

From Brand to Green: The Moderating Role of ESG Strategic Focus

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Abstract

This paper explores the interactive impact of brand reputation (BR) and corporate social responsibility (CSR) on a firm's success in raising capital via green bonds. We argue that BR alone may not be enough to help firms issue green bonds and that firms would need a specific CSR framework (e.g., ESG - Environmental, Social, and Governance) to leverage the full potential of their BR in this regard. Using an international sample of green bond issues, we find that BR has no significant direct impact but ESG and its interaction with BR (BR*ESG) have significant positive effects on the issuance of green bonds, while controlling for a wide range of variables, including fixed effects of industry, region and time. We also find that only the S (Social) component of ESG and the interactions of its E (Environmental) and G (Governance) components with BR influence green bond issuance. We discuss the conceptual contribution and managerial implications of these results along with some limitations of our research and useful directions for future research.

Keywords: CSR, green finance, ESG, Brand

1. Introduction

The market for green bonds was born in March 2007, the European Union's Energy Action Plan set ambitious targets in the areas of renewable energy and energy efficiency, urging the European Investment Bank (EIB) to engage in these areas.¹ EIB chose to emphasize its commitment via a climate-related capital market product, fostering public awareness and reaching new investors by issuing the world's first green bond – a 600 million Euro-dollar transaction initially labelled as a 'Climate Awareness Bond' – in June 2007.² The first corporate green bond was issued by the energy company EDF in November 2013. This was an important turning point in the market, as it arguably signifies the point at which private and profit-oriented companies had confidence that green bonds offered a cost-effective financing strategy. Apple is among the most eponymous of the corporate green bond issuances, having issued 2 large bonds, each with a face value of US\$1.5 billion. Their issuances highlighted the potential for firms to exploit green bonds to essentially re-brand ongoing projects by offering them an even greener 'tag'. For example, from Sustainalytics official first opinion the Apple's 2016 green bond,³ we can learn that Apple's green bond framework enables "Proceeds of the green bond [to] be allocated to new and ongoing renewable energy projects". Thus, there is potential for re-packaging and re-financing of a number of existing energy-efficiency projects.

Academic work touching on the market for green bonds is in its infancy, which is no surprise given that the market itself is little more than a decade old. The contributions which

¹ A summary of the early history of green bonds can be found at <https://www.climatebonds.net/market/history> and <https://www.environmental-finance.com/content/the-green-bond-hub/green-bond-reporting.html>.

² Climate bonds are now being considered a general class of environmentally focused bonds, with green bonds being a subset of climate bonds. Other climate bonds include for example water bonds. For more information please refer to the Climate Bonds Initiative website at <https://www.climatebonds.net/>.

³ See http://www.sustainalytics.com/sites/default/files/apple_green_bond_framework_and_opinion_-_16-02-2016.pdf.

have been offered so far have mostly focused on facets of financial performance. For instance, Choi, Gao, and Jiang (2018) show that people revise their beliefs upwards about climate change when experiencing warmer than usual temperatures. Baker, Bergstresser, Serafeim and Wurgler (2018) suggest that green bonds earn yields and are held by a smaller group of investors. These pricing and ownership effects are stronger for green bonds that are externally certified. Recently, an ESG (Environmental, Social, and Governance) approach to examine sustainability effect on financial performance is employed (Tang, Hull, and Rothenberg, 2012).

Some studies focus on the finance signals of emerging maturity in the overall market. For instance, Pham (2016) and Reboredo (2018) explore the co-movement between green bond market index benchmarks against regular bond markets and wider financial markets respectively. These studies document stabilizing relations, a precursor of sorts to a notion of stability in the market for green bonds. Building on these studies, Broadstock and Cheng (2019) develop evidence to show that the market for green bonds is also sensitive to various macroeconomic conditions, as well as underlying sentiment on the market for green bonds itself.

The above literature shows green bonds as a viable and potentially beneficial financing mechanisms. Moreover, if one opts to consider social returns, such as the benefits towards achieving sustainable development goals as discussed in Tolliver et al. (2019), then there are both intuitive and empirical benchmarks making the case for corporate exploitation of green bonds to underpin the capital structure and CSR performance concurrently. Yet there remains a significant lack of inquiry, and resulting understanding, as to how firm level characteristics connect with, or determine, the decision to issue a green bond. A particularly meaningful gap which the literature has so far remained silent on is the incremental role of brand image in terms of its direct and indirect effect on decision to raise capital using green bonds.

We address the above research gaps and make two key contributions in this paper. First, we argue that brand reputation (BR) alone is not sufficient to help firms to achieve CSR performance in terms of green bond issuance. Second, we posit that the process of CSR strategy in the form of ESG (Environmental, Social, and Governance) is a better predictor of the ability of the firms to issue green bonds. In this study, we hypothesize that ESG would actually positively moderate (enhance) the positive impact of BR on green bond issuance. We test all these hypotheses using an international sample of green bond issues to examine the direct and interactive effects of BR and ESG. Our findings confirm that brand reputation has no significant direct impact on the issuance of green bonds and only ESG and its interaction with BR (BR*ESG) have positive effects on green bonds issuance. We discuss the conceptual contribution and managerial implications of these findings along with some limitations of our study and useful directions for future research.

2. Theoretical background and hypotheses development

We combine several streams of literature as the theoretical background for our study in this section. We begin with a brief review of the literature on the topic of green financing, green bonds and the related issue of greenwashing by corporates. Next, we review the literature on corporate social responsibility and the motivations and efforts taken by firms to promote transparency in their governance structures, detail social engagement activities and disclose the environmental impacts of their business operations. Finally, we review the literature on the development of brand reputation and its impact on various aspects of firm performance. We also link these three literatures to develop our conceptual model and specific hypotheses about the direct and interactive effects of BR and ESG on green brand issuance.

2.1 Brand reputation (BR)

Brand reputation is defined by Stern (2006) as a consumer-controlled metaphor that is distinct from brand identity, brand personality or brand image. Brand identity and personality are internally controllable to the extent that the marketing function of a firm creates these and controls their deployment through various advertising channels. Brand image on the other hand starts to incorporate consumer reactions to brand, but largely through general awareness of a brand, and the ability of a consumer to connect a brand logo ('physical mark on goods or services') with a company. Brand reputation is distinct from these in that reputation embeds an additional and more complex cognitive process, through which the consumer attaches positive or negative attributes to a brand. Empirical work on brand reputation has uncovered a number of determinants of brand reputation, offering additional insights on the complexity of branding. For example an early study from Selnes (1993) uncovers an influence of product performance to brand reputation and reaffirms its important role in shaping brand satisfaction and sustaining positive brand loyalty. Veloutsou and Moutinho (2009) suggest that brand reputation can be obtained through the process of 'brand tribalism' in which a company essentially inherits brand reputation from some form of brand relationship or brand connectedness across firms – although brand tribalism and brand communities are better predictors of brand connectedness than they are of brand reputation. Cabral (2000) posits a link from initial product quality to the exploitation ('stretching') of brand reputation.

Regarding the outcomes of brand reputation, existing research has highlighted several findings. Salient to the present study, Skard and Thorbjornsen (2014, abstract) argue that *"...source effects in the communication of social sponsorships are contingent on the brand's pre-existing reputation [and] that the congruence between the credibility and trustworthiness of the message source and the brand helps predict consumer responses to a social sponsorship..."*, and subsequently that existing brand reputation may have a role to play in mediating the style and value of CSR communication activity. Sengupta et al. (2015)

highlight that brand reputation provides a moderating mechanism in coping with service failures. Corkindale and Belder (2009) question the influence of brand reputation to the process of product innovation, and stress the importance of the emotive component of brand reputation in influencing firms' decisions to adopt/support service innovations.

A seminal contribution in understanding the forces exerted from brand reputation to firm performance is Shapiro (1982). Shapiro argued that “[reputation is] an important force that prevents deterioration of the quality [of the goods] supplied by sellers...”. The argument is that reputation is viewed by consumers as a signal over the expected level of quality—especially in the case when product quality is unobservable (Rao et al., 1999) where brand reputation can be used to ‘convey unobservable quality credibility’—and that any misalignment between the signal and the outcome can be damaging to firm performance. By virtue, firms have an incentive to both develop and maintain their reputation.

While brand can clearly play a role in the successes of an established company, it also has an incremental role to play for companies transitioning from private to public entities. Bahadir et al. (2015) explore the role of the marketing function in IPO success and reducing the risk of price shortfall. Their arguments build on the same logic that a brand conveys value that is intangible and immeasurable from the physical product characteristics, but further that stakeholders in an IPO context may factor in a variety of intrinsic and extrinsic cues, leaving open the possibility for brand to be an important pre-IPO characteristic.

