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**Chhatrapati Shahu Institute of Business  
Education & Research (CSIBER)**

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**Chhatrapati Shahu Institute of Business  
Education and Research (CSIBER)**

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(SAJMR)  
Special Issue**

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## Market Reactions to Green Bond Issuances in India: Insights from the BSE 200 Index

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### Abstract

"India is the second-largest issuer of green bonds globally. This study examines the influence of green bond issuances by Indian companies on their stock market valuations and explores the underlying reasons for the market's response to these issuances." Stock prices of each company from the Bombay Stock Exchange (BSE) website, focusing on companies listed in the S&P BSE 200 index. For the analysis of this study, we have used the two methods. Firstly, the event-study methodology, considering time frames of eleven days, twenty-one days, and forty-one days. Further, we applied an OLS (Ordinary Least Squares) regression to identify significant CAR arising from events or external factors. Data analysis was conducted using R software. There was a significant negative effect on the stock market. Cumulative abnormal returns (CAR) were both statistically significant and negative. Additionally, we found that both amounts issued (AI), coupons, and growth have significantly impacted CAR with the issuance of GB. It's important to know how the market reacts when companies issue GB. This can help assess a company's worth and aid policymakers in setting rules for issuing GB in the Indian market.

**Keywords:** Key Words: Green Bonds, Stock Market Impact, Event Study Analysis, Sustainable Finance, Indian Financial Market, Market Reaction, Bombay Stock Exchange.

JEL Classification: G11, G12, Q56, Q01

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### Introduction

Company policies and strategies are increasingly impacted by environmental, sustainability, and governance (ESG) considerations (Hart and Zingales, 2017). Environmental sustainability is vital as climate change is creating long-term changes in weather patterns and global temperatures worldwide (Baulkaran, 2019). Worries about climate degradation are affecting human lives, leading governments to promote the use of Green Bonds (GB) to support sustainability. These are fixed-income bonds issued by companies that fund eco-friendly projects (Gianfrate and Peri, 2019). Additionally, corporate policies are more and more often taking into account ESG factors (Hart and Zingales, 2017).

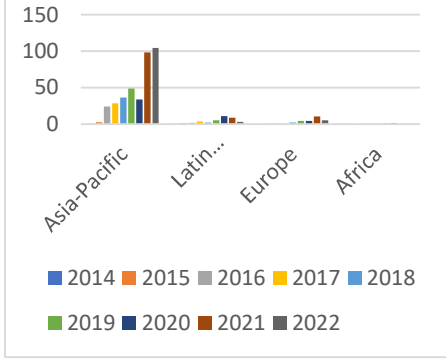
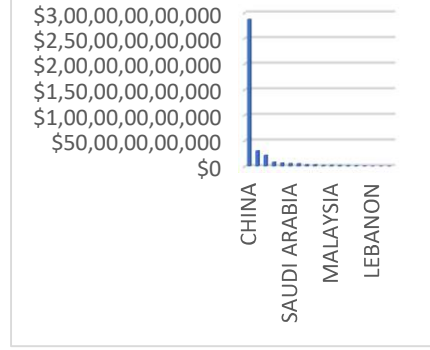
The global market for GB began to experience growth starting from 2007. This market is helping investors earn more money by backing sustainable development projects, attributed to the growing interest in green initiatives. Debts in financing can enhance organizational efficiency (Jensen and Zimmerman, 1985; Zwiebel, 1996; Lin et al., 2011), but strong bondholder control may lead to lower-risk investment selection, potentially harming shareholders' wealth (King and Wen, 2011).

GB are fixed-income, financial tools used specifically to raise funds to utilize for eco-friendly projects, with corporations issuing bonds to establish a "green image" and boost company value (Hamilton and Eriksson, 2011).

The GB market is guided using standards from the Climate Bond Initiative (CBI) and the standards framed by the International Capital Market Association (ICMA). However, outside groups like ESG research firms and environmental evaluators offer secondary opinions on GB releases, helping investors choose based on the "greenness" level. Still, this help has its limits. The ICMA has chosen green projects, and SEBI has laid down rules for issuing GB, with Indian financial institutions taking the lead in this field. GB brings several benefits like balancing assets and liabilities, drawing in long-term foreign investors, and boosting energy security.

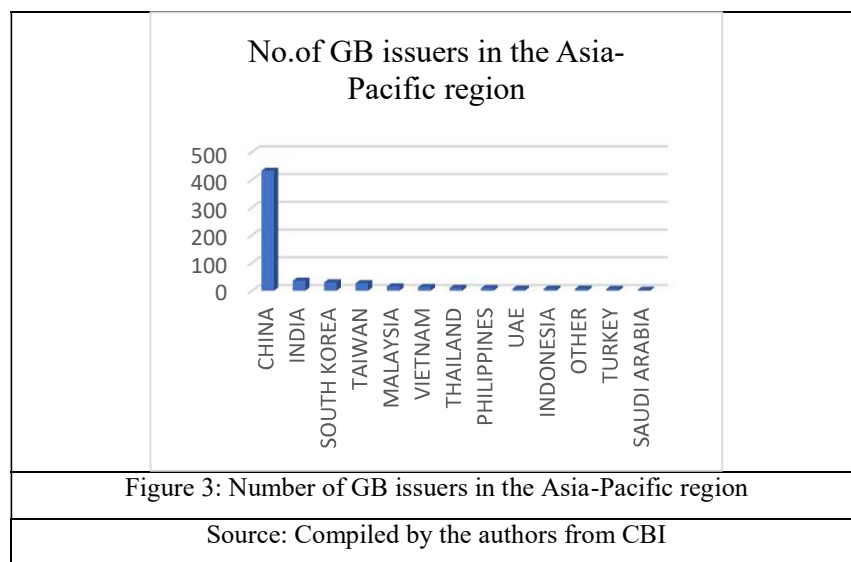
The GB sector commenced in 2013 when the European Investment Bank funded it with \$807.2 million. By January 2023, it had expanded to \$2.5 trillion, with emerging countries contributing \$74 billion, about 2% of the total spent on sustainability bonds, social bonds, and GB. Pioneers in issuing GB include the European

Investment Bank, World Bank, Electricite de France, and Bank of America. India holds a significant spot in the market, Yes Bank's debut issuance in the year of 2015, followed by IDBI, Punjab National Bank Housing Finance, Axis Bank, and more. India uses GB to fund shifts from fossil fuels to renewable sources, water management, transport, and infrastructure, attracting investment for environmental support. The country aims to spend \$4.5 trillion by 2030 for a climate-resilient economy, making GB a key financing option for both banks and non-banks, showing the market's rapid growth (Agarwal Singh, 2017; Bardhan et al., 2019).

