Green Finance

Green Finance, 2(1): 35–54.
DOI: 10.3934/GF.2020003
Received: 18 February 2020
Accepted: 09 March 2020
Published: 11 March 2020

http://www.aimspress.com/journal/GF

Research article

Private governance schemes for green bond standard: influence on public authorities' policy making

Toyo Kawabata*

Graduate School of Media and Governance, Keio University, Tokyo, Japan

*** Correspondence:** Email: toyo0815@gmail.com.

Abstract: This paper considers the guiding impact of private governance schemes on public authorities' policy-making through a case study on green bond standard. Based on theoretical review of the institutional interplay and private governance scheme, two hypotheses are proposed in this paper: horizontal interplay between transnational private governance schemes can make a particular framework prevalent in given governance area; and prevalent private governance scheme can influence policy making of public authorities through vertical institutional interplay. The argument in this paper supports that internationally-accepted private governance schemes could be in a position to influence policy-making by public authorities. Horizontal interplay in the form of alignment between the Green Bond Principles (GBP) and other private green bond standards reinforces the credibility of the overlapping elements of the private standards. As for vertical level, this paper finds that public authorities at national and regional levels take advantage of the private governance scheme, especially GBP, when developing their own standards and policy frameworks. Private institution's expertise on green bond standards effectively function to help develop coherent green bond standards globally by helping with public authorities' policy development. GBP eventually serves as a model regulation for policy makers as public authorities regard them as market best practice. This further strengthens the credibility of GBP since private governance schemes could attract more users by making it clear that those voluntary private standards are linked with standards and policy frameworks created by public authorities.

Keywords: climate finance; green bond; private governance scheme; horizontal interplay; vertical interplay

JEL Codes: G38, L15, L33, L38, O13, O44, P48, Q01, Q56

1. Introduction

Green bonds play an increasingly important role in ensuring financing for climate change prevention (Mathews & Kidney, 2014; Reichelt & Keenan, 2017; IFC, 2018). The World Bank defines a green bond as "a debt security that is issued to raise capital specifically to support climate-related environmental projects" (World Bank, 2015). As climate finance flow is still far behind what is required to achieve the global climate change goals set by Paris Agreement, there is growing interest among actors in climate governance in green bonds as a potential source to bridge the financing gap (Paula & Carola, 2016; UNEP, 2019).

Transnational non-state actors and authorities at national and regional levels have increasingly developed green bond standards. Market-led efforts towards standardisation and definition in the green bond market have borne fruit in the form of private standards. There are several private governance schemes for green bonds, such as the Green Bond Principles (GBP), developed by the International Capital Market Association (ICMA). GBP has been frequently referred to as a benchmark to meet the required level of transparency and integrity of disclosed information that will be reported by issuers to investors and multi-stakeholders, although both are only voluntary schemes developed by non-state actors. Following that, development of policy framework by public authorities has also made progress in building upon those private standards (OECD, 2015).

However, scholars of global environmental politics have not brought attention to the influence of those private green bond standards on the policy-making at public authorities. The research community has increasingly recognised the need for deeper and more comprehensive understanding on the engagement of private institutions in global environmental governance (Chan et al., 2015). In line with that, prior researches argued that it is increasingly important to study the institutional interplay of the public policies and private governance schemes (Cutler, 2009; Büthe, 2010; O'Neill, 2013; Hickmann, 2017). Still, the vertical interplay between private institutions and public authorities has not gained the scholarly attention although scholars realize its importance.

Similarly, sustainable finance governance through private governance scheme is under-researched literatures on global environmental politics. There has been research that reviews sustainable finance governance in the context of social responsibility (Richard, 2009, 2010, 2017). Thistlethwaite (2014) argued that investor-networks encourage financial institutions' sustainable investment through the "finance-led climate governance" that uses private institutions to generate political authority for sustainable financial practices. Ayling & Gunningham (2017) described that the climate finance movement forms part of the emerging transnational governance architecture that attempts to guide the mobilization of climate finance from private financial institutions and investors. However, most literatures also have yet to sufficiently explain how private governance schemes can contribute to guiding policy frameworks at public authorities.

With this background, this paper explains how private governance schemes, in particular private green bond standards, could have a guiding impact on public policy-making. The remainder of this paper will be structured as follows. First, it builds upon the climate change regime complex discussion to review the emergence of the institutional interplay and private governance schemes in global environmental politics. Based on the theoretical background, the institutional interplay for green bond standards will be reviewed at horizontal and vertical level. Following that, the paper analyzes that the outcome of the interplay forms the solid ground for the uptake of the private governance schemes on green bonds as a guiding standard for public policy-making.

2. Theoretical background and hypothesis

The following sections build upon regime complex discussion to review the arguments on institutional interplay and private governance. Based on the review, the paper formulates hypotheses on the influence of private green bond standards on policy-making at public authorities.

2.1. Regime complex

Regime theory had emerged as a response to analytical dysfunction of a state-centric approach in international political economy since late 1980s. Keohane (1989) defined regimes as institutions with explicit rules, agreed upon by governments, which pertains to particular sets of issues in international relations. Following that, it has been becoming increasingly evident that institutions are overlapping but coexist in a way to be loosely coupled to one another, sometimes conflicting and sometimes mutually reinforcing without a clear hierarchy. This situation is referred to as regime complex as scholars discussed since 2000s (Raustiala & Victor, 2004; Keohane & Victor, 2010). Although some scholars argued that it is difficult for governments to implement transnational policy frameworks in different regimes that are slightly or largely inconsistent with each other (Weiss, 1993; Hicks, 1999), regime complex discussion still identifies the benefits of its institutional multiplicity for trans-boundary governance (Abbott, 2012). The existence of multiple schemes makes it possible to fine-tune standards and programmes to particular situations and targets. In addition, loosely coupled regimes are more flexible than unitary regimes in responding to changes that influence[1] issues and actors unevenly.

Climate change is regarded as regime complex due to its fragmented governance structure as scholars of global environmental politics argues from late 2000s (Biermann, 2007; Biermann & Pattberg, 2008). States attempted to set up a comprehensive regulatory system for managing climate change with clear roles and demarcations for respective international institutions. However, these efforts eventually created what is called a "Cambrian Explosion" of climate regimes (Abbott, 2012). Fragmented climate regimes handle climate change issues in which organisations, rules, implementation mechanisms, financing arrangements and operating activities that are working for the climate change proliferate (Keohane & Victor, 2010; Abbott, 2012). In such a situation, managing climate change involves interplay of a range of actors, including multi-level institutions at transnational, national and local levels, whose goals are sometimes individual but often interdependent.