Connecting brand issues with CSR activity/performance, broadly speaking there is a lack of literature exploring the influences of brand to CSR activity. Some noteworthy recent contributions include Turkel et al. (2015), who builds on the work of Skard and Thorbjørnsen (2014) to explore the influence of brand familiarity to consumer responses to CSR communications. Their findings suggest that brand familiarity does not alter the attitude

towards CSR related messages, but does play a moderating role in consumer responses to CSR communication via the changes to their purchase activity (intention). Ettinger et al. (2017) refer to the concept of 'Integrated CSR Advertising', discussing how the notion has received disproportionately little attention given the volume of wider literature on CSR. If one takes the view that advertising is one way to communicate CSR performance, and that brand signals strength in advertising ability, then one might posit an argument that brand reputation precedes successful CSR communication and consumer responses in turn.

2.2 CSR and ESG in financial investments

CSR (Corporate social responsibility) is a general framework for businesses to promote sustainability and sustainable investments are an important channel for a firm to pursue CSR excellence. In this regard, SRI (Socially Responsible Investment) framework has been the main approach to achieve corporate social responsibility (CSR) objectives in the fields of financial investments for over ninety years (p.1, Fung et al., 2010). However, ESG (Environmental, Social, and Governance) framework has become more prominent since UN PRI (Principles for Responsible Investment) was launched in 2006. SRI and ESG frameworks are different from each other along three main dimensions.

First, the investment focus of SRI and ESG is vastly different from each other. For example, while SRI is driven by ethical principles such as religious, cultural and organization value, ESG is return-focus and based on ESG criteria to incorporate long-term sustainability factors to identify firms with higher investment potential. Second, SRI employs negative investment screens by removing investment choices that do not meet the designated SRI values (e.g. removing tobacco firms); while ESG uses positive screens by assigning scores to ESG factors to guide investment choices (instead of exclusion) to prioritize investment opportunities. Finally, SRI is based on broad principles and has no definite selection criteria;

hence, SRI screens vary among investors and may be organization- specific (e.g., health screen removes tobacco firms; religious screen removes alcohol and gambling stocks). Thus, SRI-based investment screens are somewhat subjective. In contrast, ESG must follow the boundary of E, S and G factors, wherein each of these can be considered objectively as positive screens. Thus, although the investment priorities are universal and clear, the individual emphasis of E, S, and G factors may vary among different investors.

The financial evolution from SRI to ESG can better serve a firm with more concrete roadmap and measures to achieve sustainable investments. In short, this study would employ ESG measures to proxy top management's CSR efforts. It is because ESG activities are financial costly and require firm-wide participation. Thus, ESG efforts can be initiated and implemented only with the blessings of the top management and the board. We also argue that CSR initiatives from top management drive ESG activities by recognizing that, to a certain extent, social returns can be used to substitute financial returns as social returns generate corporate utility and firms are willing to pay for it by sacrificing financial returns. Even from a pure financial performance perspective, firms appear to spend corporate resources on ESG but only generate lower financial returns. However, top management may view the utility of the combined social returns and financial returns as equal to or higher than the utility generated solely by financial returns.

In this context, traditional financial theory asserts that a firm's goal is to maximize shareholders' wealth but we argue that maximizing shareholders' wealth should not be an unconstrained process at the expense of sustainability. In other words, top management who serves as agents to pursue shareholder's wealth should be given an implicit power to achieve sustainability through ESG activities while pursuing shareholder's wealth. Just like the president of a country is given the power to do what is right for the country socially while pursuing economic prosperity. In this case, we should not focus only on financial returns in

measuring the success of a firm. An acceptable social return agenda to achieve sustainability must be considered as performance benchmark in understanding corporate behavior. We believe that green bond issuance is a good measure of sustainable investments for a firm to pursue social returns, which is part of the CSR agenda of top management.

As seen in the above discussion, there is ongoing debate over firms' engagement with the ESG/CSR reporting, and the benefits—or potentially even costs—this may have to firm value and shareholder value. Through these debates and notions, we are presented with conflicting/competing theories that are associated with firms' CSR activities. Existing theories are inconclusive as to whether firms will adopt CSR activities, and if they do whether it would be with the intention to enhance firm value or not. For example, well-governed firms may also be the ones that should be socially responsible due to an underlying premise that well governed firms are equally capable of increasing their shareholder value and maintaining positive returns to society at the same time (Deng et al., 2013).

Specifically, Deng et al. (2013) claim that CSR activities can motivate stakeholders to increase their investment into the firm, which may help increase shareholders' value by expanding the firms' resource base and value, and thus, it could be expected that. This view aligns with classical firm and contract theories, which go back as far as Coase (1937) or more recently to Cornell and Shapiro (1987). Stakeholders are willing to provide support and resources to firms in exchange for those firms pursuing business activities, and decisions, which are more friendly or favorable to the local labor force and society i.e. environmental friendly products, wage contracts, job security, etc. Thus, engaging in higher levels of CSR activity can help align the shareholder and stakeholder values more closely, which may result in higher levels of firm efficiency and profitability (Jawahar et al., 2001; Jensen, 2001; Freeman et al. 2004, Edmans, 2011; Servaes and Tamayo, 2013).

In contrast, others suggest that the decision to engage in CSR related activities is for no other purpose than to make profits and that there is no intention required by firms to actively benefit society – though it may be a ‘convenient’ side effect of using CSR to enhance firm value (Deng et al. 2013). This possibility implies scope for managerial agency problems to exist, whereby the manager responsible for CSR strategies and actions may seek primarily to benefit themselves and the stakeholders instead of firms’ shareholders (Deng et al. 2013). Thus, it is possible that managers do not always place shareholder wealth maximization at the forefront of their decision-making process i.e. that shareholder and stakeholder values are not aligned either with each other, or with the manager. Many studies highlight case of managers pursuing the maximization of either their own or stakeholders’ value, at the expense of shareholders value, which is known as the agency problem. Similar concerns exist about CSR activities (Surroca and Tribo, 2008; Cronqvist et al., 2009), however there need to be an agency conflict for shareholders to have motivations to monitor firms CSR activities.

2.3 Green financing, green bonds and greenwashing

One of the main challenges for GB funding as perceived by the market is the pricing issue. Whether GBs should carry a higher, lower, or identical yield (i.e. return) compared to their regular counterpart is a much heated debate among investment professionals. For GB new issues (i.e. IPO market), Schrodgers’ Mihkel Kase argued that Green bonds have additional risk of environmental default and “greenwashing”, leading to an additional risk premium. On the other hand, other experts suggested that no clear connection between the green bonds designation and favorable pricing can be found. Furthermore, DuPont, Levitt, and Bilmes (2016) conclude that GBs experience high demand, leading to an increased willingness to pay a price premium and therefore lower yield over time. In fact, similar debate can be found for the secondary GB market with liquidity and the loss of green credentials as the main concerns. Notwithstanding these concerns, there is a strong interest in deploying green bonds as a

mechanism to meeting global climate change objectives through innovative project financing (Tolliver et al., 2018; Baker et al., 2018). There is also emerging discussion on the wider role that green bonds are playing in the process of financial innovation by novel use of structure finance to orient both private and institutional capital flows in the direction of high-priority investment areas such as clean and renewable energy investments (Horsch and Richter, 2017).

Stimulating green investment may be costly, but can be achieved quickly with suitable incentives. What is more elusive is the good-governance process. Clapp et al. (2015) discuss the role of second opinions—a form of external due-diligence on a bond prospectus—and argue that the traditional roles in project selection may be modifying, and that for projects falling under the purview of green bonds, environmental specialists are gaining an increasingly important role in the selection process. Yet there remain concerns regarding the potential for ‘greenwashing’ i.e. using green credentials to inflate the value of projects beyond what might be deemed the true fair value of a project. Chen and Chang (2013), for example, discuss the mediation role of greenwash to consumer confusion and valuations of ‘green perceived risk’, uncovering a complexity of relationships implying a series of direct and indirect associations between greenwash and green trust among consumers.

The implication is that engaging in greenwashing erodes consumer trust. It is implicit that this would have ramifications towards pro-social elements of brand reputation which are likely to be both costly and timely to rebuild. Lyon and Montgomery (2013) discuss how a corporate social media presence provides a disclosure mechanism and monitoring function (through such media users and retweet activity) that helps to reduce the incidence of greenwash activity. Arguably green bonds carry at least part of the same function(s) through the increased disclosure of environmental performance that coincides with the corporate choice to pursue a green capital structure and issue a green bond. Tang and Zhang (2018) examine the benefits to shareholder value that accrue from corporate green bond issuance.

Specifically, they argue that there are positive stock returns to green bond issuance, and that this is most likely attributed to a positive liquidity effect as opposed to any specific changes in the cost of debt. Febi et al. (2018) also examine liquidity and find that liquidity risk impacts green bond yield spreads, arguing this to be an important signal of market maturity.

