



**RESEARCH PAPER**

**Boosting Shareholder Value: The Impact of Green Bonds on Equity Markets**

**<sup>1</sup>Ume Salma Akbar, <sup>2</sup>Niaz Ahmed Bhutto\* and <sup>3</sup>Naseer Ullah Khan**

1. Assistant Professor, Department of Business Administration at Sukkur Institute of Business Administration Sukkur Sindh Pakistan
2. Professor, Department of Business Administration at Sukkur Institute of Business Administration Sukkur Sindh Pakistan
3. Department of Business Administration at Sukkur Institute of Business Administration Sukkur Sindh Pakistan

**\*Corresponding Author:** u.salma@iba-suk.edu.pk

**ABSTRACT**

The study empirically investigates the impact of green bonds issuance on listed firms operating in G7 (Japan, UK, USA, France, Germany, Italy, and Canada) economies. The sample consist of monthly data ranges from January 2015 to August 2022. Green bonds issuance data is collected from announcements, press releases, and semi-annual or yearly reports. Additionally, we use the official websites and credit rating agency portals of the particular country to find debt issuance. The subsequent findings imply that the issuance of green bonds cast a positive impact on shareholder wealth maximization moreover, sustainable financing practice increases firm value in a long run and thus is favored by shareholders.

**KEYWORDS:** Equity Market, G7 Economies, Green Bonds, Shareholder Value, Sustainable Finance

**Introduction**

The ever-rising economic growth and human negligence have inflated the problems of pollution, climate change, depletion of resources, and environmental degradation. The ascending threats have compelled the world community to think over their actions and cooperate to combat the adverse effects of their conduct on the environment and society. World Meteorological Organization reports the last ten years from 2010-2020 is the warmest decade, and the temperature will keep rising in the upcoming year (WMO, 2020). International agreements are being signed to unite countries all over the globe with the concern of sustainability (Akhtar et al., 2023; Hongyun et al., 2023). The Paris Agreement is an international treaty initiated under the platform of the United Nations to get countries to promise to take measures against climate change and to control greenhouse gas emissions (UNFCCC, 2018). Incessant attempts have been made at the individual and institutional levels to recover the atmosphere from the damage humans have done and reportedly this is a long-running process to save the planet earth.

Environmental, social, and governance (ESG) and business performance or risk have been at the forefront of academic discussion for decades. Although they started relatively late, research on green bonds is an essential kind of green investment that went to its next level in the past tenner. Low-carbon projects and green technologies are what green bonds are all about. However, because we live in a world with imperfect markets and incomplete information, investors need more data to assess a company's environmental responsibility (Naveed et al., 2023; Dakhan et al., 2020).

One of the significant sources of financing for both government and private corporations is issuing bonds and getting finances from individual and institutional investors. These bonds are issued to finance different projects. One such type of bond is called a green bond (Jakubik, 2020; Sohu et al., 2020). Green Bonds are the bonds that are issued to finance a project that aims for environmental sustainability. European Investment Bank issued the first-ever green bond in 2007. It has then observed tremendous growth in this market. The green market grew by issuing \$ 0.8 billion in 2007 to \$859 billion in 2021 (Reuters, 2021).

Green Finance is any initiative, product, or process generated to support green projects for a better environment. The aim is to create novel financial instruments that can fund eco-friendly projects in the long term and earn a reasonable return to compete with other traditional instruments (Sohu, Mirani, et al., 2020). It has a wide range of products like bonds, investment funds, loans, and insurance policies, but the most popular is the "Green bond"- fixed income security. Firms use the proceeds to finance projects with a positive environmental impact. It attracts diverse investors committed to infusing their funds into clean projects catering to the problems of greenhouse gas emissions, climate change, wasteful resources, and so on.

Considering the conflict between the sustainability features of green bonds and the exploitation of green labels, academic scholars have devised different methodologies to resolve the puzzle of whether green bonds are perceived to be valuable and effective financial instruments for environmental projects. They have found two competing views regarding investors' feedback on the issuance of green bonds in the equity market (Sohu et al., 2019; Sohu et al., 2022). However, most studies have been conducted in developed countries, and the standard method is to find abnormal returns before and after the issuance. Thus, this paper aims to evaluate the reaction of the stock market to the announcement of the issuance of green bonds in G7 countries (Japan, France, Germany, UK, USA, Italy, and Canada). There are almost 26 thousand listed companies which are operating in G7 countries. However, very few companies issue green bonds.