<p style="text-align: center;"><b>Total amount of GB issued globally</b></p>  <p style="text-align: center;">Figure 1: Total amount of the GB issued globally</p> <p style="text-align: center;">Source: Compiled by the authors from CBI</p>	<p style="text-align: center;"><b>Total amount of GB in the Asia-Pacific region</b></p>  <p style="text-align: center;">Figure 2: Total amount of GB issued all over the Asia-Pacific region</p> <p style="text-align: center;">Source: Compiled by the authors from CBI</p>
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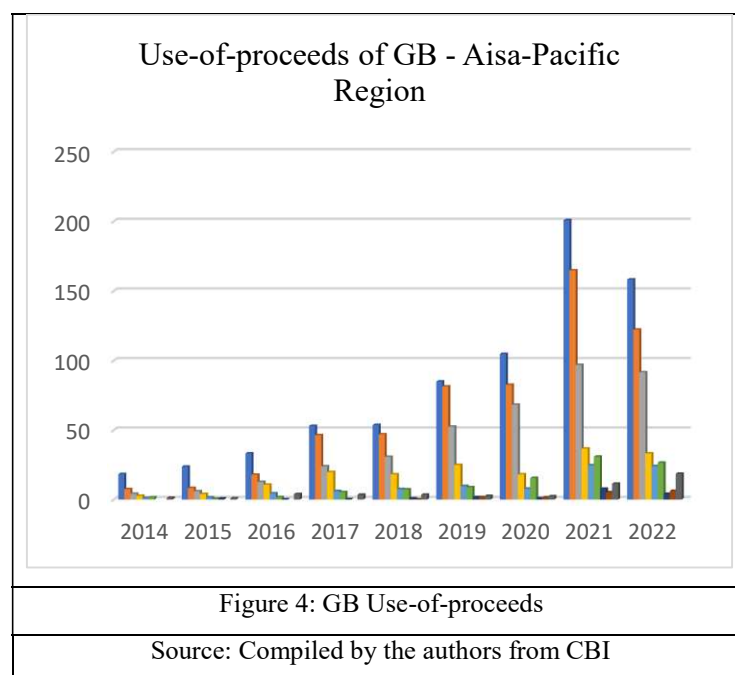
Worldwide, GB has been issued totaling \$377.4 billion. Over time, the value of these bonds in the Asia-Pacific region, as shown in Figure 1 has increased. Starting at \$0.5 billion in 2014, there was an abrupt increase in 2016, and the numbers grew steadily until they peaked in 2022 at \$104.6 billion. This area dominates in this measure. Africa's values have generally been low, peaking at \$1.2 billion in 2019. The numbers fell after 2019. Up to 2020, Latin America exhibited a consistent rise, reaching a high of 10.9. In 2021 and 2022, there was a decline nonetheless. Europe began with lower totals, reached a 10.6 high in 2020, and then had a fall in 2021 and 2022. The region with the most growth over time was Asia-Pacific, particularly from 2015 to 2022. In particular, the rise between 2020 and 2021 is noteworthy.

With a total issuance of almost \$286.91 billion in GB, China is clearly in a position to lead (see Figure 2). Comparatively, this is far higher than all the other nations on the list. With \$30.19 billion and \$21.55 billion, respectively, South Korea and India are next. Although they have a far smaller quantity than China, they are the second-largest issuers after China. GB have been issued by nations including the UAE, Indonesia, Saudi Arabia, Taiwan, Pakistan, the Philippines, Thailand, Vietnam, Malaysia, Turkey, Qatar, and Israel, and range in size from \$500 million (Pakistan) to approximately \$8 billion (UAE). In comparison to the other nations on the list, Lebanon, Fiji, and Kazakhstan all have very minor issuances, with Kazakhstan having the least at just \$474,000. Due to the active involvement of several Asian nations in environmentally friendly initiatives and sustainable finance, Asia has a significant role in the GB market. Countries like Israel, and Middle Eastern nations such as the UAE, Saudi Arabia, and Qatar are showing increasing interest in sustainable finance.



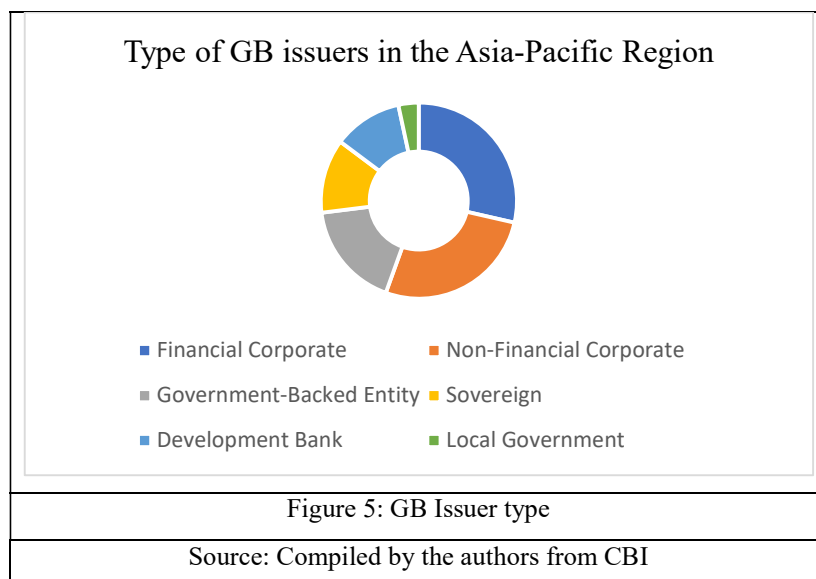
India in 2015, ranked in the top 10 emerging markets for GB, with \$7.7 billion issued to 2018, primarily by banks for renewable energy projects (The World Bank, 2018a, 2018b).

In 2023, India ranks second in the outstanding value of GB, behind China, contributing to the green environment through green finance investments. For a study analyzing shareholder wealth impact, see Figure 3.



The three main uses of the proceeds categories into buildings, transport, and energy and all together generated 77% overall green debt volume (see Figure 4). The market's proportion of adaptation-related investments has fallen from 81% in 2021 to 85% in 2020, with smaller categories gaining share as more issuers finance a wider range of projects.

Financial corporations generated 29% of 2022 green issuance volumes, with European corporations accounting for over half, as shown in Figure 5. European corporates, including German commercial bank Helaba and Danish power giant Orsted, were the leading issuers. Government-backed firms generated little under 20% of green issuance, with the EU's reopening of transactions driving the growth. Government-backed companies constituted the highest contribution to S&S bonds, with development banks second.



Several studies have been undertaken regarding market reactions to changes in investments in capital structures in finance. Most research has been conducted within developed markets, and as we can see over time, values have significantly increased in the Asia-Pacific area, Asia's emerging market. India ranks second in the outstanding value of GB, behind China, contributing to the green environment through green finance investments; however, event studies are rising for emerging markets. This research is being conducted to study how GB issued by Indian companies affects their stock market returns, essentially at the stock market's response to GB issued. This research will help in analyzing results that will be useful to other Indian companies who are deciding to raise capital using GB.

The study will be structured in sections where Section 2 will cover all the necessary literature reviews conducted on the topic. Section 3 will detail the data sets utilized during the study and the methodology applied in the research analysis. Section 4 will summarize and discuss the findings from the empirical analysis. Finally, Section 5 will conclude our research work.

## Literature Review

Yu, H. et al. (2024) analyzed how the stock market responded to 595 GB issuances between 2014 to 2021. The study found that the initial market reaction was generally negative, especially for companies with poor or no history of issuing green bonds, although this reaction tended to improve over time. The research also showed that companies with strong environmental performance saw an increase in stock liquidity, suggesting that repeated issuances and the perceived reliability of the bonds' environmental benefits could be advantageous.

Jin, J., & Zhang, J. (2023) investigated the stock performance of Chinese companies issuing GB during the pandemic of COVID-19. Non-financial GB issuers experienced positive stock returns upon COVID 19 announcements revealing during pandemic or crises the investor have high confidence on firm with high CSR (Corporate Social Responsibility). Therefore, there is need of enhancement of green finance policies which will highlight the value of CSR in times of uncertainty

Verma and Bansal (2023) evaluated the impact of green-bond issue announcements on issuers' stock price movements, finding a strong positive impact in the Indian context. Kumar and Verma (2023) revealed that the stock prices of GB-issuing companies increase positively, and their lower coupon rates provide shareholders with a leverage advantage. Most research indicates positive stock price responses to increased financial leverage, while some find a negative relationship between financial leverage and stock market reactions. GB attracts investors seeking sustainable growth and eco-friendly projects, with oversubscription and increasing demand driving market price growth.

Cursi (2022) showed a positive impact of GB issuance on stock performance, indicating that investors see GB as an average of added-value finance, which attracts more investors and positively affects stock prices and hence the cumulative abnormal return (CAR).

Löffler, Petreski, and Stephan (2021) discussed the expanding demand for green bonds and the academic literature on the topic, highlighting that companies are contributing to green governance. It analyzed the

existence of greenium in primary and secondary bond markets. Findings from the study suggested GB with larger issue sizes are issued by lower rated entities. GB yield 15-20 basis points less than the conventional bonds therefore confirming presence of a greenium.

Cortellini and Panetta (2021) have shown the influence of GB issuance on investors' and issuer shareholders' wealth, demonstrating how GB issuances can impact both investors and the wealth of issuers' shareholders. Insights on the impact of environmental investments on financial markets and economic sustainability were discussed and the growing appeal of GB among diverse investors highlights their potential role under the Paris Climate Agreement and in portfolio diversification strategies.

