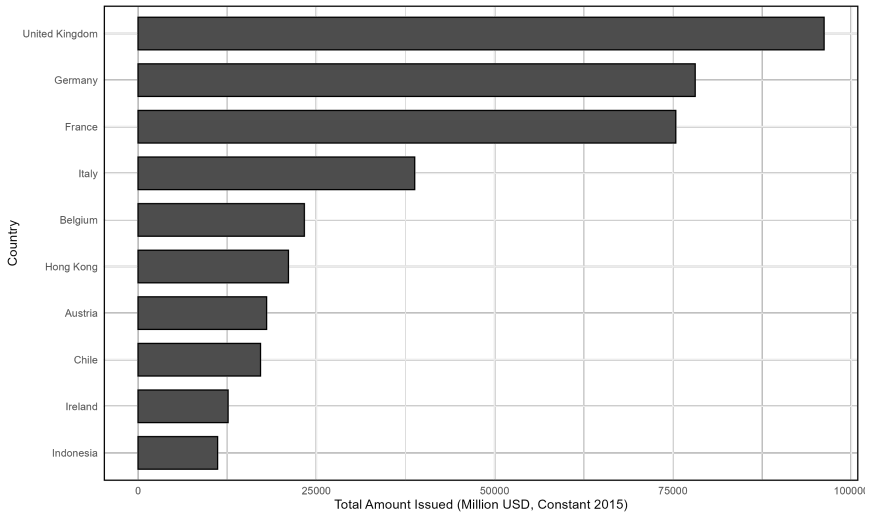
[7] "A Record Start to the Year for Sustainable Debt," June 20, 2024. Climate Bonds Initiative. https://www.climatebonds.net/2024/06/record-start-year-sustainable-debt

[8] Mirette Magdy and Olga Voitova, "Investors Snap up Saudi Arabia's Debut Euro Green Bond," February 25,

sovereign green bond in renminbi on the London Stock Exchange. [9]

Figure 4 shows the top ten issuers of green bonds, by total amount issued. Of the top issuers by total amount, seven are in Europe (Germany, France, the United Kingdom, Italy, Austria, Ireland, and Belgium), one in South America (Chile), and two are in Asia (Hong Kong and Indonesia). Chile and Indonesia are both in the top ten - indicating that EMDCs compose an important part of the green bond market, even if fewer of them have issued green bonds. Among the EMDCs, other top issuers through 2024 include Thailand, Mexico, and Peru.[10]

Figure 4: Top Sovereign Issuers of Green Bonds by Amount Issued



Note: This plot refers to the total issued amount of green bonds in millions USD, constant 2015 by country.
Source: Bloomberg.

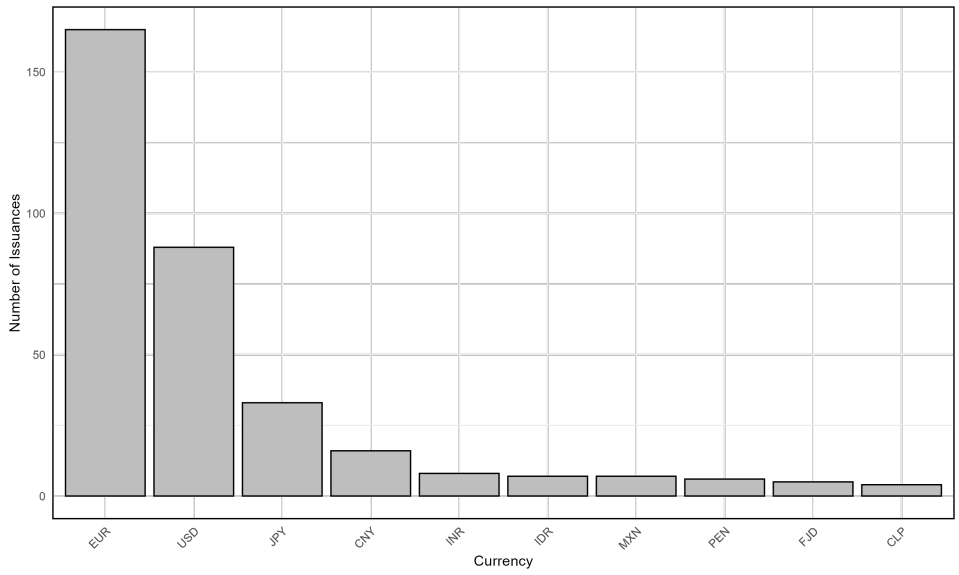
There are numerous market-based reasons why it may be less common for emerging economies to issue green bonds. Besides the previously mentioned changed credit environment after 2021, investors may be reluctant to invest in emerging economies based on limited currency transferability. Figure 5 shows the top 10 currencies of green bond issuance, with the Euro and US Dollar being the most popular. Issuing in such currencies is important to attract investors, as those most interested in green bonds are concentrated in Europe and the United States.

2025. Bloomberg. https://www.bloomberg.com/news/articles/2025-02-25/saudi-arabia-offers-middle-east-s-first-euro-green-bond

[9] "China debuts landmark sovereign green bond on global stage," April 4, 2025, Climate Bonds Initiative. https://www.climatebonds.net/2025/04/china-debuts-landmark-sovereign-green-bond-global-stage

[10] Green, Social and Sustainability-Linked Bonds Market Update, July 2024, World Bank. https://thedocs.worldbank.org/en/doc/dacb969cc71f53abde2d2758f1cc13ed-0340012024/original/GSSS-Quarterly-Newsletter-Issue-No-8.pdf

Figure 5: Sovereign green bond issuance by currency



Note: Number of issuances for the top ten most common currencies. Source: Bloomberg.

Another reason my be the lack of liquidity of emerging market bonds due to a lack of, or reduced, functioning of secondary and repo markets. This lack of capital market infrastructure hinders price discovery, a liquid secondary market further reduces risks for investors (OECD, 2023).[11] A final obstacle to sovereign green issuances may be minimum sizes that are defined by index providers. Issuing emerging markets need to have green projects worth at least 500 million USD in order for their green bond to be considered for indexes such as the MSCI Emerging Markets Sovereign Bond Index (MSCI, 2023, 2024).

2.3 What does it mean to be green?

An important aspect of the green bond realm is the lack of definitional clarity of what constitutes a labeled bond. In 2014, the industry attempted to deal with this problem by introducing the *green bond principles (GBP)* defined by the ICMA. The GBP consist of four principles that revolve around use of proceeds, project evaluation, management of proceeds and reporting standards and are non-binding. Issuers choose whether get their bonds certified according to these principles, which functions as a signaling tool to investors. These certifications are typically

[11] There have been recent attempts at developing repo markets, see for example the announcement by UN ECA 2022.

conducted by third-party providers such as auditing firms that assesses whether the projects that the fund is earmarked for are in fact 'green' (Zirek and Unsal, 2023).[12] In a second step, issuers can register their bond with the *Climate Bonds Initiative (CBI)* and would then be called 'CBI Certified.' The CBI's *Climate Bond Standard (CBS)* is more rigorous than the GBP, requiring additional external verification of pre- and post-issuance disclosure.

While GBP and CBS are internationally recognized, several regional standards efforts have followed (Cortellini and Panetta, 2021). For example, the EU Commission introduced the EU Green Bond Standard in 2019. The EU also makes external review mandatory, requires that bond proceeds fund projects contributing to at least one of the "Environmental Objectives" from the EU Taxonomy Regulation, and mandates compliance with minimum safeguards. The People's Bank of China and the ASEAN Capital Market Forum also have green bond standard initiatives but the requirements are less rigorous and have mostly been applied to subnational or corporate bonds within those geographies.

The establishment of green finance standards has fueled growth of the bond market (Banga, 2019), providing an anchor for both investors and issuers. Sovereign issuers have also led the way in such standard setting, with most central governments announcing a green bond framework aligned with ICMA principles alongside their bonds (Cheng et al., 2022). Furthermore, they are also more likely to rely on external reviews rather than self-labeling when compared to corporate issuers.

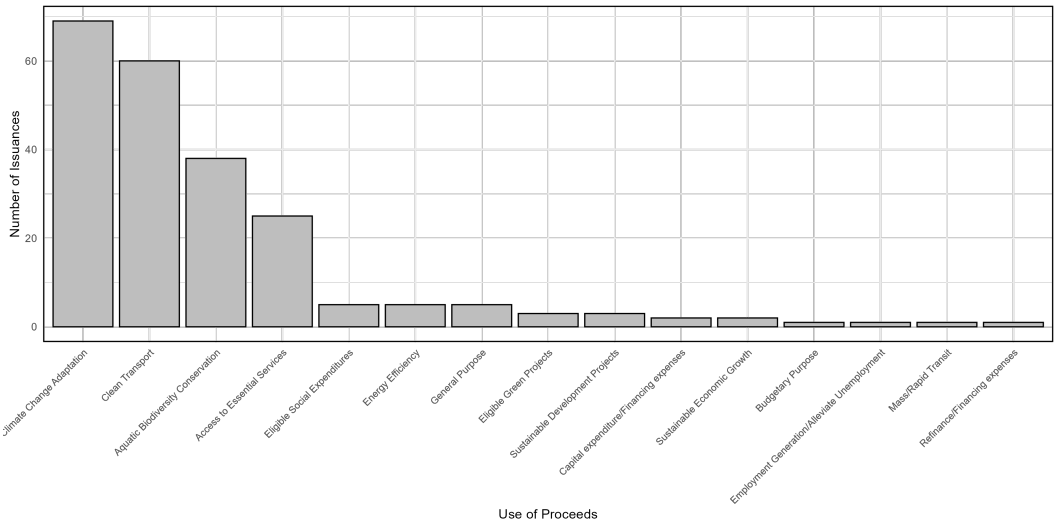
As mentioned above, there are different types of green bonds. Some are "use of proceeds," bonds which means that they are linked to specific projects or programs. These may include uses that are considered "green," "sustainable," or "transition-linked." Figure 6 displays the count of bond issuances by use of proceeds, for bonds where data was available.[13] While use of proceeds labeling is sparse and high-level, this data still provides a sense of the types of spending priorities that green bonds may be use to support.