Therefore, the study examines the impact of green bond issuance on the stock prices of G7 countries. The paper proceeds as follows: The next section briefs about the mixed evidence found in the existing literature on the effect of green bonds on financial markets and investors' preferences for such instruments. The following section, "Data and Methodology," defines the data sample and regression model constructed to answer the research question. Finally, the last section outlines and discusses the result in detail.

## **Literature Review**

We all come across various individuals and organizations who advocate for the importance of sustainable development and alert the world to the rising threats of climate change and environmental issues. Whether sustainability is limited to the debates and awareness sessions, or the world is taking practical measures and progressing towards it. According to World Investment Report 2021, investments supporting -related projects and themes amounted to \$3.2 trillion in 2020, a more than 80% increase from the previous year, and stocks with ESG factors are valued at \$88 trillion worldwide (Akbar et al., 2023). These facts give strong evidence in favor of sustainable investments. Though a wide range of financial products are available to target the theme of sustainability, green bonds have become highly popular (Dakhan et al., 2021; Iqbal et al., 2023). It is considered one of the primary sources of long-term financing for environmental projects. Climate Bonds Market Intelligence states that the green bond market amounts to half a trillion (USD517.4bn) in 2021 (Jones, 2022). Green bonds have improved the way to transform the

current production and manufacturing process from obsolete to new and advanced methods that reduce carbon emissions and pollution (Meng et al., 2022).

Various studies Maltais and Nykvist (2020) have recognized the significance and contribution of green bonds in combating problems like climate change, global warming, energy conservation, and environmental degradation and promoting energy-efficient alternatives. Sartzetakis (2021) analyzes the positive impact of green finance in moving the economy towards a low carbon footprint. It suggests that its share is increasing in the global debt market. Its scope is also widening as proceeds are now used to finance diverse projects like renewable energy, transportation, waste management, energy efficiency, and low-carbon goals.

Green bonds differ from non-green bonds due to their fund utilization in green projects and ESG components. Concern has been raised about whether the financial markets appraise this uniqueness, and as a result, prices and returns are different for these two classes of bonds. The matched pair analysis is used to compare the yield spreads of both types of bonds from 2015 to 2016, and it is observed that, on average, there is only a difference of 1.18 bps, and green bonds trade tightly due to their high demand. However, their prices have no significant difference (Hachenberg and Schiereck, 2018). According to another survey, conventional and green bonds are equally likely to be issued. While the issuance of green bonds may not provide immediate financial benefits to issuers or purchasers, including such bonds in investment portfolios might help institutional investors raise their environmental, social, and governance (ESG) score (Wang et al., 2020).

One common way of differentiating green bonds from their counterparts is to search for a green bond premium called "greenium". It is a concept that investors accept lower yields or pay higher prices for green bonds due to their positive contribution to the environment. Partridge and Medda (2020) compare the yield spreads of bonds and compound annual growth rate of bond indices and find that there are almost five bps of greenium on the average in the secondary market (Dakhan et al., 2020; Junejo et al., 2020). However, no such premium is detected in the primary market. Another study analyzes the determining factors of the interest rate of green bonds. It concludes that investors accept the lower yield spread from issuers with higher ratings, higher CSR scores and third-party certification (Li et al., 2020).

On the other hand, Larcker and Watts (2020) present contrasting results after comparing the 640 pairs of green and brown bonds. It says that "greenium" is almost zero as differential yield equals zero in 85 percent of pairs. Lau et al. (2022) conclude that there is a trivial premium of 1 bps on average, and the median is zero. The mixed evidence of literature suggests that investors are not keen to sacrifice their returns for investments like SRI, ESG, and green bonds.