2.2. Institutional interplay

Even before the discussion of regime complex emerged, scholars of global environmental politics argued institutional interplay. Young argued institutional interplay as the situation where the operation of one set of institutional arrangements affects the results of another (Young, 1996; Young et al., 2008). Numerous conceptions of institutional interaction have been presented since then, from

[1] The concept of influence is used for assessing the consequences of the behavior of actors rather than the concept of power as influence stands for the bringing about of an effect by gradual process and an agency that affects, modifies or sways (See Biermann et al., 2009).

classification to causal mechanisms. Young (1996) proposed four classifications of institutional interaction. Those include: embeddedness, that is, relationship to overarching principles and practices; nestedness, which concerns interactions where specific arrangements are folded into broader institutional frameworks; clustering, the deliberate combination of several governance arrangements in institutional packages; and overlaps, which involve unintentional influences between different individual governance arrangements (Young, 1996; Stokke, 2001; Oberthür & Gehring, 2011). Moreover, "functional interplay" refers to situations where the operation of one regime influences the effectiveness of the other, whereas "political interplay" appears between actors involved in the regime who decide to treat both arrangements as part of a broader but normatively coherent complex (Young, 1999; Stokke, 2001). Furthermore, scholars make a distinction between horizontal and vertical interplay and between functional and political interplay (Young, 1998, 1999, 2002; Stokke, 2001; Vatn & Vedeld, 2012; Hickmann, 2017). While horizontal interplay takes place at one level of a social organisation, such as between functionally separated regimes, vertical interplay occurs between regimes located at different positions on the scale, from international to local levels of management (Young, 2002; Vatn & Vedeld, 2012).

With regard to the causal mechanism between institutions, Stokke (2001) introduced three concepts. Firstly, "ideational interaction" implies that substantive or operational rules of an institution can serve as models that influence another institution (Oberthür & Gehring, 2011). Secondly, "normative interaction" means that an institution can confirm or contradict the norms of another institution (Stokke, 2011). Thirdly, "utilitarian interaction" is a situation in which one institution can alter the costs and benefits of options available in other institutions (Oberthür & Gehring, 2011). The concept of institutional interplay will be applied in this paper to study the interaction between the public policies and private governance schemes.

2.3. Private governance scheme

On the other hand, scholars of international political economy extended the concept of regime to the activities of non-state actors such as non-governmental organizations (NGOs), business associations, and transnational corporations (Cutler et at., 1996; Cutler, 2009). The roles of non-state actors in the process of regime formation and policy implementation were increasingly acknowledged in global governance (Bulkeley, 2005). Private governance schemes increasingly constitute one of the pillars of global governance for sustainable development, together with public authorities (Dingwerth, 2008). The private sector is becoming engaged as a rule-maker in the global climate and energy governance through private regimes and public-private partnerships (Kollmuss et al., 2008; and Andrade & Puppim de Oliveira, 2015).

Private governance schemes can be catered by the private institutions, which refer to actors and institutions that are not exclusively public, including businesses, civil society, epistemic communities, investor groups or private rule-setting institutions; it also extends to hybrid arrangements set up by both private and public actors (Zelli et al., 2017). In practice, while private institutions implement their activities to achieve their goals, they occasionally have the authority to govern particular issue domains by setting international standards and other rules (Hall & Biersteker, 2002). Authority is a social relationship where the subject consents to the claim of authority. Private authority can be defined as situations in which non-state actors make rules or set standards that other actors in world politics adopt (Green, 2014). Private governance schemes can emerge as private authority when there

is a demand for benefits by states or non-state actors and, at the same time, a supply of existing private expertise (Green, 2014).

According to Green (2014), private authority can be two types. On the one hand, delegated private authority is referred to as a private institution that sets rules as per assignment by the public authority. The delegated private authority could arise through a transfer of public authority, whereas there is no such transfer for entrepreneurial private authority to set rules on the governance issues. On the other hand, entrepreneurial private authority is defined as a private institution that takes entrepreneurial initiative to set rules (Green, 2014; Green & Auld, 2017; Zelli et al., 2017). Entrepreneurial private authority arises by taking advantage of the rule setting room, where public authority defers its decision-making on the contested governance issue, and important actors choose to adopt the rules created by the entrepreneurial private authority. In other words, where governments are unable or unwilling to govern, entrepreneurial private actors have an opportunity to create rules to fill the void (Green & Auld, 2017). Transfers of authority to private institutions normally come from transnational organisations, since their governance deals with transnational rule-making.

2.4. Hypothesis

Building upon the arguments of institutional interplay and private governance scheme, this paper analyses whether prevalent private governance schemes can contribute to public authorities' policy-making. This question assumes two notions: that private governance schemes could be recognised as a result of institutional interplay, and that private governance scheme could guide the policy-making of public authorities.

First of all, what does "prevalent" private governance scheme mean? Zelli (2011) provides an important implication for this: a scheme is prevalent if its approach in a given governance area has been echoed or strengthened by third-party institutions. Green (2014) raises the same point, as a governance scheme could play an authoritative role when the third parties in a given governance area adopt the rule. Since governance schemes overlap in the climate change regime complex and interact with each other, a scheme supported by a wider array of institutions can be regarded as a prevalent governance scheme. The prevalent scheme would emerge through the process of horizontal interplay among overlapping schemes.

Secondly, transnational private governance schemes can influence policy-making of public authorities at different jurisdictional levels through vertical interplay. Governance roles are normally expected at public institutions, but private governance schemes are increasingly referred to in authoritative roles such as rule-setting. In particular, private governance schemes can become prevalent in the absence of a focal public institution that deals with the given governance area (Andonova et al., 2009; Green, 2014; Zelli et al., 2017). Private governance schemes can find space to fill gaps when there is no dominant institution to oversee the issue domain (Strange, 1996). The influence of private governance schemes can be certified by the uptake of major elements of the scheme in developing policy frameworks (Green, 2014). The transnational private institutions that create private governance schemes can also get involved in policy-making on the part of public authorities through engagement in consultation meetings, knowledge brokering and information sharing. The engagement to help development of standards is also proof that private governance schemes can influence policy frameworks shaped by public authorities.

A number of studies have contributed to the conceptual and empirical analyses on institutional interplay in global climate governance over the course of past decades. Most of these studies have been dedicated to examining the horizontal dimension of institutional interplay, but vertical interplay has not gained much scholarly attention thus far (Hickmann, 2017). Vertical interplay includes interactions such as multi-scale governance between governance schemes at national and transnational levels (Hickmann, 2017). This notion can be applied to the influence of transnational governance schemes on policy-making across multiple jurisdictional levels (O'Neill, 2013).

Based on the theoretical background explained above, a hypothesis on the relation between transnational private governance schemes and national policy-making is derived as follows.

Hypothesis (a): Institutional interplay between transnational private governance schemes can make a particular framework prevalent in a given governance area.

Hypothesis (b): Prevalent private governance scheme can influence policy making of public authorities.

The hypotheses will be examined through the analysis on private governance of green bond standards in the rest of this paper.

3. Materials and method

This paper uses empirical research from primary and secondary documents on green bond standards. With regard to primary sources, the author collected the official documents of private governance schemes for green bonds including Green Bond Principles (GBP), Climate Bond Standard (CBS) and others. These official documents are used to analyse the horizontal interplay among private green bond standards. Similarly, official documents of green bond standards and policy frameworks at national and regional authorities were also reviewed to examine the vertical interplay between private green bond standards and those standards and frameworks at authorities. In addition, existing papers on green bond standards are also studied as secondary sources, which are typically published by global environmental politics scholars. International organizations' analytical research on sustainable finance governance is also broadly referred to in this paper.