Climate change adaptation is the most common use of proceeds for sovereign green bonds, followed by clean transport, and then aquatic biodiversity conservation. Transportation is espe-

[12] See Baker et al. (2022b) for additional information on the pricing

[13] Data on use of proceeds in Bloomberg is limited, and may be subject to reporting biases. This data is purely descriptive to give a sense of the types of uses.

Figure 6: Top Use of Proceeds by Number of Issuances



Note: This plot refers to the count of unique sovereign bond issuances by use of proceeds for which data is available. Source: Bloomberg (bonds), Refinitiv (use of proceeds).

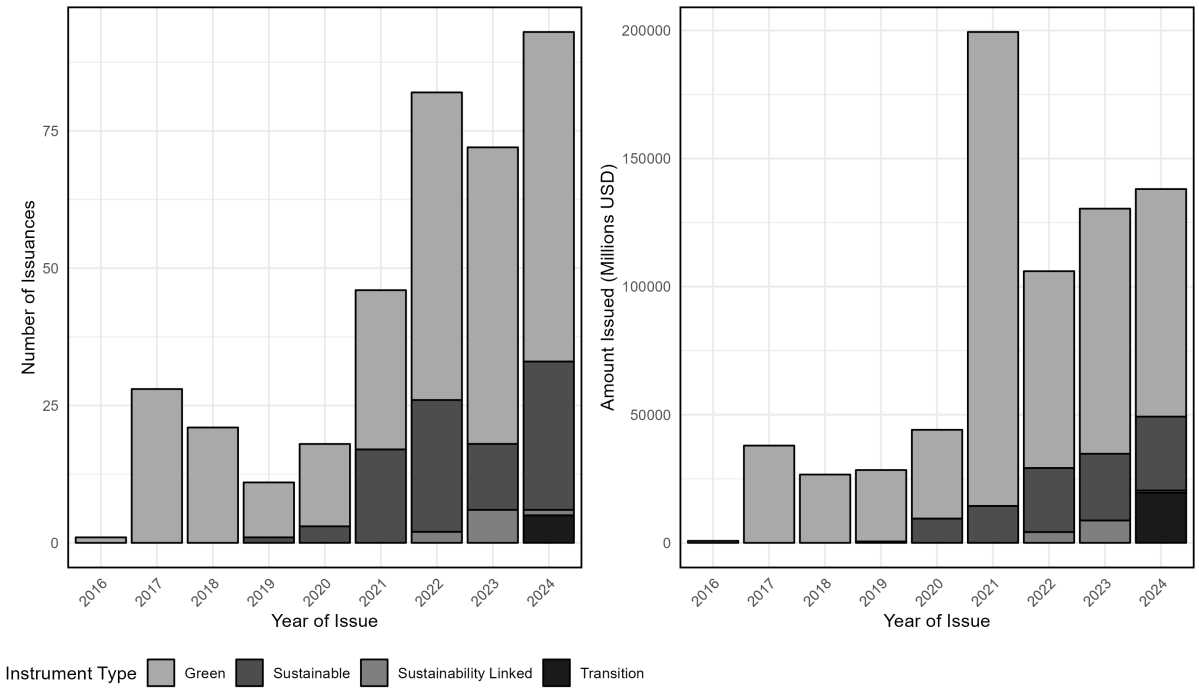
cially important, with countries including the United Kingdom, Belgium, Denmark, Chile, and Israel all dedicating significant portions of their green bond proceeds to railway development.[14] However, uses do vary. Turkey allocated 47% of its debut green bond to sustainable management of natural resources and land use, with Brazil similarly focusing on deforestation control, biodiversity conservation, and poverty reduction.[15] These examples also show the breadth of green bond uses — with some more pertaining to climate change and others to conservation or environmental goods more broadly.

In addition to use of proceeds bonds, sustainability-linked bonds are also an option for sovereigns to fund climate-related action. Such bonds are associated with sustainability performance targets that the issuer commits to meeting by a certain date. If these are not met, then the issuer is subject to a penalty. Importantly, these linked-bonds offer freedom in how the use of proceeds of a given bond are spent even if it requires achievement of certain outcomes. Figure 7 captures the growth in each type of bond over time, with classic green bonds consistently composing the majority of labeled bonds even as sustainability-linked bonds enter the market in 2022.

[14]Bryce Elder, "Green sovereign bonds are mostly for trains," March 25, 2024. The Financial Times.

[15]Malika Takhtayeva, "Sovereign green bonds - Bigger, stronger, and more diverse in 2024." May 23 2024. BNP Paribas Portfolio Perspectives.

Figure 7: Number and Total Amount of Issuances by Bond Type



Note: This plot refers to the count of unique sovereign bond issuances and total amount by type. Source: Bloomberg.

However, both use of proceeds and key performance indicator (KPI) associated bonds have challenges in determining whether they are truly used according to their definitions. Despite efforts to define and evaluate green bonds, standards are applied inconsistently and there are examples of such labeled bonds funding projects with dubious climate impacts. For example, concerns of greenwashing were especially apparent with Japan's issuance of a so-called transition bond intended to reduce the emissions associated with high pollution industries such as steel. While Japan conducted investor roadshows in major green bond markets such as the UK and Germany, a Finance ministry spokesperson said that there "were some 'dark green' investors who would rather stick with green bonds," given uncertainty about how Japan might use the proceeds from a transition bond.[16] This demonstrates the difficulty that sovereigns have trying to convince investors that they will use bonds appropriately. For sustainability-linked bonds, it can be challenging to appropriately set penalties associated with meeting sustainability targets.

[16]Yuzo Yamaguchi, "Greenwashing fears dampen global interest in Japan's inaugural transition bonds." March 17 2024. S&P Global.

Penalties may not be that credible; for example, coupon step-ups have been 25 basis points or less as in the case of Chile's sustainability-linked bonds (Cheng et al., 2022).

3 Explaining Patterns of Issuance

3.1 Determinants of Sovereign Borrowing

Governments borrow for a variety of reasons, from financing infrastructure projects and social programs to managing economic downturns and addressing fiscal imbalances. Sovereign bonds — debt instruments issued by national governments — are a central tool in this process, allowing states to access capital from domestic and international investors. The ability of governments to borrow, however, is shaped by a complex interplay of political, economic, and institutional factors. When governments borrow, they defray a future decision to repay or to default (Tomz, 2007).

Ability to re-pay is a question of whether the government has the resources available to pay back debt. This is typically associated with economic factors, as countries with lower inflation, smaller deficits, and higher rates of economic growth are better positioned to service their debt (Tomz and Wright, 2013). For these reasons, countries may implement policies that signal an ability to repay to investors — especially during times of crisis.

However, repayment is not just a matter of an ability to repay, but also a function of political will (Eaton and Gersovitz, 1981). Debt servicing requires that governments divert resources from other priorities. Existing research demonstrates a clear democratic advantage (North and Weingast, 1989), meaning that investors expect that democracies are more willing to honor their debt commitments than non-democracies. These countries have therefore been shown to have easier access to sovereign finance and receive more favorable lending conditions (Beaulieu et al., 2012). This is explained for many reasons, including respect for the rule of law (Biglaiser and Staats, 2012; Dasgupta and Ziblatt, 2022), greater transparency (Copelovitch et al., 2018; Cormier, 2021, 2023a), legislative constraints on executive power (Cox, 2016; Cox and Weingast, 2018), and cental bank independence (Bodea and Hicks, 2015b). There may also be electoral penalties for elected leaders in response to default, although the reasons for this

vary (DiGiuseppe and Shea, 2015; Saiegh, 2005; Schultz and Weingast, 2003) and some research shows that there may be important variations in propensity for repayment (Ballard-Rosa, 2016; Connell, 2019). This democratic advantage holds, even as sovereign risk premiums may increase in secondary markets in response to elections (Bechtel, 2009; Bernhard and Leblang, 2006; Mosley, 2003). And, while democracies may have easier access to credit markets, recent research provides important contextualization by demonstrating that this is conditional on structural factors such as global liquidity (Ballard-Rosa et al., 2021).

Even if overall ability and willingness may define government access to capital markets, and the overall likelihood of successful sovereign bond issuance, there are other factors explaining access to credit and cost of borrowing such as government ideology. For example, left governments typically advance social and economic protections for key constituencies, preferring fiscal autonomy to prioritize such policy priorities, compared to right governments which privilege the free market and financial liberalization. This has ramifications for currency of issuance, with left government issuing in domestic currencies to maximize flexibility and right governments choose foreign currencies to minimize borrowing costs (Ballard-Rosa et al., 2022). These assumptions about policy priorities and risk preferences also affect the cost of borrowing (Barta and Johnston, 2018; Brooks et al., 2022; Brown et al., 2024; Vaaler et al., 2006). Other factors that affect government borrowing include development status (Cormier, 2021, 2023b; Zeitz, 2022), bureaucratic autonomy (Sadeh and Porath, 2020; Sadeh and Rubinson, 2024), and peer dynamics (Brooks et al., 2015).

The factors that influence government issuance of traditional bonds and access to credit — such as macroeconomic stability, creditworthiness, investor demand, institutional capacity, and regulatory frameworks — are also likely to shape the issuance of green bonds. Governments with strong credit ratings, robust financial institutions, and a history of successful bond issuance are better positioned to issue green bonds, as they face lower borrowing costs and greater investor confidence. Even if green bonds may require additional transparency and verification to ensure compliance with environmental standards, the fundamental determinants of sovereign borrowing remain largely the same because of the baseline importance of convincing investors of country ability and willingness to pay.

Thus, we expect that green bond issuance will largely be explained by the same factors that explain the issuance of vanilla bonds:

Hypothesis 1. *Countries with stronger economic fundamentals are more likely to issue green bonds than those lacking macroeconomic stability.*

Hypothesis 2. *Democracies are more likely to issue green bonds than non-democracies.*

3.2 Reasons to Go Green

If the same fundamental factors that drive government borrowing also apply to green bonds, how can we explain variation in their issuance? While many governments that issue traditional bonds do not pursue green finance strategies, others place them at the center of their borrowing approach. Understanding this variation requires examining both the motivations behind green bond issuance—particularly the benefits governments seek to capture—as well as the challenges and potential consequences of participating in green finance markets.