After analyzing the background, sustainability component, determinants of yield, and existence of premium, another important dimension is assessing how the stock market responds when green bonds are issued. Baulkaran (2019) collects data from 54 firms worldwide and calculates abnormal returns on the announcement day of the green bond as well as in the window of [-10,10] and [-10,20] days. The abnormal returns are 1.33% positively significant on average as investors view the issuance as value enhancement activity (Junejo et al., 2022; Sohu et al., 2023). It further adds that the firms with higher growth opportunities and better financial performance receive more positive market reactions. Another empirical study is conducted to the announcement effect on shareholders by collecting data from 28 countries from 2007 through 2017. It also confirms investors' positive reaction as cumulative abnormal returns are 1.39% positive

when firms issue green bonds. Still, it does not observe any premium in the form of lower yield (Tang & Zhang, 2020).

The study was conducted in China from the data sample of 2016 to 2019 to analyze the feedback from the debt and equity markets on the issuance of the green bond and find positive feedback from both markets in terms of yield spread and returns (Wang *et al.*, 2020). Two Indian academics also studied the stock market to the issuing of the stock market's response to issuing green bonds. The findings implied that green bond issuing significantly increased stock prices. After the announcement of the issuance of green bonds, returns rose. All study samples indicate a negative return on the announcement day, but the cumulative anomalous return (CAR) over the previous ten days is positive. As a result, investor confidence is boosted when green-bond offerings are made (Verma and Bansal, 2021). Some studies have split the green funds into different categories to fund green projects. At the same time, the results are different for each class of funds. It is found that green funds and green investments do not significantly impact the issuers' share prices; issuing a green bond significantly impacts the issuer's share prices (Jakubik & Uguz, 2021).

Interesting results about the correlation between the green bond indices and the equity market are reported. It proves there is a weak or no correlation between these two variables, and the green bond market moves opposite the stock market (Kuang, 2021). Not only this, green bonds work as a "safe haven" for investors in the event of a crisis. Amid all these studies supporting the positive reaction, Lebel, Lajili Jarjir, and Sassi (2020) used the sample of 475 green bonds to determine the returns for five windows. It finds out that the issuance of green bonds elicits an adverse reaction in the investors because uncertainty arises for the firm, and the potential profits are at stake. Hence, it is confirmed that the literature provides competing evidence on the impact of green bonds on the stock market. However, the following hypothesis is proposed based on most studies supporting positive feedback.

"H0: The issuance of green bonds are priced positively by the investors in the stock market."

Different parts of the world produce varying results. Due to a potential opening in the "Debt Securities and Stock Market Reaction" field, another line of research is being broadened to encompass more regions (particularly the US, the EU, and developing markets in place of China and Southeast Asia), plus additional industrial sub-sectors (Shah *et al.*, 2021). Future research examines the connection between the features of bond and issuer and the performance of climate bonds in a broader range of geographical contexts (Saravade *et al.*, 2022).

This article explores the relationship between green bond issuance and the share prices of the issuer of green bonds. It is believed that there is a positive relationship between the two variables. The green bond issuance is supposed to increase the prices of the issuer company. It is possibly argued that investors perceive green bonds as a more attractive investment due to their perceived lesser risk exposition, environmental awareness, and investors' perceived sustainability consciousness. The article has taken G7 countries for the research. Although individual countries have been researched, the whole region is yet to be explored. This article will try to increase the sample size to avoid any omitted variable bias. We have taken all the companies of G7 countries into our sample. All companies that have issued green bonds are also listed in any exchange house.

Thus, our hypothesis of the research is that there is a positive relationship between green bond issuance and the share prices of the issuers. This is because investors positively perceived green bond issuance and reacted more favorably by investing more in that particular stock, increasing the stock prices of the green bond issuer.

## Material and Methods

Our data consists of almost 103 companies operating in G7 countries and issuing green bonds that are also listed on any stock exchange. The data is taken for monthly share prices for the eight years from 2015 to 2022 (August). Our total sample size is 9476 entities for our panel data of 103 companies. The eight years' share prices are observed in a way that reflects how share prices behave when a green bond has been issued. It is tried to observe whether, when the green bond is issued, the prices of shares increase or decrease or remain unchanged. Based on the shares price movement, we will analyze how the investor behaves when the green bonds are announced. Announcements of the issuance of green bonds have been taken from the company's website, press conferences, and public newspapers.

