How to Explore the Potential of Green Bonds?

—Based on Propensity Score Matching Method

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Abstract

Green bonds, as one of the core tools of green finance, have rapidly developed into a large-scale and far-reaching financial market since the first green bond was issued in 2007. As a direct financing channel for green projects, green bonds have promoted the rapid development of green finance in China, and under the background of "dual carbon", the demand for green bonds in China has increased significantly. In fact, the Chinese green bond investment market has vast development space. However, due to its late start and immature development, there are doubts about whether green bonds can play a positive role in enhancing the company's value. Therefore, it is urgent to conduct in-depth analysis of the impact of the company's issuance of green bonds on its value. In this paper, we used Tobin's Q to measure company value, and used panel data to explore the impact of issuing green bonds on company value through propensity score matching method. It explored the significant improvement effect of issuing green bonds and increasing their intensity on company value; and then, by analyzing the mediating effect on the impact mechanism of company value, efforts are made to discover that green bonds can enhance company value by alleviating financing constraints and improving information transparency. Finally, based on the conclusions drawn, reasonable suggestions are proposed, which have practical reference value for the development of the green bond market and the construction of a green financial system.

Keywords

Green Bonds, Corporate Value, Financing Constraints, Information Transparency

1. Background and Issues

According to the Climate Bond Initiative (CBI), the total global issuance of green bonds reached $415 billion in the first three quarters of 2023, an increase of 3.23% from $402 billion in the same period last year. From the perspective of issuance regions, Germany, China, and the United States rank among the top three in terms of global green bond issuance scale, with Germany ranking first with the issuance scale of 56.9 billion US dollars (Yao Haifeng, 2024) [1]. Looking at the development of China's bond market, according to statistics from the Climate Bond Initiative (CBI), the global proportion of China's green bond issuance from 2016 to 2023 is 15%. According to statistics from China Ecological Network, the issuance of green bonds will exceed 830 billion yuan in 2023. At the end of 2023, the balance of green loans in domestic and foreign currencies was 30.08 trillion yuan, a year-on-year increase of 36.5%. Among them, loans invested in projects with direct and indirect carbon emission reduction benefits accounted for 67.3% of green loans. As of the end of 2023, the total credit granted for climate investment and financing pilot projects in 23 regions is 455.384 billion yuan. As of the end of 2023, there are 1815 Chinese green bonds in existence, with a total bond balance of 2.1 trillion yuan. If we consider bonds that are not labeled but actually invested in the green sector, the overall amount of "invested in green" bonds exceeds 5 trillion yuan. In the past two years, China's green bond issuance scale has consistently ranked first in the world. Especially since entering 2024, green bond funds have been favored by funds, with a total of nearly 38 billion yuan raised through five new products. Among them, Morgan Asset Management's Morgan Common Catalog Green Bond Fund has raised nearly 6 billion yuan. At the same time, several public funds have submitted green bond funds awaiting approval. Institutions believe that with the continuous maturity of the green finance market and sustained policy support, the value of green themed investments is significant.

In September 2020, China first proposed at the United Nations General Assembly to achieve the goals of "peak carbon emissions" by 2030 and "carbon neutrality" by 2060. Guided by the "dual carbon" goal, promoting green development of China's economy will be the theme of the future. In China, the energy industry has the highest carbon emissions, with about 80% of carbon emissions coming from the energy industry according to statistics. However, the development of the energy industry faces both opportunities and challenges. The development of energy-saving technologies lags behind, new energy lacks competitive advantages, and there is a huge funding gap in the research and development of energy-saving and emission reduction technologies, as well as equipment updates and renovations. Therefore, it is necessary to accelerate the development of green finance and promote the green development of the energy industry. Given that China's green bond market started relatively late and has not yet matured, although it still has great development prospects, potential risks cannot be ignored. Therefore, what is the best way to cultivate the potential of green bonds? And how to control its risks is a very necessary and major issue.