3.2.1 Motivations

Why should a country issue green bonds instead of traditional vanilla bonds? One key argument in the literature is that green bonds may offer more favorable financing conditions. This potential advantage, known as the "greenium," suggests that green securities can be issued at lower yields and higher prices. However, evidence on the greenium remains mixed — some studies find small but significant effects (Bachelet et al., 2019; Hachenberg and Schiereck, 2018; Koziol et al., 2022), while others find no substantial difference (Larcker and Watts, 2020; Lau et al., 2022). This is largely due to variation in geographic sample, period of analysis, and specific characteristics of issuers or markets (Chesini, 2024). Governments may issue green bonds expecting a premium due to investor commitment to environmental goals. However, they could also face a negative premium if investors see green bonds as riskier. Given this uncertainty, and the fact that not all governments issue them, the greenium alone is unlikely to be the key driver.

Second, and perhaps most obviously, countries may issue green bonds as a direct tool to finance environmental projects and support their climate commitments. By earmarking proceeds

for renewable energy, climate resilience, or sustainable infrastructure, governments can align their borrowing strategies with national and international climate goals. For example, Polish green bonds largely prioritized sustainable agricultural operations and afforestation — issues of particularly high salience to the population (Chesini, 2024). Furthermore, governments may see public debt as an ideal mechanism for funding climate action given that it shifts the fiscal burden onto future generations and typically faces lower levels of opposition than funding climate policy through income taxes or other means (Dechezleprêtre et al., 2022; Kantorowicz et al., 2024).

Third, and relatedly, issuing green bonds allows a country to broaden and diversify its investor base, tapping into investors that are specifically looking for green investments (Maltais and Nykvist, 2020). Research on corporate securities indicates that after the issuance of green bonds, the company's ownership structure changed with now more long-term and green institutional investors, hence the market reacted positively to green and sustainable behavior of those issuing firms (Flammer, 2021).[17] Similar dynamics are likely to be at play for sovereign issuance as well. For example, Poland reported that at least 60% of the investors in its inaugural sovereign green bond were "green" investors that were new to the Polish market (Heine et al., 2019). As demand currently outstrips supply for green bonds, countries may see an opportunity to expand their investor base through such issuance.

Finally, issuing green bonds may function as a signal to both markets and to other governments of a credible commitment to sustainable and green goals (Chesini, 2024; Dell'Atti et al., 2022). Investors look for such signals when judging the risks associated with bonds (Ballard-Rosa et al., 2022; Brooks et al., 2015; Gray, 2013). Issuing the more complex and self-binding 'sustainability-linked bonds' essentially functions as a signal to markets that a country is willing to commit to both environmental and debt sustainability at the same time. SLBs require the issuing country to follow emerging best practices in public financial management with potentially positive effects on lending conditions in the future, and functions as a signal that the country is able to manage the required coordination between different governmental bodies. There is also evidence of a reputational "halo effect," whereby the commitment to finance green projects can improve the overall issuer's reputation and lead to a higher price on vanilla bonds (Ando et al.,

[17] See also: Baker et al. (2022b); Sangiorgi and Schopohl (2021); Tang and Zhang (2020).

2022).

Given these motivations, we expect that conditional upon any issuance, the degree to which a country prioritizes climate and environmental policies should help explain patterns in green debt. Governments may legitimately wish to raise funds to cover relevant policies and programs, or to signal their commitment to such policies. We therefore further hypothesize the following:

Hypothesis 3. *Countries with more ambitious climate policies issue more, and more binding, green bonds than those without ambitious climate agendas.*

Hypothesis 4. *Countries that are more vulnerable to climate change issue more, and more binding, green bonds than those that are less vulnerable.*

3.2.2 Constraints on Green Issuance

Issuing green bonds requires expertise, and many states therefore face political constraints that limit their ability to do so. This expertise goes beyond technical skills and market access needed for issuing plain vanilla bonds. First, sovereign green bond issuance requires a certain level of capacity. Some countries suffer from a lack of overall knowledge of the instrument — 74% of respondents in the G20 Green Finance Study Group reported that a lack of knowledge was a key barrier to market development (Banga, 2019). Even those with awareness may face capacity constraints such as a lack of standardized monitoring mechanisms or difficulty in developing green project portfolios (Argandoña et al., 2022; Monk and Perkins, 2020). These regulatory hurdles are pervasive given the relative newness of green bonds. Prior research focusing on corporate green bonds demonstrates that state capacity is a key predictor for adherence with green bond standards (Lin, 2024). Even the EU Green Bond Standards (EU GBS) were only officially published as 2023, and the lack of guidelines has made it difficult for governments to know how to define and issue environmental and climate bonds (Chesini, 2024).

Secondly, issuing green debt requires a pipeline of green projects (Ando et al., 2022). This can create supply constraints, as countries may not be readily able to develop green projects, especially on the required scale. Doing so requires coordination across multiple ministries — these may include the Ministry of Finance, Ministry of Environment, Ministry of Energy, Ministry of Transportation, or some combination. Each of these typically have unique goals and

skills, with variation in their propensity to collaborate on climate finance (Pickering et al., 2015). Such intragovernmental dynamics are likely to shape whether countries can issue debt for green projects.

Another key challenge for sovereign green bond issuance is the issue of fungibility—how fiscal revenues are interchangeable within public budgets. Fungibility is a core principle of public financial management, which can make it difficult for governments to ensure that green bond proceeds are strictly allocated to specific environmental projects (Cheng et al., 2022). Public budgets are subject to frequent adjustments, creating potential mismatches between bond issuance and actual green expenditures, and resistance from sovereign issuers to legally commit themselves to green use of proceeds. As a result, many green finance frameworks do not actually guarantee that bond proceeds will go to new green investments with some countries (e.g., Switzerland) addressing this issue by allocating funds to finance past expenditures (Cheng et al., 2022; Chesini, 2024).

Given these constraints on green bond issuance, we expect that government capacity is likely to be a key factor explaining additional variation. Knowledge of green instruments is typically disseminated by international organizations such as the World Bank (WB), as multilateral development banks (MDBs) played a key role in the development of green bonds (Monk and Perkins, 2020). Countries that have engaged with such organizations on public finance policies are likely to be exposed to such information, increasing their likelihood of issuing green bonds. Furthermore, given the importance of defining green projects for labeled bonds, and the multitude of capabilities necessary, we further expect that ministry coordination is likely another important element behind green bond issuance. Thus, we predict:

Hypothesis 5. *Countries with stronger coordination between ministries will be more likely to issue green bonds.*

Hypothesis 6. *International organizations such as the WB and IMF influence countries to issue green bonds.*

4 Predictors of Green Bond Issuance

To test our hypotheses, we begin by comparing drivers of non-green sovereign bond issuances to drivers of green sovereign bond issuances to test Hypotheses 1 and 2. We then integrate data on climate and environmental outcomes, policies, and interests to test Hypotheses 3 and 4. We test for Hypotheses 5 and 6 using the interview evidence.

4.1 Data

Dependent Variable: Green Bonds

We collapse our data of sovereign bond issuances into a country-year format. The unit of analysis are whether any bond was issued and the logged amount of sovereign bonds issued in that country-year. We gathered sovereign bond data from *Bloomberg*, covering the years 2015–2023. The time frame is determined by (1) the issuance of the first green sovereign bond in 2016 and (2) the general data availability of our control variables.[18] [19]

Explanatory Variables

To test Hypotheses 1 and 2, we need data that captures economic fundamentals and regime type. Our first explanatory variable is a measure of *Democracy*, we use the continuous liberal democracy index by VDem (Michael Coppedge et al., 2024). We also control for a standard set of economic predictors: *log GDP per capita*, *GDP growth*, *Current account balance*, and *Government debt*. This data comes from the World Bank's World Development Indicator (WDI) database, except for current account balance and government debt, which are from the IMF. We also include a measure of *Financial openness* and use the Chinn-ito index that is normalized to run from 0 to 1 with higher values representing less financial restrictions in place (Chinn and Ito, 2006). *OECD membership* is a dummy variable that is 1 if a country is a member of the OECD.

[18] We drop countries with fewer than 100,000 inhabitants from our sample.

[19] In the absence of a common definition or binding international standards for green sovereign bonds, the labeling of such bonds varies between data providers. We adhere to Bloomberg's definition and use data on both green and plain vanilla bonds from Bloomberg. Bloomberg tags the "Green Bond" label when an issuer self-labels its bond as green or declares its compliance with the Climate Bonds Standards as defined by the Climate Bonds Initiative (CBI). Green bond data differs across databases based on different definitions (Ando et al., 2022).

Central bank independence is a continuous measure that runs from 0 to 1 where higher values refer to more independent central banks, we specifically use the weighted measure by Garriga (2024). We also control for the *US interest rate* on US constant maturity treasury bonds in order to control for global yield environment. The annual *Inflation rate* is from the World Bank's cross-country database of inflation (Ha et al., 2023).[20] Analogous to Ballard-Rosa et al. (2021), we employ the MSCI market classification, that rates countries in standalone, frontier, emerging and developed markets. We then analogously construct a peer issuance measure that calculates the share of a country's peer issuances in the previous year within that category (but excluding that very country) and call that measure *MSCI peer issuance*. Those countries that are not included in MSCI's market classification form their own peer group. The data is from Ballard-Rosa et al. (2021) and was manually extended until 2023 by using MSCI's annual market classification updates. The *Region peer issuance* is a similar measure, but uses world regions as the respective peer group.

To assess country-level "greenness," to test Hypotheses 3 and 4, we examine a range of variables that capture climate and environmental outcomes, policies, and preferences. First, we utilize *CO_2 emissions in kt, log* and *CO_2 emissions in kt per capita, log* refer to CO_2 emissions by country from the Global Carbon Budget. Second, we include *Oil rents (% of GDP)* as a measure of reliance on fossil fuels from the World Bank.

To capture the relative stringency of climate policy at the country level, we follow standard practice in the literature and use the Climate Laws of the World database (Grantham Research Institute at the London School of Economics, 2023). Specifically, we include the total number of climate laws in effect for a given country-year, along with separate counts for laws focused on climate mitigation and adaptation. Additionally, we track the number of new mitigation and adaptation laws introduced annually.

In order to test whether a country's predisposition to climate hazards and susceptibility to climate change affects the issuance of green bonds, we include a measure of *Climate Vulnerability* (University of Notre Dame, 2024). This composite index assesses exposure to climate risks across the key sectors food, water, health, ecosystem services, human habitat, and infrastructure.

