BANCA D'ITALIA
EUROSISTEMA

Temi di discussione

(Working Papers)

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July 2026

Number 1538

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ISSN 2281-3950 (online)

Designed by the Printing and Publishing Division of Banca d'Italia

GREEN IS THE NEW BLACK

by Alessandro Moro* and Andrea Zaghini**

Abstract

Donald Trump's re-election and the United States' renewed withdrawal from the Paris Agreement marked a deterioration in the US green bond market: the share of green bonds in the US market dropped from 1.7 per cent in the pre-Trump period to just 0.6 per cent thereafter. Using a difference-in-differences approach, we estimate a decline of 4.4-6.0 percentage points in the probability of issuing green bonds and a reduction of $20-28 million in monthly green bond issuance per issuer. At the same time, the greenium – the typically negative yield spread between green and conventional bonds with similar characteristics – turned positive. This shift in the greenium, coupled with a decline in issuance, points to weakened investor demand for green assets, likely driven by both reduced environmental concerns and less optimistic outlook for environmentally conscious firms. The impact of Trump's re-election and policies on green bonds was stronger in the US than in other markets, highlighting diverging trajectories in sustainable finance at the international level.

JEL Classification: G11, G12, Q51, Q54, Q56.

Keywords: sustainable finance, green bonds, greenium, political shocks, Trump's presidency.

DOI: 10.32057/0.TD.2026.1538

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1 Introduction[1]

In line with expectations following his re-election on November 5, 2024, and consistently with his campaign slogan "Drill, baby, drill", the US President Donald Trump withdrew from the Paris Agreement on his first day in office (January 20, 2025). The withdrawal marks a significant shift in US climate policy. As the second-largest emitter of greenhouse gases after China, the US plays a pivotal role in global climate governance. A renewed emphasis on fossil fuel production is therefore likely to hinder international efforts to mitigate climate change. Moreover, the altered stance on environmental sustainability affects investors' sentiment about the valuation of firms' outlook and green financial assets.

This study focuses on the effects of the re-election of President Trump on the green bond market, a debt instrument specifically designed to finance environmentally beneficial projects. In the months following the November 2024 election, the US primary bond market continued the expansion started in the second half of 2023, whereas the green bond segment experienced a sharp reduction in placement volumes. Although this decline is part of a broader global trend, it appears to be more pronounced in the US market.

By employing a difference-in-differences (DID) approach, we find that the probability of issuing a green bond in the US market declined after Trump's election by about 5 percentage points. In addition, the value of the green placements shrank by 20 to 28 USD million per issuer-month, causing more than a halving of the already low green share of the US bond market, from 1.7 per cent to 0.6 per cent.

At the same time, the yield on green bonds increased. We estimate that the greenium (the

[1]The views expressed in the paper are those of the authors and do not involve the responsibility of the Bank of Italy. We thank Massimiliano Affinito, Lorenzo Braccini, Antonio Di Cesare, Matilde Faralli, Fabrizio Ferriani, Raffaela Giordano, Angela Gattulli, Marco Taboga, and two anonymous referees of the Banca d'Italia's Working Paper Series for their insightful comments and suggestions.

spread between the yield on a green bond and the yield on an otherwise similar traditional bond, that is typically negative) deteriorated in the US market relatively more than in other markets, by an overall 69-78 basis points range. Following Trump's re-election, this increase was large enough to push the greenium into positive territory.

Since both issuance volumes and bond prices declined, our evidence supports the view that US green bonds faced a demand shock. While investors' environmentally oriented preferences are unlikely to vanish following the election of a less climate-oriented administration, political shifts can affect the valuation of green assets through well-defined economic and institutional channels. In the context of President Trump's re-election, at least three mechanisms are particularly relevant. First, the renewed withdrawal of the United States from the Paris Agreement represents a negative shock to the credibility of long-term climate commitments. For green bonds, whose value critically depends on the expected policy environment over long maturities, the weakening of international climate commitments increases regulatory uncertainty and reduces the expected benefits associated with financing green projects. Second, the re-election altered expectations about domestic climate-related policies, including subsidies, tax incentives, and public support for renewable energy and low-carbon investments. A less supportive policy outlook lowers the expected cash flows and growth prospects of environmentally oriented firms, thereby reducing the attractiveness of green bonds, even for investors with weak or no environmental preferences. Third, changes in political priorities may undermine the perceived enforcement of green standards and reporting requirements, increasing uncertainty about the environmental integrity of green labels. This mechanism reduces investors' willingness to accept a lower return on green bonds, as concerns about greenwashing become more salient in the absence of strong regulatory oversight. Through these channels, the political shock operates primarily on the demand side

of the green bond market, consistently with the joint decline in issuance volumes and bond prices documented in the empirical analysis.

Our paper contributes to the empirical literature on the pricing of green bonds and the geoeconomics of green financial markets. Several studies estimate the cost advantage of issuing green bonds to finance climate-related projects, either through regression-based approaches (Ehlers and Packer, 2017; Baker et al., 2022; Zaghini, 2024; Moro and Zaghini, 2025) or a statistical matching method (Zerbib, 2019; Fatica and Panzica, 2021; Flammer, 2021; Caramichael and Rapp, 2024, Fricke and Meinerding, 2025). They usually report a negative premium in favour of green bonds, thus suggesting that investors have environmentally-oriented non-pecuniary motives that make them renounce to part of the return when financing a green project. Within this strand of research, Moro and Zaghini (2025) show that the greenium tends to be larger (more negative) in advanced economies than in emerging markets. Their findings further suggest that the financial advantage of issuing green bonds in advanced economies is associated with open capital accounts and stronger adherence to the rule of law. According to our results, the political reversal under the President Trump administration has eroded, at least partially, this comparative advantage for the US market.

We also add to the literature examining how political shocks affect financial markets, with a particular focus on the implications of Trump's presidency and policy agenda. Wagner et al. (2018) finds that the stock market's response to Trump's 2016 election aligned with expectations of substantial corporate tax cuts,[2] while Nerger et al. (2021) shows that the weakening of environmental regulation enforcement led to significant positive abnormal returns in the coal sector. Interestingly, despite elevated political uncertainty following the

[2]Specifically, firms facing high tax burdens and those with large deferred tax liabilities saw gains, while companies with deferred tax assets from net operating losses experienced losses. Firms oriented toward the domestic market outperformed those with a global focus.

election, market volatility remained subdued, breaking a pattern observed over the previous decade and surprising many analysts. Pastor and Veronesi (2017), building on their theoretical model (Pastor and Veronesi, 2012, 2013), argue that this muted response was due to the conflicting and ambiguous nature of the new administration's communications, which made it difficult for investors to form clear expectations. Focusing on the 2024 electoral campaign and looking at opinion polls, Albori et al. (2024) find that a higher probability of Trump's election increases volatility in the US bond market, while it reduces equity market volatility and oil prices, and boosts stock prices. This suggests that financial markets anticipated the new Trump administration to be more market-oriented than Biden's, with less emphasis on environmental issues and public debt sustainability. Instead, focusing on market developments in the aftermath of the election, Ferriani et al. (2025), relying on a novel firm-level textual measure, document significant positive abnormal returns for companies aligned with Trump's policy agenda.