From a practical perspective, studying the new financing method of green bonds can provide reference for clean energy enterprises to alleviate their financial difficulties. In addition, through internal research on the impact mechanism of company value, issues such as financing constraints, information transparency, and research and development innovation can be reflected, which has practical significance for the government to introduce policies, the regulation and sustainable development of the green bond market, the financing effects and innovation of enterprises, the understanding of investment participants, and green sustainable development.

2. Literature and Review

The references closely related to the research topic of this paper can be mainly divided into two categories: the first category is mainly based on research cases dissecting specific green bonds, and the second category is mainly based on empirical analysis with a large amount of data statistical analysis.

2.1. Case Analysis

Li Jiawei (2024) [2] analyzed the motives and effects of BYD Co., Ltd.'s (Build Your Dream Corporation Limited) green bond financing based on an investment philosophy that comprehensively considers environmental, social, and corporate governance factors from an ESG perspective. The analysis results show that BYD has issued green bonds for two consecutive years due to environmental benefits, green brand image, and alleviation of mismatched investment and financing periods. At the environmental level, BYD has reduced the emission density of greenhouse gases through green projects, thereby reducing the harm of production activities to the ecological environment. At the level of corporate governance, BYD closely follows the green policy orientation and occupies an important position in the new energy market, effectively reducing risks in supply chain management in both supply and demand dimensions. Ye Peijie *et al.* (2024) [3] used Industrial Bank's green bonds as an example to analyze the current situation of commercial bank's green bonds. They studied the risks of Industrial Bank's green bonds from bond interest rate risk, credit risk, liquidity risk, etc., and proposed risk management strategies for Industrial Bank's green bonds under the background of big data, thereby guiding commercial banks to establish and improve green credit mechanisms and enhance environmental investment levels. Yao Haifeng (2024) [1] took Beijing Bank as an example and proposed a complete set of paths and prevention strategies for the impact of green bonds on bank risks. There are still many literature on similar case studies, for example, Yang Minglu *et al.* (2024) [4] studied the case of BAIC Green Debt; Du Limin and Lu Yang *et al.* (2024) [5] take the "23 TianYing GK" bond as an example.

2.2. Empirical Analysis

Green financing activities in the environmental protection industry cover project

investment, financing, operation, and risk management services in the fields of environmental protection, energy conservation, clean energy, green transportation, and construction. Feng Wei (2024) [6] believes that with the increasing severity of global environmental problems and the growing popularity of sustainable development concepts, the funding demand for the environmental protection industry continues to grow, especially in areas such as clean energy, green transportation, and green buildings. As the investment scale of projects continues to expand, the demand for green financing is also increasing. Liu Lijun and Shen Cuiwei (2024) [7] used a multi time difference in differences model to examine the impact of green bond issuance on the debt financing scale of real enterprises based on data from listed companies from 2018 to 2023. The research results indicate that issuing green bonds has expanded the scale of debt financing for real enterprises; In terms of mechanism, the issuance of green bonds has improved the ESG performance of enterprises, played an intermediary role in ESG, and expanded the debt financing scale of physical enterprises; The effect of issuing green bonds to expand the scale of corporate debt financing has heterogeneity in corporate property rights, which is significant in state-owned enterprises but significantly reduced in non-state-owned enterprises; The effect of issuing green bonds to expand the scale of corporate debt financing has heterogeneity in enterprise size, which is significant in large-scale enterprises but not significant in small-scale enterprises.

Zekai Şenol, *et al.* (2025) [8] employed a series of methods, including quantile-on-quantile return connectedness (QQC), cross-quantilogram (CQ), and Granger causality in quantiles (GC), which allow us to make inferences about the safe-haven ability of green bonds. Their results included that the connectedness at directly related quantiles is more pronounced than those of inversely related quantiles for all cases; The degree of return connectedness is highest with conventional bonds, followed by gold and stocks; Green bonds act as the net transmitter of spillover shocks to Bitcoin and gold markets, whereas it serves as the receiver of shocks from the remaining markets; Their CQ results indicate that positive returns in green bonds significantly follow negative returns in conventional bonds 5 days later, suggesting that green bonds have a one-week lagged safe-haven ability. Their GC from green bonds is bidirectional and mostly intensified in extreme quantiles with oil, cryptocurrencies, and conventional stocks, but unidirectional and visible with Islamic stocks during market downturns.