[20] We use the annual headline consumer price inflation

Higher values indicate greater sensitivity to climate-related disruptions, with the maximum observed value in our dataset being 0.66 and the minimum 0.25.

We report summary statistics of our variables for green and plain vanilla sovereign issuances in the Appendix, these can be found in Table A.1 and A.2.

4.2 Estimation Strategy

We are interested in the effect of different country characteristics on green bond issuance. We analyze *sovereign bond issuance* as a binary variable indicating whether a country issued a bond on the primary bond market in a given year. We estimate a set of probit models that can be described as follows:

$$Y_{i,t} = \alpha + \beta_1 Democracy_{i,t-1} + \beta_2 Economy_{i,t-1} + \beta_3 Climate_{i,t-1} + \gamma \mathbf{X}_{i,t-1} + \delta_r + \delta_t + \epsilon_{i,t}$$

where *Democracy* indicates a country's regime type, *Economy* indicates key economic fundamentals, *Climate* indicates a country's "greenness," δ_r and δ_t represented region and year fixed effects, respectively, and $\mathbf{X}_{ict}$ represents a vector of country-year-level covariates. All explanatory variables are lagged by one year in order to address potential simultaneity bias. We report robust standard errors clustered by country.

We are primarily interested in cross-country differences, but replicate these analyses by replacing region fixed-effects with country fixed-effects in Table A.3 in the Appendix. We also replicate the analyses using OLS models, these can be found in Table A.4 in the Appendix, and in Table A.5, where we use the total amount issued as the dependent variable.

4.3 Results

We first examine whether and how the issuance of labeled sovereign bonds differs from that of conventional (plain-vanilla) bonds. This analysis serves as a test of Hypotheses 1 and 2. Table 1 presents a comparative analysis of these two bond types: Models 1 and 2 focus solely on non-green bonds, while Models 3 and 4 analyze green bonds. The data are structured in a country-year format.

Table 1: Sovereign bond issuance, 2015-2023

	Nongreen bonds		Green bonds	
VARIABLES	(1)	(2)	(3)	(4)
Democracy (VDem)	0.263	-0.080	-0.235	0.113
	(0.519)	(0.620)	(0.539)	(0.565)
Log of GDP per Capita	-0.013	0.029	-0.165	-0.154
	(0.114)	(0.140)	(0.176)	(0.195)
GDP growth (annual %)	0.006	0.003	0.022	0.028
	(0.011)	(0.015)	(0.012)	(0.019)
Current Account Balance (% of GDP)	-0.001	0.005	-0.014	-0.011
	(0.013)	(0.015)	(0.009)	(0.014)
Government Debt (% of GDP)	0.001	0.001	-0.005	-0.006*
	(0.003)	(0.004)	(0.003)	(0.003)
Inflation Rate	-0.000	-0.000	-0.017	-0.000
	(0.000)	(0.000)	(0.019)	(0.001)
MSCI Peer Issuance	6.231***	6.634***	4.420**	4.030**
	(0.695)	(0.712)	(1.124)	(1.369)
Region Peer Issuance		-2.134		-9.697
		(1.228)		(4.746)
Capital Account Openness		0.162		-0.208
		(0.329)		(0.402)
Central Bank Independence		1.699**		1.618
		(0.587)		(0.837)
OECD Membership	-0.198	-0.330	0.792**	0.931*
	(0.373)	(0.436)	(0.302)	(0.374)
Num.Obs.	1210	1022	1016	828
R2	0.274	0.331	0.293	0.310
FE: Country	-	-	-	-
FE: Region	✓	✓	✓	✓
FE: Year	✓	✓	✓	✓

Note: This table reports results of probit regressions using the binary measure *sovereign bond issuance* as the dependent variable, robust standard errors are clustered by country. Models 1-4 also controlled for *US interest rate* and *OECD Membership*, this variable is however collinear to the year fixed effects. * significant at 10%, ** significant at 5%, *** significant at 1%.

Our findings indicate no large differences between green and non-green bonds for standard measures of bond issuance, such as democracy, GDP per capita, or GDP growth. We find a negative and significant (at the 10% level) relationship between government debt to GDP relationship for green bonds. This seems to suggest that countries may only be willing to issue green bonds when they are not worried about their existing debt burden. We also see that OECD countries are more likely to issue green bonds than non-OECD countries when controlling for other factors. This further seems to indicate the importance of fiscal space and development capacity for motivating green bond issuance.

Similarly, the MSCI peer issuance measure — capturing issuance by peers within the same risk category — positively affect both non-green and green bond issuance, which aligns with conventional expectations: as more peers issue bonds, the market is likely to respond positively to additional issuances. However, this peer effect is not significant when controlling for regional issuances. Additionally, open capital accounts and independent central banks, which have been shown to reassure investors of a country's ability and willingness to repay debt by subjecting them to market discipline (Bodea et al., 2019; Bodea and Hicks, 2015a; Kaplan and Thomsson, 2017), have the expected positive effect on non-green bond issuances, it however becomes insignificant for green issuances. These findings suggest that the factors driving sovereign bond issuance are largely similar for green and plain-vanilla bonds, providing support for Hypotheses 1 and 2.

We replicate the same analysis replacing region with country fixed effects, allowing us to test for differences within countries. One limitation of this analysis is however based on the probit model, which drops countries without any change in the dependent variable for the years we observe. This is especially an issue for the product of green bonds, that have only more recently proven to become more popular, and we hence lose countries in the analyses that have not (yet) ever issued a green bond. A second limitation with this analysis is the small number of country-years where green bonds have been issued which reduces the robustness of our analyses, a challenge which is worsened by missingness in the control variables as well. We also replicate the same analyses using OLS regressions. These are provided in the Appendix.

The results are largely similar, democracy however now has a positive relationship with

issuance, aligning with the broader literature on the so-called "democratic advantage," although the effect is not significant. GDP per capita is positively and significantly associated with non-green bond issuance, but this effect becomes insignificant and the direction flips for green bonds. We also again see that OECD countries are more likely to issue green bonds than non-OECD countries when controlling for other factors.

To test Hypothesis 3, we examine whether there is a link between ambitious climate agendas and the use of these instruments, we employ both country and region fixed effects separately. Table 2 presents the results, assessing whether emissions levels, oil rents, climate vulnerability, and climate policy measures help explain green bond issuance in a given country-year. In Models 2, 3, 5, and 6, we also include the same covariates used in Table 1.

Model 1 shows that emissions levels do not significantly influence whether a country issues green bonds, and this result remains consistent across all model specifications. However, reliance on fossil fuels seems to reduce the likelihood of green bond issuance as the relationship is negative and statistically significant in the country-fixed effects specification.

Regarding Hypothesis 3, we observe no clear pattern for climate laws. On the one hand, the number of climate laws introduced in the previous year has a consistently positive effect, but total number of climate laws has a negative effect in some of the models. This seems to suggest that countries may issue green bonds after they instate new climate laws to fund related policies, but that there is no cumulative effect of regulations. Across the models with the full suite of controls, climate vulnerability has a positive effect on issuance, but it is not significant which means we cannot confirm Hypothesis 4.

We also control for plain-vanilla bond issuances in the previous year, and also find this to be a strong predictor of green bond issuance. This seems to indicate that green bonds are part of an overall debt management strategy, and that governments that are more likely to issue debt generally are also more likely to utilize use of proceeds bonds. We further find GDP growth to have a positive relationship, although per capita GDP is negative. To conclude, the overall evidence remains mixed. We find limited support for Hypothesis 3, but only if we think of ambition in terms of new climate laws or a lack of reliance on oil rents. We do not find conclusive evidence for Hypothesis 4, that climate vulnerability drives issuance.

Table 2: Green bond issuance, 2015-2023

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Co2 emissions per capita, log	3.550	5.330	8.104	-0.091	0.042	0.278
	(3.180)	(5.326)	(11.364)	(0.093)	(0.157)	(0.187)
Climate Vulnerability	38.632	46.801	49.773	-0.369	3.255	4.691
	(31.164)	(46.844)	(67.218)	(2.275)	(2.837)	(3.368)
New Climate Laws	0.318***	0.409***	0.385***	0.071	0.156**	0.208**
	(0.083)	(0.097)	(0.118)	(0.042)	(0.043)	(0.048)
Total Climate Laws	-0.067*	-0.130***	-0.116	0.003	-0.016	-0.013
	(0.036)	(0.047)	(0.079)	(0.010)	(0.011)	(0.012)
Oil Rents (% of GDP)			-1.413***			-0.025
			(0.447)			(0.033)
Democracy (VDem)		-2.044	-1.037		0.173	0.586
		(6.655)	(8.066)		(0.652)	(0.797)
Log of GDP per Capita		-10.919	-13.660		-0.218	-0.466
		(7.837)	(12.546)		(0.248)	(0.289)
GDP growth (annual %)		0.129**	0.250**		0.026	0.061
		(0.052)	(0.122)		(0.014)	(0.030)
Current Account Balance (% of GDP)		-0.049	0.028		-0.012	-0.003
		(0.046)	(0.076)		(0.014)	(0.020)
Government Debt (% of GDP)		-0.040	-0.043		-0.007*	-0.009*
		(0.029)	(0.084)		(0.003)	(0.004)
Inflation Rate		-0.118	-0.092		-0.017	-0.003
		(0.081)	(0.174)		(0.019)	(0.030)
MSCI Peer Issuance		4.971	-10.376		4.028**	3.597*
		(3.729)	(7.744)		(1.170)	(1.319)
Lagged Nongreen Issuance		6.850***	6.002*		8.008***	5.154***
		(0.777)	(3.478)		(1.545)	(0.967)
OECD Membership				0.834**	0.854*	1.106*
				(0.309)	(0.369)	(0.410)
Num.Obs.	259	259	173	1050	1009	846
R2	0.383	0.446	0.464	0.258	0.357	0.359
FE: Country	✓	✓	✓	-	-	-
FE: Region	-	-	-	✓	✓	✓
FE: Year	✓	✓	✓	✓	✓	✓
Countries	37	37	29			
Regions				6	6	5

Note: This table reports results of probit regressions using the binary measure *sovereign bond issuance* as the dependent variable, robust standard errors are clustered by country. Models 1-6 also controlled for *US interest rate*, these variables are however collinear to the year fixed effects. Models 1-3 also controlled for *OECD Membership*, the variable was however collinear to the country fixed effects. * significant at 10%, ** significant at 5%, *** significant at 1%. The analysis is replicated using an OLS Model, see Table A.6 in the Appendix.