Studying more specifically the effects of Trump's election on green markets, Ramelli et al. (2021) investigate the cross-section of stock returns after 2016. They show that carbon-intensive firms benefited from Trump's election, but they also report that companies displaying a high level of climate responsibility benefited as well, because investors expected more stringent climate policies from the future administrations. Instead, Cosma et al. (2025) document just a quick shift in US stock market valuations following the 2024 election, as investors reallocated capital toward firms perceived as less environmentally conscious, anticipating policies favoring "brown" sectors. In line with their findings, the evidence presented in this paper suggests that Trump's re-election in 2024 also affected the bond segment of green finance, triggering a substantial decline in investor demand for green bonds.

The rest of the paper is organised as follows. Section 2 presents the data used and

illustrates some stylized facts. Section 3 analyses the impact of Trump's re-election on green bond issuance in the US. Section 4 quantifies the effect on the pricing of US green bonds. Section 5 performs some robustness checks. Finally, Section 6 concludes.

2 Data and stylized facts

To assess the impact of President Trump's re-election on green bond issuance, we construct a comprehensive dataset covering both green and conventional bond placements in global primary markets from January 2021 to August 2025. This time span allows us to compare developments during the Biden presidency with those observed after the November 2024 presidential election.

Bond-level information is sourced from three complementary providers: Dealogic DCM Analytics, LSEG Data & Analytics, and Bloomberg. From Dealogic DCM Analytics we obtain, for each bond issuance, the ISIN code, pricing date, green bond label, credit rating, maturity, issued amount, currency of denomination, issuer identity, and the issuer's business sector classified at the two-digit SIC level. The annualized yield to maturity at issuance is retrieved from LSEG Data & Analytics and Bloomberg. Using the ISIN code, we also identify the market of issuance. Table 1 reports the summary statistics of the main variables employed in the regression analysis split between United States and Rest of the World.

Preliminary evidence points to a marked contraction in the US green bond segment following President Trump's re-election in November 2024. As illustrated in Figure 1 (upper panel), green bond placements in the United States declined sharply, in contrast to the broader US primary bond market, which continued the expansion initiated in the second half of 2023 before stabilizing in April-May 2025. While the slowdown in green bond issuance

Table 1: Summary statistics: Treated vs Control Sample

	United States			Rest of the World		
Variable	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.
yield (units)	19,732	5.52	1.71	32,335	4.37	2.82
value (millions)	19,704	454.0	2734	32,335	288.3	897
maturity (days)	19,732	3580	4762	32,335	2973	7978
Investment Grade (dummy)	19,732	0.95	0.21	32,335	0.94	0.24
Collateralized (dummy)	19,732	0.28	0.45	32,335	0.12	0.33
Callable (dummy)	19,732	0.44	0.50	32,335	0.20	0.40
Subordinated (dummy)	19,732	0.17	0.38	32,335	0.05	0.21
Bond rating (0-20)	18,732	17.51	3.81	19,407	15.14	3.56
Issuer rating (0-20)	14,172	17.61	3.67	17,636	15.21	3.23

reflects a global trend, its intensity is considerably stronger in the US. The lower panel of Figure 1 shows that, relative to an October 2024 baseline, the US green bond issuance index fell by roughly 40 percent by mid-2025, a substantially larger contraction than that observed in Europe or in the rest of the world (excluding the US). Consistent with this evidence, the share of green bonds in total US bond issuance dropped from an already modest 1.7 percent in the pre-election period to just 0.6 percent thereafter.

3 Effects on green bond issuance

3.1 The estimation methodology

We quantify the causal effect of President Trump's re-election on green bond issuance using a difference-in-differences (DID) framework. The dataset is collapsed at the issuer $\times$ month level, and issuance activity in the US market is compared with two alternative control groups: (i) the global market excluding the United States, and (ii) the European market.[3] The

[3]The European market is defined as the aggregate of the international European market, the domestic markets of the 27 EU Member States, and the markets of Great Britain, Norway, and Switzerland.