2.4 ESG (Environmental, Social and Governance) framework

Firms typically review their production processes, then implement strategies to transition towards more environmentally friendly production. This minimizes the environmental impact of production, though can require a considerable (vast even) amount of vital resources to achieve (Deng et al., 2013). If their competitors do not adopt similar strategies (e.g., cleaner production technologies) then firms that have applied CSR/ESG practices may be at a competitive disadvantage, raising their production costs and biting into their own profit margins, which in turn may lead to a decrease in the shareholders' value. However, a contrasting view suggests that wider stakeholders' value may actually increase as a positive response to the environmental compliance. For example, Bénabou and Tirole (2010) and Krüger (2015) developed a theory of “doing well by doing good”, which suggests that CSR practices should be expected to (eventually) reflect positively on firms' performance (financial and/or operating) and which will therefore enhance shareholder value.

Several studies have sought to address and review empirical dimensions of this intuitive but well-constructed “doing well by doing good” proposition but most of these show mixed results (e.g., Dowell et al., 2000; Margolis and Walsh, 2003; Shen and Chang, 2009; Gillan et al., 2010; Mănescu, 2011; Ameer and Othman, 2012; Dimson et al., 2012; Wu and Shen, 2013; Di Giuli and Kostovetsky, 2014; Fatemi et al., 2015; Jain et al., 2016; Bhandari and Javakhadze, 2017). With a view to reconciling the mixed results Broadstock *et al.*

(forthcoming) uncover a generally non-linear relation between ESG performance and dimensions of corporate performance reflecting the more nuanced view that a firm can obtain returns to improve ESG performance when current performance levels are low. However when ESG scores increase, the returns are diminishing up until the point when ESG performance is already strong, and the corporate performance gains diminish to zero or become potentially even negative. This is intuitive if one accommodates the view that pushing the advanced boundary of ESG performance is likely to be more costly than initial ESG efforts, as all the low hanging fruit has already been picked. All these studies investigate the effect of corporate decisions regarding the adoption of CSR, and often ESG policies in particular, to some dimension of firm performance. Performance has been measured in different ways, for different purposes, including using firms' value, operational performance, financial or accounting performance and/or operating efficiency.

In terms of some of the most recent studies, Jain et al. (2016) provide empirical evidence that short sellers target firms with lower ESG scores, on the understanding that higher firm performance is commonly associated with lower values of the composite ESG scores. Tang, Hull, and Rothenberg, (2012) shows a positive relationship between CSR (through ESG scores) and financial performance. Bhandari and Javakhadze (2017), using an unbalanced panel of US firms covering the period 1992-2014, provide empirical evidence that firms' CSR policies reduces accounting and stock-based performance. Moreover, their empirical evidence indicates that CSR practices impact on firms' allocation efficiencies, which in turn reflect negatively on firms' future performance levels. Notwithstanding the useful contribution of the aforementioned studies, they examine the effect of firms' CSR or ESG policies on firms, operational, financial and/or accounting performance and ignore their ability to create an attraction factor that not only stimulates increased positive attention from existing customers/stakeholders, but also gains the attention of a new class of pro-social

(environmental) stakeholders. Based on this discussion, we hypothesize that adoption of ESG policies would have a positive effect on a firm's ability to issue green bonds, as follows:

H1: ESG would have a positive effect on green bond issuance.

2.5 Interaction between BR and ESG

To potentially bridge the gap between brand reputation and the specific dimensions of CSR that cover ESG, Batra et al (2017) discuss and identify consumers develop brand perceptions on the basis of the consistency of corporate image with individual cultural values. They argue that individuals are in general attracted to brands who conduct business in a manner that is more closely aligned with their individual/societal values. This effect is strengthened, in a natural and intuitive fashion, if the societal values are common to multiple countries. Batra et al. (2017) add that “the attitudinal impact of a multi-country brand's positioning” is greater when product and service competition is small, whereby brand image can be used as a source of product differentiation in highly competitive and homogenous product markets. In fact, companies have been using sustainability effort as a strategy to achieve brand differentiation (Forbes, 2012). As ESG involves a general global alignment of societal values and expectations, its dimensions may complement brand reputation within the corporate context. Based on this discussion, we hypothesize that the ESG performance of a firm may enhance the impact of its brand reputation on its probability of green bond issuance, as follows:

H2: ESG would positively moderate the positive effect of BR on green bond issuance, such that BR would have a stronger effect on green bond issuance for firms with higher ESG scores.

3. Methodology

3.1 Data and measures

The data includes a range of variables intended to capture company specific features covering financial performance and governance structures, industry and country controls including:

"**GREEN_BOND**" is our dependent variable and is a dummy variable taking the value 1 if the company is a green bond issuer or not. This value is intended to capture the timing that the firm switches to a 'greener capital structure'. Once a firm has issued a green bond it 'switches' value from 0 to 1, and can never reverse.

"**BRAND**" reflects whether a company enjoys a strong international brand reputation (BRAND=1) or does not (BRAND=0). To determine this we refer to brand reputation data available from www.brands.com through which we are able to identify companies with strong brand reputation i.e. within the top 500 global brands. We also identify companies with strong regional brand reputation i.e. the leading brands in their country. Companies with recognized high-level international or regional brand reputation are deemed as strong brand companies i.e. BRAND=1. There are alternative ways to define global brand value. For robustness, we also consider one popular alternative, which is to define a dummy variable, BRAND_b, which takes the value 1 for all firms whose market capitalization is in the top 20 firms listed on the country's main stock exchange and zero otherwise.⁴ This results in a similar number of globally branded firms, albeit with slightly different membership.

"**ESG**" refers to the environmental, social and governance disclosure score reported by Bloomberg LLC. This is Bloomberg's proprietary score developed on the basis of firms'

⁴ In practice we (i) use the top half of observations in markets where the main index has less than 40 members and (ii) in cases where there are multiple strong exchanges, such as the US, we focus on the individual exchange which a stock is listed on i.e. NASDAQ or NYSE etc.

disclosure of ESG related information. ESG reports are often not mandated company filings, and as discussed below many companies still choose not to disclose such reports.

A range of other more standard firm level controls are used in the analysis including: "MCAP", the market capitalization of a firm; "DvdYLD", the dividend yield; "CAGR", the cumulative average growth rate of sales over the preceding 12 months; "OPM", the operating profit margin; "DE", the net debt to equity ratio; "WACCD", the weighted average cost of debt faced by a firm; "PE", the price to Earnings ratio; "IDOB", the percentage of independent directors on the board; "WOB", the percentage of Women on Board; and "CEOTENURE", the CEO Tenure as a percentage of Financial Year Earning.

In addition to these ‘traditional’ variables, following recent studies in behavioral finance, and environmental economics, we also control for the effects of climate related variables. To construct these variables we obtain a range of climatic variables from the Weather Underground website (using their API interface, <https://www.wunderground.com>), for the final day of each month of the year, for all countries represented in our sample. We adopt a relatively crude assumption with regard to the geography of our observations, choosing either the largest/capital city where possible, but where data access does not permit this, we use recordings made at the largest international airport within the country of the issuer. We acknowledge some imprecision in our assumptions here, but contend that our approach captures sufficient variation between countries and over time to suit our needs. We concentrate on using (i) temperatures – arguably the most eponymous indicator of climate change featured in both research and the popular press and (ii) visibility, which will decrease with increasing pollutants of various types, as well as with other weather conditions. The variables used in the analysis are: The summary statistics for the data are presented in Table (1), while Table (2) provides some additional information on sample construction steps.

<< TABLES 1 & 2 ABOUT HERE >>

3.2 Matching process

To ensure our analysis is able to give a reliable, informative and fair overview of the drivers of the decision to issue a green bond, we develop our analysis around a matched sample of green and black bond issuers. For this purpose we adopt an $n:1$ propensity score matching (PSM) design to construct the empirical dataset we use in the subsequent analysis.

We wish to ensure that our estimation sample is comprised only of companies that issue bonds, such that our analysis is simplified by taking the decision to issue a corporate bond as given. To facilitate this, we place the bond as the primary unit of interest within the matching process. The steps to the matching process can be described as follows:

- We obtain bond structure and pricing information from a combination of data contained in the Bloomberg and Datastream databases. In this process we note that data on bond rating is derived from multiple rating agencies, and we therefore borrow the universal rating scheme outlined in Bhorjaj and Sengupta (2003) to place all bonds into a common rating framework.
- We extract the list of green bond issuers, and then ensure that we remove from the black bond . This again eases our empirical work by ensuring that we focus attention on the decision to be a green bond issuer or not, and thus, circumvent the complex question of whether any given firm decides to issue a green bond in any given year.⁵
- We implement an exact $n:1$ (with $n=3$) sample scheme on propensity scores obtained on the following bond characteristics: the *coupon rate* of the bond; the *term* of the bond; whether a bond is *perpetual* or not; whether the bond is traded on the *international*

⁵ We recognize this more general question is of interest in its own right. However, within the scope of our primary research question and the confines of the available data, we felt more comfortable narrowing the empirical focus in this manner.

markets or not; the main trading currency of the bond (e.g. in *Euro, USD, RMB or 'other'*); the *industry* of the bond issuer; and the issuer *country/region*.