5 Green Bond Prospectus & Framework Analysis

In the previous section we tested the intuitive link between ambitious climate policies and sovereign green bond issuance. The results were mixed: while we could not find a clear link between ambitious climate policies and issuance, vulnerability to climate change and new climate legislation both had a significant positive effect on issuance. As formulated in Hypotheses 3 & 4, we also expect countries' climate policies and vulnerability to have an affect on how binding climate commitments by those financial instruments are - hence conditional on issuance.

In order to test this, we analyze supporting documentation for sovereign green bonds, namely bond prospectuses and green finance frameworks. A prospectus is a listing document that contains material information about a financial instrument and discloses payment terms, amount issued, risk factors and events of default (Park, 2024; Park and Samples, 2024). They also frequently contain information on the issuer such as sovereign risk factors and more generally include information on the obligations of the issuer to investors (European Securities and Markets Authority., 2022). Prospectuses also include a section on the use of proceeds - hence information on what types of projects the raised funds can or cannot be used for. Sovereign green bond frameworks are official documents that outline how governments define, select, and manage environmentally focused projects financed through green bond issuances. They provide a standardized basis for evaluating the intended use of proceeds, project eligibility criteria, and reporting commitments.

Specifically, we ask: Do countries more severely affected by climate change, or those that are pursuing more ambitious policy trajectories, provide more detailed use-of-proceeds disclosures when issuing green bonds? Are these issuers more inclined to self-bind by offering greater transparency to investors? And how do these frameworks vary in terms of sectoral focus, specificity, and reporting mechanisms, potentially signaling different strategic priorities across countries?

5.1 Bond Prospectuses

5.1.1 Data

Since Poland's inaugural sovereign green bond in 2016, 281 such instruments had been issued by the end of 2023, according to Bloomberg.[21] We collected prospectuses for these bonds by first searching Refinitiv via ISIN codes and downloading available offering documents. When unavailable, we consulted the websites of issuing countries' Ministries of Finance or Debt Management Offices, as well as national financial regulatory authorities. We also reviewed materials from green finance organizations such as the World Bank IFC and CBI, and contacted Debt Management Offices directly when necessary. In total, we obtained prospectuses for 148 instruments, 65 of which contained a use-of-proceeds section.

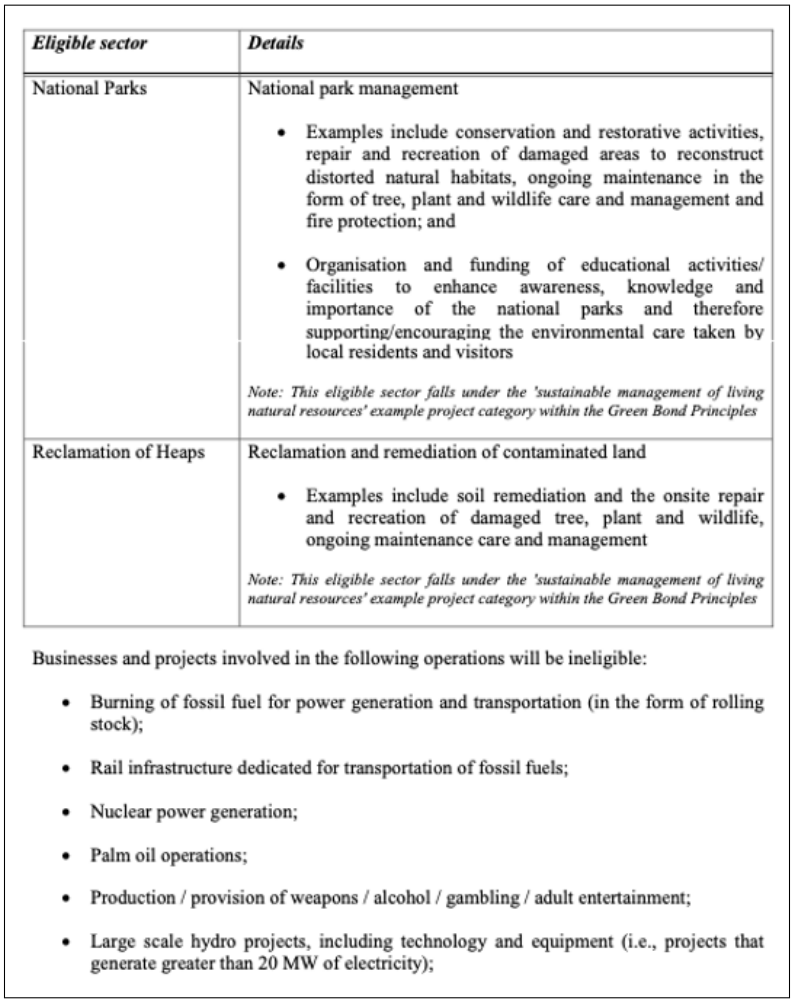
5.1.2 Discussion

As one of the main vehicles for communicating environmental intent to investors, the use-of-proceeds sections are designed to outline the scope of eligible projects and funding restrictions. Figure 8 shows an example from a Polish green bond issued in 2016. The use-of-proceeds section defines both a list of eligible sectors that range from *Renewable Energy* and *Clean Transportation* to *Afforestation* and *Sustainable Agriculture*. Importantly, it also defines a list of projects that will be ineligible for funding by the bond's proceeds.

Another example from a Chilean green bond issued in 2019 similarly names categories that may be eligible for the bond's proceeds, these include *Clean Transportation*, *Living Natural Resources* and *Green Buildings*. However, the prospectus also emphasizes that these projects are largely illustrative and that "no assurance can be provided that disbursements for projects with these specific characteristics will be made by Chile." Chile also references its *Green Bond Framework,* a document cited across multiple prospectuses that outlines how its green bond program aligns with recognized sustainability standards, including criteria for eligible projects, reporting procedures, and impact assessment. Similar to the Polish prospectus, Chile's framework provides a detailed list of eligible sectors and projects, as well as a negative list specifying

[21] The analysis period reflects the availability of explanatory variables. As of January 2025, 381 sovereign green bonds have been issued.

Figure 8: Use-of-Proceeds Section in Prospectus of Green Bond Issued by Poland in 2016, ISIN XS1536786939



Eligible sector	***Details***
National Parks	National park management • Examples include conservation and restorative activities, repair and recreation of damaged areas to reconstruct distorted natural habitats, ongoing maintenance in the form of tree, plant and wildlife care and management and fire protection; and • Organisation and funding of educational activities/ facilities to enhance awareness, knowledge and importance of the national parks and therefore supporting/encouraging the environmental care taken by local residents and visitors *Note: This eligible sector falls under the 'sustainable management of living natural resources' example project category within the Green Bond Principles*
Reclamation of Heaps	Reclamation and remediation of contaminated land • Examples include soil remediation and the onsite repair and recreation of damaged tree, plant and wildlife, ongoing maintenance care and management *Note: This eligible sector falls under the 'sustainable management of living natural resources' example project category within the Green Bond Principles*

Businesses and projects involved in the following operations will be ineligible:

- Burning of fossil fuel for power generation and transportation (in the form of rolling stock);
- Rail infrastructure dedicated for transportation of fossil fuels;
- Nuclear power generation;
- Palm oil operations;
- Production / provision of weapons / alcohol / gambling / adult entertainment;
- Large scale hydro projects, including technology and equipment (i.e., projects that generate greater than 20 MW of electricity);

Figure 9: Use-of-Proceeds Section in Prospectus of Green Bond Issued by Chile in 2019, ISIN US168863DL94

As described under "Recent Developments—Environment—Green Bond Framework," Chile has established a framework for the issuance of green bonds. It is Chile's intention to invest an amount equal to the proceeds from the sale of the notes, as well as an amount equal to the proceeds of any notes denominated in Euros and issued in 2019 pursuant to Supreme Decree No. 195 of the Ministry of Finance (the "Supreme Decree"), into projects that may qualify as "eligible green expenditures" under the Green Bond Framework. The Supreme Decree authorizes Chile to issue up to U.S.$2.5 billion. Eligible green expenditures may include tax expenditures (subsidies and tax exemptions), operational expenditures, investments in real assets and maintenance costs for public infrastructure, intangible assets and capital transfers to public or private entities, in one or more of the following categories: clean transportation, energy efficiency, renewable energy, living natural resources, land use and marine protected areas, water management and green buildings.

The examples of projects described above are for illustrative purposes only and no assurance can be provided that disbursements for projects with these specific characteristics will be made by Chile in an amount equal to the proceeds from the sale of the notes. There can be no assurance that any projects so funded will meet investor expectations regarding sustainability performance. Adverse environmental or social impacts may occur during the design, construction and operation of the projects or the projects may become controversial or criticized by activist groups or other stakeholders.

exclusions.

A third example from Hong Kong[22] includes no information on eligible projects in the prospectus and directly refers "For Eligible Projects as defined under the Green Bond Framework, as further described in the Offering Memorandum."

While use-of-proceeds sections in prospectuses can offer valuable insights into sovereign green bond commitments, analysis reveals significant variation in their availability and depth. In many cases, legal exemptions — such as those under the EU Prospectus Regulation[23] — mean that sovereign issuers are not required to publish prospectuses. Even when available, the level of detail within the use-of-proceeds sections is inconsistent, and prospectuses frequently defer to national green bond frameworks for substantive information on project eligibility, environmental criteria, and monitoring protocols, as shown above. These limitations underscore the importance of analyzing green bond frameworks themselves, which often serve as the primary document outlining how governments define "green" spending, assess project impact, and commit to reporting standards. We therefore turn next to a systematic analysis of sovereign green bond frameworks to better understand how countries communicate their environmental priorities, and the extent

[22] Bond issued in 2023, ISIN HK0000929700

[23] The exemption from the prospectus requirement for governments and certain public institutions in the European Union is defined in Article 1, paragraph 2, of the Prospectus Regulation (Regulation (EU) 2017/1129).

to which they self-bind through transparent and specific commitments.