Flammer (2020) addressed the primary drivers i.e., signaling, cost of funding, and greenwashing for the GB. Flammer (2021) further investigates the financial and environmental elements of corporate GB, indicating their rising appeal among long-term investors and sustainable practices ethical investors.

Tang and Zhang (2020) researched that stock prices tended to rise around the issuance of GB in 28 countries during 2007-2017, but noted that GB isn't necessarily a cheaper financing option, yet they positively affect stock prices and increase institutional ownership after issuance.

Agliardi and Agliardi (2019) developed a model for understanding the green bond pricing dynamics and the greenium. Determinants of GB value and their impact on issuer credit quality, cost effectiveness for funding the sustainable investments has been examined, revealing that enhanced credit quality, tax incentives, and increased environmental awareness significantly contribute to the growth of the green bond market. Enhanced credit quality, tax incentives, and increased environmental awareness significantly contribute to the growth of the green bond market.

Zerbib (2019) and Agliardi and Agliardi (2019) noted a trend of GB being oversubscribed upon their release, indicating that introducing GB into the market can draw in investors while also lowering financing costs for the issuing company. Zerbib (2019) studied the how bond market prices are affected by pro-environmental preferences using GB. Results showed a small negative yield premium on GB compared to conventional bonds, averaging 2 basis points. The trend was more evident in financial and low rated bonds giving insights that environment preferences slightly discourage investment in GB market.

Barua and Chiesa (2019) observed changes in the average issue size of GB over time, with higher-grade bonds having smaller average sizes, and found that the stock market reacts positively to certified GB announcements and negatively to non-certified issues, with most companies experiencing positive price effects.

Baulkaran (2019) analyzed the impact of GB announcements on stock market performance and noted the stock market's positive response to GB issuances, interpreting it as shareholders viewing it as value-enhancing and funds being used for profitable green projects.

Reboredo (2018) suggested potential spillover effects between the GB market and stocks, which could affect how a company's bond announcement impacts stock prices. The findings from the study reveal strong linkages with corporate and treasury markets but weak association with stock and energy market. Insights from the study reveals there is limited diversification benefits in treasury and corporate contexts but significant benefits in stock and energy sectors.

Bancel and Glavas (2018) employed agency and stakeholder theories to analyses the pre issuance determinants, identified the main drivers i.e., agency offerings and state ownership behind GB issuances, highlighted by the consistent negative correlation with cash dividend distribution. It added perspective to the understanding of the GB market dynamics.

Ben-Rephael et al. (2017) found that the market in developed countries typically reacts negatively to GB issuances, unlike in developing economies, likely due to investor valuation based on the initial issuance.

De Roon and Veld (1998) analyzed that warrant-bond loans and convertible bond loan announcements in the Dutch market provide positive but insignificant abnormal returns and significant positive abnormal returns, respectively. This findings of the study contrasts with the studies conducted in United States which report negative results. The positive outcomes in the Dutch market are linked to firm specific news which give insights that market and announcement significantly affect investor reactions.

Negative news on environmental issues adversely affects stock prices, while companies with strong environmental records enjoy better stock prices, as analyzed by Klassen and McLaughlin (1996) and Dasgupta et al. (2001). Dasgupta et al. (2001) examines in developing nations how capital markets reacts to the announcements made on environmental performance. There is a belief that regulatory incentives help in

pollution control but the results from the study suggested that informed market offer significant reputational and financial motivations. Hence there is need for improved public disclosure of practices particularly related to environment where regulation is limited.

Dann and Mikkelsen (1984) examined the effects of valuation with the issuance of convertible debt. The study described that financial markets are extremely reactive to disclosures of information in the market, with common shareholders experiencing large negative abnormal earnings on average following a new convertible debt public offering.

**Table 1:** Literature related to the Impact of Green Bond Issuances

Sl. No.	Year	Author(s)	Country	Reaction
1.	2024	Yu, H. et al.	International	Negative
2.	2023	Jin, J., & Zhang, J.	China	Positive
3.	2023	Kodiyatt et al.	India	Negative
4.	2023	Shankar, N., & Sharma, S.	India	Negative
5.	2023	Sreelakshmi, P., & Greeshma, R. J.	International	Negative
6.	2023	Verma, R. K., & Bansal, R.	India	Mixed
7.	2022	Chen, X. et al.	China, Hong Kong	Positive
8.	2022	Cicchello et al.	European	Mixed
9.	2022	Liu, M.	-	Negative
10.	2022	Wu, Y.	China, Global	Negative
11.	2022	Xi, B., & Jing, H.	China	Mixed
12.	2021	Antoniuk, Y., & Leirvik, T.	-	Negative
13.	2021	Yi, X., Bai, C. et al.	China	Positive
14.	2020	Glavas, D.	-	Positive
15.	2020	Lebelle et al.	International	Negative
16.	2019	Baulkaran, V.	-	Positive
17.	2017	Mohd Roslen et al.	Multi-country	Positive

Source: Compiled by Authors.

### Research Objective

- To evaluate the impact of GB issuances on the stock prices of companies listed on the S&P BSE 200 index in the Indian market.
- To investigate impact of bond characteristics and firm-level financial indicators on CAR.

### Hypothesis Development

To study the green bond (GB) issuance on stock prices in the Indian market, insights were drawn from existing literature that suggests a notable link between GB issuance and stock market reactions see Table 1. Studies like that of Glavas (2018) have shown that announcements related to corporate social responsibility (CSR), such as issuing GBs, can positively influence stock prices in the short term. This reaction is attributed to the positive perception by investors when companies engage in environmentally responsible activities, thereby improving their corporate image and attracting investment.

Further, Flammer (2021) provided empirical evidence that issuing GB not only signals a company's commitment to sustainable practices but also leads to significant cumulative excess returns on their stock. This finding underscores the potential financial benefits that accrue from adopting green initiatives, which can be seen as enhancing the company's value in the eyes of shareholders and investors.



Building on these insights and considering the increasing emphasis on sustainable investment in India, our hypothesis posits that similar positive effects would be observable in the Indian market. Given that the Indian market is becoming increasingly aware of and responsive to CSR and environmental sustainability, it is reasonable to hypothesize that GB issuances, which are a direct reflection of a company's commitment to environmental stewardship, would lead to a positive reaction in stock prices.

Therefore, synthesizing the theoretical and empirical evidence from global contexts and adapting it to the Indian economic environment leads us to hypothesize for first objective of the study as:

**Hypothesis 1 (H1):** The issuance of Green Bonds in the Indian market has an impact on the stock prices of the companies issuing these bonds.

For objective 2, firm specific financial indicators and bond characteristics were taken into consideration. Baulkaran (2019) examined CAR stemming from bond characteristics and firm level financial indicators. CAR served as the dependent variable, while independent variables for insights into the green bond market included factors like Coupon rate, Maturity (Years), A-rated bonds, Second Review, and Issue Volume (USD Million). Additionally, financial indicators of firms were taken into account as control variables, including firm efficiency proxied by return on assets (ROA) Asset Growth, and Financial Leverage was taken into consideration.

## Data

This research study analysis relies on secondary data. We obtained individual stock prices from the Bombay Stock Exchange (BSE) official website, as all sampled companies are part of the S&P BSE 200 index. The dates when green bonds (GB) were issued were gathered from publications and periodicals like The Economic Times and India Times and were verified against the Bloomberg database and Climate Bonds Initiative (CBI) website, which holds verification reports for each company. Initially, our sample consisted of certified GB from the CBI database and other GB mentioned in articles from Business Standard, The Economic Times, and India Times, leading to a total of 57 issued GB. From these, we selected only companies listed in the S&P BSE 200, ending up with 17 GB samples. Other companies in the list were not listed on any exchange in India. Thus, this selection was based on the visibility and impact of firms within the S&P BSE 200, aiming to enhance the generalizability and applicability of our findings to significant market participants. These included eight issues from the banking sector, five from financial institutions, two from power production, one from Non-Banking Financial Companies (NBFCs), and one from a housing finance company. For our study's data analysis, we eventually chose 14 GB issued by nine companies between 2014 and 2023. We excluded three samples because historical stock prices were not available. The events in this context are the issuances of GB, and the event dates (t) are the dates these bonds were issued, as listed in Table 2. We obtained all bond ratings from Fitch Ratings. We delved into the influence of various financial indicators and market conditions on the performance and issuance of green bonds where we examined the firm-level indicators such as growth (efficiency), return on assets (ROA), and financial leverage, alongside factors specifically related to the GB-like maturity, amount issued, ratings, coupons, review. In the previous literature (Baulkaran, 2019; Eccles et al., 2012; Goss and Roberts, 2011; Kliger and Sarig, 2000) highlighted their significance in financial analyses related to green financing and sustainability investments.