- This process identifies a black bond issuers, which we then proceed to collect the remaining financial characteristics and brand value scores for.

The matching process outlined above therefore does not impose the requirement that green and black bond issuers are required to have similar underlying characteristics, rather that they are firms approaching the market with similar financial products. Notwithstanding this, Table (XX) provides descriptive statistics for the green and black bond issuers respectively, from which it can be seen that the firms also match quite closely in many of the firm-specific attributes. Thus, while more elaborate matching schemes might be considered in future work when more data becomes available, we are content that the matching scheme applied here provides a reliable and informative benchmark sample for our subsequent analysis.

4. Data analysis

4.1 Empirical framework

The empirical strategy is developed around a discrete choice model of the decision to issue a green bond. Our primary focus, given the discussion above, is to establish (i) if ESG increases the probability of issuing a green bond and (ii) which global brand status reinforces the role of ESG. The empirical model we use to explore these two aspects may be specified as follows:

$$Pr. (Green Bond_{it} = 1) = f(\beta_0 + \beta_1 ESG_{it} + \beta_2 BRAND_{it} + \beta_3 (ESG_{it} * BRAND_{it}) + \beta_k X_{kit} + \epsilon_{it})$$

(1)

Where X_{kit} is a vector of control variables, as described in the data section, covering core firm specific attributes including financial characteristics and governance structures. The main estimation work being done here using standard logit specifications. In estimation we also allow for year, industry sector, and main global region fixed effects.

The main coefficient of interest are therefore β_1 and β_2 and especially β_3 . To help keep our discussions succinct we now formally specify the hypotheses we wish to test:

- H1: $\beta_1 > 0$ i.e. not only does ESG affect the probability of issuing a green bond, but that it increases the probability. This is because higher ESG scores reflect (i) greater public exposure in relation to environmental management by the firm (a stakeholder pressure effect) and/or (ii) a propensity/disposition by the firm towards strong environmental management strategies. Both of these possible channels of effect should reinforce the decision to issue a green bond.
- H2: $\beta_2 > 0$ i.e. a firm which has taken the dedicated effort to establish a global brand reputation will likely be incrementally more willing than other firms to pursue business decisions that may offer value in enhancing, or at least sustaining, its public image. Well implemented green financing offers direct benefits to external stakeholders, and should therefore be expected to work in the same direction as an improved corporate image.
- H3: $\beta_2 > 0$ i.e. that the incentives to issue green bonds are further reinforced with both the ESG and BRAND effects co-exist i.e. $ESG > 0$ and $BRAND = 1$.

We take two approaches towards evaluating H1-H3. In the first instance we estimate Eq. (1) for the full sample of data, from which we obtain direct estimates of β_1 , β_2 and β_3 . We then complement this by estimating models for sub-samples varied along the cross-section of BRAND and ESG values, from which we garnish some additional insights. Specifically these cross sections are the sub-sample with $BRAND = 0$ and another with $BRAND = 1$, then

for ESG we consider the cases where $ESG=0$, $ESG>0$. We lastly take the median of all non-zero ESG scores, τ , and run additional regressions for cases with poor and good ESG performance respectively i.e. where $0<ESG \leq \tau$ and $\tau <ESG \leq 100$, recalling that 100 is the maximum attainable score for ESG. We report estimates from both general ('full') specifications and also from 'stepwise' estimation of the preferred models, where information criterion comparisons help to identify the 'optimal' set of control variables.

5. Results

We proceed to present and discuss the results, presenting the findings in order of the three primary hypotheses which we aim to evaluate. We also conduct several robustness checks on our main results to verify their insensitivity to key model choices or sample considerations, which we present towards the end of this section.

5.1 Main results

Table (3) presents the first and main set of results. Columns (1)-(4) of the table records regression results using our preferred BRAND measures, while results using the alternative brand measure (BRAND_B) are presented in columns (5)-(7). For brevity we concentrate our discussion on the key ESG and BRAND variables, along with their interaction. Broadly speaking, in Table (3) and all subsequent tables, the control variables take plausible signs. One noteworthy exception is that of MCAP, which is either insignificant or negative. This is an artifact of the data construction process, and simply reflects that the sample of green bond issuers are on average smaller in market cap than the sample of black bond issuers.

We first conduct empirical test regards the role of brand to green bond issuance. The research question is that, all other things equal, would brand reputation (BR) exert a positive influence

to the probability of issuing a green bond? The evidence is mixed. Using our primary BRAND measure, under columns (2)-(4), we do not observe statistical significant for the coefficient on BRAND. Admittedly we observe a positive coefficient in column (2), but again stress it is statistically insignificant. Using the alternative BRAND_B measure the evidence is a little more stable, insofar as the coefficients for all three specifications (5)-(7) are positive. For column (6) the positive coefficient is statistically insignificant. However we would tend to favor column (7) results, which adopts a stepwise estimation routine to obtain the most parsimonious model specification on the basis of standard information criteria – note that for similar reasons we generally favor column (4) to (3). Under column (7) we can see that BRAND_b is both positive and significant. On the basis of these findings, we cannot draw the conclusion to support a positive relationship between BR and green bond insurance.

<< TABLE 3 ABOUT HERE >>

Next we direct attention towards the first hypotheses, which asserts that ESG performance e.g. better ESG scores, will positively associate with the probability of issuing a green bond. For this variable we have a visibly more stable result. Except for the models in columns (2) and (5)—which exclude ESG, for each of the alternative BRAND specifications—the coefficient on ESG is always positive and always significant. It is worth noting that for the stepwise regression in (4) and (7), the ESG variables do not ‘drop out’. Unambiguously, ESG performance and higher ESG scores are consistent with a higher propensity to issue a green bond. The scale of the coefficients is generally stable across our main specifications ranging between 0.014-0.016, not including (1) which forcibly excludes BRAND variables. The stability of the coefficients across the alternative model specifications may be taken as an indicator of the robustness of the relation between ESG performance and green bond issuance, which is by no means guaranteed, and not seen for other variables which exhibit wider variability in coefficient values. Accordingly, we may comfortably accept H1.

The last of our leading hypotheses, H2, concerns the potential for a positive moderating role of BR to green bond issuance, working on the premise that BR would have a stronger effect on green bond issuance for firms with higher ESG scores. In our regression models this is captured by the interaction BRAND*ESG, included in model specifications (3) and (6), and subject to stepwise model reduction, may also appear in (4) and (7). For our primary BRAND measure we observe from both columns (3) and (4) that there is a positive and significant coefficient on the variable interaction. Thus, the interaction gives rise to a positive reinforcing effect i.e. the influence of ESG to the probability of issuing a green bond will be incrementally larger for companies with strong BR. Taking column (4) as the benchmark model, the effect of ESG for a firm with BR=0 will be 0.14, but will more than double to 0.31 ($=0.14+0.17$), for a firm with BR=1. The initial evidence means that we cannot reject H2, but we recognize that using the alternative BRAND_b*ESG measures, that while the estimated coefficient in (6) is positive, it is not significant, moreover it drops out during the stepwise estimation process and hence does not appear in (7). Thus at this stage the results on H2 are somewhat mixed, however Table (4) will help shed some additional light on this hypothesis.

In the following tables and discussion we aim to further deconstruct our results along a number of dimensions of possible interest, and to make the conclusions on our main hypotheses more concrete. The next set of results reported in Table (4) consider how the main variables of interest vary along sub-samples of the data. In Panel (A) we estimate models for subsamples of the data, based on BRAND, causing the variable to drop out of the estimated models. From this panel we observe that the effect of ESG is stronger, reflected by a larger coefficient which incidentally has a tighter confidence interval also, for observations with BRAND = 1 versus observations with BRAND = 0, e.g. compare column (2) against (1). This finding is stable to the definition of brand, and the same result holds using the BRAND_b measure, in columns (3) and (4).

Panel (B) of Table (4) shows the alternative cut of the data, and reveals how the role of BRAND varies along with subsamples of observations chosen according to ESG performance level. Taking our preferred BRAND specification, column (1) considered the case of firms with no disclosed ESG score, which may first be compared against firms with a positive score, shown in column (2). The coefficient in (1) is negative, and not statistically significant. In column (2) this reverses, and firms with positive ESG scores see a positive, albeit fairly weakly significant influence of BR to the probability of bond issuance. In columns (3) and (4) the subsample of observations with positive ESG scores is further decomposed into those with below median⁶ ESG performance, versus those with above median performance. In column (3) it is observed that for low-ESG firms BRAND carries no significant contribution to the probability of green bond issuance, while for high-ESG firms there is a large, positive and significant effect. The results are qualitatively invariant to the use of the alternative BRAND_b measure, though we acknowledge some quantitative differences in the size and significance of the BRAND_b coefficient in (5) versus its counterpart in (1).