5.2 Green Bond Frameworks

5.2.1 Data

Green bond frameworks can be understood as a set of guidelines and criteria that establish a country's green debt finance strategy. These documents typically define project eligibility criteria and provide transparency and credibility to investors. Green bond - or broader green finance - frameworks will usually also inform investors about monitoring and project evaluation protocols.

The green bond data that we have collected from Bloomberg covers sovereign issuances from 51 countries. Unlike prospectuses, which are issued at the bond level, green bond frameworks are published at the country level. Some countries have updated their frameworks over time. As with the prospectuses, we collected frameworks for countries by first using Bloomberg and Refinitiv to search at the product level using ISIN codes, and then downloading available green bond frameworks. When unavailable, we consulted the websites of issuing countries' Ministries of Finance or Debt Management Offices, as well as national financial regulatory authorities. In total, we obtained frameworks for 44 countries out of the 51 issuers in our dataset.[24]

5.2.2 Discussion

The design and content of the frameworks vary widely across countries, even as it seems common practice to have one in place before bond issuance. Most frameworks are anchored in global standards—such as the ICMA Green Bond Principles— but notable heterogeneity in specificity, ambition, and alignment with national climate goals remains.

Sovereign green bond frameworks differ widely in their rigor and specificity regarding what qualifies as an eligible green use-of-proceeds. Some governments adopt a focused and highly targeted approach. Lithuania, for example, channels its green bond proceeds almost exclusively into residential energy efficiency retrofits, with a clear ex ante benchmark of 40% energy savings

[24] Additional data collection is ongoing to address the missing frameworks and to ensure that we have all relevant collateral material.

per project and stringent third-party verification mechanisms. In contrast, Brazil and Peru define broader, multi-sectoral eligibility criteria, weaving together environmental and social priorities under a sustainability umbrella. Peru's framework explicitly links green bond use-of-proceeds to its National Competitiveness and Productivity Plan, incorporating a wide array of sectors including forest conservation, health access, and education infrastructure. And, while Poland and Belgium include detailed exclusion lists and prioritize mitigation-focused sectors like clean transportation and afforestation, frameworks from the Philippines and Colombia adopt more flexible definitions that include social infrastructure and development goals, with limited detail on enforcement or impact metrics.

Other frameworks emphasize legal and institutional embeddedness. Canada's framework is deeply integrated with its national climate accountability architecture, referencing the Net-Zero Emissions Accountability Act and including exclusionary criteria such as fossil fuel investments. New Zealand's framework similarly reflects legislative commitments — most notably the Zero Carbon Act — and provides extensive detail on climate governance, emissions budgets, and biodiversity strategy.[25]

In short, a preliminary analysis demonstrates that sovereign green bond frameworks reflect more than compliance with international norms; they encode strategic decisions about how states position themselves in the green finance landscape. Ongoing textual analysis will further assess variation in language, structure, and institutional commitments.

6 Elite Interviews

Green sovereign bonds represent a relatively recent financial instrument, with only a few hundred issuances recorded since 2016. While the preceding empirical analyses facilitate a structured comparison between green and plain-vanilla sovereign bonds and identify factors influencing covenant design, the relatively small sample size poses inherent limitations. Additionally, several key factors outlined in the hypothesis section are difficult to quantify in a cross-country context, further complicating statistical inference.

[25]Links to selected green bond frameworks of Brazil, Canada, Lithuania, New Zealand and Peru.

To address these limitations, we conduct elite interviews with industry specialists. Qualitative methods are particularly useful in this case because they allow us to explore the motivations, decision-making processes, and institutional constraints that shape green bond issuance—factors that are often difficult to observe in large-scale data.

6.1 Methodology

We conducted a series of elite interviews with officials from debt management offices (DMOs), relevant ministries, international organizations, and financial intermediaries. Interviewees were identified through a combination of purposive and snowball sampling: we began by cold-emailing officials with public-facing roles in sovereign green bond programs, supplemented with outreach to relevant staff at IFIs. We also relied on professional connections and followed up on recommendations from initial interviewees to expand the sample across a diverse range of issuer contexts and perspectives.

All interviews were semi-structured and conducted in English between March and May 2025 via video conference or phone. Participants were senior officials and technical experts accustomed to professional communication in English, and interviews ranged from 30 to 60 minutes. A flexible interview guide was used to ensure consistency across conversations while allowing space for generative discussion (see Section C.3). Interviews were conducted under strict conditions of confidentiality and anonymity, in line with Princeton University IRB protocol. Table A.7 summarizes the full list of interviews to-date (18 total), with additional interviews ongoing.

6.2 Preliminary Findings

Determinants of Sovereign Issuance

We asked interviewees to describe the main motivations behind sovereign green bond issuance. Conversations reveal a blend of financial, political, and reputational considerations, with many emphasizing variation across countries. Although green bonds are often framed as tools for expanding sustainable finance, the decision to issue is rarely grounded in a singular goal of environmental policy advancement. Rather, interviewees consistently emphasized strategic calculations involving investor engagement, fiscal management, and domestic political coordination.

Several interviewees noted that perceived investor demand plays an important enabling role, but is rarely the core constraint. One green finance expert observed that "whenever a bond comes out, it is bought," suggesting that supply-side limitations—rather than a lack of investor appetite—are more determinative of whether governments proceed with issuance.[26] Technical advisors and financial consultants emphasized that countries pursue labeled issuance either to "diversify the investor base," respond to "peer pressure" from other issuers, or demonstrate alignment with global climate norms.[27] Issuers also note experiencing investor demand and interest for labeled products, along with pressure from organizations like CBI.[28] Yet, one official noted that "investor interest seems to have plateaued," raising questions about the durability of these motivations over time.[29]

In many cases, the Ministry of Finance (MOF) plays a leading role, reflecting the embeddedness of green bond decisions within conventional debt management strategies. One interviewee explained, "this is core debt management, prudent risk mitigation."[30] For another issuer, they discussed how their green bond's appeal to both green and non-green investors was a central design feature, intended to avoid sacrificing liquidity or incurring additional costs. Such bonds are also typically issued when there is a sudden increase in need for government finance, such as after the COVID-19 pandemic or following natural disasters.[31] Such examples provide evidence in support of Hypotheses 1 and 2, that is the idea that green bond issuance is largely explained by the factors that drive the issuance of vanilla bonds.

Green bond issuance was also framed by some officials as highly dependent institutional learning and bureaucratic coordination. Multiple officials reflected on how the issuance process prompted greater cross-ministerial cooperation and increased awareness within ministries about climate-related expenditure.[32] Others discussed how long-standing challenges of inter-agency coordination slowed initial uptake.[33] But, in most cases, whenever the MOF prioritized issuance,

[26] Interview A5.
[27] Interviews A1, A2, A5.
[28] Interview A6.
[29] Interview A4.
[30] Interview A5.
[31] Interviews A4, A7, A13.
[32] Interviews A3, A4, A6, A7, A11.
[33] Interview A1.

the process was described as "very fast," signaling a shift in political prioritization.[34] In other contexts, green bond issuance was explicitly encouraged by international actors such as the World Bank, which offered technical assistance and, at times, made framework development a prior action condition for programmatic lending.[35] Such instances of bureaucratic constraint or the importance of IFI involvement provide some preliminary support for Hypotheses 5 and 6.

Across interviews, one additional theme was the demonstration effect of sovereign issuance. Especially for emerging economies, issuing a green bond was seen as a credibility-enhancing move with potential signaling effects.[36] For some, sovereign issuance was described as a benchmark-setting move designed to grow the domestic market for overall climate finance and stimulate replication.[37] As another advisor put it, sovereign green bonds offer "bragging rights" at international summits and serve as "platforms" for climate finance diplomacy.[38]

Overall, the interviews suggest that sovereign green bond issuance is best understood not solely as an environmental policy tool, but as hybrid instruments. While climate accountability may shape long-run trajectories, the proximate drivers reflect calculated responses to evolving financial and bureaucratic opportunity structures.

Variation in Greenness

To better test for Hypotheses 3 and 4, we also engaged interviewees about the degree to which sovereign green bonds vary in their stringency of climate and environmental commitments. While green bonds share a standardized market label, interviews highlight considerable variation in the degree to which sovereign issuances substantively reflect environmental ambition. This variation arises not only from differences in project selection and reporting rigor, but also from political economy dynamics and capacity constraints that shape implementation.

Across contexts, interviewees pointed to the limited "additionality" of sovereign green bonds.[39] As one official noted, expenditures are often "already in the budget and only then tagged as green," a practice that risks blurring the line between new green investments and mere rela-

[34] Interview A2.
[35] Interview A10.
[36] Interview A10.
[37] Interviews A7, A8.
[38] Interview A5.
[39] Interviews A3, A11.

beling.[40] Another government representative acknowledged that despite robust institutional infrastructure and a dedicated green bond team, "a lot of the eligible expenditure is just what we would have done anyway," reinforcing concerns about the marginal impact of issuance.[41] It has however also been acknowledged, that the issuance of green bonds may generally raise awareness among government officials, encouraging inter-ministerial coordination, and fostering policy feedback that helps embed environmental considerations more deeply into public investment planning.

Differences in the greenness of bonds also stem from variation in the political salience of climate goals. Multiple interviews reflected on how green bond strategies were pursued when a green party was in government or when a leader was more inclined towards climate action.[42] Despite examples of interest fluctuation based on political dynamics, most interviewees commented that they expect the market for green bonds to grow despite headwinds. One expert reflected that "sustainability and decarbonization targets are not going away," expecting Europe and China to lead the way even if the US pulls back from green finance.[43] Others went so far as to suggest that the US retrenchment actually creates opportunity for the leadership of China, as demonstrated by its debut sovereign green bond issuance in 2025,[44] and countries in Latin America[45] to respond to continuing investor demand, especially in Europe.