## Results and Discussion

**Table 1**  
**List of variables employed**

Variables	Abbreviation	Description
Returns of a specific company	ldprice	Variations in the equity price of a particular firm are expressed as logarithms
Market return	bldmarket	Logarithmic difference of the market return, which is based on the MSCI index
Green Dummy	green	A green dummy indicates whether the company has issued a bond in a specific time period or not. We set 1 for those who issue green bonds at a specific time.
Debt	lndebt	The natural logarithm of the reported amount of bonds issued by firms. If there are no issuances during the specified time t, the variables are set to 0.

Our dataset contains 198 announcements in total. The list of the companies and their announcements are given in Table 2, along with the descriptive statistics, which reflect the market returns of each company.

**Table 2**  
**Descriptive Statistics of Market Returns of Sample Firms**

Company	Max	Min	Mean	Standard Deviation	Announcements
Alimentation Couche-Tard Inc	0.1157	-0.1484	0.0042	0.0430	1
Bank of Nova Scotia	0.1037	-0.1330	0.0038	0.0385	2
Brookfield Renewable Partners LP	0.0877	-0.1124	0.0032	0.0326	4
Canadian Imperial Bank of Commerce	0.1163	-0.1492	0.0042	0.0432	1
Granite Real Estate Investment Trust	0.0995	-0.1276	0.0036	0.0370	3
Northland Power Inc	0.0513	-0.0658	0.0019	0.0191	2
RioCan Real Estate Investment Trust	0.1361	-0.1746	0.0049	0.0506	2
Summit Industrial Income REIT	0.1206	-0.1547	0.0044	0.0448	1
Toronto-Dominion Bank	0.1011	-0.1296	0.0037	0.0376	1
Citigroup Inc	0.1833	-0.2350	0.0067	0.0681	3
Clearway Energy Inc	0.0853	-0.1094	0.0031	0.0317	3
Dana Inc	0.2599	-0.3333	0.0094	0.0966	2
Digital Realty Trust Inc	0.0401	-0.0515	0.0015	0.0149	2
Hawaiian Electric Industries Inc	0.0367	-0.0471	0.0013	0.0136	1
Norfolk Southern Corp	0.1515	-0.1942	0.0055	0.0563	2
Owens Corning	0.1761	-0.2259	0.0064	0.0654	2