It is important to note that the paper's objective is not to evaluate the effectiveness of private and public green bond standards on improvement of sustainable finance. Rather, the paper's objective is to examine how the private green bond standards contribute to the creation of the standards and policy frameworks at the national and regional authorities from the perspective of global environmental politics.

With this in mind, the remainder of this paper reviews the private governance schemes on green bond, followed by the analysis on the green bond policy framework and standard at national and regional public authorities. Based on the analysis, horizontal and vertical interplay of green bond standards is discussed.

4. Transnational private governance on green bond standards

With the hypotheses as described above, this paper considers how and why voluntary self-regulation schemes influence public authorities' policy-making, examining the case of private governance schemes and national policy frameworks for green bonds. There has not been limited scholarly attention paid to the sustainable finance governance through private governance scheme as

mentioned at the beginning of this paper. However, it can be observed that non-state actors developed private green bond standards that can guide policy-making of national or regional green bond standards.

Green bonds[2] are among the first financial instruments that assist markets in achieving environmental sustainability with increased investment opportunities and improved risk management (IFC, 2018). Over the decades, an enabling environment for green bonds has also been developed, which includes policy guidelines, frameworks and market development. Non-state actors, such as the International Capital Markets Association (ICMA) and the Climate Bond Initiative (CBI), have developed international voluntary green bond standards. In a nutshell, those standards ensure compatibility in a way that meets the homogeneous requirement in major components of the standards, although there are some differences in minor components. In reality, there are countries that have developed green bond frameworks based on those voluntary standards, and an increasing number of countries are following, as discussed in the following sections.

In order to examine these dynamics, the next section focuses on the horizontal interplay between private green bond standards to see what are the prevalent elements of the private green bond standards, followed by the section that analyses how the private green bond standards influence the policy-making at public authorities.

4.1. Horizontal interplay in private governance green bond schemes

For investment in green bonds to take off, it is important that investors are able to make a distinction between green bonds versus non-green bonds. Green bonds should use proceeds for environmentally sustainable activities, have a process for determining project eligibility, manage the proceeds in a traceable fashion, and report annually on the use of proceeds (Ehlers & Packer, 2016).

There are several green bond frameworks that were developed by different transnational private institutions. Voluntary frameworks for green bonds were developed by transnational private institutions such as ICMA and CBI, followed by development of frameworks by public authorities. The commonality of those frameworks is that the use of funds and subsequent revenues must be linked to green investment.

First of all, the Green Bond Principles (GBP) was developed as a voluntary process guideline that were issued by the ICMA in 2014. The executive committee that governs GBP consists solely of investors, issuers and underwriters, and other stakeholders are positioned as observers. GBP puts

[2] Green bonds are especially valuable in countries where demand for sustainable infrastructure investment is high, but supply of long-term bank loans is limited (UNEP, 2019). In reality, green bond markets have been growing rapidly. Annual issuance of green bonds went over USD$100 billion in 2017, while gross green bond issuance had reached around USD 300 billion since its first appearance in 2007 (Reichelt & Keenan, 2017). Although issuers like the World Bank dominated the green bond market until 2012, an increasing number of corporates, energy and utility companies, and governments started to issue green bonds around the world in 2013 (Reichelt & Keenan, 2017). Moreover, large pension funds and sovereign wealth funds have begun to express strong interest in putting their resources in green bonds (Mathews & Kidney, 2014). There are a number of reasons green bonds are increasingly attracting investors (People's Bank of China [PBoC] & UNEP, 2015). Green bonds not only provide environmental and social value, but also present good investment returns: for example, they often offer tax exemption or other risk mitigation measures. Moreover, their relatively short maturity—around three to seven years with high liquidity—can activate active trading in secondary markets. Many green bonds are tax-exempt and thus present good investment returns.

together by major private financial institutions constitute the highest level of criteria (Ehlers & Packer, 2016). While specific targets of environmental projects and activities financed by green bonds are not illustrated in the principles, their primary purpose is to clarify the approach for issuance of a green bond and encourage the integrity of the green bond market (IFC, 2016). GBP requires the following four elements to label a bond as green (Pham, 2016). First, a green bond's proceeds need to be used for environmentally friendly capital expenditures, such as investment in low-carbon transition. A list of broad categories of green bonds is provided by GBP for checking eligibility. Second, green bonds' documentation must include specific criteria and processes for determining the eligibility of projects or investments. Third, a formal process that regulates the use of net proceeds must be disclosed in the supporting document. And fourth, issuers of green bonds should report at least annually on the specific investments made with the green bond proceeds and document the environmental impacts of those investments. It is suggested that the application of qualitative and quantitative indicators should be used in reporting the performance of green bonds. Moreover, it is recommended that issuers should use an external review to confirm the alignment of green bonds with GBP, and the alignment could be verified by certification, rating and consultant review (IFC, 2018).

Second of all, with regard to the CBI, the Climate Bond Standard (CBS) was developed as a labelling scheme for bonds. The CBS Board is composed of members from a broad array of investor and stakeholder groups (Park, 2018). Moreover, the CBI partnered with the Sustainable Banking Network Green Bond Working Group and the International Finance Corporation (IFC) to develop a map of existing guidelines and green bond frameworks in emerging markets in 2018. They have developed the tools to build the capacity of policymakers in developing countries. These include a self-assessment tool for planning capital market development and a capacity building needs assessment tool (CBI, 2018a). Those tools can be leveraged to strengthen the market environment of the green market based on improved policy frameworks in developing countries, which conform to the GBP as much as possible.

Interestingly, the frameworks are aligned substantially between the GBP and CBS, since CBS and its certification process are built upon the GBP (IFC, 2016, 2018; Rose, 2018). The fact that CBS integrated the GBP's four main elements reinforced the credibility of the standards. Alignment of green bonds with GBP has become the shared foundation for issuing green (IFC, 2018). GBP and CBS have eventually attracted a lot of issuers to use the standards. For issuers, voluntary compliance with those standards would result in gaining a positive brand reputation (Park, 2018)

Moreover, CBS elaborated sector-specific quantitative criteria for the definition of green that fall into eight broad categories, whereas GBP leaves the definition to issuers. CBS lends itself more readily to immediate applications, and provides clearer, sector-specific eligibility criteria (Ehlers & Packer, 2016). This is an effort by CBS to accelerate market development by providing a more certain process to issue green bonds, or climate bonds in the terminology of CBS (Rose, 2018). In addition, CBS requires third-party verification to award certificates, while GBP only recommends that a third party should verify issuers. Once the third party verifies the compliance of the bond to CBS, the certification will be awarded (IFC, 2016). Auditors enhance the credibility of issuers using CBI, as in general, third party verification makes the standard hard to meet (Chen et al., 2014; Green, 2014). In reality, the issuance of a CBI-certified green bond is positively associated with the effect on firm value, as well as profitability and environmental rating (Flammer, 2018). All in all, CBI helped green bond governance to become more prescriptive than GBP (Park, 2018). Furthermore, CBI has a more inclusive governance approach than the Executive Committee of GBP, since the CBS Board is

composed of a broader array of investors and stakeholder groups. CBS is drawing attention to the green bond market from a wider variety of stakeholders.