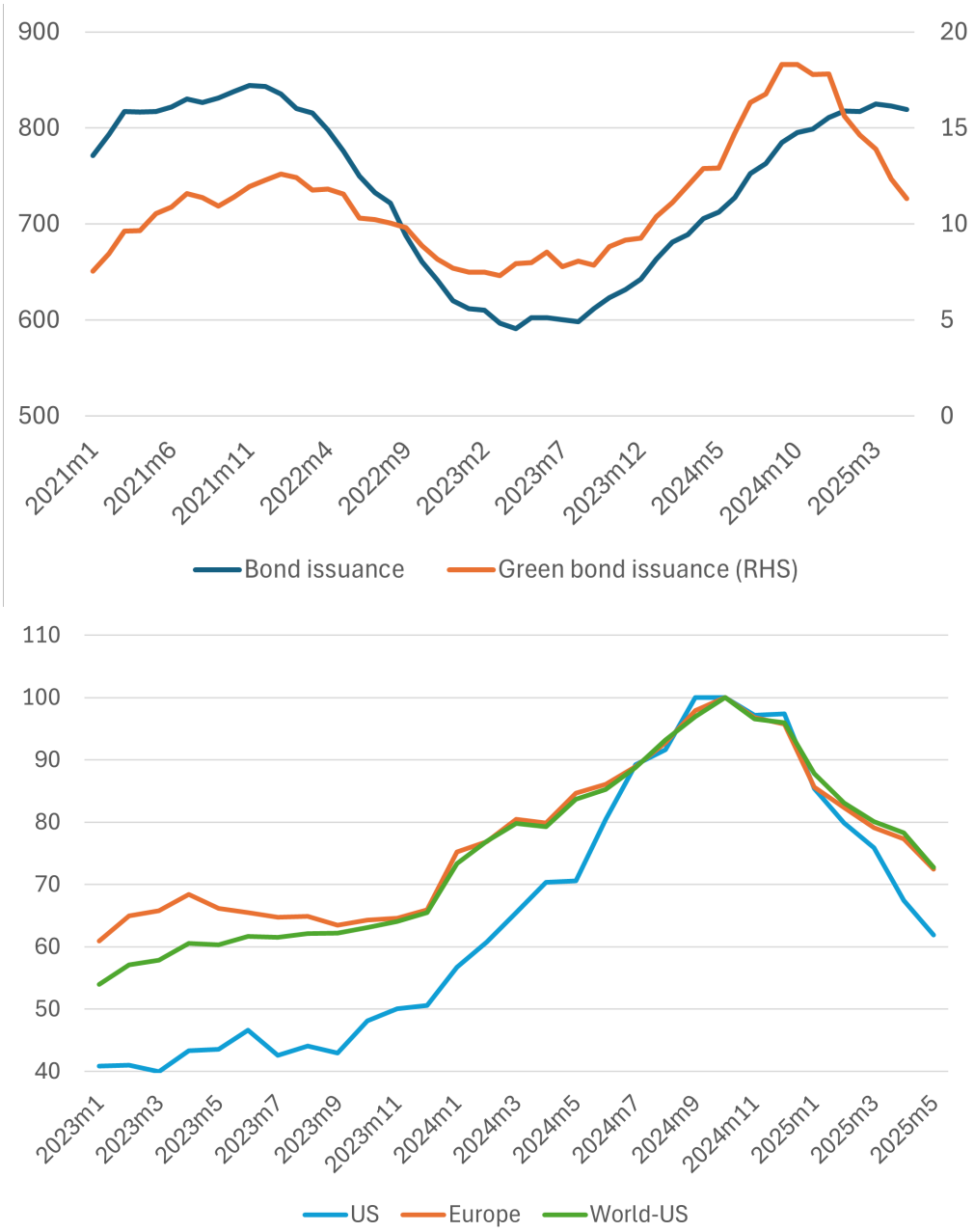

Figure 1: Volume of placements. Upper panel: total bond issuance and green bond issuance in the US market (USD billion, twelve-month moving average). Lower panel: green bond issuance in the US, World excluding US, Europe, index (October 2024=100), twelve-month moving average.

baseline quantity regressions are estimated using the full sample from January 2021 onward, allowing us to compare green bond issuance during the Biden presidency with the post-election period following President Trump's re-election.[4]

We focus on two key outcomes commonly employed in the sustainable finance literature: (i) the probability that an issuer places at least one green bond, capturing participation at the extensive margin; and (ii) the total volume of green bond issuance, capturing activity at the intensive margin. Specifically, we estimate the following Probit model for the probability that issuer i, operating in sector s, issues a green bond in market m at time t:

$$\Pr(GB_{i,s,m,t} = 1) = \Phi\left(\beta_0 + \beta_1 US_m + \beta_2 Post_t + \beta_3 US_m \times Post_t + \gamma_s + \delta_m + \lambda_t + \varepsilon_{i,s,m,t}\right), \tag{1}$$

where $\Phi(\cdot)$ denotes the cumulative distribution function of the standard normal distribution. The indicator US_m identifies issuance in the US market, $Post_t$ is a dummy equal to one for the post-election period (November 2024-May 2025), and γ_s, δ_m, and λ_t denote sector, market, and time fixed effects, respectively. Standard errors are clustered at the issuer's sector level.

To analyse issuance volumes, we estimate the following Ordinary Least Squares (OLS) specification for the total value of green bonds issued by issuer i in sector s, market m, and month t ($GBI_{i,s,m,t}$):

$$GBI_{i,s,m,t} = \beta_0 + \beta_1 US_m + \beta_2 Post_t + \beta_3 (US_m \times Post_t) + \gamma_s + \delta_m + \lambda_t + \varepsilon_{i,s,m,t}. \tag{2}$$

[4]For the sake of consistency with the price regressions proposed in the following sections, we employ the sample up to May 2025.

3.2 Results

The upper panel of Table 2 presents the results obtained using the global (non-US) market as the control group. Across all specifications, the coefficient on the interaction term $US \times Post$ is negative and statistically significant. In the Probit estimates (columns 1 and 2), the probability that US-based issuers place a green bond declines by approximately 4.4-4.7 percentage points following President Trump's re-election. Consistently, the OLS estimates (columns 3 and 4) indicate a reduction of about USD 28 million in monthly green bond issuance per issuer.

The negative and statistically significant coefficient on the US dummy in the Probit model (column 1) further indicates that, even before the 2024 presidential election, issuers operating in the US market were less likely to issue green bonds than their counterparts elsewhere.

The *Post* dummy is also negative and significant, suggesting that Trump's re-election may have generated spillover effects beyond the United States. While the largest contraction is observed among US issuers, the political shift appears to have influenced green financing activity internationally as well. The US withdrawal from the Paris Agreement may have weakened global coordination on climate policies and increased uncertainty about future regulatory support for sustainable finance. If this interpretation holds, our estimates are likely to represent a lower bound of the overall adverse effect of Trump's re-election on green bond issuance in the United States.

When the European market is employed as control group, the estimated effects on the probability of green bond issuance are even more pronounced. The $US \times Post$ coefficient in the Probit model (Table 2, columns 1 and 2) implies a decline of roughly 5.7-6.0 percentage points, while the reduction in issuance volumes (columns 3 and 4) amounts to approximately

Table 2: Changes in probability and volume of placement of green bonds in the US market after Trump's election (monthly data, January 2021–May 2025). Estimates of the probability of placing a green bond are reported in columns (1) and (2), estimates of the placement volume are reported in columns (3) and (4). In the upper panel the control sample is the global market excluding US, in the lower panel is the European market. Marginal effects. Cluster-robust standard errors at the issuer's sector level in parentheses. Significance level: *** p<0.01; ** p<0.05; * p<0.1.

	(1) Prob. of GB issuance	(2) Prob. of GB issuance	(3) GB issuance (USD mn.)	(4) GB issuance (USD mn.)
Control Group: Rest of the World (54,247 observations)				
US	-0.0575***		0.0624	
	(0.015)		(9.435)	
Post	-0.0196***		-13.62***	
	(0.004)		(4.280)	
US x Post	-0.0471***	-0.0441***	-28.07***	-27.62***
	(0.015)	(0.014)	(8.948)	(8.731)
Control Group: Europe (30,541 observations)				
US	-0.0936***		-38.02**	
	(0.019)		(14.494)	
Post	-0.0111*		-21.57**	
	(0.006)		(8.838)	
US x Post	-0.0605***	-0.0567***	-20.93**	-20.06**
	(0.013)	(0.013)	(9.586)	(9.453)
Sector FE	YES	YES	YES	YES
Market FE	NO	YES	NO	YES
Time FE	NO	YES	NO	YES

USD 20 million per issuer-month. The more negative coefficient on the US dummy confirms that, relative to European issuers, US firms were already substantially less engaged in green finance prior to President Trump's re-election. Finally, the negative and significant *Post* coefficient confirms that the election may have contributed to a broader slowdown in green bond issuance, including the European market.

The estimated effects are robust across alternative specifications and sample definitions. Indeed, the main results are unchanged when narrowing the time window around the 2024

election, using alternative control groups, and allowing for flexible dynamic patterns in issuance through an event-study specification (Section 5).

4 Effect on green bond yields

4.1 The estimation methodology

In order to assess the effect of President Trump's re-election on US green bond prices we must rely on an appropriate identification strategy. In particular, while remaining in the econometric framework of difference-in-differences (DID) by Wooldridge (2007), we take a step further in the analysis. We move from the traditional DID estimator, that, as is well known, takes into account one control group, to the triple difference estimator (DDD), that instead takes into account two control groups. The rationale for employing two control groups lies in the need to isolate the effect of the treatment from broader trends that may confound the analysis. For example, suppose that in the six months following the US presidential election, the yield on US green bonds increased by 50 basis points relative to conventional bonds. At first glance, this differential might be interpreted as a causal effect of the election outcome. However, such an inference would be unwarranted without accounting for global trends in green bond performance. If, over the same period, green bonds issued in other markets also outperformed their conventional counterparts by a similar margin, the observed yield differential in the US could simply reflect a global shift in investor preferences or changed market conditions, rather than a country-specific response to the election. Incorporating a second control group – green bonds issued outside the US – allows for a more credible identification strategy by differencing out such common shocks.