Portland General Electric Co	0.0605	-0.0776	0.0022	0.0225	1
Welltower Inc	0.1126	-0.1444	0.0041	0.0418	2
BNP Paribas SA	0.2056	-0.2637	0.0075	0.0764	3
Covivio SA	0.1673	-0.2145	0.0061	0.0622	3
Derichebourg SA	0.1522	-0.1952	0.0055	0.0566	1
Electricite de France SA	0.1264	-0.1621	0.0046	0.0470	3
Engie SA	0.1109	-0.1422	0.0040	0.0412	3
Faurecia SE	0.1917	-0.2458	0.0070	0.0712	1
Getlink SE	0.1012	-0.1298	0.0037	0.0376	3
Icade SA	0.1440	-0.1847	0.0052	0.0535	1
Vinci SA	0.1149	-0.1474	0.0042	0.0427	1
Barclays PLC	0.1887	-0.2419	0.0069	0.0701	2
Paragon Banking Group PLC	0.0331	-0.0425	0.0012	0.0123	1
National Grid PLC	0.1966	-0.2521	0.0071	0.0730	2
Natwest Group PLC	0.1951	-0.2502	0.0071	0.0725	2
Renewi PLC	0.2008	-0.2575	0.0073	0.0746	2
SSE PLC	0.0794	-0.1019	0.0029	0.0295	3
Vodafone Group PLC	0.1133	-0.1453	0.0041	0.0421	1
Workspace Group PLC	0.1581	-0.2027	0.0057	0.0587	2
BASF SE	0.1498	-0.1921	0.0054	0.0557	1
BayWa AG	0.0783	-0.1004	0.0028	0.0291	2
Commerzbank AG	0.1614	-0.2070	0.0059	0.0600	3
Deutsche Bank AG	0.1337	-0.1715	0.0049	0.0497	2
Deutsche Wohnen SE	0.0277	-0.0356	0.0010	0.0103	1
E.ON SE	0.0663	-0.0850	0.0024	0.0246	3
EnBW Energie Baden Wuerttemberg AG	0.0404	-0.0518	0.0015	0.0150	4
Porsche Automobil Holding SE	0.1699	-0.2179	0.0062	0.0631	1
RWE AG	0.0845	-0.1083	0.0031	0.0314	2
Volkswagen AG	0.1659	-0.2127	0.0060	0.0616	1
Vonovia SE	0.0665	-0.0853	0.0024	0.0247	1
Enel SpA	0.0909	-0.1166	0.0033	0.0338	4
Hera SpA	0.0859	-0.1102	0.0031	0.0319	1
Intesa Sanpaolo SpA	0.1670	-0.2142	0.0061	0.0621	4
IREN SpA	0.0874	-0.1120	0.0032	0.0325	5
Snam SpA	0.0522	-0.0670	0.0019	0.0194	4
Terna Rete Elettrica Nazionale SpA	0.0424	-0.0544	0.0015	0.0158	6
Activia Properties Inc	0.1024	-0.1312	0.0037	0.0380	4
Advance Residence Investment Corp	0.0327	-0.0420	0.0012	0.0122	2
Aeon Financial Service Co Ltd	0.1663	-0.2133	0.0060	0.0618	1
ANA Holdings Inc	0.1182	-0.1515	0.0043	0.0439	1
Asahi Holdings Inc	0.0206	-0.0264	0.0007	0.0076	1
Central Japan Railway Co	0.1218	-0.1562	0.0044	0.0453	2
Daiwa House Industry Co Ltd	0.0850	-0.1090	0.0031	0.0316	1
Daiwa House REIT Investment Corp	0.0513	-0.0657	0.0019	0.0190	3
Daiwa Securities Group Inc	0.1052	-0.1349	0.0038	0.0391	1
Fuyo General Lease Co Ltd	0.1284	-0.1647	0.0047	0.0477	2
GLP J-REIT	0.0329	-0.0422	0.0012	0.0122	4
Hankyu Hanshin REIT Inc	0.0910	-0.1167	0.0033	0.0338	1
Hokuriku Electric Power Co	0.0819	-0.1051	0.0030	0.0304	1
Japan Excellent Inc	0.0915	-0.1173	0.0033	0.0340	2
Japan Hotel Reit Investment Corp	0.1590	-0.2039	0.0058	0.0591	1
Japan Prime Realty Investment Corp	0.0911	-0.1168	0.0033	0.0339	3
Kajima Corp	0.1436	-0.1842	0.0052	0.0534	1
Kenedix Office Investment Corp	0.0952	-0.1221	0.0035	0.0354	2
Kirin Holdings Co Ltd	0.1080	-0.1385	0.0039	0.0401	1
Marui Group Co Ltd	0.1399	-0.1794	0.0051	0.0520	1
Meidensha Corp	0.1507	-0.1933	0.0055	0.0560	1
Mitsubishi Electric Corp	0.1385	-0.1776	0.0050	0.0515	1
Mitsubishi Estate Co Ltd	23.6551	13.5291	17.8325	2.3153	1
Mitsubishi Heavy Industries Ltd	0.1117	-0.1432	0.0041	0.0415	2
Mitsubishi UFG Financial	0.1002	-0.1285	0.0036	0.0372	6