Others emphasized the differences between ministries as an important political dynamic for understanding green bonds. For example, principal-agent problems arise when MOFs must assume reputational risk for commitments made by other agencies. One interviewee described how debt managers may "fear getting in trouble" for complex instruments that are hard to monitor or explain to Parliament, especially when line ministries "do not have explicit targets for sustainability."[46] This coordination failure is often compounded by underdeveloped data systems and weak reporting infrastructure, which impede both pre-issuance planning and post-issuance impact evaluation.[47]

[40] Interview A6.
[41] Interview A3.
[42] Interviews A7, A8, A10.
[43] Interview A9.
[44] Interview A2
[45] Interview A10
[46] Interview A5.
[47] Interview A12.

A key dividing line between higher- and lower-ambition green bonds appears to be the seriousness with which governments approach framework development and impact reporting. As green finance frameworks are commonplace in the market, some interviewees raised concerns that these documents may be more about signaling than substance.[48] However, others reflected that there is meaningful variation, and that investors are increasingly able to identify higher-quality green bond offerings.[49] In jurisdictions with more rigorous frameworks, ministries emphasize close alignment with ICMA standards, proactive engagement with external reviewers, and efforts to produce detailed allocation and impact reports.[50] Such governments see the framework not merely as a marketing tool but as an accountability mechanism that could drive systemic improvement in budgeting practices.[51] In addition, per the challenge of coordination across ministries, one expert noted that a good way to distinguish the quality of a green finance framework is whether it delineates decision-making and reporting responsibilities within the government.[52] Despite some concerns of greenwashing, there was a general consensus across many interviews that the frameworks provide legitimacy to the market and help increase investor confidence.[53]

The rise of sustainability-linked bonds (SLBs) has further sharpened questions around greenness and credibility. Advisors and financial intermediaries noted growing interest in SLBs due to their performance-based design, which can better align with investor concerns about impact and accountability.[54] However, SLBs also introduce new complexities, including KPI design, data availability, and legal exposure if performance targets are missed. In some cases, the mere act of modeling out KPI scenarios created political resistance. One advisor recounted how, after showing a country that meeting its renewable energy target would require substantial investment, "the government wanted to back off," afraid of the legal and fiscal implications of committing to measurable outcomes.[55]

These challenges show that the credibility of a green bond depends not only on which projects

[48] Interview A1.
[49] Interviews A10, 12.
[50] Interview A12.
[51] Interview A11.
[52] Interview A12.
[53] Interview A9.
[54] Interviews A1, A5.
[55] Interview A5.

are selected but also on institutional capacity, political commitment, and coordination across government. As one official noted, the green bond is "almost the last piece of the story," reflecting broader efforts around budgeting, planning, and climate policy. The label by itself is not enough; what matters is how it is implemented and whether it leads to meaningful action.

7 Conclusion

This paper aims to provide one of the first systematic examinations of the political economy of sovereign green bond issuance, shedding light on how governments navigate the intersection of climate finance and sovereign debt markets. Our findings suggest that green bond issuance largely follows the same logic as conventional sovereign borrowing, reinforcing the idea that these instruments primarily serve as an additional revenue-generating tool and a way of accessing a new and "green-conscious" investor base, rather than a direct mechanism for advancing national climate policies. While we observe some linkages between climate legislation and green bond issuance, the broader regulatory environment does not appear to play a decisive role. Moreover, countries heavily reliant on fossil fuels are somewhat less likely to issue green bonds, yet we find no strong relationship between issuance and environmental outcomes such as carbon emissions. These results challenge assumptions that green bond issuance is necessarily driven by environmental ambition alone and highlight the need for a more nuanced understanding of how financial and political incentives shape sovereign green finance.

Interviews reinforce these patterns and offer important context for interpreting the quantitative results. Practitioners consistently described green bonds as instruments shaped by financial strategy and reputational considerations, at least to a similar degree as environmental policy goals. Document analysis of green bond frameworks further supports this view, revealing substantial variation in the specificity and rigor of project selection, monitoring, and impact reporting. Together, these qualitative insights suggest that green bond issuance reflects broader political and institutional dynamics, not simply environmental commitments.

Beyond the empirical findings, this study makes several contributions to the literature on climate finance and sovereign debt. By situating green bonds within the broader landscape

of government borrowing, we offer insights into how states incorporate climate finance into their overall economic strategies. Our analysis underscores the importance of political economy factors—including regime type, macroeconomic fundamentals, and bureaucratic capacity—in determining which countries adopt green bonds. Furthermore, we link green bond issuance to global debt market dynamics, particularly as emerging markets and developing economies become increasingly central players in sovereign finance. Understanding how governments leverage green bonds in the context of fiscal pressures, debt sustainability, and international financial institutions provides a valuable lens through which to assess evolving patterns in both climate policy and sovereign borrowing.

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Appendices

A Data Summary

Table A.1: Summary Statistics - Green Bonds

	N	Min	Max	Median	Mean	SD
Issuance, Binary	1431	0.00	1.00	0.00	0.06	0.23
Number of Bonds Issued	1431	0.00	28.00	0.00	0.15	1.22
Total Amount Issued, in Mil USD	1431	0.00	49775.13	0.00	284.05	2072.65
Democracy (VDem)	1216	0.03	0.90	0.42	0.44	0.26
US Treasury Rate	1431	0.89	3.96	2.14	2.29	0.85
GDP per Capita	1429	262.17	110425.89	6191.66	14835.80	19483.31
GDP growth (annual %)	1429	-32.91	63.44	3.08	2.68	5.37
Current Account Balance (% of GDP)	1430	-68.80	34.30	-2.30	-2.51	8.51
Government Debt (% of GDP)	1416	2.06	357.69	51.55	58.61	36.45
Capital Account Openness	1068	0.00	1.00	0.45	0.55	0.37
MSCI Peer Issuance	1431	0.00	0.77	0.44	0.44	0.14
Region Peer Issuance	1431	0.23	0.67	0.45	0.44	0.08
Central Bank Independence	1422	0.14	0.97	0.61	0.61	0.17
Inflation Rate	1431	-3.75	65374.08	3.25	69.72	1807.56
Oil Rents (% of GDP)	1096	0.00	45.77	0.03	2.26	6.23
Co2 emissions in kt, log	1422	135568.00	11902503000.00	20631736.00	216786051.48	972255049.00
Co2 emissions per capita, log	1422	0.03	38.84	3.10	4.81	5.82
Climate Vulnerability	1256	0.25	0.66	0.41	0.42	0.09
New Climate Laws	1431	0.00	45.00	1.00	1.84	2.55
Total Climate Laws	1431	1.00	128.00	15.00	18.09	13.77

Note: Please note that the data is in a country-year format, the issuance variables hence refer to the number and amount of bonds issued in a country-year. For clarity we divide *total amount issued*/1000 for this summary table, we however do not use this for the analyses. We use the log of the *total amount issued*, *GDP per capita* and *Co2 emission* in our analyses.

Table A.2: Summary Statistics - Plain Vanilla Bonds

	N	Min	Max	Median	Mean	SD
Issuance, Binary	1431	0.00	1.00	1.00	0.81	0.39
Number of Bonds Issued	1431	0.00	284.00	4.00	9.02	17.42
Total Amount Issued, in Mil USD	1431	0.00	9197647.10	1975.32	61399.12	461241.84
Democracy (VDem)	1216	0.03	0.90	0.42	0.44	0.26
US Treasury Rate	1431	0.89	3.96	2.14	2.29	0.85
GDP per Capita	1429	262.17	110425.89	6191.66	14835.80	19483.31
GDP growth (annual %)	1429	-32.91	63.44	3.08	2.68	5.37
Current Account Balance (% of GDP)	1430	-68.80	34.30	-2.30	-2.51	8.51
Government Debt (% of GDP)	1416	2.06	357.69	51.55	58.61	36.45
Capital Account Openness	1068	0.00	1.00	0.45	0.55	0.37
MSCI Peer Issuance	1431	0.00	0.74	0.43	0.43	0.13
Region Peer Issuance	1431	0.00	0.67	0.43	0.42	0.09
Central Bank Independence	1422	0.14	0.97	0.61	0.61	0.17
Inflation Rate	1431	-3.75	65374.08	3.25	69.72	1807.56
Oil Rents (% of GDP)	1096	0.00	45.77	0.03	2.26	6.23

Note: Please note that the data is in a country-year format, the issuance variables hence refer to the number and amount of bonds issued in a country-year. For clarity we divide *total amount issued*/1000 for this summary table, we however do not use this for the analyses. We use the log of the *total amount issued*, *GDP per capita* and *Co2 emission* in our analyses.

B Robustness

Table A.3: Sovereign bond issuance with country-year fixed effects, 2015-2023

	Nongreen bonds		Green bonds	
DV: *Sovereign Issuance (binary)*	(1)	(2)	(3)	(4)
Democracy (VDem)	1.239	0.381	0.336	0.502
	(3.214)	(3.882)	(5.026)	(5.799)
Log of GDP per Capita	3.564***	2.975	-3.930	-4.401
	(1.244)	(1.966)	(5.359)	(6.770)
GDP growth (annual %)	-0.005	-0.018	0.091	0.192
	(0.016)	(0.024)	(0.059)	(0.116)
Current Account Balance (% of GDP)	0.011	0.024	-0.019	0.036
	(0.024)	(0.025)	(0.039)	(0.051)
Government Debt (% of GDP)	0.001	-0.013	-0.024	-0.033
	(0.009)	(0.015)	(0.038)	(0.068)
Inflation Rate	0.000	0.000	-0.079	0.018
	(0.000)	(0.000)	(0.061)	(0.112)
MSCI Peer Issuance	8.168***	9.354***	3.951	-9.987
	(1.620)	(1.971)	(3.133)	(6.654)
Region Peer Issuance		2.425		-16.059
		(3.169)		(12.312)
Capital Account Openness		6.446***		2.713
		(2.091)		(4.749)
Central Bank Independence		4.303		328.652**
		(2.959)		(127.991)
Num.Obs.	456	357	259	162
R2	0.380	0.440	0.317	0.381
FE: Country	✓	✓	✓	✓
FE: Region	-	-	-	-
FE: Year	✓	✓	✓	✓
Countries	57	51	37	27

Note: This table reports results of probit regressions using the binary measure *sovereign bond issuance* as the dependent variable, robust standard errors are clustered by country. Models 1-4 also controlled for *US interest rate*, this variable is however collinear to the year fixed effects. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table A.4: OLS: Sovereign bond issuance, 2015-2023