The DDD methodology is perfectly suited to the task of assessing whether the US green

bond prices were differently affected by the domestic election with respect to other markets. As shown by Olden and Møen (2022), the DDD estimator can be interpreted as the difference between two DID estimators. The first estimating the difference between US green bonds and US non-green bonds after Trump's election; the second estimating the difference between green bonds and non-green bonds placed in other markets, over the same time span. In other words, the triple difference estimator of the change in the yield on US green bonds after Trump's election comes net of the change happened to green bonds in the rest of the world.

Analytically, we estimate the following model for the yield of bond b, issued by issuer i, in currency c, at time t:

$$\begin{aligned} Yield_{b,i,c,t} = \beta_0 &+ \beta_1 Green_b + \beta_2 US_b + \beta_3 Post_t + \beta_4 (Green_b \times US_b) \\ &+ \beta_5 (Green_b \times Post_t) + \beta_6 (US_b \times Post_t) + \beta_7 (Green_b \times US_b \times Post_t) \\ &+ \alpha X_{b,i,c,t} + \gamma_i + \lambda_{c,t} + \varepsilon_{b,i,c,t} \end{aligned} \tag{3}$$

where $Yield_{b,i,c,t}$ is the annualized yield to maturity at issuance, $Green_b$ is a dummy variable tracking green bonds, $X_{b,i,c,t}$ are bond controls (issuance volume, maturity, rating, frequency of coupon, dummies for fixed-rate, collateralized and callable bonds), γ_i are issuer-specific fixed effects, $\lambda_{c,t}$ are currency per time fixed effects.[5] The coefficient of interest is β_7, that provides the estimate of President Trump's effect on US green bonds, net of the change in the US non-green bonds and the overall development of green bonds placed elsewhere. Regressions are run via weighted OLS regressions for three different treated and control samples: the US market vs the global bond market (excluding US); the US vs the European market; the US non-financial corporations vs European non-financial corporations.

[5]Since time fixed effects capture all time-specific shocks common to all units, the $Post_t$ dummy becomes collinear with them and is thus not separately identified in the model.

As in the previous analysis, bond characteristics are sourced from Dealogic DCM Analytics, yields from LSEG Data & Analytics and Bloomberg. However, the dataset preserves its original granularity at the bond level, and the regression sample spans the period from January 2024 to August 2025. Compared to issuer-level aggregations, the use of bond-by-bond data allows us to focus on a narrower time window centered around the November 2024 presidential election. This higher-frequency approach improves identification by reducing the scope for confounding factors unrelated to the political event and by capturing more precisely the immediate market response.

The OLS weights are obtained from an entropic matching procedure implemented before running the DDD estimations, in order to make green and non-green bonds more comparable (Hainmueller, 2012). The entropic algorithm induces a re-weighting of a dataset such that the covariate distributions in the re-weighted data satisfy a set of specified conditions on selected moments of the variables in both the treated and the control groups. The method boils down to delivering a set of matching weights for each unit in the sample that forces given metrics to hold. On this respect, we select which of the first three moments (mean, variance, and skewness) of each of the chosen covariates, has to match between the treated group (green bonds) and the control group (traditional bonds). In particular, the entropic rebalancing can be seen as a generalization of a propensity score weighting. In the latter methodology, one would first estimate the unit weights and then compute balance checks to make sure that the estimated weights indeed equalize the covariate distributions. The entropic algorithm tackles the matching problem from the opposite side, i.e., it estimates the weights directly from the imposed restrictions on the moments of the covariates. Instead of checking ex-post whether an accurately estimated score has managed to balance the covariates, the entropy exploits the knowledge of the sample moments of the covariates and requires that the sample

moments in the re-weighted control group exactly match the corresponding moments in the treatment group. In this way, ex-post balance checking is no longer necessary.[6]

We selected the following variables to be matched: value placed; maturity at issuance; quarter of issuance; dummy for collateralized bonds; dummy for subordinated bonds; dummy for callable bonds; currency of denomination; issuer rating; issuer business sector. For dummies and discrete variables we required the first moment to be matched, while for the continuous variables also the second moment had to be matched.

4.2 Results

When the global bond market is employed as control group, estimation results show that before Trump's re-election there was a greenium of 10.6 basis points worldwide (Table 3, Column 1). However, in the six-month period after the US election, the Green x Post coefficient suggests a significant deterioration of the premium of around 13 basis points. Was this deterioration felt the same way in the US market? To answer this question, we must look at the coefficient β_7 in equation 3. As mentioned, β_7 is the post-Trump effect on US green bonds net of the change on global green bonds. The Green x US x Post estimate indicates that green bonds placed in the US recorded a further large deterioration of 68 basis points.

To assess the overall deterioration experienced by US green bonds and get an estimate of the value of the US greenium before and after Trump's re-election, several coefficients have to be compared. Following Olden and Møen (2022), we have that the value of the greenium before Trump is given by $(\beta_1+\beta_4)$; the value of the greenium after Trump by $(\beta_1+\beta_4+\beta_5+\beta_7)$; the overall deterioration by $(\beta_5+\beta_7)$. The estimated values so computed, together with the

[6]See Tsang et al. (2024), Yu et al. (2024), Di Tommaso et al. (2025), Fornari et al. (2026) for recent contributions in the green finance literature relying on the entropic matching approach.

Table 3: Estimates of the DDD model for the evolution of the US yield on green bonds versus non-green bonds and versus other markets. Cluster-robust standard errors at the currency level in parentheses. Significance level: *** p<0.01; ** p<0.05; * p<0.1.

	(1)	(2)	(3)
VARIABLES	World	Europe	NFCs
Green	-0.1058*	-0.1575*	-0.0919*
	(0.0543)	(0.0884)	(0.0529)
US	-0.4554***	-0.4822***	0.0452
	(0.1496)	(0.1561)	(0.0387)
Green x US	-0.1822***	-0.1733***	-0.2740***
	(0.0425)	(0.0571)	(0.0489)
Green x Post	0.1288**	0.1680*	0.1355***
	(0.0568)	(0.0906)	(0.0294)
US x Post	0.4102***	0.4685***	0.2277***
	(0.0762)	(0.1069)	(0.0516)
Green x US x Post	0.6846***	0.6601***	0.6377***
	(0.0446)	(0.0786)	(0.0479)
Pre-Trump US greenium	-0.2881***	-0.3308***	-0.3659***
	(0.0342)	(0.0389)	(0.0517)
Trump's effect	0.8134***	0.8281***	0.7732***
	(0.0285)	(0.0236)	(0.0324)
Post-Trump US greenium	0.5254***	0.4974***	0.4073***
	(0.0342)	(0.0311)	(0.0669)
Observations	49,428	34,356	8,090
R-squared	0.831	0.773	0.907
Bond Controls	YES	YES	YES
Issuer FE	YES	YES	YES
Currency x Month FE	YES	YES	YES

standard errors, are reported in the lower panel of Table 3. The change in the US greenium is striking. In the period following Trump's election, green bonds placed in the US market experienced a deterioration in the spread with respect to traditional bonds of 81 basis points. This worsening is so large that the greenium turned from a negative value of 29 basis points to a positive value of 53 basis points. The loss is large also in economic terms: given that the unconditional average yield on bonds placed in the US market over the period taken into

account is 5.5 per cent, the post-election positive premium amount to an additional cost of funding of around 10 per cent for environmentally friendly projects.