Moreover, Centre for International Climate and Environmental Research (CICERO) that is an interdisciplinary research institution for climate change and environment based in Oslo provides second opinions on green bond frameworks. It has completed 70 second opinions for green bond issuers including multinationals, corporate and municipalities worldwide by providing an independent quality check on the green bond issuance and project selection. It developed the Shades of Green methodology that provides an assessment on the degree of bond's adherence to a long-term vision: the assessment gives three different degrees including dark, medium and light green depending on the level of contribution to long-term low carbon and climate resilience (Ehlers & Packer, 2016). The assessment is applied to the project based on the project categories that covers both climate mitigation and adaptation such as energy generation, transport and flood security. As CICERO analyses that GBP's provision on the definition is not sufficiently detailed, it provides much deeper clarity on the definition of green to reveal the potential climate risks associated with the bond while regarding GBP as a loose and overall guidance (CICERO, 2016). In addition, it differs from CBS in a way that it provides tailored assessment for each project instead of applying the fixed criteria, which allows higher granularity on the analysis than CBS (Shishlov et al., 2018). In short, the Shades of Green provides an alternative way to assess and define green while accepting GBP as a global best practice.

Furthermore, credit rating agencies provide the assessment on the relative likelihood that bond proceeds will be invested to support environmentally friendly projects (Ehlers & Packer, 2016). In line with the four elements of GBP, Moody's Green Bond Assessment (GBA) uses further numerous quantifiable factors in its assessment to increase the transparency and replicability (Ehlers & Packer, 2016). As another example, S&P Global Ratings' Green Bond Evaluation Tool allows analysis on the environmental impact of bond projects, which can give views as an second opinion for the alignment of bonds with GBP (S&P, 2018).

Considering the alignment of GBP and other private standards as described above, it is observed that GBP operates as a base for green bond standards. On the one side, CBS and other standards and frameworks contain the elements that overlap with GBP, which eventually reinforces the credibility of each element. On the other side, building on GBP, they made efforts to make more specific guidance on green bond issuance than GBP. As H(a) supposes, institutional interaction, materialised as the aligned standards among standards and frameworks, is making GBP the prevalent regime for green bond standards through functional interplay, which could eventually reinforce the credibility of the overlapping elements of GBP and others.

Those voluntary green bond standards were crystallised as outputs of efforts made by transnational private institutions. Public authority did not solicit development of standards; rather, it was their voluntary efforts to govern financing for climate change. In this respect, their work is well aligned with the definition of entrepreneurial private authority. Rule setting as development of standards and certification schemes through non-state-market-driven governance are the most common entrepreneurial authorities (Cashore, 2012; Green, 2014).

4.2. Influence of private standards on policy-making at public authorities

Since green bonds can catalyse instrumental financing for climate change, national frameworks play an essential role in accelerating the development of green bond markets (IFC, 2018). A growing number of countries have been developing green bond markets and their own green bond standards and national frameworks. This is the case in developed countries as well as developing countries.[3] It is noticeable that those national and regional frameworks are aligned with the aforementioned green bond standards developed by non-state actors, as explored in the following.

4.2.1. Japanese green bond guideline

The Ministry of Environment Japan (MOEJ) issued the Green Bond Guideline 2017 in order to spur the issues of green bonds, and investments in them, for the long-term substantial reduction of greenhouse gas emissions in Japan. In addition to climate concern, the 2030 Agenda for Sustainable Development globally agreed on in 2015 has also increased expectations for the role of private investments in projects for the prevention of natural capital deterioration and other environmental purposes (MOEJ, 2017).

In order to formulate the guideline, expert meetings were organised from 2016. The Green Bond Review Committee met four times and ensured that the draft guideline was consistent with the "globally-accepted GBP" (MOEJ, 2017) and considered as a solution to prevent green wash bonds, which are labeled as green despite having exaggerated or no environmental benefits (OECD, 2017). Moreover, an opinion exchange meeting was held with the Review Committee members and European and American financial market participants well versed in the GBP to discuss the guidelines, followed by invitation of the public comments (MOEJ, 2017). Building upon those efforts, Japan's Green Bond Guideline was materialized in line with the four elements of GBP. For example, both GBP and the Japanese Guideline identify as types of green bonds project bond, revenue bond and securitized bond, and the same sectors of the use of proceeds, such as energy, buildings and climate adaptation. In addition, the Guideline explicitly mentions, "projects should fall under the business categories specified for the use of proceeds in the GBP or in the Guidelines" (MOEJ, 2017).

However, this does not imply the copy and paste of GBP to the Guideline, and rather the Guideline specifies further guidance building upon GBP. For instance, regarding the project evaluation for selection of projects, the Guideline recommends bond issuers to consider the potential environmental negative impacts. As another example, the Guideline suggests that green bond issuance in Japan should be in line with the existing environmental certification system that is widely applied in Japan, such as Leadership in Energy and Environmental Design (LEED), Comprehensive Assessment System for Built Environment Efficiency (CASBEE) and Building-Housing Energy-efficiency Labelling System (BELS). In addition to that, the Guideline illustrates plenty of business cases where green bonds can be used in order to encourage the Japanese stakeholders to apply the green bond building upon the guideline. Furthermore, the Guideline provides the recommendation on the reporting

[3] For example, in developed countries, the Tokyo Stock Exchange in Japan has launched a new platform for green and social bonds, whereas Barcelona issued green and social bonds with a €35 million notional in 2017 (Info Barcelona, 2017; CBI, 2018a). As for developing countries, the PBoC released guidelines for verifying green bonds jointly with the China Securities Regulatory Commission in China in 2017 (Whiley, 2018).

format, metrics and indicators that should be applied to the illustrated sectors of the use of proceeds, which have not been specified in GBP. To sum up, while the Japanese Guideline is deliberately aligned with GBP, it adds further elaboration to some aspects in order to tailor the green bond standard for the existing Japanese environmental practices and policies.

4.2.2. Chinese green bond policy framework

Having faced severe environmental pollution, China received a recommendation from transnational organisations to develop a green financial system and green bond market (PBoC & UNEP, 2015; CBI & IISD, 2015). Responding to that, Chinese authorities have strengthened support for the development of green bonds, and stock exchanges also strongly support the listed green bond market by streamlining approval procedures, launching green bond indices and cooperating with international exchanges in enhancing transparency and disclosure.