The existing literature on the impact of green bonds on corporate value is mainly based on empirical analysis of data from listed companies, and most of them have concluded that they have a positive impact. Wang Qian *et al.* (2021) [9] used regression models to study mixed panel data of listed companies issuing green bonds, and concluded that issuing green bonds can have a positive impact on company value, and the proportion of green bonds has a stacking effect on value enhancement; Ma Yaming and Hu Chunyang (2020) [10] concluded that issuing green bonds can dynamically enhance a company's value based on the DID model; Wu Yuhui *et al.* (2020) [11] used bond issuing companies from 2009

to 2019 as a sample and found that issuing green bonds can generate good industry spillover effects; Lu Xuechun (2022) [12] constructed a model using PSM method and also concluded that issuing green bonds has a significant effect on increasing the company's value. At the level of financing constraints, scholars pay their attention to the impact mechanism on company value through financing constraints. Ning Jinhui *et al.* (2021) [13] found that green bonds reduce maturity mismatches by alleviating financing constraints based on the basic principle of maturity matching; Huang Huaji *et al.* (2022) [14] used companies that issue green bonds and ordinary bonds as sample data to measure the operational efficiency of listed companies through the DEA-BCC model. At the same time, they analyzed the role of financing constraints using mediation effects and found that green bonds can improve the operational efficiency of companies by reducing financing constraints, promoting corporate transformation and upgrading, and reducing operating costs; Wang Qian *et al.* (2021) [9] also found through empirical research that green bonds have a mediating effect of increasing company value by reducing financing constraints.

In terms of information transparency, Qi Huaijin (2021) [15] used "green" labeled bonds issued within China from 2016 to 2019 as the research object to examine the impact mechanism of green premiums, and found that information disclosure is an important channel affecting green premiums; Li Hongwei (2017) [16] used the mediating effect to test the transmission law of media supervision affecting company value through information disclosure level, revealing the transmission path of "media supervision environmental information disclosure company value". Lu Ahui *et al.* (2021) [17] also found a positive relationship between information transparency and company value.

2.3. Literature Review

Against the backdrop of global efforts to address climate change and environmental challenges, green finance, as an important tool for promoting sustainable economic development, is increasingly receiving attention from governments and financial institutions around the world. Since the reform and opening up, the industrialization process has accelerated, and people have begun to realize that there is an undeniable contradiction between ecological protection and economic development, making environmental pollution a focus of public attention. Nowadays, the automotive industry urgently needs to invest in the research and development of new energy technologies. In its development process, green bond financing has gradually gained attention and favor from the industry. Due to the fact that China only officially issued green bonds in 2016, the research time on green bonds in China is relatively short, and the quantity and content are far behind those related to ordinary bonds and stocks. Existing literature mainly focuses on empirical analysis and financial institutions, lacking case studies on non-financial institutions, especially clean energy companies, issuing green bonds. Secondly, it has been fully demonstrated that issuing green bonds can increase a company's value, but most companies measure their value based on stock prices.

Considering the dual role of the capital market and corporate debt, Tobin's Q is more suitable for measuring company value to eliminate the impact of stock market fluctuations; In addition, there is a lack of research on the combination of corporate value and its impact mechanism, and the relationship between green bond intensity and corporate value is relatively scarce. On the basis of the above literature, in this paper, we firstly used Tobin's Q to measure company value, and uses panel data to explore the impact of issuing green bonds on company value through propensity score matching method, as well as whether the issuance of green bonds and the increase in intensity have a significant effect on company value; Secondly, by analyzing the mediating effect on the impact mechanism of company value, efforts are made to discover the potential of green bonds, that is, to what extent they can enhance company value by alleviating financing constraints and improving information transparency.