	Nongreen bonds		Green bonds	
DV: *Sovereign Issuance (binary)*	(1)	(2)	(3)	(4)
Democracy (VDem)	0.254	0.259	-0.177	-0.233
	(0.254)	(0.249)	(0.141)	(0.153)
Log of GDP per Capita	0.424*	0.311	-0.019	-0.002
	(0.222)	(0.255)	(0.098)	(0.108)
GDP growth (annual %)	-0.001	-0.001	0.002	0.003
	(0.002)	(0.002)	(0.001)	(0.002)
Current Account Balance (% of GDP)	0.002	0.003	-0.002**	-0.002*
	(0.003)	(0.004)	(0.001)	(0.001)
Government Debt (% of GDP)	0.000	-0.001	-0.000	-0.001
	(0.001)	(0.001)	(0.000)	(0.000)
Inflation Rate	0.000***	0.000***	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
MSCI Peer Issuance	1.311***	1.508***	0.190**	0.064
	(0.186)	(0.184)	(0.083)	(0.069)
Region Peer Issuance		0.331		-0.244
		(0.210)		(0.156)
Capital Account Openness		0.575**		0.100
		(0.222)		(0.064)
Central Bank Independence		0.626**		-0.051
		(0.313)		(0.099)
OECD Membership		0.006		0.121***
		(0.023)		(0.013)
Num.Obs.	1210	1022	1210	1022
R2	0.589	0.637	0.300	0.301
FE: Country	✓	✓	✓	✓
FE: Year	✓	✓	✓	✓
Countries	152	147	152	147

Note: This table reports results of OLS regressions using the binary measure *sovereign bond issuance* as the dependent variable, robust standard errors are clustered by country. Models 1-4 also controlled for *US interest rate*, this variable is however collinear to the year fixed effects. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table A.5: OLS: Sovereign bond issuance, continuous DV, 2015-2023

	Nongreen bonds		Green bonds	
DV: *Total Amt Issued*	(1)	(2)	(3)	(4)
Democracy (VDem)	8.582*	7.183*	-3.780	-4.981
	(4.654)	(4.299)	(3.050)	(3.230)
Log of GDP per Capita	9.900**	7.469	-0.905	-0.620
	(4.682)	(5.500)	(2.080)	(2.215)
GDP growth (annual %)	-0.028	-0.037	0.048	0.056
	(0.047)	(0.051)	(0.031)	(0.038)
Current Account Balance (% of GDP)	0.043	0.073	-0.053**	-0.039*
	(0.069)	(0.076)	(0.021)	(0.020)
Government Debt (% of GDP)	0.013	-0.007	-0.010	-0.014
	(0.019)	(0.025)	(0.009)	(0.009)
Inflation Rate	0.000***	0.000*	0.000**	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
MSCI Peer Issuance	26.189***	29.394***	4.652**	1.706
	(3.854)	(3.823)	(1.841)	(1.419)
Region Peer Issuance		11.530***		-4.476
		(4.403)		(3.227)
Capital Account Openness		12.661***		2.108
		(3.931)		(1.357)
Central Bank Independence		16.008**		-1.306
		(6.697)		(2.196)
OECD Membership		-3.382***		2.548***
		(0.532)		(0.245)
Num.Obs.	1210	1022	1210	1022
R2	0.623	0.654	0.299	0.295
FE: Country	✓	✓	✓	✓
FE: Year	✓	✓	✓	✓
Countries	152	147	152	147

Note: This table reports results of OLS regressions using the continuous measure *Total Amount Issued* as the dependent variable, the log+1 is used. Robust standard errors are clustered by country. Models 1-4 also controlled for *US interest rate*, this variable is however collinear to the year fixed effects. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table A.6: OLS: Green bond issuance, 2015-2023

DV: *Sovereign Issuance (binary)*	(1)	(2)	(3)	(4)	(5)	(6)
Co2 emissions per capita, log	-0.023	-0.039	-0.039	-0.001	0.002	0.016
	(0.048)	(0.053)	(0.045)	(0.005)	(0.011)	(0.011)
Climate Vulnerability	0.695	1.082	1.715	0.049	0.106	0.181
	(1.295)	(1.367)	(1.337)	(0.158)	(0.174)	(0.169)
New Climate Laws	0.010	0.010	0.004	0.016*	0.017*	0.016*
	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)
Total Climate Laws	0.005*	0.004	0.008**	0.001	0.000	0.001
	(0.003)	(0.003)	(0.004)	(0.002)	(0.002)	(0.002)
Oil Rents (% of GDP)			-0.003			-0.000
			(0.002)			(0.001)
Democracy (VDem)		-0.140	-0.181		-0.037	-0.020
		(0.137)	(0.153)		(0.049)	(0.045)
Log of GDP per Capita		0.007	0.064		-0.002	-0.013
		(0.099)	(0.125)		(0.015)	(0.014)
GDP growth (annual %)		0.002*	0.003		0.001	0.002
		(0.001)	(0.002)		(0.001)	(0.001)
Current Account Balance (% of GDP)		-0.002**	-0.001		-0.002*	-0.001
		(0.001)	(0.001)		(0.001)	(0.001)
Government Debt (% of GDP)		-0.000	-0.000		-0.000	-0.000*
		(0.000)	(0.000)		(0.000)	(0.000)
Inflation Rate		0.000	0.000		0.000	0.000
		(0.000)	(0.000)		(0.000)	(0.000)
MSCI Peer Issuance		0.131	-0.036		0.203**	0.078
		(0.090)	(0.062)		(0.067)	(0.057)
Lagged Nongreen Issuance		-0.000	0.019		0.005	0.017
		(0.015)	(0.013)		(0.012)	(0.013)
OECD Membership	0.098***	0.101***	0.132***	0.095**	0.104*	0.104*
	(0.014)	(0.017)	(0.021)	(0.036)	(0.047)	(0.044)
Num.Obs.	1248	1202	1043	1248	1202	1043
R2	0.321	0.327	0.323	0.141	0.159	0.136
FE: Country	✓	✓	✓	-	-	-
FE: Region	-	-	-	✓	✓	✓
FE: Year	✓	✓	✓	✓	✓	✓
Countries	156	151	150			
Regions				7	7	7

Note: This table reports results of OLS regressions using the binary measure *sovereign bond issuance* as the dependent variable, robust standard errors are clustered by country. Models 1-6 also controlled for *US interest rate*, this variable is however collinear to the year fixed effects. * significant at 10%, ** significant at 5%, *** significant at 1%.

C Interviews

C.1 Method

All interviews were semi-structured and conducted in English. Using English was not a barrier given that interviews were conducted with policymaker elites who are accustomed to conducting business in English. Interviews varied in length from 30 to 60 minutes and were held via video conference (Zoom / Microsoft Teams) or over the phone. We used a set of questions to guide the conversation (see Section C.3), leaving time for follow-up questions. The advantage of this methodology is that it focuses interviews on essential questions for the study while also allowing for generative discussion. Interviewees preferred to speak in confidentiality and with strict anonymity, following IRB protocol #17074 to allow for full expression of opinions without connection to the individual's name or organization, which meant that we did not record the interviews and instead took typed notes.

C.2 Sample

See Table A.7 for a full list of completed interviews, denoting the organization and entity type.

C.3 Interview Script

General Understanding & Motivation[56]

1. What initially motivated your country to consider issuing green bonds?
2. Can you describe the decision-making process that led to your country's first green bond issuance?
3. What are the primary objectives your country aims to achieve through green bond issuance?
4. How do green bonds fit into your country's broader climate policy goals? How do they fit into your country's broader fiscal strategy?

[56]Note, these are focused on the country-based sample, we adjust to similar but appropriate questions for industry professionals.

Table A.7: List of Interviews

ID	Role	Entity Type	Date
A1	Senior Debt Specialist	International Financial Institution	March 2025
A2	Regional Director for Climate Bonds	International Organization	April 2025
A3	Policy Expert, Ministry of Environment	Issuing Country	April 2025
A4	Innovative Finance Specialist	International Organization	April 2025
A6	Head of Bond Products	Issuing Country	April 2025
A7	Lawyer, National Debt Office	Issuing Country	April 2025
A8	Administrator, National Debt Office	Issuing Country	April 2025
A9	Director for Sustainable Finance	International Organization	April 2025
A10	Regional Director for Climate Bonds	International Organization	April 2025
A11	Head, Treasury Front Office	Issuing Country	April 2025
A12	Senior Manager for Sustainable Finance	SPO Provider	April 2025
A13	Policy Expert, Reserve Bank	Issuing Country	April 2025
A14	Senior Trader, Debt Agency	Issuing Country	May 2025
A15	Climate Change Economist	International Financial Institution	May 2025
A16	Director, Public Debt	Issuing Country	May 2025
A17	Legal Advisor, Ministry of Finance	Issuing Country	May 2025
A18	Economist, Ministry of Finance	Issuing Country	May 2025

5. What were the main steps involved in preparing for your country's green bond issuance? What is the purpose of a green framework versus the bond prospectus?

6. How was the green bond framework developed, and which agencies or stakeholders were involved in the process?

7. How did your country determine the size and structure of the green bond issuance?

8. What types of projects or expenditures are eligible for financing through your country's green bonds?

9. Why issue green bonds instead of using traditional funding sources like MDB loans, tax revenues, or standard government bonds?

Political and Institutional Considerations:

10. Have political shifts or government turnover influenced your country's approach to green finance?

11. Have you encountered any resistance within the government? If so, what were the primary concerns or objections?

12. To what extent does your country's existing legal and regulatory framework facilitate or constrain green bond issuance?

Market / Peer Considerations:

13. Have external advisors played a role in your decision to issue (or not issue) green bonds? What about investor pressure?

14. Do you coordinate with regional or peer countries that have issued green bonds? Have their experiences influenced your approach?

15. Do multilateral agreements (e.g., EU Green Bond Standards, Paris Agreement targets) play a role in your green bond strategy?

Effectiveness Considerations:

16. Are there sufficient green projects in your country to support regular green bond issuance? If not, what are the key barriers?

17. How does your country ensure that proceeds from green bonds are actually used for environmentally beneficial projects? What is the process for selecting, monitoring, and reporting on green bond projects?

18. Have there been any difficulties in aligning different ministries (Finance, Environment, Energy, etc.) on green bond issuance?