Back in 2015, China became the first emerging market to issue mandatory guidelines for green bonds. People's Bank of China, a Chinese central bank (PBoC), and the National Development and Reform Commission (NDRC) have published green bond guidelines respectively, with a list of qualifying green projects and proposals for policy incentives (IFC, 2018). However, the harmonisation of a green bond framework had not been reached, as there were multiple official guidelines in China, which were inconsistent with international voluntary standards, such as GBP and CBS (Stock Exchange of Hong Kong (HKEX), 2018). For example, China regarded construction and operations of clean coal-fired plants, such as the ultra supercritical generator unit, within the scope of the green bond projects, while is never the case in GBP and CBS (Green Finance Committee [GFS], 2015). In this regard, the use of proceeds was not consistent between China's green bond policy and international practices (Dai & Kidney, 2016). Moreover, the aforementioned two sets of Chinese guidelines regulated the issuance of green bonds in a complementary manner, but slight differences between the two schemes created confusion in the market.

The development of China's green bond guidelines relied on international experience, as Chinese regulators keep regular contacts with international self-regulatory organisations, market standards providers, market participants and other regulators, despite inconsistency in Chinese green bond guidelines among domestic and international frameworks. Even during the development of the green bond guidelines in 2015, ICMA's GBP and CBI's CBS were used as references (Wang & Zhang, 2017). As international investors prefer to invest in green bonds that are aligned with international standards, addressing the differences in definition is necessary to attract a number of investors. China's Green Finance Committee (GFC), which works under the PBoC, benefited from discussion with ICMA and CBI, and also strived to harmonise multiple Chinese green bond standards (Wang & Zhang, 2017).

Consequently, there has been improvement in Chinese green bond policies in recent years. PBoC and NDRC reached a consensus to work towards a common Green Bond Catalogue (CBI & China Central Depository and Clearing Company [CCDC], 2018). Moreover, internationally aligned green bond issues from China are increasing, while Chinese green bonds that are not in line with international definitions have decreased in 2018 (CBI & CCDC, 2019). Furthermore, the Green Bond Standard Committee established in December 2018 under the guidance of the PBoC, the China Securities Regulatory Commission (CSRC), and other regulators is China's first self-regulatory and coordination mechanism for green bonds, and is expected to play an important role in 2019,

especially in the harmonisation of green bond standards and market access of green bond verifiers (SynTao Green Finance, 2019). The regulation and transparency of green bonds have been developing in China in terms of both policies and actual issues.

4.2.3. EU green bond standard

In order to encourage the member states of the European Union (EU) to mobilise financing of sustainability, the European Commission (EC) drafted the Action Plan on Financing Sustainable Growth in 2018. Action 2 in the Plan describes that the EC will produce the framework for green financial products such as green bonds. The Technical Expert Group on Sustainable Finance (TEG) identified the EU Green Bond Standard (EU-GBS) as one of the key frameworks to be developed (EC, 2018). Following the Action Plan, the TEG proposed an EU Green Bond Standard outlining that the it will accelerate the issue of green bonds and support the link with other sustainable financial instruments. The Interim Report displayed the scope of the EU-GBS, explicitly illustrating that the EU-GBS builds on "market best practices" such as the GBP because it is important to create a standard that promotes market integrity (EC, 2019a, 2019b). Interestingly, the report also explained that the EU-GBS will be a voluntary framework that can be applied not only to green bond issuers in Europe, but to any type of issuers globally (EC, 2019a). This is because the TEG expects that the EU-GBS could be supported by issuers and investors, even if only voluntarily (EC, 2019b). In order to reduce the complexity for issuers so that they can easily track the procedure, EU-GBS simplifies management of the proceeds so that issuers need only track equivalent amounts to eligible green projects (Moody's, 2019).

Once issuers opt for the EU-GBS, the issuance must be verified by an EU-accredited external verifier. While EU-GBS is coherently aligned with and built on GBP, the TEG developed the concept of verification further. ICMA, with the GBP Executive Committee, does not provide standardised guidance on the specificities of external review procedures. However, the TEG suggests that the EU-GBS should have a standardised verification procedure by accredited verifiers in order to reduce information asymmetries, avoid green washing, and produce convenient financing conditions (Bachelet et al., 2019; EC, 2019b). The proposed requirements of the reporting are more specific than GBP and other market practices to meet the objective of EU's green policy (EC, 2019b).

In addition, the use of proceeds under the EU-GBS also ensures alignment with EU's green finance policies. The green bond projects are expected to build upon the categories of the EU Taxonomy regulation that identifies the assets and projects needed to deliver a low carbon economy and give GHG emissions screening criteria consistent with the 2-degree global warming target set by the COP 21 Paris Agreement (CBI 2019). This alignment will help mitigate reputational risk in this area and alleviate market concerns about greenwashing (EC, 2019b).

4.2.4. ASEAN green bond standard

The Association of Southeast Asian Nations (ASEAN) developed regional frameworks for green bonds, the ASEAN Green Bond Standards (ASEAN GBS), which are a set of voluntary guidelines based on a consensus of ten countries in the ASEAN Capital Markets Forum (ACMF) in 2017. ICMA was closely consulted during development of the ASEAN GBS since the ACMF regards the GBP as "internationally accepted and widely used" standard (ACMF, 2017). The goal of the ASEAN GBS is to facilitate and streamline national and cross-border issuances, and bonds aligned with the

standards have been already issued by Indonesia, Malaysia and Singapore (IFC, 2018). Unlike the EU GBS, the application of the standard is limited to the issuers or issuance of green bonds with geographical or economic connections to the region (CBI, 2018b). The standard clearly establishes that it was developed based on GBP, as they are internationally accepted and widely used for the development of national green bond guidelines or standards issued globally (ACMF, 2017).

The ASEAN GBS further specified additional features, building upon the GBP. It explicitly addresses that fossil fuel power generation projects are excluded from the use of proceeds as the ASEAN was concerned about the misunderstanding on green bond investors. It also recommends green bond issuers to have more frequent periodic reporting that can increase transparency on the additional use of proceeds. Moreover, it illustrates examples of qualitative and quantitative measures that can be used for reporting, while those examples less details than Japanese Guideline. Development of green bond standard in ASEAN is noticeable given the less mature financial market in the region. Those elaborations of the ASEAN GBS intended to assure the credibility of the green bond, which attract more investors with the enhanced transparency.

4.2.5. Other countries

Other emerging markets introduced national or regional frameworks on green bonds. Those markets include Brazil, India, Indonesia, Kenya, Malaysia, Mexico, Morocco, Peru, and South Africa. For example, green bonds sold in India are subject to the Security and Exchange Board of India (SEBI) regulations on the issuance and listing of debt securities. Green bonds in India are aligned with GBP as the Securities and Exchange Board of India (SEBI) released the Guidelines on Disclosure Requirements for Issuance and Listing Green Bonds, based on the GBP, in 2016 (SEBI, 2016). As another example, CBI supported the development of Kenya Green Bond Guidelines, together with the Kenyan Banker Association and Nairobi Security Exchange (NSE), to bring them in line with international best practices and standards, such as GBP and CBS (CBI, 2017; Park, 2018).

4.3. Discussion on vertical interplay

Private governance schemes such as GBP and CBS, especially the internationally-accepted elements discussed before, have been used as references by public authorities at national and regional levels to develop their own green bond standards and policy frameworks. Public authorities regard those private governance schemes as a useful reference for addressing transnational regulatory problems, as those schemes were designed by transnational private institutions in response to the needs of market participants.