3. Data and Empirical Analysis

3.1. Data and Variables

3.1.1. Data Processing

In this paper, we choose the propensity score matching model to do the test of whether to issue green bonds and its intensity on the company value. Firstly, we screen the companies listed in A-share and issued green bonds from 2014 to 2023, totaling 272 companies. The selected data are treated as follows: (A) Excluding listed companies in the financial industry; (B) Excluding companies containing missing variables; (C) Excluding delisted companies. Finally, 82 companies remain. At the same time, A-share listed companies with the same year and industry as the above 82 companies but without issuing green bonds are selected, and 1208 companies are left after being sorted out according to the above treatment.

3.1.2. Variable Settings

All the selected company financial variables are summarized in Table 1:

Table 1. Summary of the selection of variables and their interpretation.

Variable type	Variable name	Notation	Annotations
Explained variable	Company value	*Q_inc*	Tobin's Q growth rate
Explanatory variable	whether to issue green bonds	*Gre*	the company issued green bonds is assigned a value of 1, otherwise 0
	issuance intensity of green bond	*GST*	size of green debt/total debt greater than the mean is assigned a value of 1, otherwise 0
Intervening variable	financing constraints	*SA*	−0.737 * company size + 0.043 * company size^2 −0.04 * age of company
	information transparency	*Tra*	information disclosure evaluations A-D are assigned in order 4-1
Control variable	growth capacity	*Gro*	revenue growth rate
	return on assets	*ROA*	net profit/total assets
	company size	*Size*	natural logarithm of total assets at the end of the period
	financial leverage	*LEV*	total liabilities/total assets

3.1.3. Descriptive Statistics

The results of descriptive statistics for all variables in the treatment group are shown in Table 2.

As shown in Table 2, the mean and median of the financial data of all the selected companies are controlled within a reasonable range, and the outliers have less influence on the data. This indicates that most of the companies issuing green bonds are operating well and meet the study's requirements.

Table 2. Table of descriptive statistics for treatment group.

Variable	Observed quantity	Mean	Median	Standard deviation	Minimum	Maximum
Q_inc		−0.034	−0.012	0.083	−0.159	0.046
Gre		1.000	1.000	0.000	1.000	1.000
GST		0.073	0.056	0.076	0.003	0.444
Gro	82	0.400	0.164	0.949	−0.313	7.268
ROA		0.033	0.029	0.028	−0.055	0.125
Size		24.598	24.405	1.413	21.338	28.543
LEV		0.592	0.609	0.121	0.218	0.823

3.2. Fundamental Assumptions

3.2.1. Balancing Assumption

The balancing assumption and the common support assumption are the two basic assumptions of PSM, which need to be tested to ensure rational analysis. Due to the fact that propensity score matching can achieve balance between the treatment group and the control group on multiple covariates through the matching process, thereby improving the accuracy and reliability of statistical estimation, it is chosen for this section.

As shown in Table 3, the result of the PSM balance test. None of the T-tests for the means of the control variables after matching are significant, which solves the problem of significant deviation. The result of the PSM balance test indicates the null hypothesis is accepted which indicates the differences between the groups are not significant and the variables are balanced in the treatment and control groups after matching, in line with the balancing assumption of the PSM.

Table 3. Result of the PSM balance test.