**Table 2:** List of Companies selected in our study

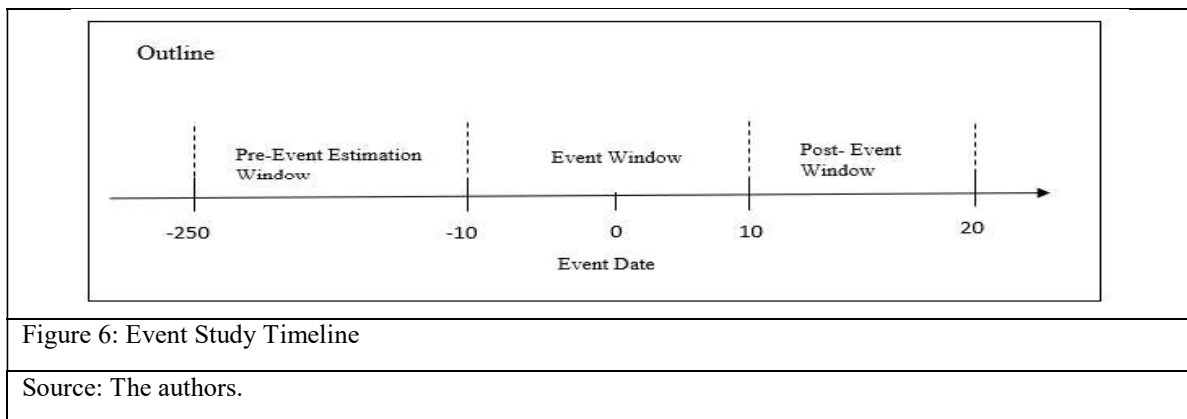
Company	Issue Date/Month/Year	Sector
Yes Bank	24/02/2015, 05/08/2015, 29/12/2016	Private Bank Sector
IDBI Bank	23/11/2015	Private Bank Sector
Axis Bank	23/05/2016	Private Sector Bank
NTPC Ltd	10/8/2016	Power Generation
Rural Electrification Corporation Limited	29/06/2017, 11/04/2023	Financial Institution
Power Finance Corporation	6/12/2017	Financial Institution
State Bank of India	30/07/2018, 28/09/2018, 28/03/2020	Public Sector Bank
Adani Green Energy	15/10/2019	Power Generation
Bajaj Finance	14/07/2016	NBFC

Source: The authors.

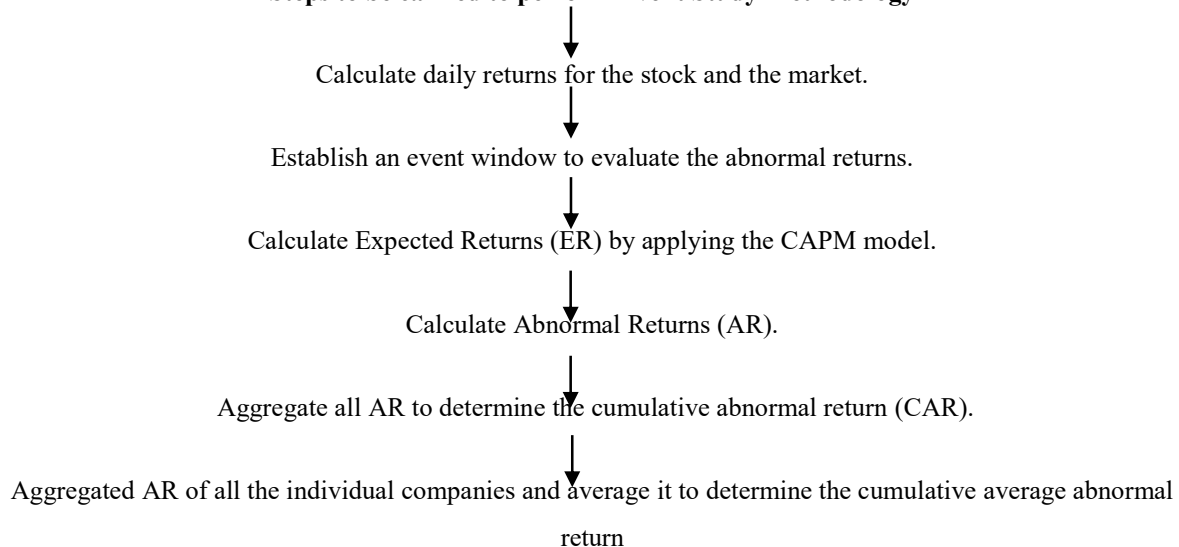
\*Abbreviation: IDBI- Industrial Development Bank of India; NTPC- National Thermal Power Corporation

## Methodology

To understand the financial effects on the value of a company, event studies examine stock market responses to significant corporate events. If a market is efficient, the value of an event is immediately reflected in a company's stock price. This approach serves dual purposes: it tests the Efficient Market Hypothesis (EMH), which is under scrutiny if abnormal returns persist post-event, and it assesses the impact of significant corporate actions or wider economic disruptions using short-term stock price data Kothari and Warner (2007). We applied the standard event study to examine stock prices around the issuance date to evaluate market reactions (Werner, 2010; Pandey and Kumari, 2021; Baulkaran, 2019; Verma and Bansal, 2023;). This method, rooted in the semi-strong form of market efficiency Fama (1965), suggests that earning regular excess returns is not feasible as newly available public information is immediately incorporated into prices. An event study identifies the event, event date, window, estimation window, and model specifically for green bonds (GB) issuances see Figure 6.



### Steps to be carried to perform Event Study Methodology



**Calculation of daily returns of stock and market:** Firstly, we have calculated the daily returns of stock and market using Equation 1

$$\text{Equation 1: Daily Returns } (r) = \ln(\text{Ending Price} \div \text{Beginning Price}) \dots\dots\dots (1)$$

**Establishment of Event window for expected return:** In our analysis, we utilized data from 250 trading days before the event date. Our study aimed to examine the connection between market returns and stock returns before the event occurred. To achieve this, we established an event window Baulkaran (2019) that spanned 10

days before and 10 days after the event, as well as another window extending from 20 days before to 20 days after the event and reducing from 5 days before and 5 days after the event.