Mizuho Financial Group Inc	0.0966	-0.1238	0.0035	0.0359	3
Mori Hills Reit Investment Corp	0.0544	-0.0697	0.0020	0.0202	4
Nidec Corp	0.1532	-0.1965	0.0056	0.0569	2
Nippon Yusen KK	0.2236	-0.2867	0.0081	0.0831	1
Nomura Real Estate Master Fund Inc (JPY)	0.0653	-0.0837	0.0024	0.0242	2
Nomura Research Institute Ltd	0.1138	-0.1460	0.0041	0.0423	1
Obayashi Corp	0.1192	-0.1529	0.0043	0.0443	1
Odakyu Electric Railway Co Ltd	0.1266	-0.1623	0.0046	0.0470	1
Orient Corp	0.1271	-0.1630	0.0046	0.0472	2
ORIX Corp	0.1443	-0.1851	0.0052	0.0536	3
Orix JREIT Inc	0.0996	-0.1277	0.0036	0.0370	3
Penta-Ocean Construction Co Ltd	0.1408	-0.1806	0.0051	0.0523	1
Ricoh Co Ltd	0.1240	-0.1590	0.0045	0.0461	2
Seibu Holdings Inc	0.1152	-0.1477	0.0042	0.0428	2
Seiko Epson Corp	0.1795	-0.2302	0.0065	0.0667	1
Sekisui House Reit Inc	0.0605	-0.0775	0.0022	0.0225	5
Senko Group Holdings Co Ltd	0.0651	-0.0835	0.0024	0.0242	1
Shimizu Corp	0.1285	-0.1648	0.0047	0.0477	1
Sumitomo Mitsui Financial Group Inc	0.1277	-0.1637	0.0046	0.0474	1
Takasago Thermal Engineering Co Ltd	0.0957	-0.1227	0.0035	0.0355	1
Toda Corp	0.1002	-0.1285	0.0036	0.0372	3
Tokyo Century Corp	0.1832	-0.2349	0.0067	0.0681	1
Tokyo Gas Co Ltd	0.0200	-0.0257	0.0007	0.0074	1
Tokyo Tatemono Co Ltd	0.1685	-0.2161	0.0061	0.0626	1
United Urban Investment Corp	0.0886	-0.1137	0.0032	0.0329	1
Z Holdings Corp	0.1208	-0.1549	0.0044	0.0449	1

The model addresses the concern differently. It has taken the eight-year panel data for the sample companies. This is more robust and long-time-series data. Moreover, previous research has mainly been conducted on green bonds and their prices instead of share prices. This study has considered the share prices to check how investors have reacted to bond issuance, or we can say how green issuance affects the company's overall performance.

Following are the equations to run the panel data:

$$\text{ldprice} = \beta_1 \text{bldmarket} + \beta_2 \text{green} \quad (\text{Pool-1})$$

$$\text{ldprice} = \beta_1 \text{bldmarket} + \beta_2 \text{green} + \text{Indebt} \quad (\text{Pool-2})$$

$$\text{ldprice} = \beta_1 \text{bldmarket} + \beta_2 \text{green} + \text{Indebt} + \sum \beta_3 \text{months}_{i,t} + e_{i,t} \quad (\text{Pool-3})$$

The model is designed to see the impact of regressors on prices (ldprice). The "ldprice" is the natural logarithm of prices of shares, which would result in percentage price changes. The regressors in the model are logarithmic market returns multiplied by the beta of specific companies (market), green bond issuance, debt variable (debt), and time-series impact taken as monthly data. So "bldmarket" is included to control the impact of overall market performance. The benchmark is the MSCI World Index for market returns. It is also taken in the logarithmic form to assess the market performance in percentage. This benchmark is the most suitable of all for G7 countries.

Moreover, the model has a dummy variable, "green." It has a value of "1" if the company has issued a green bond; otherwise, it is "0". This variable is of particular importance to the model design. It will help us determine how much the green bond issuance has impacted the share prices. The following variable included in the model is " $\sum \beta_3 \text{months}_{i,t}$ ". This particular variable is included to control for the seasonal impact. It will control the time series data for fluctuations or trends. The pooled estimate of the

model with the standard robust error was employed. We check the fixed effect from pool estimations by conducting the Hausman test.

## Discussion

Before formally testing our hypothesis, we conducted some tests to check the reliability and validity of the data and model. First of all, we checked whether the data was stationary or non-stationary. We applied the Levin-Lin-Chu unit root test to check the stationarity of the data. The results given in the table show that the Levin-Lin-Chu unit is rejecting our null hypothesis. Our null hypothesis is that the data contains unit roots, i.e., non-stationary data, which the unit root test rejects. Hence, our data is stationary. Also, we tested our panel data by applying the Hausman test to identify whether to use a fixed effect model. Moreover, our results showed that we do not need a fixed effect model.