Variable	Before matching (U) After matching (M)	A(*Gre*)			B (*GST*)		
		Mean		*P-value*	Mean		*P-value*
		Treatment group	Control group		Treatment group	Control group	
Q_inc	U	0.021	0.050	0.208	0.043	0.012	0.432
	M	0.021	0.006	0.598	0.043	−0.006	0.685
Gro	U	−0.043	0.000	0.000	0.012	−0.071	0.001
	M	−0.043	−0.053	0.402	0.012	−0.029	0.057

Continued

ROA	U	−0.004	0.000	0.152	−0.072	−0.032	0.000
	M	−0.004	−0.082	0.494	−0.072	−0.082	0.065
Size	U	0.359	0.000	0.000	0.756	0.125	0.021
	M	0.359	0.852	0.821	0.756	0.865	0.152
LEV	U	0.364	0.000	0.000	−0.038	0.537	0.045
	M	0.364	0.298	0.461	−0.038	0.312	0.085

3.2.2. Common Support Assumption

Before matching, the probability of a firm's decision to issue green debt, i.e., the propensity score of issuance of green debt, needs to be estimated. Whether a company issues green bonds is a logistic variable, so this paper uses the Logit model to estimate the propensity score of issuance of green bonds and intensity of green bond issuance, and the estimated model is shown below:

$$p_i = p\left(Y = 1 | X_i\right), \quad Y = Gre/GST \tag{3.1}$$

where p_i is the propensity score of issuing green debt; X_i is the control variable that influences both the company's issuance of green debt and company value; Gre is whether to issue green bonds or not, and GST is the intensity of green debt issuance.

Table 4. Results of Logit Regression.

Variable	A (*Gre*)		B (*GST*)	
	Coefficient	Std.Err	Coefficient	Std.Err
Intercept	−4.6771*** (0.000)	0.2193	−0.5270 (0.213)	0.5599
Gro	0.0632** (0.035)	0.1241	−0.2105* (0.632)	0.0462
ROA	−0.4185** (0.046)	0.3382	0.5921** (0.032)	0.1336
Size	1.2206* (0.041)	0.1596	1.2201*** (0.000)	0.0044
LEV	−0.5358*** (0.000)	0.2512	−0.5352** (0.017)	0.0493
Adjust_R^2	0.5922**		0.6861**	

Note: *, **, and *** indicate significance at the 10%, 5%, and 1% significance levels, respectively. The same applies to all subsequent tables.

As shown in **Table 4**, the control variables exhibit statistical significance at specific levels regarding the probability of issuing green bonds and the intensity of green bond issuance, which indicates the logit model can explain the propensity scores of whether to issue green bonds and the intensity of issuance well.