<< TABLE 4 ABOUT HERE >>

Thus, whichever way we opt to ‘slice’ the data, the evidence from the subsample estimations becomes much clearer not only that BR reinforces the probability of issuing a green bond, but that the moderating role of BR is stronger for firms with higher ESG scores. These results therefore verify indirectly the results in Table (3), and provide supporting evidence that importance of global brand status to the adoption of green finance varies along with ESG performance. Similarly, that the importance of ESG performance varies along the existence of a global brand status. Thus, implicitly verifying, from both directions, that a material interaction exists between these variables.

⁶ These medians are evaluated excluding the cases of ESG=0. The decision to use a median rather than a mean was due to the non-normal distribution of ESG score. In such a case the median is better suited to capturing the most frequent ESG performance level.

Connotations of the results in Tables (3) and (4) are that ESG is positively correlated with green bond issuance as expected, but brand has a significant role in enhancing green bond issuance, conditional to ESG score. This means brand reputation plays an incremental role for brand on green bond issuance, beyond the base ESG score i.e. that we are unable to dismiss the moderating role of BR. The effect of ‘brand to green’ is a largely unexploited issue, as reflected by the general absence of prior literature and empirical inquiry.

5.2 Further sub-sample estimation: The roles of gender, regional effects, and separate E, S and G components.

For a more complete/thorough discussion, although we have established evidence in support of our main hypotheses, there are several additional sets of results we explore. In no specific order these include examining the role of individual E, S and G characteristics i.e. deconstructing the combined ESG score. After this we consider the role of women on the board of directors – a test of a sort of ‘mother nature’ effect. Lastly we briefly summarise results by key geographic region

<< TABLE 5 ABOUT HERE >>

Table (5) reports results from regressions including separate E, S and G scores, rather than a single ESG score. Through this we are able to provide a more nuanced appraisal of the moderating role of BR to green bond issuance. We do not have any priors as to whether the effect should be stronger or weaker for any of the E, S or G components, and here only seek to summarize and reflect on the empirical evidence. The results are however quite interesting. In essence, and looking across the columns of Table (5), we can observe that BR moderates E and G, but not S. We will not attempt to qualify the results here, but note that these results leave room for more complete theories of the BR/ESG nexus to be conceptualized, and point towards an important incongruence in the S dimension of ESG.

<< TABLE 6 ABOUT HERE >>

In Table (6) we provide a reflection on the unique role and importance of women on the board. While a topic with long-standing interesting, questions over the role and influences of gender diversity and equality remain at the forefront of society, and the modern corporation. The results in Table (6) would appear to emphasize the benefits—at least to pursuing a green capital structure—of having a higher proportion of women on the company board. This result is most cleanly illustrated by comparing columns (3) with (4). Here, subsamples are constructed around the median ratio of women on the board. The results suggest that the role of ESG is ‘dampened’ in firms with low shares of women on the board, and moreover for these firms the relationship becomes linear in BRAND only. With higher fractions of women on the board (column (4)), the ESG channel ‘switches on’, and the moderating role of BR also comes back into force. These results are of interest, yet we note that the findings do show some sensitivity to the specification of BRAND measures. We would cautiously conclude a non-trivial role for women on the board, but would also future research to explore this issue with more comprehensive board characteristics data, with a view to obtaining more robust empirical findings. We do conduct regressions using a more primitive definition of firm-year observations with zero women on the board versus non-zero numbers of women on the board in columns (1) and (2), but we believe(/hope) this dichotomy to be of limited practical interest since such extreme patterns of board diversity are inconsistent with large mainstream, modern, corporations.

<< TABLE 7 ABOUT HERE >>

The final comparison we explore are the main geographic region differences, captured in Table (7). We summarize the ESG, and BRAND effects, as well as their interaction, alongside the women on the board effect. Columns (1) and (2) show that for the full-sample,

that ESG impacts bond issuance, and there is a moderating role for BR, and also that WOB has a significant and positive influence. The moderating role of BR continues to be significant for Europe, and ‘other’ countries, but intriguingly becomes insignificant for US bond issuers. The US data in fact places no significant role on BR, and instead sees that (of the variables of interesting) it is only ESG performance that impacts the decision to issue a green bond. Perhaps more interesting than this though is the estimated negative relation between ESG and green bond issuance. The implication is that firms with lower performance It would be naïve to claim outright that this is evidence of corporate greenwashing by US green bond issuers, yet it is not inconsistent with the possibility. The final point to note is that for the ‘other’ country issuers, ESG scores are only significant when interacted with BRAND, While this is not inconsistent with our main hypothesis, it does suggest a different nature of association between ESG and BRAND. We would add that while we can observe some seemingly noteworthy regional differences, our data does not allow us to consider richer explorations. Future research must remain mindful of the need to re-address our empirics here and to give more rich explanations of unique regional attributed and the propensity to issue green bonds.

5.3 Additional robustness checks

We now turn attention to briefly evaluating the robustness of our results to key modeling concerns/choices. Our data limit the scope and range of tests we can feasibly employ, nonetheless we are able to consider the following three issues:

[1] Self-selection into global brand status: Developing and maintaining a global brand requires serious effort, and it is possible that a company’s decision to issue a green bond might be conditional upon it having already ‘selected’ itself (committed itself) to becoming a

company with a global brand. To therefore alleviate any concerns that our results are sensitive to the presence of such selectivity, and the statistical ‘biases’ it might induce, we re-estimate the main model within a Heckman selection framework, with the first stage being the self-selection into a global branded status, with this first stage equation being a function of a range of firm-level characteristics, and sector and year fixed effects.

[2] Lagged effects and path dependence: There is a legitimate case to be made for the possibility that the decision to issue a green bond in any given year might be connected to the previous year’s brand status. Our data does not provide many spare observations to explore dynamics to their full extent, though we are able to lag brand effects by one year and establish whether there exist any sensitivities among our main conclusions.

[3] Small sample size concerns: The estimation sample is of modest dimensions, as a final check we pass the main model, i.e. column (3) from Table (3), through a standard bootstrap estimation and inference procedure using $b=1,000,000$ replications.⁷ We then visually inspect the main parameters of interest to verify the stability of the coefficient distributions.

We briefly outline the results for robustness checks [1] and [2] in Table (4). We see that adding lags seems to result in a 5-7% improvement in Pseudo- R^2 , however we must be cautious in interpreting this, since we also lose close to one third of the observations in order to be able to estimate the models containing the lag. Other than this, we generally observed that our results are not materially sensitive to either the presence of endogeneity, or to the timing of BR effects. Even if BR is lagged, its role as a moderator remains.

⁷ Strictly speaking this is many more replications than we need, nonetheless the only burden of having more replications is levied on the PC used for estimation, and the benefits are increasingly continuous approximations to the empirical coefficient density functions, i.e. the benefits outweigh the costs.

<< TABLE 8 ABOUT HERE >>

We lastly consider the bootstrap distributions for the BRAND and ESG variables along with their interaction, i.e. robustness check [3], as shown in Figure (2). The concern was that the results may be subject to (relatively) small sample sensitivities. From the histograms, we get a clear understanding of the roles of ESG and BRAND to green bond issuance. ESG has a positive effect, BRAND a negative effect, and the moderating effect capture through the BRAND*ESG interaction also being positive. The estimated empirical coefficient distributions are generally skewed (non-normal) but surprisingly smooth/continuous for bootstrap estimates, loosely implying the bootstrap results should be quite robust.

6. << FIGURE 1 ABOUT HERE >>**Discussion**

In this work we have provided an initial assessment of the relation between brand value, and the corporate decision to engage in green financing activities.

One limitation of the data is its poor representation of the Chinese market. While Chinese issuers and investors have been a large feature of the market for green bonds in recent years, they largely dropped out of the estimation dataset. This is mostly on the basis of the availability of detailed bond pricing information from the Datastream database. We do not see this as a limitation of our work, merely a reflection of the available market intelligence, yet we recognize that future work will require to verify our main conclusions hold for the Chinese mainland market context.

We additionally note that the unit of observation for our study is the bond issuer, and not the specific bonds. We do not contain information on individual bonds for this reason, and also for the fact that a single issuer may issue more than one bond, even within the same year. Accounting for such bond-level data will likely increase the complexity of the analysis, but

we think in the present case would not materially alter our conclusions. Notwithstanding this, it remains an important direction for future research to tackle the bond-level data more directly.

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Table 1: Summary statistics for firms by green bond issue status.