These results are confirmed when taking into account the European market as the second control group (Column 2). With respect to the deterioration of the European green segment by 17 basis points (Green x Post), the β_7 coefficient suggests a further worsening in the US market by 66 basis points. This in turn leads to an overall decline in the US greenium by 83 basis points and to the switch from a negative to a positive premium of 50 basis points. Results do not change even when focusing on more restricted and homogeneous samples of US and European non-financial corporations (NFCs) only. Column 3 shows that the overall effect on US green bonds stands at 77 basis points.

From the DDD estimations thus emerges that after Trump's re-election green bonds in the US market experienced a significant repricing with respect to non-green bonds. The repricing was so strong that the yield on green bonds increased much more than that on traditional bonds leading to a sign reversal of the spread: the greenium, usually negative, turned into the positive territory.

Additional robustness checks, reported in Section 5, confirm that the main pricing results are insensitive to alternative treatment periods, samples, and benchmark elections.

5 Robustness

5.1 Sample period in quantity regressions

As a robustness check, we re-estimate the baseline Probit and OLS models for green bond issuance using a shorter sample period spanning January 2024 to August 2025, i.e. a window more tightly centered around President Trump's re-election. This exercise addresses concerns

related to potential confounding dynamics affecting sustainable finance markets during the post-pandemic period. Indeed, investors tend to increase their allocation to green assets during periods of economic and financial distress (Alessi et al., 2023), as observed during the pandemic, when a more negative greenium was documented, followed by a gradual attenuation in subsequent years (Liberati and Marinelli, 2025). By focusing on a narrower time span, we reduce the influence of medium-run changes in investors' preferences and macro-financial conditions, thereby sharpening the identification of the electoral shock. Importantly, this period coincides with the sample used in the greenium analysis presented in Section 4, ensuring consistency across the quantity and pricing dimensions of the empirical investigation.

When the rest of the world (excluding the US) is used as the control group (Table 4, upper panel), the interaction term between the US market indicator and the post-election dummy remains negative and statistically significant in both the Probit and OLS specifications. Relative to non-US issuers, US firms experience a sharp decline in the probability of issuing green bonds following Trump's re-election, as well as a substantial contraction in issuance volumes. The magnitude of the estimated effects is comparable, and in some specifications even larger, than those obtained using the longer sample period, confirming the robustness of the main findings.

When Europe is used as the control group (lower panel), the negative and statistically significant effect of the $US \times Post$ interaction persists for the probability of green bond issuance, indicating a sustained contraction at the extensive margin relative to European issuers. In contrast, the effect on issuance volumes is no longer statistically significant. This result suggests that, within the shorter time window, the primary adjustment relative to Europe operates through participation rather than issuance size.

Taken together, these findings confirm that the core result of the paper–a pronounced

Table 4: Changes in probability and volume of placement of green bonds in the US market after Trump's election (monthly data, January 2024–May 2025). Estimates of the probability of placing a green bond are reported in columns (1) and (2), estimates of the placement volume are reported in columns (3) and (4). In the upper panel the control sample is the global market excluding US, in the lower panel is the European market. Marginal effects. Cluster-robust standard errors at the issuer's sector level in parentheses. Significance level: *** p<0.01; ** p<0.05; * p<0.1.

	(1) Prob. of GB issuance	(2) Prob. of GB issuance	(3) GB issuance (USD mn.)	(4) GB issuance (USD mn.)
Control Group: Rest of the World (20,922 observations)				
US	-0.0348		8.335	
	(0.024)		(15.162)	
Post	-0.0384***		-25.53***	
	(0.004)		(8.395)	
US x Post	-0.0737***	-0.0619***	-38.08**	-33.82*
	(0.024)	(0.022)	(18.053)	(17.430)
Control Group: Europe (10,997 observations)				
US	-0.0812**		-36.22*	
	(0.035)		(19.741)	
Post	-0.0452***		-44.27***	
	(0.006)		(13.713)	
US x Post	-0.0810***	-0.0788***	-19.57	-17.26
	(0.025)	(0.024)	(15.802)	(15.411)
Sector FE	YES	YES	YES	YES
Market FE	NO	YES	NO	YES
Time FE	NO	YES	NO	YES

and election-driven retreat of US issuers from the green bond market–does not depend on the inclusion of longer-run post-pandemic dynamics and remains robust across alternative sample periods and control groups.

5.2 Parallel trends in quantity regressions

To assess the validity of the parallel trends assumption underlying our difference-in-differences design, we estimate an event-study specification that allows for a flexible dynamic response of green bond issuance around the November 2024 presidential election. Specifically, we replace the post-election indicator with a full set of bimonthly time dummies constructed relative to the election date and interact each of them with the US market indicator. Time is discretized into bimesters spanning several periods before and after the election.

We first focus on the extensive margin by estimating the following event-study Probit model for the probability that issuer i, operating in sector s, issues at least one green bond in market m during bimester t:

$$\Pr(GB_{i,s,m,t} = 1) = \Phi\left(\sum_{\tau} \beta_{\tau} \left(US_m \times Bim_{\tau,t}\right) + \sum_{\tau} \gamma_{\tau} Bim_{\tau,t} + \gamma_s + \delta_m + \varepsilon_{i,s,m,t}\right), \quad (4)$$

where $Bim_{\tau,t}$ is a dummy equal to one if period t falls in bimonth τ relative to the election date. The coefficients β_{τ} capture, for each bimester τ, the difference in the probability of green bond issuance between US and non-US issuers.

To analyze dynamics along the intensive margin, we estimate an analogous event-study specification using OLS for the total value of green bonds issued:

$$GBI_{i,s,m,t} = \sum_{\tau} \beta_{\tau} \left(US_m \times Bim_{\tau,t}\right) + \sum_{\tau} \gamma_{\tau} Bim_{\tau,t} + \gamma_s + \delta_m + \varepsilon_{i,s,m,t}. \quad (5)$$

This event-study framework provides a direct assessment of the parallel trends assumption. Under the identifying hypothesis, the coefficients β_{τ} associated with the pre-election

bimesters should display no systematic differences and remain stable over time, indicating the absence of differential pre-trends between US and non-US issuers prior to the election.