3.2.3. Propensity Score Distribution

Figure 1 and Figure 2 represented the histograms of propensity scores of the treatment and control groups before and after matching, respectively. As shown in Figure 1 and Figure 2, before matching, there is a significant difference of the propensity scores distribution between the treatment and control groups. However, after matching, there is almost no difference between the two groups, which indicates the samples of the treatment group are matched in the control group, in line with the common support assumption of PSM.
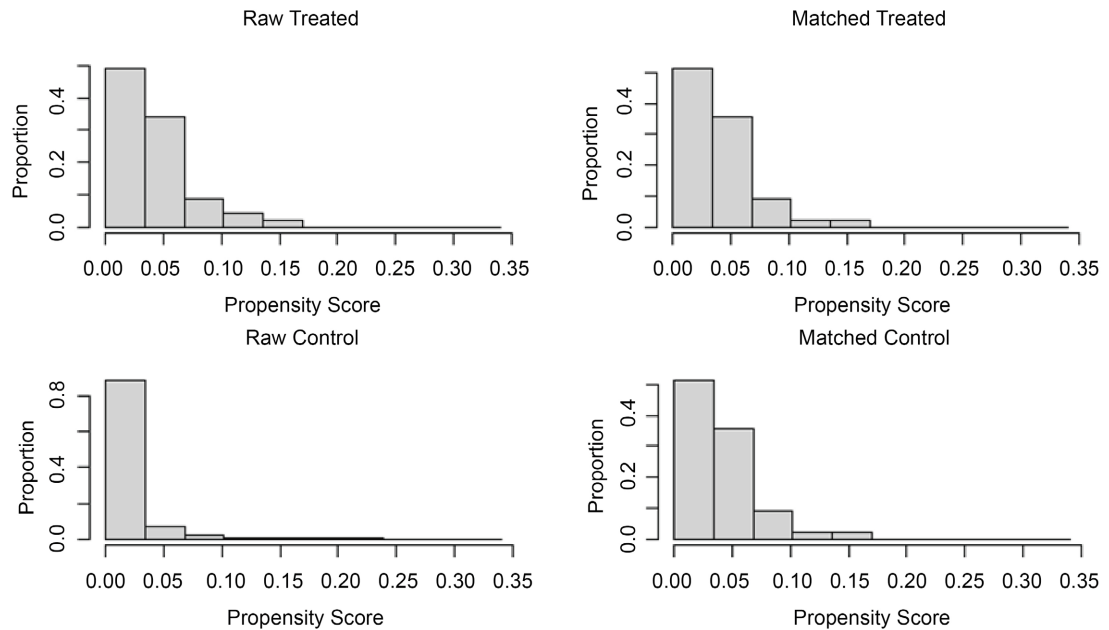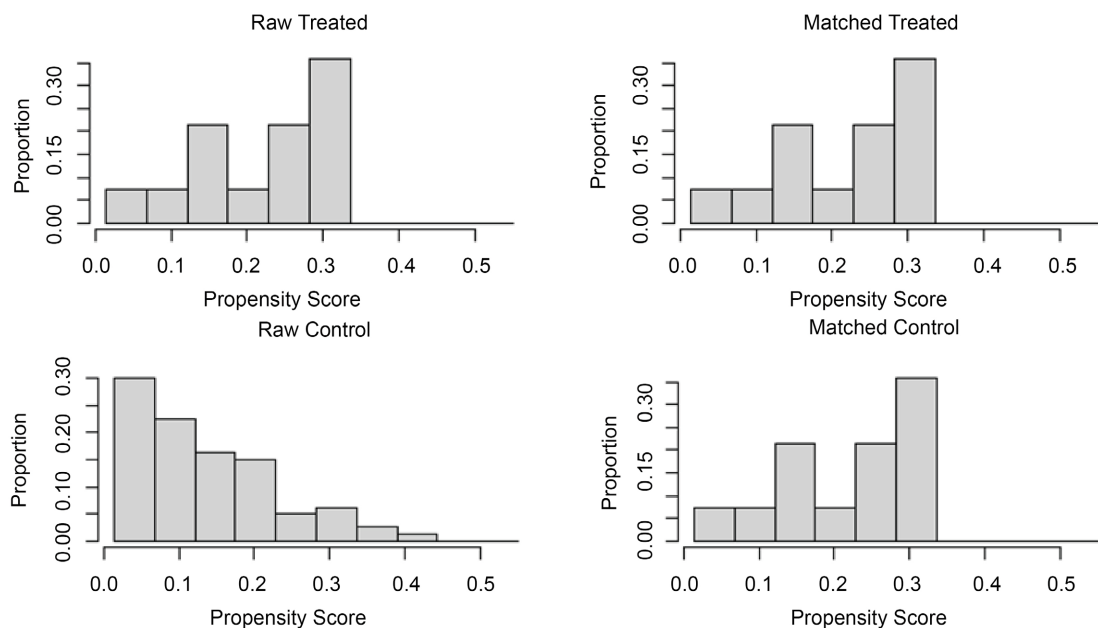

Figure 1. Histogram of Gre propensity score.

Figure 2. Histogram of GST propensity score.

3.3. Empirical Analysis

3.3.1. Discuss Whether to Issue Green Bonds (Gre)

Based on the Logit model and balancing assumption test, a 1:1 matching method is employed to match companies in the control group with those in the treatment group that have similar propensity scores. The matching results are listed as follows:

Table 5. Results of Gre propensity score matching.

		Treatment group (T)	Control group (C)	ATT
Gre	before matching (U)	0.0106	−0.0001	0.0108 (0.235)
	after matching (M)	0.0106	−0.0163	0.0269*** (0.001)

As shown in Table 5, ATT is greater than 0 but not significant before matching. ATT is 0.0269 after matching, and the issuance of green bonds leads to an increase in Tobin's Q growth rate by 0.0269 under the same propensity score, which indicates the issuance of green bonds increases the company value.