**Calculating expected returns utilizing the CAPM model:** There are several models for the estimation of the expected return. In our analysis, we have used the **Sharpe (1964) and Lintner (1975)**, CAPM model to calculate the expected returns using Equation 2

$$\text{Equation 2: } ER_i = R_f + \beta_i(ER_m - R_f) \dots\dots\dots (2)$$

Where: -

$ER_i$  = expected return on investment

$R_f$  = risk-free rate of return (We have used 91 days T-bills)

$\beta_i$  = beta of the investment

$(ER_m - R_f)$  = market risk premium

**Calculation of AR:** AR for each day within the event window was calculated. The AR was calculated using Equation 3.

$$AR = \text{Actual return of the stock on day } t - \text{Expected Return of the stock on day } t \quad (3)$$

**Calculation of CAR:** The CAR is a method used to measure the total impact of an event by summarizing the abnormal returns over the event window. CAR was calculated using equation 4.

$$\text{Equation 4: } CAR = \sum AR \dots\dots\dots (4)$$

**Calculation of test statistics:** To determine the statistical significance of a CAR we tested its significance against zero by calculating the t-statistic using equation 5

$$\text{Equation 5: } t = CAR_t \div \text{Standard Error of } CAR_t \dots\dots\dots (5)$$

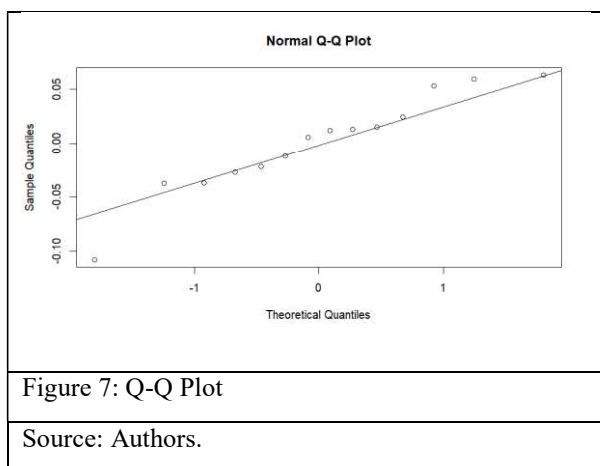
The CAR is considered statistically significant if the absolute value of the t-statistic exceeds the critical value from the t-distribution, which is typically 1.96 for a 95% confidence level. Here, the standard error is derived from the S.D. of the AR during their estimation window.

In this study, we used OLS (Ordinary Least Squares) regression, as applied in the similar study by Baulkaran (2019) to identify significant CAR stemming from a specific event or bond characteristics. CAR served as the dependent variable, while independent variables for insights into the green bond market included factors like Coupon rate, Maturity (Years), A-rated bonds, Second Review, and Issue Volume (USD Million). Additionally, financial indicators of firms were taken into account as control variables, including firm efficiency proxied by return on assets (ROA) Asset Growth, and Financial Leverage was taken into consideration.

$$\text{Equation 6: } CAR_i = \beta_0 + \beta_1 SR_i + \beta_2 A \text{ rated bonds}_i + \beta_3 Maturity_i + \beta_4 AI_i + \beta_5 Coupons_i + \beta_6 ROA_i + \beta_7 FL_i + \beta_8 Growth_i + \varepsilon_i \dots\dots\dots (6)$$

where i refers to an individual company,  $\beta$ 's are the coefficients of variables,  $\varepsilon$  is the error term, SR is the Second Review, AI is the amount issued, ROA is the return on assets and FL is the Financial Leverage.

Initially, the OLS regression was performed to examine the relationship between CAR and various financial indicators. The dataset was prepared and cleaned to ensure completeness and accuracy for the regression analysis. Preliminary data analysis included checking for missing values, understanding the data structure via the 'str ()' function in R software, and summarizing the dataset with descriptive statistics. Cases with missing values were removed to maintain the integrity of the regression analysis. However, to address the issue of multicollinearity among the independent variables, we used the variance inflation factor (VIF). Residual plots and normal QQ plots were used to assess the assumptions of homoscedasticity and normality, respectively. Durbin- Watson test was used to check for serial correlation in the dataset and was observed that autocorrelation is absent. Robust standard errors were also applied in R to compute these robust standard errors using the HC1 method. The OLS regression was then run after checking for all the assumptions and to ensure the robustness of our findings.



Most points lie on or very close to the reference line in Figure 7, indicating that the residuals of your model (assuming these are residuals) are normally distributed.

Table 3: Check for multicollinearity

Variable	SR	A-rated bonds	Maturity years	AI	Coupons	ROA	Financial Leverage	Growth
VIF	2.973	2.850	3.550	4.302	4.064	4.851	2.320	2.364

Source: Authors.

The variation inflation factor is used to check multicollinearity. For each independent variable, the VIF value was found to be less than 10 see Table 3, implying the absence of multicollinearity.

## EMPIRICAL RESULTS AND DISCUSSION

Table 4: CAR of selected GB issued

Company	Yes Bank	Yes Bank 1	Yes Bank 2	IDBI Bank	Axis Bank	NTPC	REC Ltd.	REC Ltd. 1	PFC Ltd.	SBI	SBI 1	SBI 2	Adani Green Energy	Bajaj Finance
{-10, 10}	-0.970	-0.943	-1.000	-0.934	-1.021	-0.930	-1.027	-0.804	-1.125	-0.906	-0.870	-0.893	-0.626	-0.928
{-5, 5}	-0.509	-0.564	-0.486	-0.506	-0.568	-0.412	-0.448	-0.335	-0.508	-0.469	-0.453	-0.558	-0.287	-0.456
{-20, 20}	-1.943	-1.870	-1.949	-1.872	-1.933	-1.856	-2.020	-1.628	-2.011	-1.868	-1.743	-1.703	-1.261	-1.730

Source: Authors.

The CAR (Cumulative abnormal return) values for the {-10, 10}, {-5, 5}, {-20, 20} in the Table 4 and window are negative for all companies, indicating that the stock prices generally experienced abnormal losses over this period. The negative AR (abnormal return) suggest that the market did not react favorably to these announcements, potentially perceiving them as bad news or reflecting broader market conditions. It becomes important to understand the effect of negative CAR across all the companies which could be due to firm-level conditions or the nature of the announcements.

**Table 5:** T-statistic results for the GB issued

Company	P-value	T-stat.	P-value	T-stat.	P-value	T-stat.
	{-10, 10}		{-5, 5}		{-20, 20}	
YES BANK	***	-13.3342	**	-8.09392	***	-23.4165
YES BANK 1	***	-25.0626	***	-17.2998	***	-20.9809
YES BANK 2	***	-16.3245	***	-13.7196	***	-27.1364
IDBI	***	-8.71799	**	-9.30757	***	-14.4932
Axis Bank	***	-19.6892	***	-15.88	***	-24.8434
NTPC	***	-20.0233	***	-15.159	***	-15.9034
REC Ltd.	***	-17.1037	***	-11.3582	***	-25.058
REC Ltd. 1	***	-14.8284	**	-6.2866	***	-21.0433
PFC Ltd.	***	-29.9203	***	-23.0997	***	-42.174
SBI	***	-12.1977	**	-7.38565	***	-18.4764
SBI 1	***	-12.6104	***	-11.6526	***	-18.4758
SBI 2	**	-4.27352	**	-3.16782	***	-6.53502
Adani Green Energy	***	-5.08651	*	-2.85744	***	-6.46785
Bajaj Finance	***	-20.1662	***	-11.2853	***	-10.2321

Source: Authors

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

Yes Bank's entries—Yes Bank, Yes Bank 1, and Yes Bank 2—refer to three separate issuances of green bonds, which occurred on 24/02/2015, 05/08/2015, and 29/12/2016, respectively. REC Ltd. and REC Ltd. 1 represent two green bond issuances by REC Ltd., dated 29/06/2017 and 11/04/2023, respectively. Similarly, the entries SBI, SBI 1, and SBI 2 correspond to GB issued by the State Bank of India on 30/07/2018, 28/09/2018, and 28/03/2020, respectively.

The consistent negative CAR across all the event windows and companies indicates the negative reactions and significant t statistics and low p values further support the results in Table 5. PFC Ltd. and REC Ltd. showed the most substantial negative reactions this suggests companies the importance of clear, strategic communication when announcing green finance initiatives plus the findings suggest there are some specific factors related to announcements or company conditions that played a role in the market's reaction.

**Table 6:** T-statistic results of CAAR

Window	-10 to 10	-5 to 5	-20 to 20
CAAR	-0.927	-0.469	-1.813
CAAR t-statistic	-29.7	-21.449	-34.394

Source: Authors.

The consistent negative Cumulative average abnormal return (CAARs) and highly significant t-statistics across all event windows in Table 6 suggest that the market reacted adversely to the announcements of green bonds. The longer the window, the more pronounced the negative cumulative returns, indicating persistent negative sentiment. This could be due to investor concerns about the costs, risks, or implications of these green financing initiatives.

Companies should be aware of potential market reactions and consider strategic communication and investor education when announcing such initiatives to mitigate negative perceptions and highlight long-term benefits.