Figure 2 reports the estimated β_τ coefficients for the Probit (upper panel) and OLS specifications (lower panel), respectively, together with 95% confidence intervals. In both figures, the coefficients in the pre-election period are small in magnitude and statistically indistinguishable from zero, supporting the absence of differential pre-trends between US and non-US issuers. Consistent with visual inspection, formal tests fail to reject the null hypothesis that the pre-election coefficients are jointly equal to zero, supporting the validity of the parallel trends assumption.[7]

Following the November 2024 election, however, a sharp and persistent decline emerges. This effect is particularly pronounced in the Probit specification, indicating a stronger and more immediate contraction at the extensive margin, i.e. in the probability that US issuers access the green bond market. The corresponding decline in issuance volumes, shown in the OLS specification, is also negative and persistent, though somewhat more gradual.

The consistency of the dynamic patterns across the extensive and intensive margins confirms that the contraction in green bond issuance by US issuers coincides with President Trump's re-election and is unlikely to be driven by pre-existing trends. Overall, this evidence supports the validity of the identification strategy and strengthens the causal interpretation of the baseline difference-in-differences estimates.

[7]The p-values of the formal test for the joint non-significance of the coefficients are equal to 0.196 for the Probit specification and 0.141 for the OLS regression, respectively.

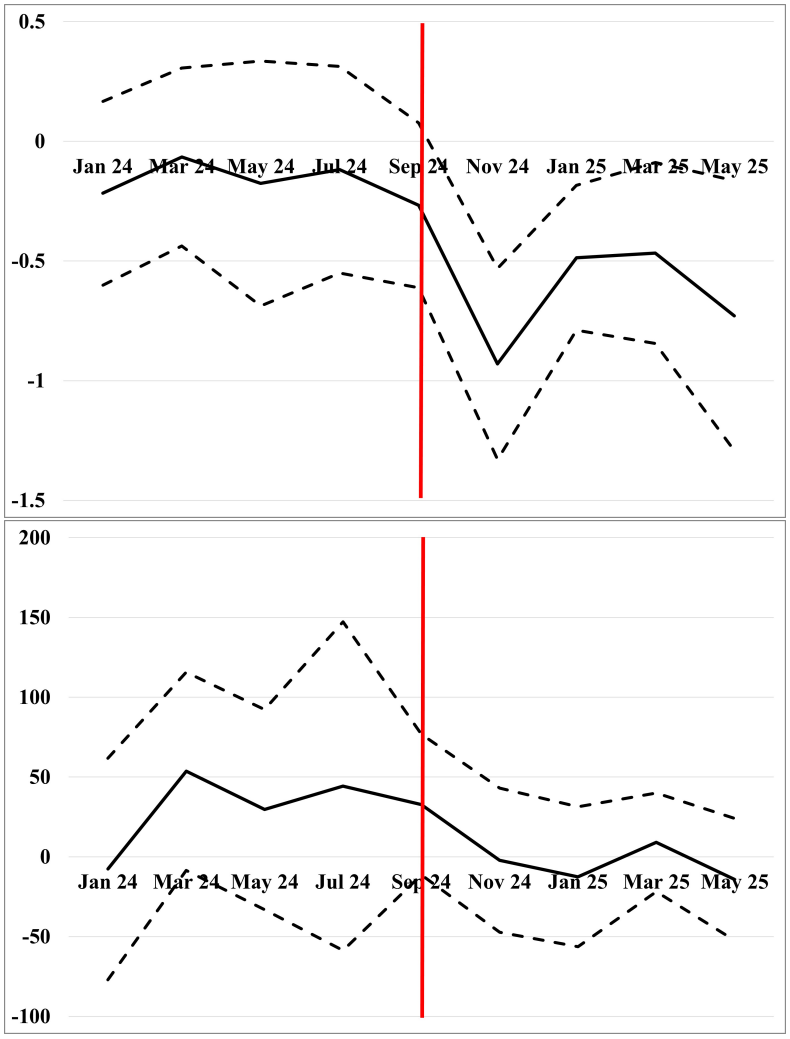

Figure 2: Event-study estimates of the effect of President Trump's re-election on green bond issuance. Upper panel: estimated coefficients β_τ from the Probit specification, capturing the differential probability of green bond issuance in the US relative to the control group across bimesters. Lower panel: corresponding event-study coefficients from the OLS specification for green bond issuance volumes. Dashed lines denote 95% confidence intervals.

5.3 Parallel trends in yield regressions

As reported above, to support a causal interpretation of the effects of President Trump's election on green bond yields, it is important to verify the parallel trend assumption for the

groups of treated and non-treated bonds in the pre-treatment period, that is at the base of the DID approach (Wooldridge, 2007). However, when relying on the DDD framework, there are two groups of non-treated bonds, one from each DID in which the DDD can be decomposed (Olden and Møen, 2022). We thus run the following regression for both the set of bonds placed in the US market and the set of bonds placed worldwide (excluding the US):

$$Yield_{b,i,c,t} = \sum_{\tau} \beta_{\tau} \left(Green_b \times Bim_{\tau,t} \right) + \sum_{\tau} \gamma_{\tau} Bim_{\tau,t} + \alpha X_{b,i,c,t} + \varepsilon_{b,i,c,t}. \tag{6}$$

where all the variables are defined as in Eq. (3) and $Bim_{\tau,t}$ are dummy variables tracking the bimesters in the period under analysis. The coefficients of interest are the β_{τ} up to the fifth bimester in 2024: they estimate the yield difference between green and non-green bonds in the pre-election period. They are reported in Figure 3 together with the 95% confidence interval, for both the US market (upper panel) and the rest of the world (lower panel).

Even though not a formal test, the visual inspection suggests that the difference between green and non-green bonds was not showing any trend. In both panels, the four changes recorded between the five consecutive bimesters before November 2024 do not show more than two consecutive changes in the same direction, and in the top panel they are equally split into two increases and two decreases. In addition, a formal F-test for both regressions confirms that the pre-election coefficients are jointly equal to zero.[8] The gathered evidence thus supports the parallel trend assumption for the whole DDD framework.

Interestingly, in the period after Trump's re-election, there emerges a different behaviour between the two markets. While in the US the yield difference significantly moves into positive territory and there it remains, the effect is of a lesser magnitude and short-lived in the rest of the world. This evidence is fully in line with the results provided in the baseline

[8]The p-value of the F-test stands at 0.772 for the US sample and 0.091 for the Rest of the World.