3.3.2. Discussion on Green Bond Issuance Intensity (GST)

As shown in Table 6, ATT is greater than 0 but not significant before matching. ATT is 0.0487 after matching, and Tobin's Q growth rate of companies with high green bond issuance intensity is higher than that with low issuance intensity by 0.0487 under the same propensity score, and thus an increase in issuance intensity contributes to the value of the firm.

Table 6. Results of GST propensity score matching.

		Treatment group (T)	Control Group (C)	ATT
GST	before matching (U)	0.0433	0.0125	0.0308 (0.152)
	after matching (M)	0.0433	−0.0066	0.0487** (0.021)

3.4. Mediating Effects

3.4.1. Basic Linear Regression Model

We constructed a basic linear regression model by using the data obtained after matching based on whether issuing green bonds or not:

$$Q\_inc_{it} = \beta_0 + \beta_1 Gre_{it} + \beta_2 X_{it} + T_t + Ind_i + \varepsilon_{it} \quad (3.2)$$

where Q_inc_{it} is the growth rate of Tobin's Q. Gre_{it} is the core explanatory variables, X_{it} are a set of control variables, the basic linear regression model controls for industry (Ind) and year (T).

As shown in Table 7, Gre's coefficient is 0.0588 and significant at the 5% level under the fixed year and other variables being controlled, indicating that there is

a significant positive correlation between the issuance of green bonds and company value, in line with the results of the previous PSM analysis.

Table 7. Results of Basic Linear Regression.

Variable	Coefficient	Std.Err	*t*_value	*P*_value
Intercept	−0.6332	0.4873	−1.299	0.197
Gre	0.0588**	0.0446	2.297	0.021
Gro	0.0003**	0.0004	2.798	0.035
ROA	0.0028***	0.1297	9.452	0.000
Size	−0.0211	0.0209	1.597	0.114
LEV	−0.2073	0.0021	1.011	0.316
Ind				
T		control		
Adjust_R²		0.7320**		

3.4.2. Mediating Effects of Financing Constraints

To study whether issuing green bonds increases company value by alleviating financing constraints, an SA index is constructed to measure the extent of financing constraints.

$$SA = -0.737\,Size + 0.043\,Size^2 - 0.04\,Age^2 \tag{3.3}$$

The SA index is negative, and the smaller the SA index, the more severe the company's financing constraints are.

Then, we constructed the mediating effects of financing constraints:

$$SA_{it} = \alpha_0 + \alpha_1 Gre_{it} + \alpha_2 X_{it} + T_i + Ind_i + \varepsilon_{it} \tag{3.4}$$

$$Q\_inc_{it} = \beta_0 + \beta_1 Gre_{it} + \beta_2 SA_{it} + \beta_3 X_{it} + T_t + Ind_i + \varepsilon_{it} \tag{3.5}$$

As **Table 8** shown, Column A presents the result of the regression equation examining the impact of the company's green bonds issuance on financing constraints, and the coefficient showing significantly positive, indicating that green

Table 8. Estimation results of the mediating effect of financing constraints.

Variable	A (*SA*)			B (*Q_inc*)		
	α	Bootstrap error	Bootstrap confidence interval	*β*	Bootstrap error	Bootstrap confidence interval
Gre	0.0671*	0.0252	10.1433, 10.5712	0.0437**	0.0474	0.0391, 0.1444
SA				0.0739*	0.0281	0.1278, 0.0185
X						
T		control			control	
Ind						
Adjust_R²		0.9406**			0.2496**	
P_value		0.0211			0.0156	

bonds issuance effectively alleviates corporate financing constraints. Column B is the regression equation containing the mediating variable financing constraints, and the coefficients are significantly positive, indicating that issuing green bonds can increase company value effectively by alleviating the company's financing constraints. Observing the bootstrap confidence interval for the mediating variable SA, the interval does not contain zero and the mediating effect is significant.