Variable	N	Mean	St. Dev.	Min	Max
Panel A: Green bond issuers					
BRAND	305	0.148	0.355	0	1
ESG	305	19.838	23.884	0.000	78.070
BRAND_b	305	0.213	0.410	0	1
log(MCAP)	305	4.972	5.315	0.000	16.170
DvdYLD	305	1.581	2.424	0.000	13.790
CAGR	305	2.563	13.628	-100.000	98.310
OPM	305	26.465	42.255	-162.100	361.660
DE	305	216.940	1,008.500	-118.420	16,584.800
WACCD	305	1.711	3.490	0.000	25.150
PE	305	10.797	58.491	0.000	962.500
IDOB	305	28.968	35.131	0.000	100.000
WOB	305	11.850	16.398	0.000	75.000
CEOTENURE	305	1.778	3.934	0.000	26.000
TEMP_RANGE	305	14.889	3.490	8.750	27.000
VIS_RANGE	305	6.235	4.494	0.250	16.000
US	305	0.148	0.355	0	1
EUROPE	305	0.466	0.500	0	1
Panel B: Black bond issuers					
BRAND	1,584	0.114	0.317	0	1
ESG	1,584	17.428	21.565	0.000	80.700
BRAND_b	1,584	0.097	0.295	0	1
log(MCAP)	1,584	5.439	5.247	-4.605	16.949
DvdYLD	1,584	1.533	2.971	0.000	34.010
CAGR	1,584	3.456	13.138	-53.170	228.010
OPM	1,584	5.678	341.922	-13,462.780	300.550
DE	1,584	167.048	545.003	-1,324.040	12,380.930
WACCD	1,584	1.430	2.061	-0.160	25.940
PE	1,584	27.995	567.072	0.000	22,476.190
IDOB	1,584	31.257	37.745	0.000	100.000
WOB	1,584	9.744	13.455	0.000	53.850
CEOTENURE	1,584	2.560	4.868	0.000	40.000
TEMP_RANGE	1,584	14.581	3.437	8.750	27.000
VIS_RANGE	1,584	5.952	4.278	0.250	16.000
US	1,584	0.388	0.488	0	1
EUROPE	1,584	0.364	0.481	0	1

Note: In the top part of this table we summarize key descriptive statistics for green bond issuers (GREEN_BOND=1). In the bottom part of the table we summarize the same measures for the matched sample of black bond issuers (GREEN_BOND=0). These summary statistics reflect the final sample characteristics which make it through to estimation.

Table 2: Additional details on data collection, and construction of the final estimation sample.

Data processing step	Sample information
<i>Phase 1: Bond sample construction</i>	
Generate a list of green bonds based on the Bloomberg database list of green bonds, cross verified against the Climate Bonds Initiative (CBI) certified bond list	Circa. 1000 green bonds up until the 2016 sample cutoff date.
Of which we then isolate the corporate issuances. Most green bonds up until the end of our sample period were by non-corporate issuers, thereby eliminating many observations from the sample.	Giving a sample of 338 corporate green bonds in total, issued across a sample of 108 unique firms from across the globe
Create a matched sample of black bonds from the universe of international corporate bonds issuances over the sample period, taken from Datastream.	Circa 250,000 corporate black bonds identified over the sample period
Implement a 3:1 propensity score based matching of black bonds against the green bonds on a range of bond-level characteristics including coupon, term, whether bond type is perpetual or fixed, currency of issue, industry of issue, and country of issuer.	1,358 corporate bond issuances are identified, from 651 unique firms. <i>GB mean coupon rate = 3.221</i> <i>BB mean coupon rate = 3.316</i> <i>GB ST.Dev. of coupon rate = 2.288</i> <i>BB ST.Dev. of coupon rate = 2.647</i>
<i>The matching process is constrained to identify black bonds only from companies that have no history of issuing a green bond, such that we do not compare green and black bonds from the same company.</i>	<i>Note: BB = 'black bond'</i>
<i>Phase 2: Construction of firm level indicators</i>	
Obtain a range of firm level accounting and corporate governance variables. Data are hand collected from the Bloomberg database, availability of consistently measured international data, Bloomberg's proprietary disclosure measures, and corporate governance variables are the main factors reducing sample size	From the 651 unique firms we potentially have 1,953 firm-year observations available for estimation.
Global brand ranking classifications are identified using information from http://interbrand.com . This website provides access to comprehensive global and regional brand ranking data. We hand collect all global and country specific ranking reports over the sample period, then carefully match brand names against corporate names. (Where necessary, brand information was allocated to the parent company, if the brand belongs to a subsidiary of the parent company)	138 of the firms in the sample are identified as having a strong global brand, of which 31 are green bond issuers (<i>i.e. roughly 22.5% of firms with brand reputation issued a green bond in our sample</i>)

Table 3: Main results. Note that insignificant control variables are not reported for brevity, these included: DvdYLD, CAGR, DE, PE, IDOB and CEOTENURE. Stepwise regressions results are shown in columns (4) and (7). All models include year, industry and region fixed effects.

<i>Dependent variable:</i>							
GREEN_BOND (=1)							
	(1) – (4) Original brand measure				(5)– (7) Alternative brand measure		
	(1) <i>No Brand</i>	(2) <i>No ESG</i>	(3) <i>Full</i>	(4) <i>Stepwise</i>	(5) <i>No ESG</i>	(6) <i>Full</i>	(7) <i>Stepwise</i>
ESG	0.020*** (0.007)		0.015** (0.007)	0.014** (0.007)		0.016** (0.007)	0.016** (0.007)
BRAND		0.256 (0.208)	-0.533 (0.412)	-0.442 (0.403)			
BRAND_b					0.640*** (0.191)	0.242 (0.343)	0.549*** (0.190)
log(MCAP)	-0.068* (0.039)	-0.057 (0.038)	-0.082** (0.040)	-0.088** (0.039)	-0.059 (0.038)	-0.079** (0.040)	-0.084** (0.039)
DvdYLD	0.035 (0.029)	0.026 (0.029)	0.041 (0.030)		0.029 (0.029)	0.033 (0.030)	
CAGR	0.001 (0.006)	-0.001 (0.005)	0.002 (0.006)		-0.001 (0.006)	0.001 (0.006)	
OPM	0.009*** (0.002)	0.008*** (0.002)	0.009*** (0.002)	0.008*** (0.002)	0.009*** (0.002)	0.009*** (0.002)	0.009*** (0.002)
DE	-0.00000 (0.0001)	0.00000 (0.0001)	0.00000 (0.0001)		-0.00001 (0.0001)	-0.00001 (0.0001)	
WACCD	0.046* (0.026)	0.060** (0.026)	0.046* (0.026)	0.049* (0.026)	0.064** (0.026)	0.053** (0.026)	0.056** (0.026)
PE	-0.0001 (0.0003)	-0.0001 (0.0004)	-0.0001 (0.0003)		-0.0001 (0.0003)	-0.0001 (0.0003)	
IDOB	0.003 (0.005)	0.002 (0.005)	0.001 (0.005)		0.004 (0.005)	0.004 (0.005)	
WOB	0.024** (0.009)	0.028*** (0.009)	0.024** (0.009)	0.022*** (0.008)	0.024** (0.009)	0.019** (0.010)	0.019** (0.008)
CEOTENURE	-0.035 (0.023)	-0.037* (0.023)	-0.033 (0.023)	-0.049** (0.021)	-0.037 (0.023)	-0.034 (0.023)	-0.049** (0.021)
BRAND*ESG			0.019** (0.009)	0.017* (0.009)			
BRAND_b*ESG						0.010	

						(0.008)	
Constant	-2.149***	-1.481**	-1.811**	-1.219**	-1.704**	-2.151***	-1.444***
	(0.734)	(0.693)	(0.756)	(0.523)	(0.705)	(0.752)	(0.512)
Observations	1,934	1,934	1,934	1,934	1,934	1,934	1,934
Log Likelihood	-766.572	-770.110	-764.192	-766.756	-765.393	-761.353	-764.873
Akaike Inf. Crit.	1,583.143	1,590.219	1,582.385	1,565.512	1,580.786	1,576.706	1,559.746
Chi-square test	Pass						
Pseudo R ²	0.108	0.104	0.111	0.107	0.109	0.114	0.110

Note:

* ** *** p<0.01

Table 4: Panel (A) shows estimation results for subsamples defined by global brand status: no brand and with brand. Panel (B) shows results for subsamples defined by ESG performance: no ESG score, positive score, ‘poor’ positive score and ‘good’ positive score (refer back to the main text for detailed explanation of ‘poor’ and ‘good’). Control variables are not reported for brevity. All models include year, industry and region fixed effects.