However, private governance schemes may lack legitimacy (Park, 2018). These schemes could be vulnerable to criticism from the perspective of public transparency and civil society participation due to the lack of broad-based participation by non-corporate stakeholders. In this regard, the legitimacy of their rule-making process, and the rules themselves, need to ensure the expectation of stakeholders. The emergent public policy framework can address those challenges by referring to the private governance schemes. Incorporation of private governance schemes by reference is a strong institutional interaction, in the sense that it provides a new institutional framework for entrepreneurial authority (Green & Auld, 2017).

The question still remains why public authorities made an alignment with private governance schemes. While public authorities are responsible for the domestic implementation and enforcement of rules in their jurisdiction, private governance schemes target those actors responsible for economic activities. On the one hand, private governance schemes target the voluntary behavioural change of non-state actors in most cases, since they do not have the authority to force change on those actors, unlike regulations made by public authorities. On the other hand, since private governance schemes are less legalised than regulations, they have the flexibility to adapt to the needs of the targets. Transnational voluntary green bond standards, such as GBP and CBI, can be explained by those characteristics. The adoption of the standards is up to the issuers of green bonds. In addition, the standards were updated over a period of years.

What does this imply for interactions between transnational private governance schemes and public regulations? Private governance schemes can serve as an idea incubator, as they can function as an arena of experimentation and learning to an extent which public regulators cannot attempt (Green & Auld, 2017). From this angle, private governance schemes are viewed as alternative conceptualisations of rules proposed by transnational non-state actors. Since policy frameworks regarding green bonds have implications for economic activities, public authorities could hesitate to regulate and also lack the expertise to do so. Building on their expertise, private institutions can bridge this governance gap in a way to propose a set of voluntary rules as a solution to the challenge of financing for climate change (Büthe, 2010).

Once the public authorities observe a wide uptake of voluntary standards, they would become confident enough to regulate a given issue by building on those standards, as public regulation can ensure behavioural change in non-state actors. It can be expected that a wide range of actors will support a new public regulation, since it is aligned with an existing private governance scheme that actors already accept. In other words, a private governance scheme can support public authorities by creating avenues for regulation. By so doing, green bond standards formulated by private institutions raise momentum for public authorities to create a policy framework for green bonds. As illustrated in the cases above, some authorities are already working to harmonise standards that are aligned with private governance schemes, including GBP and CBS.

In addition, given that green bonds are a financial instrument linked to the global capital market, authorities have no choice but to take the widely-accepted standards into consideration for policy-making. International harmonisation of green bond standards is an issue to give coherent understanding to investors to attract them. Otherwise, local green bond markets would lose investors' confidence in green bond investments, which would lead to a failure to mobilise climate finance through green bonds (IFC, 2018). Domestic guidelines that are not consistent with international guidelines run the risk of limiting the value of any particular green certification scheme to the domestic investor base alone (Ehlers & Packer, 2016). This is well illustrated in the shift of the Chinese green bond standard. Although the taxonomy of Chinese green bond standards was not coherent with GBP and CBS at first, the European Investment Bank and China's Green Finance Committee published a white paper in 2018 that identifies differences between the European and Chinese green bond standards in order to work on harmonisation of the Chinese standard in the future (Bachelet et al., 2019). Since the maturing Chinese national green bond market is expanding the cross-border issuance and investment, China has recognised the importance of integrating its standard to the international

standard.[4] As this case illustrates, it is essential to harmonise green bond standards across jurisdiction to ensure the integrity of domestic and international capital markets.

All in all, vertical interplay can be seen in the process in which policy development by public authorities is built upon existing private governance schemes created by transnational private institutions. GBP developed by ICMA have served as a model regulation for policy makers, as public authorities regard them as market best practice, as discussed above. Through this ideational interaction, substantive criteria of green bonds and operational rules are reflected in the policy development of green bonds by authorities. A functional linkage between them reinforces the implementation of respective standards. On the one hand, the credibility of GBP will be strengthened as Hickmann (2017) suggests: private governance schemes could attract more users by making it clear that those voluntary private standards are linked with standards and policy frameworks created by public authorities. On the other hand, issuance of green bonds that respect a national policy framework aligned with GBP can attract investors beyond national jurisdiction, as the green bonds are aligned with market best practice, as argued in H(b).

It is also noticeable that countries and regions are likely to reflect their policy and regulatory context when incorporating GBP to their own standards. In other words, there is national and regional difference of the influence from the private governance schemes (Ren et al., 2018). As described above, the Guideline of Japan encourages the alignment of green bond issuance with the existing environmental certification system that is widely applied in Japan. As another example, ASEAN GBS suggests more frequent reporting with qualified data in order to attract investors, which is a key challenge for the region. Countries and regions adapt the GBP to their circumstances. Since the national and regional green bond standards evolve over years, the standards will be adapted further in accordance with the particular context of the jurisdiction. This can be examined in the future research.

5. Conclusion

The argument in this paper supports the proposed hypothesis that internationally-accepted private governance schemes could be in a position to influence policy-making by public authorities. The horizontal interplay between private governance frameworks for green bonds reinforces the credibility of private standards and attracts users increasingly. Building upon the GBP, CBS was developed in line with GBP, while including functional additions such as sector-specific standard criteria, stricter verification systems, and a more inclusive approach. Major alignment between those standards contributed to gaining the application from broad stakeholders. Reflecting this, public authorities at national and regional levels take advantage of those private governance schemes when developing their own standards and policy frameworks to ensure the market integrity of green bonds. Private schemes served as a model regulation, since public authorities regard them as market best practice.

A number of standards and policy frameworks have been and will be continuously developed in different countries. The private governance schemes have been playing an essential role in developing solid policies that ensure a coherent global approach. This is interesting, as private

[4] Remark by Ma Jun, Chairman of GFC and Member of the PBoC Monetary Policy Committee, on 6 December 2018 at the United Nations Climate Change Conference (COP24) in Katowice, Poland. Available from: https://www.eib.org/en/press/all/2018-327-towards-a-common-language-in-green-finance-progress-is-made-at-cop24-in-katowice.

governance schemes as a model standard have greatly affected the development and the effectiveness of policies by public authorities, even though many actors, including private and public institutions, are involved in green bonds (Oberthür & Gehring, 2006; Kent, 2014). Since international institutions rarely stand alone in climate governance (Orsini et al., 2013), effective institutional interactions could serve as a solution to governance challenges. In green bond governance, private governance schemes play a significant role in the alignment of policies to eventually attract investors to the green bond market. The expertise and flexibility of private institutions effectively functions to develop coherent green bond standards globally through the creation of private governance schemes and the help of public authorities' policy development.

The argument in this paper has implications for how to leverage private governance green bond schemes for exploring not only climate finance flow, but also finance flow for Sustainable Development Goals. Further study of contribution to private governance schemes could be important in bringing accelerated implementation of activities against sustainability challenges.

Conflict of interest

The author declares no conflicts of interest in this paper

References

Abbott KW (2012) The transnational regime complex for climate change. *Environ Planning C Gov Policy* 30: 571–590.