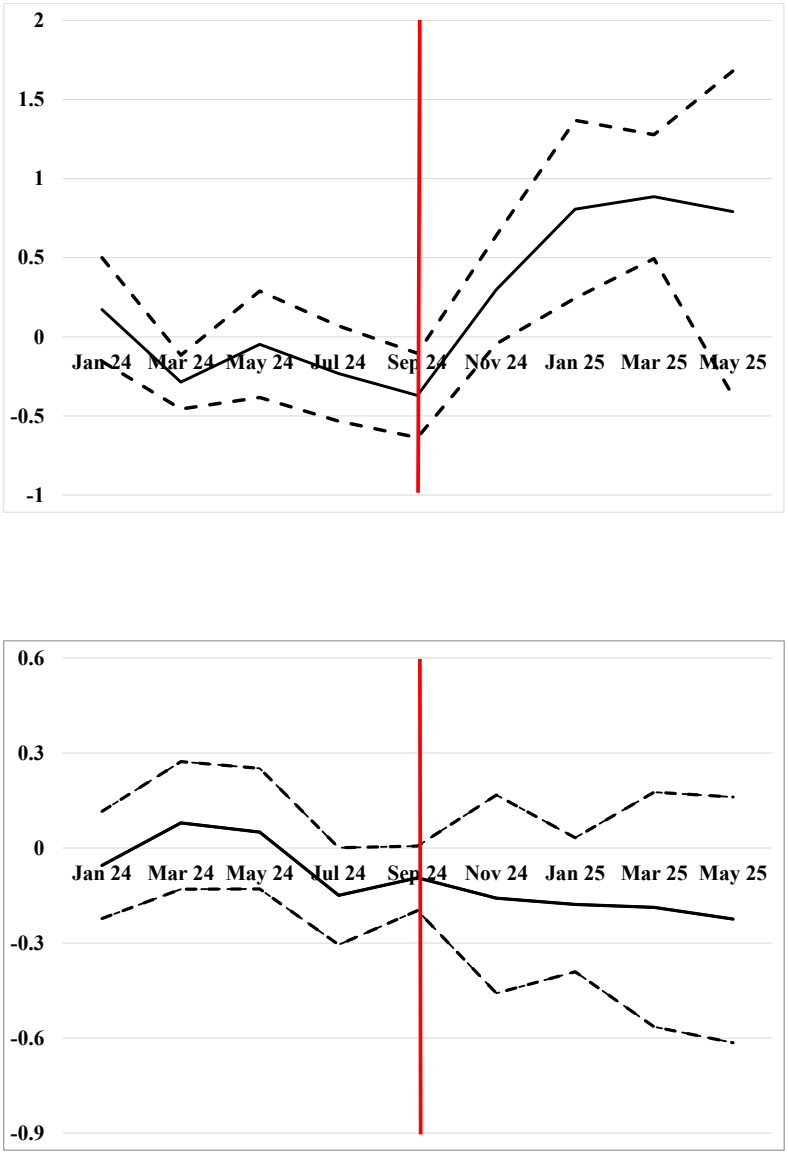

Figure 3: Event-study estimates of the effect of President Trump's re-election on green bond yields: estimated coefficients δ_s from equation 6. Upper panel: US market. Lower panel: Rest of the world; 95% confidence interval (dashed lines).

estimations.

5.4 Treatment period in yield regressions

In this section we propose two robustness checks concerning the treatment period in yield regressions. The first is about the length of the treatment period: 9 months instead of the 6-month baseline period. The second regards the starting point of the treatment period: 20 January, 2025 (the first day of office for President Trump) instead of 5 November, 2024 (the election day) in the baseline.

The first three columns in the upper panel of Table 5 show a structure of the estimations very close to the baseline scenario built on the 6-month period after the 2024 election results. At the same time, the lower panel indicates that the negative effect of President Trump is still strong after 9 months from election day: the positive premium on US green bonds ranging between 38 and 42 basis points.

Columns 4 to 6 report instead the coefficient estimates when the first day of office of President Trump is taken into account as a starting moment of the treatment period. Even though there were no reasons to believe that once appointed President Trump would not implement the policy measures proposed in the electoral campaign, the very first set of 26 executive orders left no doubt about his commitment. However, despite the fact that most likely the decisions about environmental sustainability were already anticipated by market participants,[9] the estimates are in line with the baseline scenario whatever international sample is taken into account. The deterioration in the yield on US green bonds let the greenium turn largely positive, in the 39-47 basis points range.

[9]Indeed, as shown in the upper panel of Figure 3, the yield spread on US green bonds deteriorated already in the last bimester of 2024. This development is correctly taken into account by the baseline regressions.

Table 5: Estimates of the DDD model for the evolution of the yield on green bonds placed in the US market versus non-green bonds and versus other markets. 9-month period after the election day (5 November, 2024) in columns 1 to 3; 6-month period after the first day of office of President Trump (20 January, 2025) in columns 4 to 6. Cluster-robust standard errors at the currency level in parentheses. Significance level: *** p<0.01; ** p<0.05; * p<0.1.

	9-month after 5 Nov 2024			**6-month after 20 Jan 2025**		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	World	Europe	NFC	World	Europe	NFCs
Green	-0.1146**	-0.1577**	-0.0553	-0.1144**	-0.1616**	-0.0593
	(0.0501)	(0.0780)	(0.0441)	(0.0504)	(0.0780)	(0.0481)
US	-0.4761***	-0.5222***	0.0319	-0.4797***	-0.5246***	0.0278
	(0.1311)	(0.1325)	(0.0354)	(0.1354)	(0.1362)	(0.0324)
Green x US	-0.2000***	-0.1703***	-0.2570***	-0.2027***	-0.1720***	-0.2619***
	(0.0397)	(0.0435)	(0.0403)	(0.0410)	(0.0469)	(0.0413)
Green x Post	0.1160**	0.1607**	0.1185**	0.1302	0.1800**	0.1375***
	(0.0506)	(0.0781)	(0.0419)	(0.0529)	(0.0832)	(0.0387)
US x Post	0.4362***	0.5024***	0.2451***	0.4283***	0.5003***	0.2318***
	(0.0720)	(0.0939)	(0.0471)	(0.0691)	(0.0922)	(0.0433)
Green x US x Post	0.5737***	0.5773***	0.6142***	0.5817***	0.5821***	0.6540***
	(0.0480)	(0.1372)	(0.0415)	(0.0414)	(0.0754)	(0.0448)
Pre-Trump US greenium	-0.3144***	-0.3280***	-0.3123***	-0.3171***	-0.3336***	-0.3213***
	(0.0419)	(0.0509)	(0.0694)	(0.0362)	(0.0433)	(0.0652)
Trump's effect	0.6897***	0.7380***	0.7327***	0.7119***	0.7621***	0.7915***
	(0.0532)	(0.0354)	(0.0088)	(0.0578)	(0.0274)	(0.0137)
Post-Trump US greenium	0.3753***	0.4050***	0.4204***	0.3949***	0.4285***	0.4702***
	(0.0513)	(0.0639)	(0.0694)	(0.0445)	(0.0403)	(0.0716)
Observations	60,528	42,355	10,172	56,713	39,541	9,488
R-squared	0.823	0.766	0.909	0.829	0.773	0.908
Bond Controls	YES	YES	YES	YES	YES	YES
Issuer FE	YES	YES	YES	YES	YES	YES
Currency*Month FE	YES	YES	YES	YES	YES	YES

5.5 Markets and elections

While just around 5 per cent of bonds from American issuers are placed outside the US market, the share of bonds placed by foreign issuers in the US market is much larger at 17 per cent. A check of the results of the previous Section is provided in Table 6 (columns 1-3), where instead of looking at the US market, we focus on American placements. In other

words, with respect to the baseline sample, we do not take into account the 17 per cent of foreign issues in the US market, while we include the 5 per cent of bonds placed by American issuers elsewhere.