Panel A

<i>Dependent variable:</i>				
GREEN_BOND (=1)				
	(1)	(2)	(3)	(4)
	<i>BRAND=0</i>	<i>BRAND=1</i>	<i>BRAND_b=0</i>	<i>BRAND_b=1</i>
ESG	0.021** (0.008)	0.107*** (0.036)	0.014* (0.008)	0.071*** (0.025)
Observations	1,705	229	1,715	219
Log Likelihood	-652.903	-76.707	-632.438	-109.226
Akaike Inf. Crit.	1,357.806	201.413	1,316.876	270.451
Chi-square test	Pass	Pass	Pass	Pass
Pseudo R ²	0.122	0.332	0.110	0.185

Note: * p<0.1 ** p<0.05 *** p<0.01

Panel B

<i>Dependent variable:</i>								
GREEN_BOND (=1)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>ESG=0</i>	<i>ESG>0</i>	<i>0<ESG<τ</i>	<i>τ<ESG<100</i>	<i>ESG=0</i>	<i>ESG>0</i>	<i>0<ESG<τ</i>	<i>τ<ESG<100</i>
BRAND	-0.352 (0.444)	0.495* (0.264)	0.343 (0.514)	0.738** (0.367)				
BRAND_b					0.681* (0.370)	0.793*** (0.248)	-0.007 (0.436)	1.227*** (0.345)
Observations	1,048	886	446	440	1,048	886	446	440
Log Likelihood	-425.015	-318.578	-141.755	-158.225	-423.743	-315.220	-141.974	-153.728
Akaike Inf. Crit.	900.029	687.156	333.510	364.449	897.487	680.439	333.948	355.456
Chi-square test	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Pseudo R ²	0.079	0.200	0.242	0.247	0.081	0.208	0.241	0.268

Note: * p<0.1 ** p<0.05 *** p<0.01

Table 5: The role and influence of separate E/S/G components to the firm decision to issue green bonds.

	<i>Dependent variable:</i>							
	GREEN_BOND (=1)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ESG	E	S	G	ESG	E	S	G
BRAND	-0.533 (0.412)	-0.525 (0.386)	-0.159 (0.354)	-0.598 (0.443)				
BRAND_b					0.242 (0.343)	0.046 (0.332)	0.446 (0.319)	0.499 (0.348)
ESG	0.015** (0.007)				0.016** (0.007)			
E		0.011 (0.007)				0.011 (0.007)		
S			0.013** (0.006)				0.013** (0.006)	
G				0.005 (0.010)				0.009 (0.009)
BRAND*ESG	0.019** (0.009)							
BRAND*E		0.021** (0.010)						
BRAND*S			0.010 (0.008)					
BRAND*G				0.018** (0.008)				
BRAND_b*ESG					0.010 (0.008)			
BRAND_b*E						0.018** (0.009)		
BRAND_b*S							0.004 (0.007)	
BRAND_b*G								0.003 (0.007)
Observations	1,934	1,934	1,934	1,934	1,934	1,934	1,934	1,934
Log Likelihood	-764.19	-762.70	-765.82	-766.75	-761.35	-759.07	-762.18	-764.71
Akaike Inf. Crit.	1,582.385	1,585.407	1,585.642	1,587.497	1,576.706	1,578.148	1,578.366	1,583.427

Chi-square test	Pass							
Pseudo R ²	0.111	0.113	0.109	0.108	0.114	0.117	0.113	0.110

Note: * p < 0.05 ** p < 0.01 *** p < 0.001

Table 6: The influence of women on the board to the decision to engage in green finance. “High % WOB”, refers to observations where the percentage of women on the board is (i) more than zero, and (ii) more than the median of all observations with a non-zero score. “Low % WOB” is similarly defined, but isolating firms with low (below the median score) percentages of women on the board.

<i>Dependent variable:</i>								
GREEN_BOND (=1)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	WOB=0	WOB=1	Low % WOB	High % WOB	WOB=0	WOB=1	Low % WOB	High % WOB
ESG	0.040*	0.026**	0.002	0.049***	0.033	0.022**	-0.005	0.060***
	(0.024)	(0.011)	(0.016)	(0.016)	(0.022)	(0.011)	(0.016)	(0.017)
BRAND	-0.365	-1.503	2.371*	-4.625*				
	(0.456)	(1.215)	(1.382)	(2.383)				
ESG*BRAND	0.080***	0.033	-0.040	0.090**				
	(0.029)	(0.024)	(0.031)	(0.044)				
BRAND_b					0.753**	-1.068	0.128	1.319
					(0.366)	(0.989)	(1.587)	(1.632)
ESG*BRAND_b					-0.028	0.041**	0.013	0.002
					(0.032)	(0.020)	(0.036)	(0.031)
Observations	1,131	803	404	399	1,131	803	404	399
Log Likelihood	-453.21	-289.67	-107.84	-147.00	-455.11	-283.11	-108.50	-142.55
Akaike Inf. Crit.	958.421	631.346	267.680	342.007	962.228	618.213	268.995	333.091
Chi-square test	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Pseudo R ²	0.083	0.207	0.337	0.265	0.079	0.225	0.333	0.287

Note: * p < 0.05 ** p < 0.01 *** p < 0.001

Table 7: Results by key geographic region. Note that over the estimation sample period, the main issuing regions were Europe and the US. All other regions are collected into an ‘other’ countries category.

	<i>Dependent variable:</i>							
	GREEN_BOND (=1)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>All full</i>	<i>All stepwise</i>	<i>US full</i>	<i>US stepwise</i>	<i>Europe full</i>	<i>Europe stepwise</i>	<i>Other full</i>	<i>Other stepwise</i>
BRAND	-0.533 (0.412)	-0.442 (0.403)	-1.577 (2.303)	-1.286 (2.146)	1.299* (0.693)	1.286* (0.682)	-0.954 (0.641)	-1.126* (0.623)
ESG	0.015** (0.007)	0.014** (0.007)	-0.064* (0.038)	-0.062* (0.035)	0.062*** (0.015)	0.065*** (0.015)	0.003 (0.014)	0.003 (0.014)
WOB	0.024** (0.009)	0.022*** (0.008)	0.077* (0.046)	0.062* (0.035)	0.022 (0.014)	0.019 (0.013)	0.010 (0.021)	
BRAND:ESG	0.019** (0.009)	0.017* (0.009)	0.092 (0.056)	0.077 (0.052)	-0.025* (0.015)	-0.027* (0.014)	0.033* (0.018)	0.034** (0.017)
Observations	1,934	1,934	660	660	759	759	515	515
Log Likelihood	-764.19	-766.76	-120.57	-123.92	-330.77	-333.03	-243.97	-245.80
Akaike Inf. Crit.	1,582.385	1,565.512	291.145	269.840	711.545	698.060	537.940	519.592
Chi-square test	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Pseudo R ²	0.111	0.108	0.266	0.246	0.123	0.117	0.127	0.121

Note:

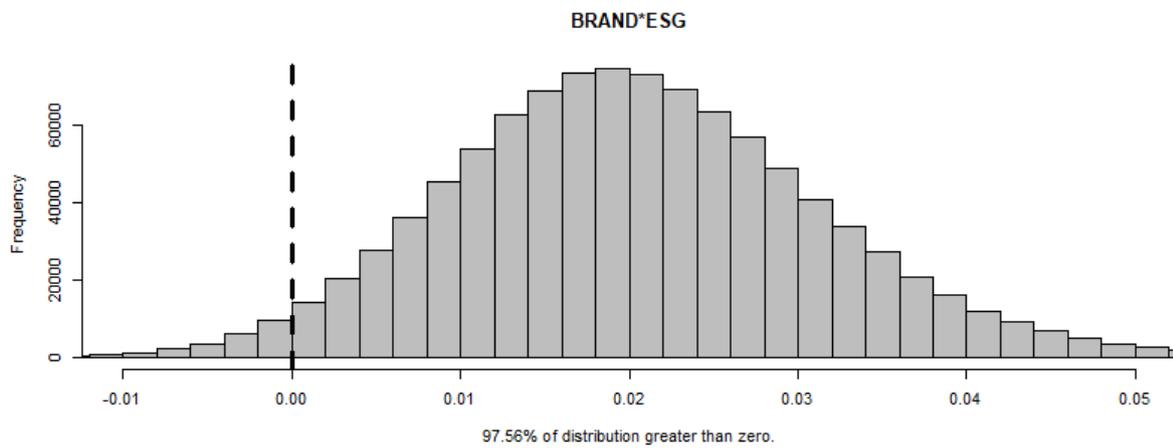
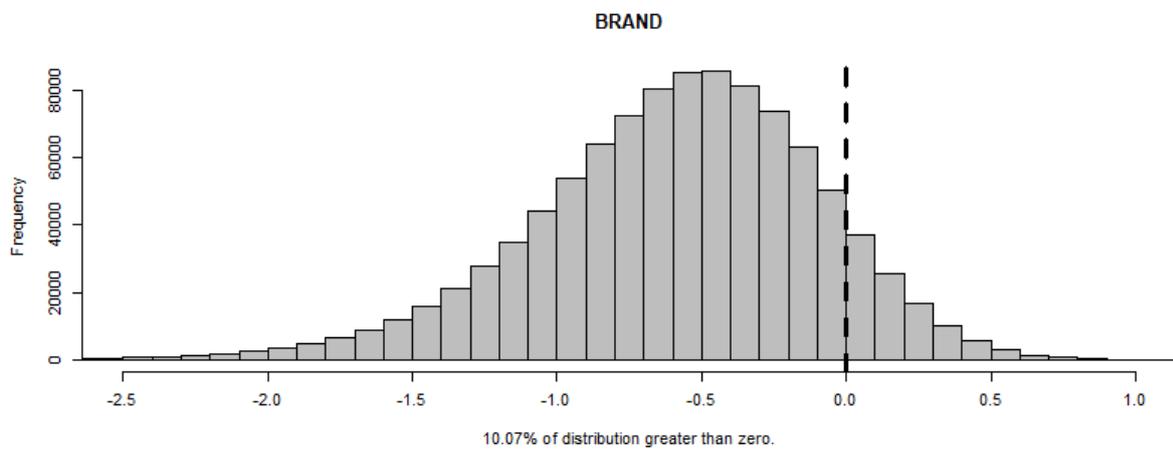
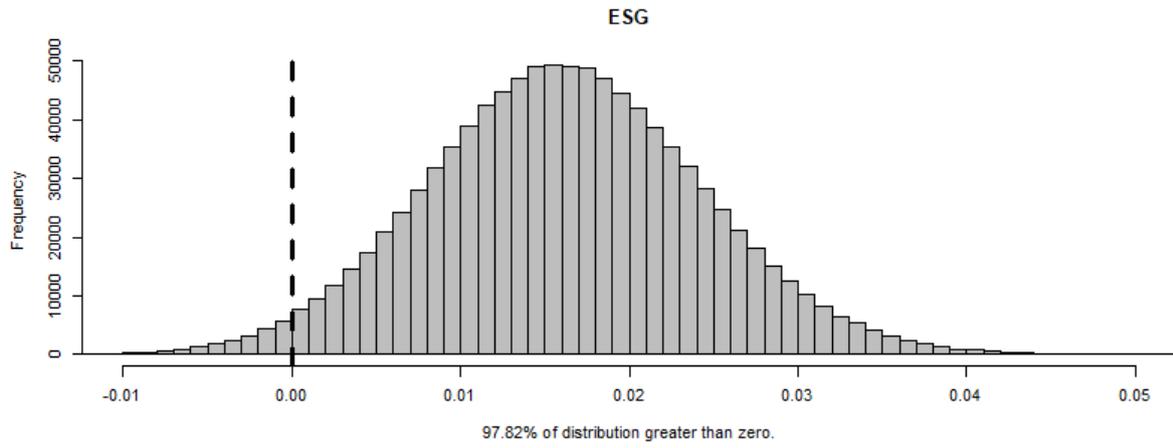
* ** *** p<0.01