ACMF (2017) ASEAN Green Bond Standards. Available from: http://www.theacmf.org/ACMF/upload/GREENBONDACMF.pdf.

Andrade J, Puppim de Oliveira JA (2015) The Role of the Private Sector in Global Climate and Energy Governance. *J Bus Ethics* 130: 375–387.

Andonova LB, Betsill MM, Bulkeley H (2009) Transnational Climate Governance. *Global Environ Politics* 9: 52–73.

Ayling J, Gunningham N (2017) Non-state Governance and Climate Policy: The Fossil Fuel Divestment Movement. *Climate Policy* 17: 131–149.

Bachelet JM, Becchetti L, Stefano M (2019) The Green Bonds Premium Puzzle: The Role of Issuer Characteristics and Third-Party Verification. *Sustainability* 11: 1–22.

Bernstein S, Cashore B (2007) Can non-state global governance be legitimate? An analytical framework. *Regul Gov* 1: 347–371.

Biermann F (2007) 'Earth system governance' as a crosscutting theme of global change research. *Global Environ Change* 17: 326–337.

Biermann F, Pattberg P (2008) Global Environmental Governance: Taking Stock, Moving Forward. *Annu Rev Env Resour* 33: 277–294.

Biermann F, Pattberg P, van Asselt H, et al. (2009) The fragmentation of global governance architectures: a framework for analysis. *Global Environ Politics* 9: 14–40.

Bulkeley H (2005) Reconfiguring environmental governance : towards a politics of scales and networks. *Political Geogr* 24: 875–902.

Büthe T (2010a) Private Regulation in the Global Economy: A (P)Review. *Bus Politics* 12: 1–38.

Cashore B (2002) Legitimacy and the Privatization of Environmental Governance: How Non–State Market–Driven (NSMD) Governance Systems Gain Rule–Making Authority. *Governance* 15: 508–529.

CBI (2018a) Green Bonds Policy: Highlights from 2017. Available from: https://www.climatebonds.net/files/ reports/cbi-policyroundup_2017 _final_3.pdf.

CBI (2018b) ASEAN Green Finance State of the Market. Available from: https://www.climatebonds.net/resources/reports/asean-green-finance-state-market-2018.

CBI & CCDC (2018) China Green Bond Market 2017. Available from: https://www.climatebonds.net/files/files/China_Annual_Report_2017_English.pdf.

CBI (2019) Climate Bonds Taxonomy. Available from: https://www.climatebonds.net/files/files/CBI_Taxonomy_Tables-Oct19_Final.pdf.

CBI & CCDC (2019) China Green Bond Market 2018. Available from: https://www.climatebonds.net/resources/reports/china-green-bond-market-2018.

CBI & IISD (2015) Growing a green bonds market in China: Key recommendations for policymakers in the context of China's changing financial landscape. Available from: https://www.climatebonds.net/files/files/Growing%20a%20green%20bonds%20market%20in%20China.pdf.

Chan S, van Asselt H, Hale T, et al. (2015) Reinvigorating international climate policy: a comprehensive framework for effective nonstate action. *Global Policy* 6: 466–473.

Chen CJ, Srinidhi B, Su X (2014) Effect of auditing: Evidence from variability of stock returns and trading volume. *China J Accounting Res* 7: 223–245.

CICERO (2016) Framework for CICERO's 'Second Opinions' on green bond investments. Available from: https://cicero.oslo.no/en/posts/single/CICERO-second-opinions.

Cutler CA, Haufler V, Porter T (1999) *Private Authority and International Affairs*, Albany: SUNY Press.

Cutler CA (2009) *Private international regimes and interfirm cooperation. The Emergence of Private Authority in Global Governance*, Cambridge: Cambridge University Press, 23–40.

Dai W, Kidney S (2016) Climate Bonds Initiative International Institute for Sustainable Development. Aavailable from: https://www.climatebonds.net/resources/Roadmap-for-China/April/2016/Paper1.

Dingwerth K (2008) Private transnational governance and the developing world: A comparative perspective. *Int Stud Q* 52: 607–634.

EC (2018) Action Plan: Financing Sustainable Growth. Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0097&from=EN.

EC (2019a) Report of the Technical Expert Group (TEG) subgroup on Green Bond Standard Proposal for an EU Green Bond Standard: Interim Report. Available from: https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/190306-sustainable-finance-teg-interim-report-green-bond-standard_en_0.pdf.

EC (2019b) Report on EU Green Bond Standard. Available from: https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/190618-sustainable-finance-teg-report-green-bond-standard_en.pdf.

Flammer C (2018) Corporate Green Bonds. Available from: https://doi.org/10.2139/ssrn.3125518.

Gehring T, Oberthür S (2011) *Institutional Interaction: Ten Years of Scholarly Development. Managing Institutional Complexity*, Cambridge: MIT Press, 25–58.

GFS (2015) Preparation Instructions on Green Bond Endorsed Project Catalogue. Available from: https://www.bourse.lu/documents/brochure-GB_endorsed_project_catalogue_2015.pdf.

Green JF (2014) *Rethinking private authority: agents and entrepreneurs in global environmental governance*, Princeton, New Jersey: Princeton University Press.

Green JF, Auld G (2017) Unbundling the regime complex: the effects of private authority. *Transnational Environ Law* 6: 1–28.

Ehlers T, Packer F (2017) Green Bond Finance and Certification. BIS Quarterly Review September 2017. Available from: https://ssrn.com/abstract=3042378.

Hall RB, Biersteker TJ (2002) *The emergence of private authority in the international system. The Emergence of Private Authority in Global Governance*, Cambridge: Cambridge University Press, 3–22. Available from: https://doi.org/10.1017/CBO9780511491238.

Hickmann T (2017) The Reconfiguration of Authority in Global Climate Governance. *Int Stud Rev* 19: 430–451.

Hicks BL (1999) Treaty Congestion in International Environmental Law: The Need for Greater International Coordination. *Unive Richmond Law Rev* 32: 1643–41674.

HKEX (2018) The green bond trend: Global, Mainland China and Hong Kong. Available from: https://www.hkex.com.hk/-/media/HKEX-Market/News/Research-Reports/HKEx-Research-Papers/2018/CCEO_GreenBonds_201812_e.pdf?la=en.

IFC (2016) Mobilizing Private Climate Finance-Green Bonds and Beyond. Available from: https://openknowledge.worldbank.org/bitstream/handle/10986/30351/110881-BRI-EMCompass-Note-25-Green-Bonds-FINAL-12-5-PUBLIC.pdf?sequence=1&isAllowed=y.

IFC (2018) Creating Green Bond Markets—Insights, Innovations, and Tools from Emerging Markets. Available from: https://www.ifc.org/wps/wcm/connect/55e5e479-b2a8-41a6-9931 -93306369b529 /SBN+Creating+Green+Bond+Markets+Report+2018.pdf?MOD=AJPERES.

Info Barcelona (2017) First issue of green and social bonds for municipal funding. Available from: https://www.barcelona.cat/infobarcelona/en/first-issue-of-green-and-social-bonds-for-municipal-funding_595425.html.