3.4.3. Mediating Effects of Information Transparency

Constructed the mediating effects of information transparency as follows:

$$Tra_{it} = \alpha_0 + \alpha_1 Gre_{it} + \alpha_2 X_{it} + T_t + Ind_i + \varepsilon_{it} \tag{3.6}$$

$$Q\_inc_{it} = \beta_0 + \beta_1 Gre_{it} + \beta_2 Tra_{it} + \beta_3 X_{it} + T_t + Ind_i + \varepsilon_{it} \tag{3.7}$$

As shown in **Table 9**, column A presents the result of the regression equation examining the impact of the company's green bonds issuance on information transparency, and the coefficient is positive, indicating that green bonds issuance effectively enhances the information transparency of the company column B is the result of the regression equation containing mediating variable information transparency, and the coefficients are significantly positive, indicating that issuing green bonds can effectively improve information transparency and thus enhance company value. By observing the bootstrap confidence interval for the mediating variable Tra, we found that the interval does not contain zero and the mediating effect is significant.

Table 9. Estimation results of the mediation effect of information transparency.

Variable	A (*Tra*)			B (*Q_inc*)		
	α	Bootstrap error	Bootstrap confidence interval	β	Bootstrap error	Bootstrap confidence interval
Gre	0.1234***	0.0478	0.0521, 0.1385	0.0381**	0.0478	0.0521, 0.1385
SA				0.0048*	0.0057	0.0337, 0.0466
X						
T		control			control	
Ind						
Adjust_R^2		0.175***			0.147***	
P_value		0.000			0.004	

4. Conclusions

The multifaceted return interdependence between green bonds and various assets and markets (conventional bonds, Islamic and conventional stocks, Bitcoin, Ethereum, crude oil, and gold), have covered various market conditions. It played more and more important role for green bonds to accelerate industrial sustainability in the OECD economies since 2010. Lau *et al.* (2025) [18] found that the Artificial Neural Network predicts the influence of green bonds on industrial sustainability more accurately than other methods. He also observed that green

bonds accelerate industrial sustainability in the OECD economies. The upper percentile group is primarily concerned with industrial sustainability rather than the lower as well as middle percentile groups. Therefore, the OECD economies should emphasise the green bonds component in the green finance baskets to achieve carbon neutrality. However, Green bonds are not always far ahead of traditional bonds in all aspects. Yan Ming *et al.* (2025) [19] showed their worry about the disadvantage of green bonds, and their empirical study revealed significant differences in liquidity between green and conventional bonds that could affect this cost advantage. Their findings show that, due to their unique attributes, green bonds tend to have lower liquidity than conventional bonds; these results in higher liquidity costs, which counterbalance the cost benefits of the green premium. The liquidity disadvantage of green bonds thus weakens the overall financing cost advantage they might otherwise offer through the green premium.

In this paper, we took companies that have issued green bonds as the experimental group and companies that have not issued green bonds during the sample period as the control group. By using propensity score matching method, the relationship between issuing green bonds and company value is empirically studied, and the path of the impact of issuing green bonds on company value is analyzed in depth from the perspectives of financing constraints and information transparency. Our research results indicate that the issuance of green bonds enhances the company's value, and the higher the issuance intensity, the more significant the increase in company value. In addition, through mechanism analysis, it can be concluded that issuing green bonds can absorb more bank loans and corporate bond funds, significantly expand the company's debt financing, reduce financing constraints, and thus enhance the company's value; As investors attach increasing importance to green concepts, the issuance of green bonds will encourage companies to improve their information disclosure levels, reduce their risk compensation costs, and promote company appreciation However, The sample size of 82 companies that issued green bonds is relatively small, potentially limiting the generalizability of the findings. In future research, we will expand the sample size. Continue to track and investigate the long-term impact of green bond issuance, while using better statistical analysis tools to examine the effectiveness of different green bond standards and certifications.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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