Table 8: Results from additional robustness checks [1] and [2], to control for concerns of endogeneity and lagged effects. Control variables are not reported for brevity. All models include year, industry and region fixed effects.

	<i>Dependent variable:</i>			
	GREEN_BOND (=1)			
	Endogenous brand choice		Lagged brand effects	
	(1)	(2)	(3)	(4)
	<i>Full</i>	<i>Stepwise</i>	<i>Full</i>	<i>Stepwise</i>
BRAND	-0.539 (0.412)	-0.442 (0.403)		
BRAND_LAG			-0.510 (0.500)	-0.443 (0.491)
ESG	0.010 (0.012)	0.014** (0.007)	0.012 (0.009)	0.011 (0.009)
BRAND:ESG	0.019** (0.009)	0.017* (0.009)		
BRAND_LAG:ESG			0.023** (0.011)	0.021* (0.011)
Observations	1,934	1,934	1,289	1,289
Log Likelihood	-764.065	-766.756	-506.520	-508.138
Akaike Inf. Crit.	1,584.131	1,565.512	1,065.040	1,048.277
Chi-square test	Pass	Pass	Pass	Pass
Pseudo R ²	0.111	0.101	0.116	0.113

Note: * p < 0.05 ** p < 0.01 *** p < 0.001

Figure (1): Bootstrap coefficient distributions for main coefficients of interest, robustness check [3]. Note that the results are based on B=1,000,000 bootstrap replications of the ‘general’ model in column (3) of Table (3).



Appendices

A1: Types and examples of green bonds that have been issued.

Type	Proceeds raised by bond sale are	Debt recourse	Example
"Use of Proceeds" Bond	Earmarked for green projects	Recourse to the issuer: same credit rating applies as issuer's other bonds	EIB "Climate Awareness Bond" (backed by EIB); Barclays Green Bond
"Use of Proceeds" Revenue Bond or ABS	Earmarked for or refinances green projects	Revenue streams from the issuers though fees, taxes etc are collateral for the debt	Hawaii State (backed by fee on electricity bills of the state utilities)
Project Bond	Ring-fenced for the specific underlying green project(s)	Recourse is only to the project's assets and balance sheet	Invenergy Wind Farm (backed by Invenergy Campo Palomas wind farm)
Securitisation (ABS) Bond	Refinance portfolios of green projects or proceeds are earmarked for green projects	Recourse is to a group of projects that have been grouped together (e.g. solar leases or green mortgages)	Tesla Energy (backed by residential solar leases); Obvion (backed by green mortgages)
Covered Bond	Earmarked for eligible projects included in the covered pool	Recourse to the issuer and, if the issuer is unable to repay the bond, to the covered pool	Berlin Hyp green Pfandbrief; Sparebank 1 Bolligkredit green covered bond
Loan	Earmarked for eligible projects or secured on eligible assets	Full recourse to the borrower(s) in the case of unsecured loans. Recourse to the collateral in the case of secured loans, but may also feature limited recourse to the borrower(s).	MEP Werke, Ivanhoe Cambridge and Natixis Assurances (DUO), OVG
Other debt instruments	Earmarked for eligible projects		Convertible Bonds or Notes, Schuldschein, Commercial Paper, Sukuk, Debentures

Source: <https://www.climatebonds.net/market/explaining-green-bonds>

Table A1: List of green bond issuers included in the ‘Brands to Green’ sample.

500 Georgia Office Partnership	ABN Amro Bank NV	Acciona Financiacion Filiales Sau
Alliander NV	Apple Incorporated	Arise AB
Atrium Ljungberg AB	Bahia Sul HLDG GmbH	Banco Nacional de Costa Rica
Bank of America Corporation	Bank of China Ltd (London Branch)	Bank of China Ltd (Luxembourg Branch)
Bank of China Ltd (New York Branch)	Bank Sinopac Company Ltd	Berlin Hyp AG
BKK AS	Bpce SA	BRF SA
Castellum AB	City Developments Limited	Cooperatieve Centrale Raiffeisen Boerenleenbank BA
Credit Agricole Corporate and Investment Bank SA	CTBC Bank Company Ltd	Deutsche Kreditbank AG
Digital Realty Trust LP	DNB Bank ASA	E Sun Commercial Bank Ltd
Electricite de France SA	Energia Eolica SA	Engie SA
Enna Energia SRL	Entra ASA	Fabege AB
Fastighets AB Forvaltaren Fortum Varne Holding	Fibria Overseas Finance Limited	Fonciere des Regions SA
Samagt MED STHLMS Stad Publ	AB Georgia Power Company	Goldwind New Energy HK Investment Ltd
Green Bancorp Inco	Greenko Investment Company	Hera SpA
HSBC France SA	Hyundai Capital Services Incorporated	Iberdrola Finanzas SA
Iberdrola International BV	Icpf Finance Pty Ltd	ING Bank NV
Innovatec SpA	Intesa Sanpaolo SpA	Inversiones CMPC SA
Investa Office Fund	Kaiser Foundation Hospitals	KGI Bank Company Ltd
Latvenergo AS	Link Finance Cayman 2009 Ltd	LM Group Holding AS
LTC GB Limited	Lyse AS	Mexico City Airport Trust
Mitsubishi UFJ Financial Group Incorporated	Modern Land China Company Ltd	Morgan Stanley
MTR CI Corporation Ltd	National Australia Bank Limited	National Bank of Abu Dhabi
Nomura Research Institute Limited	Nordea Bank AB	NRG Yield Operating LLC
NTPC Limited	NYA Svensk Fastighetsfinansiering Publ AB	Paprec Holding SA
Pattern Energy Group Inco	QBE Insurance Group Limited	Rapid Holding GmbH
Regency Centers Limited Partnership	Rikshem Publ AB	Rodamco Sverige AB

SBAB Bank Publ AB	SCA Hygiene AB	Scatec Solar ASA
Schneider Electric SE	Shanks Group PLC	Skandinaviska Enskilda Banken AB
Skanska Financial Services AB	Societe Generale SA	Solarcity Corporation
Southern Power Company	Stangastaden AB	Stockland Trust Management Limited
Sumitomo Mitsui Banking Corporation	Svensk Fastighetsfinansiering II Publ AB	Tennet Holding BV
Terraform Global Operating LLC	Terraform Power Operating LLC	Turkiye Sinai Kalkinma Bankasi AS
Unibail Rodamco SE	Unilever PLC	United Photovoltaics Group Ltd
Uppsalahem AB	Vardar AS	Vasakronan Publ AB
Verbund AG	Vestas Wind Systems A/S	Vornado Realty LP
Wallenstam AB	Westar Energy Incorporated	Westpac Banking Corporation