Finally, we applied Pooled Least Squared (PLS) to test our hypothesis. The pool-1 model is tested to check the effect of the announcement of green bond issuance (Green) on stock prices (ldPrice). The results show that the coefficients for bldmarket is 0.7967 and 0.0488 for the announcement of Green bond issuance. The p vlaue results that (bldmarket) and (Green) have a significant effect on stock prices (ld Prices). Coefficients show that if the stock price changes by 0.7967% when there is a 1% change in the market return. Also, the price increases by 4.88% when the company announces the issuance of green bonds as per pool1. However, there may be omitted variable biases due to the tax shield provided by the debt, and that may give us wrong results that the effect of these variables is significant, which may not be the case if we add all the affecting variables. So, to avoid omitted variable biases due to the tax shield effect on green bonds, we add the variable of debt factor (Lndebt) of the company in model pool-2. The results of pool-2 do not change our decision about the effect of our variables. However, it brought about some changes in the coefficients such that the coefficient of dummy variable Green decreased from 4.88% to 3.19%. The effect announcement of green bond issuance (Green) and debt factor (Lndebt) on stock prices (ldprice) remained significant in results of p value to increase the reliability, we add another variable of time effect to check for the seasonality effect of the green bond issuance a dummy variable "month<sub>j,t</sub>". Therefore, the model pool-3 was tested, and it was found that all the results including time series are significantly affecting the stock prices (ldprice) except for the month j=4 and j=11, although, it caused changes in coefficients like the coefficient of bldmarket decreased from 0.7960 to 0.7546.

**Table 3**  
**Regression Results**

	Pool(1)	Pool(2)	Pool(3)
Dependent: ldprice			
bldmarket	0.7967*** (0.0135)	0.7960*** (0.01353)	0.7546*** (0.01347)
Green	0.0488** (0.005618)	0.031855*** (0.00660)	0.020968*** (0.006760)
Lndebt		0.00138*** (0.000281)	0.000778*** (0.000284)
month, j = 1			-0.009281** (0.002807)
month, j = 2			-0.014889** (0.002766)
month, j = 3			-0.005707*** (0.002768)
month, j = 4			-0.001178



			(0.002764)
month, j = 5			0.021625***
			(0.002854)**
month, j = 6			0.007729***
			(0.002764)
month, j = 7			0.031952***
			(0.002821)
month, j = 8			0.0102***
			(0.002767)**
month, j = 9			0.005803***
			(0.002862)
month, j = 10			-0.032923***
			(0.002851)
month, j = 111			0.02291
			(0.002855)
Observations	9476	9476	9476

## Conclusion

Sustainable growth has become one of the main objectives of organizations around the world. Market participants have high expectations of inclusion of ESG targets in corporate strategy. There are different instruments that facilitate this objective and green finance is one of them. Our paper contributes to the literature by examining the impact of green bonds issuance on investors and their decision making. The model empirically tests whether issuance of green bonds is priced positively or negatively by the stock market in G7 countries. For this purpose, public data of prices and market returns for 103 countries have been collected along with the official announcements regarding the issuance from company's website. Debt financing and dummy variables of month have been added to control the effect of tax shield and seasoning respectively. Finally, pool regression is carried out to assess the impact of green bonds.

Our results have shown that the stock market reacts positively to the issuance of green bonds. Announcement of green bonds issuance by companies has a positive and statistically significant impact on the price appreciation of stocks. It means that investors consider the option of green financing as value adding and thus encourage this by exhibiting strong preferences toward such companies. There are concerns over "greenwashing" which means companies are just labeling their financial instruments as "green" to capture market's attention. This has decreased the confidence of stakeholders to the extent that a negative reaction has been observed in some parts of the world on the introduction of green policies. In such a scenario, it is really commendable to get the positive reaction from seven developed countries. Though, in-depth analysis is required to understand the popularity of green financing.