Kent A (2014) Implementing the principle of policy integration: institutional interplay and the role of international organizations. *Int Environ Agreements* 14: 203–224.

Keohane RO (1989) "Neoliberal Institutionalism: A Perspective on World Politics," In Keohane, R., O. *International Institutions and State Power: Essays in International Relations Theory*, Boulder CO: Westview Press.

Keohane RO, Victor DG (2010) The Regime Complex for Climate Change. Discussion Paper 2010-33, Cambridge, Mass.: Harvard Project on International Climate Agreements, January 2010. Available from: https://www.belfercenter.org/sites/default/files/legacy/files/Keohane_Victor_Final_2.pdf.

Kollmuss A, Zink H, Polycap C (2008) Making sense of the voluntary carbon market: A comparison of carbon offset standards. Available from: https://mediamanager.sei.org/documents/Publications /SEI-Report-WWF-ComparisonCarbonOffset-08.pdf.

Mathews JA, Kidney S (2014) Climate bonds: mobilizing private financing for carbon management. *Carbon Manage* 1: 9–13.

Moody's (2019) Corporate issuers drive strong global green bond volume in Q1 2019. Available from: https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/Public-research-resources /Corporate-issuers-drive-strong-global-green-bond-volume-in-Q1-2019-220719.pdf.

Oberthür S, Gehring T (2006) *Institutional interaction in global environmental governance*, Cambridge MA: MIT Press.

OECD (2015) *Green Bonds Mobilising the debt capital markets for a low-carbon transition*, Paris: OECD Publishing.

OECD (2017) *Mobilising Bond Markets for a Low-Carbon Transition, Green Finance and Investment*, Paris: OECD Publishing.

O'Neill K (2013) Vertical Linkages and Scale. *Int Stud Rev* 15: 571–573.

Orsini A, Morin JF, Young OR (2013) Regime Complexes: A Buzz, a Boom, or a Boost for Global Governance? *Global Gov* 19: 27–39.

Park SK (2018) Investors as regulators: Green bonds and the governance challenges of the sustainable finance evolution. *Stanford J Int Law* 54: 1–47.

Paula C, Carola B (2016) Climate Finance after the Paris Agreement: new directions or more of the same? Available from: https://doi.org/10.5167/uzh-137944.

PBoC & UNEP (2015) Establishing China's Green Financial System. Available from: https://www.cbd.int/financial/privatesector/china-Green%20Task%20Force%20Report.pdf.

Pham L (2016) Is it risky to go green? A volatility analysis of the green bond market. *J Sust Financ Investment* 6: 263–291.

Raustiala K, Victor DG (2004) The Regime Complex for Plant Genetic Resources. *Int Organ* 58: 277–309.

Reichelt H, Keenan C (2017) The Green Bond Market: 10 years later and looking ahead. Available from: http://pubdocs.worldbank.org/en/554231525378003380/publicationpensionfundservicegreenbonds201712-rev.pdf.

Ren S, Li X, Yuan B, et al. (2018) The effects of three types of environmental regulation on eco-efficiency: A cross-region analysis in China. *J Clean Prod* 173: 245–255.

Richardson BJ (2009) Climate Finance and Its Governance: Moving to a Low Carbon Economy Through Socially Responsible Financing? *Int Comp Law Q* 58: 597–626.

Richardson BJ (2010) Reforming Climate Finance Through Investment Codes of Conduct. *Wisconsin Int Law J* 27: 483–515.

Richardson BJ (2017) Divesting from Climate Change: The Road to Influence. *Law Policy* 39: 325–348.

Rose P (2018) Certifying the "Climate" in Climate Bonds. Legal Studies Working Paper Series No. 458. Available from: https://ssrn.com/abstract=3243867.

S&P (2018) Frequently Asked Questions: Green Evaluations And Transaction Alignment With The Green Bond Principles 2018. Available from: https://www.spratings.com/documents/20184/4756601/Green+Evaluations+And+Transaction+Alignment+With+The+Green+Bond+Principles+2018%2C+July+24+2018.pdf/8295714b-4eab-4c35-86e4-835ccf738902.

SEBI (2016) Disclosure Requirements for Issuance and Listing Green Bonds. Available from: https://www.sebi.gov.in/sebi_data/meetingfiles/1453349548574-a.pdf.

Shishlov I, Nicol M, Cochran I (2018) Environmental integrity of green bonds: stakes, status and next steps. Available from: https://www.i4ce.org/download/environmental-integrity-of-green-bonds/.

Stokke OS (2001) The Interplay of International Regimes: Putting Effectiveness Theory to Work. Available from: https://www.files.ethz.ch/isn/100208/01-14-oss.pdf.

Strange S (1996) *The Retreat of the State*, Cambridge: Cambridge University Press.

SynTao Green Finance (2019) Top Ten Responsible Investment Trends in China in 2019. Available from: http://www.syntaogf.com/Menu_Page_EN.asp?ID=21&Page_ID=292.

Thistlethwaite T (2014) Private governance and sustainable finance. *J Sustainable Financ Investment* 4: 61–75.

UNEP (2019) Sustainable Finance Progress Report. Available from: http://unepinquiry.org/wp-content/uploads/2019/03/Sustainable_Finance_Progress_Report_2018.pdf

Vatn A, Vedeld P (2012) Fit, interplay, and scale: a diagnosis. Ecology and Society 17:12. Available from: http:// dx.doi.org/10.5751/ES-05022-170412.

Wang Y, Zang R (2017) China's green bond market. International Capital Market Features, 44: 16–17.

Weiss EB (1993) International Environmental Law: Contemporary Issues and the Emergence of a New World Order. *Georgetown Law J* 675: 675–710.

Whiley A (2018) Chinese regulators introduce supervisory scheme for green bond verifiers - Further step in building market frameworks. Available from: https://www.climatebonds.net/2018/01/chinese-regulators-introduce-supervisoryscheme-green-bond-verifiers-further-step-building.

World Bank (2015) Innovative Finance for Development Solutions. Available from: http:// siteresources.worldbank.org/CFPEXT/Resources/IF-for-Development-Solutions.pdf.

Young OR (1996) Institutional Linkages in International Society: Polar Perspectives. *Global Gov* 2: 1–24.

Young OR (1999) *Governance in World Affairs*, Ithaka, NY: Cornell University Press.

Young OR (2002) *The Institutional Dimensions of Environmental Change: Fit, Interplay, and Scale*, Cambridge MA: MIT Press.

Young OR, King LA, Schroeder H (2008) *Institutions and environmental change: principal findings, applications, and research frontiers*, Cambridge, MA: MIT Press.

Zelli F (2011) Regime Conflicts and Their Management in Global Environmental Governance, *Managing Institutional Complexity: Regime Interplay and Global Environmental Change*, Cambridge MA:MIT Press. 197–226.

Zelli F, Moller I, van Asselt H (2017) Institutional complexity and private authority in global climate governance: the case of climate engineering, REDD+ and short-lived climate pollutants. *Environ Politics* 26: 669–693.

AIMS Press