To understand the negative and significant market reaction to the issuance of green bonds, the study examined both firm-level indicators and insights into the green bond market. This approach aimed to identify the reasons behind the impact of market reaction resulting from green bond issuances.

**Table 7:** Statistical description

US \$	Minimum	1st Quartile	Median	Mean	3rd Quartile	Maximum	S.D
Section A- Firm-Level Indicator							
Financial Leverage	0.43	0.795	0.86	0.7973	0.885	0.9	0.152
Growth	0.03	0.05	0.11	0.1247	0.14	0.45	0.106
Section B- Insights into the GB Market							
Second Review	0	1	1	0.8	1	1	0.414
A-rated bonds	0	0	0	0.2667	0.5	1	0.457
Maturity years	5	5	5	6.067	7	10	1.791
Amount issued	14.22	18.07	19.67	18.94	19.98	20.44	1.616
Coupons	1.84	4.375	5.63	5.787	7.44	8.85	1.978
Return on assets	0.04	0.055	0.08	0.07133	0.085	0.11	0.021

Source: Authors.

In Table 7, the statistical description of the firm-level indicator in section A is in US dollars for the sample. In terms of financial leverage, the data ranges from 0.43 to 0.9 suggesting that most firms have a moderate to high leverage. The mean leverage of 0.7973 is close to the median, indicating a symmetric distribution around a relatively high leverage point. The relatively low standard deviation (S.D) of 0.152 points indicates uniformity in financial risk exposure among the firms. In terms of Growth Ranging from 0.03 to 0.45, with a significant standard deviation of 0.106 relative to the mean of 0.1247, it indicates a wide variability in growth rates among firms. This suggests differing capabilities in expanding operations, which is a critical indicator for potential sustainable investors.

In Section B insights into the GB market SR and A-rated bonds are categorical variables if green is certified by CBI will be 1 or else zero and A-rated bonds equal one if rates are above A or else zero. The median and third quartile values being 1 for both variables indicate that a majority of the bonds have undergone a second review and many are A-rated, suggesting a focus on quality and due diligence in the green bond market, GB are medium-term maturities which would reflect a balance between risk and reward that investors and issuers look in green investment. A larger amount of green bonds has also been issued to be directed towards sustainable projects and it is lucrative for investors of green bonds as it might compensate them for their protentional risks and a low SD of indicating consistent performance across the sector, as it signals to both current and prospective investors that green bonds offer reliable returns from assets use of proceed allocated in sustainable projects.

**Table: 8** Regression of CAR for different event windows and firm and bond indicators

	Initial Standard Error				Robust Standard error				Financial Impact
	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	
	{-10, 10}		{-20, 20}		{-10, 10}		{-20, 20}		
Second Review	-0.17985	-3.091*	-0.1154	-1.319	-0.17985	-2.7229*	-0.1154	-0.9521	Detracti ng
A-rated bonds	0.03027	0.625	-0.10223	-1.403	0.030274	0.5802	-0.10223	-1.4323	Mixed/ Neutral
Maturity	-0.01871	-1.355	-0.05507	-2.652*	-0.01871	-1.1862	-0.05507	-2.2839	Detracti

years									ng
Amount issued	0.01634	0.97	0.052988	2.092	0.01634	0.8037	0.052988	1.8156	Enhancing
Coupons	0.02608	1.75	0.061517	2.745*	0.026082	1.7333	0.061517	3.8121*	Enhancing
Return on assets	-2.4096	-1.687	-0.28122	-0.131	-2.4096	-1.4907	-0.28122	-0.108	Detracting
Financial Leverage	-0.03025	-0.23	-0.00464	-0.024	-0.03026	-0.2635	-0.00464	-0.0226	Neutral
Growth	0.78117	4.132**	1.249109	4.393**	0.781173	7.3873***	1.249109	6.414**	Enhancing

Source: Authors.

In table 8. The coefficients do not change between the initial standard error and the robust standard error. This suggests that the estimates of the regression parameters are stable even when accounting for potential heteroscedasticity (unequal variances) in the residuals. Regardless of the measures of CAR, Growth is only consistent and is statistically significant. Using growth as a proxy of efficiency, indicating a strong and significant positive impact on the dependent variable (CAR). The positive association between Growth and CAR implies that firms experiencing higher growth rates tend to have more favorable market reactions, which could be interpreted as the market valuing or enhancing future potential and profitability brought about by growth similarly amounts issued and Coupons showed a positive relationship with CAR, indicating that increases in these factors are associated with positive AR, suggesting these are value-enhancing for the firms upon the issuance of green bonds. Second Review impact may diminish over a longer period but in a shorter period the coefficient is negative (-0.17985) and statistically significant at a conventional level (t-stat: -3.091\*), suggesting that the second review hurts CAR within this window on the contrary to Second Review, maturity and coupon rate more relevant to investors over a longer horizon possibly due to perceived higher yields over time but second review and maturity years suggests these factors could detract value or investor perception when associated negatively with CAR. These results from Table 7 suggest that market participants react to immediate financial metrics and forward-looking indicators like growth prospects. The variable significance across different time windows also hints at evolving market perceptions, where immediate reactions might differ from more considered responses as more information becomes available or market conditions change.

## Conclusion

This study aimed to assess whether issuing green bonds (GB) positively impacts the stock prices of the company issuing GB in the Indian market. We focused on GB issued by Indian companies between 2014 and 2022, noting that the Asia-Pacific region, with India as a key contributor, leads the global market in GB issuance. Employing the event-study methodology, we empirically analyzed stock market reactions to GB issuances, using the Capital asset pricing model (CAPM) to estimate the expected market return for these companies.

Our findings indicated that the CAR was negative and statistically significant, suggesting an unfavorable stock market response to the issuance of GB. The complexities involved in issuing green bonds suggest that external market conditions, the specifics of the bond issuance (like coupon rate) (Baulkaran, 2019), and broader investor perceptions about the issuer's environmental and financial strategy all play critical roles in influencing market reactions. This comprehensive view provides a strong justification for the negative CAR observed in your study, illustrating the need for firms to consider timing (Liu, M., 2022), market conditions, and investor sentiment when planning green bond issuances. This contradicts our null hypothesis that GB issuance has no impact on the issuing company's stock price in the Indian market our study was not consistent with Verma and Bansal (2023) that there are mixed market reaction results (Kodiyatt et al.,2024) results of the insignificant impact of the GB issuance in the market. The results diverge from Fama's (1965) semi-strong market efficiency theory, which posits that all public company information should be rapidly integrated into stock prices. However, our study shows that the event impact lasts up to 20 days post-issuance. Furthermore, we found that both amounts issued, coupons and Growth have significantly impacted the relationship between GB issuance and market response in the green bond market. To better understand the negative and significant market reaction to green bond issuances, the study delved into both firm-level indicators and broader insights into the GB market. Through this approach, it succeeds in unveiling the underlying reason impacting the market's response to green bond issuances.

GB emerged as crucial for promoting sustainable growth and funding projects that meet Sustainable Development Goals and India's Intended Nationally Determined Contributions, with an allocation of USD 2.5 trillion for climate action. GB might offer an advantage over traditional bonds by potentially increasing market demand. Green investors might be open to accepting lower returns for investments in projects linked with green use of proceeds (Zerbib, 2019; Ehlers and Packer, 2017).

### **Implications of the Study**

**Theoretical Implications:** The study adds knowledge to the body's existing literature concerning GB and market efficiency. Empirical evidence shows the stock market reaction to GB issuances in the Indian context. The study tests Fama's (1965) semi-strong market efficiency theory where results show that the event impact lasts up to 20 days post-issuance suggesting the market may not recognize public information regarding GB. Furthermore, we found that negative CAR indicates different investor perceptions and behavioral biases which may not be captured as the CAPM model has been used in the study which calls for future research to study external market conditions that affect the market response to the issuance of the GB.

**Practical Implications:** The results from the study have significance for investors and portfolio managers as negative CAR post-issuance of GB suggests that investors in the Indian market treat conventional bonds and GB differently. Therefore, before investing in GB investors should conduct research so it can incorporate all the additional risk factors aligned with GB.