Table 6: Estimates of the DDD model for the evolution of the yield on US green bonds versus non-green bonds and versus other markets. Bonds placed by American issuers in columns 1 to 3; bonds placed in the US market around the first Trump election (20 November, 2016) in columns 4 to 6. Cluster-robust standard errors at the currency level in parentheses. Significance level: *** p<0.01; ** p<0.05; * p<0.1.

	US issuers (2024 election)			**1st Trump's election (2016)**		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	World	Europe	NFC	World	Europe	NFCs
Green	-0.0957*	-0.1273*	-0.1773	-0.4994**	-0.4493**	0.1125
	(0.0483)	(0.0739)	(0.1192)	(0.2057)	(0.2298)	(0.1035)
US	-0.1654**	0.7094***	0.2999**	-0.3111**	-0.4123***	-0.2005***
	(0.0694)	(0.0526)	(0.3494)	(0.1518)	(0.1421)	(0.0255)
Green x US	-0.3170***	-0.2983**	0.3016	0.2233	0.3691	-0.3935***
	(0.0991)	(0.1134)	(0.2778)	(0.1864)	(0.2734)	(0.1001)
Green x Post	0.1680*	0.2050	0.2054***	0.0206	-0.0387	-0.1909***
	(0.0954)	(0.1357)	(0.0434)	(0.1287)	(0.1020)	(0.0118)
US x Post	0.0777**	0.5062***	0.0541	-0.3552***	-0.3881***	-0.0360
	(0.0368)	(0.0776)	(0.1453)	(0.0502)	(0.0533)	(0.0282)
Green x US x Post	0.5173***	0.4746***	0.0684***	-0.1063	0.1427	0.3945***
	(0.0665)	(0.1109)	(0.1311)	(0.1509)	(0.1374)	(0.0558)
Pre-Trump US greenium	-0.4127***	-0.4255***	-0.1602***	-0.1978	-0.0803	-0.2810***
	(0.1277)	(0.1535)	(0.0259)	(0.1659)	(0.2316)	(0.0263)
Trump's effect	0.6852***	0.6796***	0.8291***	0.0891	0.1040	0.2037***
	(0.1366)	(0.1394)	(0.1116)	(0.1329)	(0.1537)	(0.0515)
Post-Trump US greenium	0.2726***	0.2541***	0.6689***	-0.1087	0.0238	-0.0773*
	(0.0671)	(0.0514)	(0.0259)	(0.2683)	(0.1258)	(0.0499)
Observations	48,428	28,059	6,126	54,938	42,212	7,089
R-squared	0.830	0.762	0.891	0.822	0.773	0.955
Bond Controls	YES	YES	YES	YES	YES	YES
Issuer FE	YES	YES	YES	YES	YES	YES
Currency*Month FE	YES	YES	YES	YES	YES	YES

Estimation results confirm that after President Trump's re-election: 1) there was a significant deterioration of green bond prices worldwide (β_5 ranging from 17 to 21 basis points); 2) American green bonds fared worse than global and European green bonds (β_7 ranging from

47 to 62 basis points); 3) the overall effect is so large that the American greenium switched from negative to positive (lower panel).

A different exercise is proposed in the last three columns of Table 6, where the focus of the analysis is centered on the first Trump's election in November 2016. We consider the time period from January 2016 to September 2017. We use this period both as a placebo test for the baseline estimations and as a benchmark of comparison with the extant literature on the first Trump election.

Besides the fact that the outcome of the election day on 8 November 2016 was a surprise, the policy changes proposed in Trump's first presidential program were so vast that there was uncertainty not only about the speed of realization, but also about the actual implementation of the reforms. In addition to dismantle the environmental protection rules introduced during the Obama presidency and exit the Paris Agreement, among Trump's key policy proposals were a decrease in the corporate tax rate, the expensing of capital expenditures with limits on interest deductions, the increase in tariffs to protect American businesses, the taxation of accumulated foreign earnings.

It is thus not a surprise that, as already mentioned in the Introduction, the results of the literature about the financial market developments in that period are somewhat mixed. For instance, Mukanjari and Sterner (2024) while finding a negative reaction of renewable and alternative energy stocks prices, they surprisingly do not find a positive effect for the coal industry, with only oil and gas benefiting of abnormal returns. On the other hand Ramelli et al. (2021) find that investors reacted to Trump's election by rewarding the coal industry and other carbon-intensive firms. At the same time, they suggest that investors also sustained companies demonstrating more responsible climate strategies: rather than penalizing green firms, they continued to reward them – possibly reflecting a persistent market endorsement of

the environmental policy framework inherited from the previous Democratic administration.

When the two largest samples are employed (global and European markets), the DDD regression results from equation (3) show that the first Trump's election had a very limited impact on the green segment of the US bond market. Indeed, most of the coefficients are statistically not significant, including β_7 (Table 6, column 4 and column 5). Instead, when the more restricted and uniform sample made by NFCs only is employed to compare the US and the European green issuance, results are more similar to the 2024 election. The β_7 coefficient is positive and significant and the overall Trump effect for the segment of US green bonds reduces the greenium from 28 to 7 basis points (column 6).

Thus, at least for the last sample, we have a result different from that reported by Ramelli et al. (2021) for US equity market and more in line with Mukanjari and Sterner (2024). Investors immediately penalized the placement of green bonds, most likely perceiving a discontinuity with the previous administrations. However, the perception was not so strong as in the aftermath of the second Trump election.

6 Concluding remarks

After the re-election, President Trump withdrew the US from the Paris Agreement, signalling a major shift in climate policy. This move, coupled with a renewed focus on fossil fuel production, raised concerns about the global effort to mitigate climate change and influenced investor sentiment, particularly in the green finance sector.

In the case of the US green bond market, we provide evidence consistent with a demand shock, that typically occurs when both prices and quantities decrease. In the six-month period following election day, we estimate a significant drop in both the probability of issuance

and the amount placed per month (i.e., a drop in the equilibrium quantities). At the same time this contraction was accompanied by a deterioration in the pricing conditions of green bonds (i.e., a drop in the equilibrium prices). The deterioration was so strong that it even triggered a sign reversal of the usually negative green bond premium.

The combined effect of reduced issuance and higher yields most likely reflects a weakening of investor appetite for green assets, driven by diminished expectations of regulatory support and climate leadership. Overall, our findings highlight the sensitivity of sustainable finance to political signals that are able to affect market expectations about the earnings prospects of the green sector, and underscore the importance of credible and stable climate policies in sustaining investor engagement and market development.

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