**Managerial Implications:** The findings from the study pinpoint the need for a strategic approach when they are issuing GBS. Issuers should be conscious of factors like coupon rate, and maturity to reduce negative market reactions and to positively influence the investors' perceptions there should be clear communications regarding environmental and financial benefits from the proceeds raised through GB.

### **Limitations and Future Scope of the Study**

Future research should explore different asset pricing models to calculate expected returns, thereby enriching the existing literature. Additionally, employing larger samples could yield more conclusive results. This study examined the stock price reactions to GB issuance and exploring non-price factors such as credit ratings, reputation effects, and investor sentiment are yet to be explored.



## Reference

- Agarwal, S., & Singh, T. (2017).** Unlocking the green bond potential in India. The Energy and Resources Institute (TERI). <https://www.teriin.org/projects/nfa/files/Green-Bond-Working-Paper.pdf>
- Agliardi, E., & Agliardi, R. (2019).** Financing environmentally-sustainable projects with green bonds. *Environment and development economics*, 24(6), pp 608-623. <https://doi.org/10.1017/S1355770X19000020>
- Antoniuk Y., & Leirvik T. (2021).** Climate Transition Risk and the Impact on Green Bonds. *Journal of Risk and Financial Management*, 14(12), 597. <https://doi.org/10.3390/jrfm14120597>
- Baker, M., Bergstresser, D., Serafeim, G., & Wurgler, J. (2022).** The pricing and ownership of US green bonds. *Annual review of financial economics*, 14, pp 415-437. <https://doi.org/10.1146/annurev-financial-111620-014802>
- Bancel, F., & Glavas, D. (2018).** Are Agency Problems a Determinant of Green Bond Issuance. *SSRN Electronic Journal*. Are-Agency-Problems-a-Determinant-of-Green-Bond-Issuance.pdf (researchgate.net)
- Bardhan, R., Debnath, R., & Jana, A. (2019).** Evolution of sustainable energy policies in India since 1947: A review. *Wiley interdisciplinary reviews: Energy and environment*, 8(5), e340. <https://doi.org/10.1002/wene.340>
- Barua, S., & Chiesa, M. (2019).** Sustainable financing practices through green bonds: What affects the funding size? *Business Strategy and the Environment*, 28(6), pp 1131-1147. <https://doi.org/10.1002/bse.2307>
- Baulkaran, V. (2019).** Stock market reaction to green bond issuance. *Journal of Asset Management*, 20(5), pp 331-340. <https://doi.org/10.1057/s41260-018-00105-1>
- Ben-Rephael, A., Da, Z., & Israelsen, R. D. (2017).** It depends on where you search: Institutional investor attention and underreaction to news. *The Review of financial studies*, 30(9), pp 3009-3047. <https://doi.org/10.1093/rfs/hhx031>
- Chen X., Weber O., & Saravade V. (2022).** Does It Pay to Issue Green? An Institutional Comparison of Mainland China and Hong Kong's Stock Markets Toward Green Bonds. *Frontiers in Psychology*, 13, 833847. <https://doi.org/10.3389/fpsyg.2022.833847>
- Cicchiello A.F., Cotugno M., Monferrà S., & Perdichizzi S. (2022).** Credit spreads in the European green bond market: A daily analysis of the COVID-19 pandemic impact. *Journal of International Financial Management and Accounting*, 33(3), pp 383-411. <https://doi.org/10.1111/jifm.12150>
- Climate Bonds Initiative. Home. <https://www.climatebonds.net/>
- Cortellini, G., & Panetta, I. C. (2021).** Green bond: A systematic literature review for future research agendas. *Journal of Risk and Financial Management*, 14(12), 589. <https://doi.org/10.3390/jrfm14120589>
- Cursi, M. (2022).** Does ESG rating affect the stock market reaction to a green bond issuance?
- Dann, L. Y., & Mikkelsen, W. H. (1984).** Convertible debt issuance, capital structure change and financing-related information: Some new evidence. *Journal of Financial Economics*, 13(2), pp 157-186. [https://doi.org/10.1016/0304-405X\(84\)90022-9](https://doi.org/10.1016/0304-405X(84)90022-9)
- Dasgupta, S., Laplante, B., & Mamingi, N. (2001).** Pollution and capital markets in developing countries. *Journal of Environmental Economics and management*, 42(3), pp 310-335. <https://doi.org/10.1006/jeem.2000.1161>
- De Roon, F., & Veld, C. (1998).** Announcement effects of convertible bond loans and warrant-bond loans: An empirical analysis for the Dutch market. *Journal of Banking & Finance*, 22(12), pp1481-1506. [https://doi.org/10.1016/S0378-4266\(98\)00055-7](https://doi.org/10.1016/S0378-4266(98)00055-7)
- Dell'Atti S., Di Tommaso C., & Pacelli V. (2022).** Sovereign green bond and country value and risk: Evidence from European Union countries. *Journal of International Financial Management and Accounting*, 33(3), pp 505-521. <https://doi.org/10.1111/jifm.12155>
- Eccles, R. G., Ioannou, I., & Serafeim, G. (2012).** *The impact of a corporate culture of sustainability on corporate behavior and performance* (Vol. 17950, No. 1, pp. 2835-2857). <https://mikekrzus.com/downloads/files/HBS-Impact%20of-Culture.pdf>

- Ehlers, T., & Packer, F. (2017).** Green bond finance and certification. *BIS Quarterly Review September*. <https://ssrn.com/abstract=3042378>
- Fama, E. F. (1965).** The behavior of stock-market prices. *The journal of Business*, 38(1), pp 34-105. <http://www.jstor.org/stable/2350752>
- Flammer, C. (2020).** Green bonds: effectiveness and implications for public policy. *Environmental and Energy Policy and the Economy*, 1(1), pp 95-128. <https://doi.org/10.1086/706794>
- Flammer, C. (2021).** Corporate green bonds. *Journal of financial economics*, 142(2), 499-516. <https://doi.org/10.1016/j.jfineco.2021.01.010>
- Gianfrate, G., & Peri, M. (2019).** The green advantage: Exploring the convenience of issuing green bonds. *Journal of cleaner production*, 219, pp 127-135. <https://doi.org/10.1016/j.jclepro.2019.02.022>
- Glavas, D. (2018).** How do stock prices react to green bond issuance announcements?. *Glavas, D.(2020). Green Regulation and Stock Price Reaction to Green Bond Issuance. Finance*, 1(1), pp 7-51. <https://doi.org/10.3917/fina.411.0007>
- Glavas, D. (2020).** Green regulation and stock price reaction to green bond issuance. *Finance*, 41(1), pp 7-51. <https://doi.org/10.3917/fina.411.0053>
- Goss, A., & Roberts, G. S. (2011).** The impact of corporate social responsibility on the cost of bank loans. *Journal of banking & finance*, 35(7), pp 1794-1810. <https://doi.org/10.1016/j.jbankfin.2010.12.002>
- Hamilton, I., & Eriksson, J. (2011).** Influence strategies in shareholder engagement: a case study of all Swedish national pension funds. *Journal of Sustainable Finance and Investment*, 1(1), pp 44-61. <https://doi.org/10.3763/jsfi.2010.0006>
- Hamilton, J. T. (1995).** Pollution as news: Media and stock market reactions to the toxics release inventory data. *Journal of environmental economics and management*, 28(1), pp 98-113. <https://doi.org/10.1006/jeem.1995.1007>
- Hart, O., & Zingales, L. (2017).** Serving shareholders doesn't mean putting profit above all else. *Harvard Business Review*, 12, 2-6. Hart Zingales 2017 Serving Shareholders HBR.pdf ([arrunada.org](http://arrunada.org))
- Hart, O., & Zingales, L. (2017).** Companies should maximize shareholder welfare not market value. *ECGI-Finance Working Paper*, (521). <https://dx.doi.org/10.2139/ssrn.3004794>
- Jensen, M. C., & Zimmerman, J. L. (1985).** Management compensation and the managerial labor market. *Journal of Accounting and Economics*, 7(1-3), pp 3-9. [https://doi.org/10.1016/0165-4101\(85\)90025-4](https://doi.org/10.1016/0165-4101(85)90025-4)
- Jin, J., & Zhang, J. (2023).** The Stock Performance of Green Bond Issuers During COVID-19 Pandemic: The Case of China. *Asia-Pacific Financial Markets*, 30(1), pp 211-230. <https://doi.org/10.1007/s10690-022-09386-4>
- King, T. H. D., & Wen, M. M. (2011).** Shareholder governance, bondholder governance, and managerial risk-taking. *Journal of Banking & Finance*, 35(3), pp 512-531. <https://doi.org/10.1016/j.jbankfin.2010.07.011>
- Klassen, R. D., & McLaughlin, C. P. (1996).** The impact of environmental management on firm performance. *Management science*, 42(8), pp 1199-1214. <https://doi.org/10.1287/mnsc.42.8.1199>
- Kliger, D., & Sarig, O. (2000).** The information value of bond ratings. *The journal of finance*, 55(6), pp 2879-2902. <https://doi.org/10.1111/0022-1082.00311>
- Kothari, S. P., & Warner, J. B. (2007).** Econometrics of event studies. In *Handbook of empirical corporate finance* (pp. 3-36). Elsevier. <https://doi.org/10.1016/B978-0-444-53265-7.50015-9>
- Kodiyatt, S. J., Nair, B. A. V., Jacob, M. S., & Reddy, K. (2024).** Does Green Bond Issuance Enhance Market Return of Equity Shares in the Indian Stock Market? *Asia-Pacific Journal of Financial Studies*, 53(3), pp 390-409. <https://doi.org/10.1111/ajfs.12459>
- Kumar, M., & Verma, R. (2023).** Effect of Green Bond Issuance on Stock Returns of Indian Public Companies. *IUP Journal of Applied Economics*, 22(1). Effect of Green Bond Issuance on Stock Returns of Indian Public Companies. | IUP Journal of Applied Economics | EBSCOhost

- Lebelle, M., Lajili Jarjir, S., & Sassi, S. (2020).** Corporate green bond issuances: An international evidence. *Journal of Risk and Financial Management*, 13(2), 25. <https://doi.org/10.3390/jrfm13020025>
- Lin, C., Ma, Y., Malatesta, P., & Xuan, Y. (2011).** Ownership structure and the cost of corporate borrowing. *Journal of financial economics*, 100(1), pp 1-23. <https://doi.org/10.1016/j.jfineco.2010.10.012>
- Lintner, J. (1975).** The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. In *Stochastic optimization models in finance* (pp. 131-155). Academic Press. <https://doi.org/10.1016/B978-0-12-780850-5.50018-6>
- Liu, M. (2022).** The driving forces of green bond market volatility and the response of the market to the COVID-19 pandemic. *Economic Analysis and Policy*, 75, pp 288-309. <https://doi.org/10.1016/j.eap.2022.05.012>
- Löffler, K. U., Petreski, A., & Stephan, A. (2021).** Drivers of green bond issuance and new evidence on the “greenium”. *Eurasian Economic Review*, 11(1), pp 1-24. <https://doi.org/10.1007/s40822-020-00165-y>
- Makpotche, M., Bouslah, K., & M'Zali, B. (2024).** Long-run performance following corporate green bond issuance. *Managerial Finance*, 50(1), pp 140-178. <https://doi.org/10.1108/MF-12-2022-0588>
- Mohd Roslen S.N., Yee L.S., & Binti Ibrahim S.A. (2017).** Green Bond and shareholders' wealth: A multi-country event study. *International Journal of Globalisation and Small Business*, 9(1), pp 61-69. <https://doi.org/10.1504/IJGSB.2017.084701>
- Pandey, D. K., & Kumari, V. (2021).** Event study on the reaction of the developed and emerging stock markets to the 2019-nCoV outbreak. *International Review of Economics & Finance*, 71, pp 467-483. <https://doi.org/10.1016/j.iref.2020.09.014>
- Reboredo, J. C. (2018).** Green bond and financial markets: Co-movement, diversification and price spillover effects. *Energy Economics*, 74, pp 38-50. <https://doi.org/10.1016/j.eneco.2018.05.030>
- Roslen, S. N. M., Yee, L. S., & Ibrahim, S. A. B. (2017).** Green Bond and shareholders' wealth: a multi-country event study. *International Journal of Globalisation and Small Business*, 9(1), pp 61-69. <https://doi.org/10.1504/IJGSB.2017.084701>
- Shankar, N., & Sharma, S. (2023).** Impact of green bonds issuance on stock prices - Evidence from India. *AIP Conference Proceedings*, 2763(1), Article 60002. <https://doi.org/10.1063/5.0159422>
- Sharpe, W. F. (1964).** Capital asset prices: A theory of market equilibrium under conditions of risk. *Journal of Finance*, 19, pp 425-442. <https://doi.org/10.1111/j.1540-6261.1964.tb02865.x>
- Sreelakshmi, P., & Greeshma, R. J. (2023).** Green Bonds: A Propitious Financial Instrument of Climate Finance. *Vision*. <https://doi.org/10.1177/09722629221138679>
- Tang, D. Y., & Zhang, Y. (2020).** Do shareholders benefit from green bonds?. *Journal of Corporate Finance*, 61, 101427. <https://doi.org/10.1016/j.jcorpfin.2018.12.001>
- The World Bank. (2018a, November 16).** From evolution to revolution: 10 years of green bonds. From Evolution to Revolution: 10 Years of Green Bonds ([worldbank.org](http://worldbank.org))
- The World Bank. (2018b., November 27).** From evolution to revolution: 10 years of green bonds. From Evolution to Revolution: 10 Years of Green Bonds ([worldbank.org](http://worldbank.org))
- Verma, R. K., & Bansal, R. (2023).** Stock market reaction on green-bond issue: Evidence from Indian green-bond issuers. *Vision*, 27(2), pp 264-272. <https://doi.org/10.1177/09722629211022523>
- Werner, S. P. (2010).** The event study methodology. In *Short Selling Activities and Convertible Bond Arbitrage: Empirical Evidence from the New York Stock Exchange* (pp. 53-66). Wiesbaden: Gabler. [https://doi.org/10.1007/978-3-8349-6003-0\\_3](https://doi.org/10.1007/978-3-8349-6003-0_3)
- World Bank. (2023, April 10).** From India to Indonesia: Green bonds help countries move toward sustainability. Climate Stories | Green Bonds ([worldbank.org](http://worldbank.org))
- Wu, Y. (2022).** Are green bonds priced lower than their conventional peers? *Emerging Markets Review*, 52, Article 100909. <https://doi.org/10.1016/j.ememar.2022.100909>

- Xi, B., & Stephan, H. (2021).** Research on the impact of green bond issuance on the stock price of listed companies. *Kybernetes*, 51(4), pp 1478-1497. <https://doi.org/10.1108/K-12-2020-0900>
- Yi X., Bai C., Lyu S., & Dai L. (2021).** The impacts of the COVID-19 pandemic on China's green bond market. *Finance Research Letters*, pp 42, 101948. <https://doi.org/10.1016/j.frl.2021.101948>
- Yu H., Burlacu R., & Enjolras G. (2024).** Green Bond Issuances: A Promising Signal or a Deceptive Opportunity? *Business and Society*. <https://doi.org/10.1177/00076503241255072>
- Zala, P., & Vel, R. (2020).** Empirical Evidence on Announcement Effect: The Case of Green Bond Offerings by Indian Companies. *Indian Journal of Research in Capital Markets*, 7(1), pp 38-47. Empirical-Evidence-on-Announcement-Effect-The-Case-of-Green-Bond-Offerings-by-Indian-Companies.pdf (researchgate.net)
- Zerbib, O. D. (2019).** The effect of pro-environmental preferences on bond prices: Evidence from green bonds. *Journal of banking & finance*, 98, pp 39-60. <https://doi.org/10.1016/j.jbankfin.2018.10.012>
- Zwiebel, J. (1996).** Dynamic Capital Structure under Managerial Entrenchment. *The American Economic Review*, 86(5), pp1197–1215. <http://www.jstor.org/stable/2118286>