## References

- Akbar, U. S., Bhutto, N. A., & Rajput, S. K. O. (2023). How do carbon emissions and eco taxation affect the equity market performance: An empirical evidence from 28 OECD economies. *Environmental Science and Pollution Research*, 58(30), 1–20. <https://doi.org/10.1007/s11356-023-29882-y>
- Akhtar, S., Li, C., Sohu, J. M., Rasool, Y., Hassan, M. I. U., & Bilal, M. (2023). Unlocking green innovation and environmental performance: The mediated moderation of green absorptive capacity and green innovation climate. *Environmental Science and Pollution Research*, 58(30), 1–16. <https://doi.org/10.1007/s11356-023-31403-w>
- ASEAN. (2021). *ASEAN development trajectories reach new milestone*. ASEAN
- Baulkaran, V. (2019) 'Stock market reaction to green bond issuance', *Journal of Asset Management*, 20(5), 331–340.
- Dakhan, S. A., Sohu, J. M., Jabeen, A., Mirani, M. A., Shaikh, J. A., & Iqbal, S. (2020). Impact of Green HRM on Employees Pro-Environmental Behavior: Mediating Role of Women Environmental Knowledge at Higher Education Institutions. *IJCSNS International Journal of Computer Science and Network Security*, 20(12), 202–208.
- Dakhan, S. A., Sohu, J. M., Mustafa, S., & Sohu, S. A. (2021). Factors Influencing Political Orientation: Mediating Role of Women Empowerment. *International Journal of Management (IJM)*, 12(1), 786–795
- Glavas, D. (2019) 'How Do Stock Prices React to Green Bond Issuance Announcements?', *SSRN Electronic Journal*, 1(1), 1–34. doi: 10.2139/ssrn.3279069.
- Hachenberg, B. and Schiereck, D. (2018) 'Are green bonds priced differently from conventional bonds?', *Journal of Asset Management*, 19(6), 371–383.
- Hongyun, T., Sohu, J. M., Khan, A. U., Junejo, I., Shaikh, S. N., Akhtar, S., & Bilal, M. (2023). Navigating the digital landscape: Examining the interdependencies of digital transformation and big data in driving SMEs' innovation performance. *Kybernetes*, 53(1), 1–29. <https://doi.org/10.1108/K-07-2023-1183>
- Iqbal, S., Akhtar, S., Anwar, F., Kayani, A. J., Sohu, J. M., & Khan, A. S. (2023). Linking green innovation performance and green innovative human resource practices in SMEs; a moderation and mediation analysis using PLS-SEM. *Current Psychology*, 42(13), 11250–11267. <https://doi.org/10.1007/s12144-021-02403-1>
- Jakubik, P. (2020). Impact of green bond policies on insurers: evidence from the european equity market. *Journal of Economics and Finance*, 45 (13), pages 381–393.
- Junejo, I., Sohu, J. M., Aijaz, A., Ghumro, T. H., Shaikh, S. H., & Seelro, A. D. (2022). The Mediating Role of Brand Attitude for Purchase Intention: Empirical Evidence from Fast Food Industry in Pakistan. *ETIKONOMI*, 21(1), 103–112.
- Junejo, I., Sohu, J. M., Ali, S. H., Qureshi, S., & Shaikh, S. A. (2020). A Study of Consumer Attitude Towards Counterfeit Fashion Luxurious Products: The Mediating role of Purchase Intension. *Sukkur IBA Journal of Management and Business*, 7(1), 1.
- Jakubik, P. and Uguz, S. (2021) 'Impact of green bond policies on insurers: evidence from the European equity market', *Journal of Economics and Finance*, 45(2), . 381–393.

- Jones, L. (2022) \$500bn Green Issuance 2021: social and sustainable acceleration: Annual green \$1tn in sight: Market expansion forecasts for 2022 and 2025, Climate Bonds Initiative.
- Kuang, W. (2021) 'Are clean energy assets a safe haven for international equity markets?', *Journal of Cleaner Production*, 302 (2), 127006.
- Larcker, D. F. and Watts, E. M. (2020) 'Where's the greenium?', *Journal of Accounting and Economics*, 69(2-3), 101312.
- Lau, P. et al. (2022) 'The Economics of the Greenium: How Much is the World Willing to Pay to Save the Earth?', *Environmental and Resource Economics*, 81(2), 379-408.
- Lebelle, M., Lajili Jarjir, S. and Sassi, S. (2020) 'Corporate green bond issuances: An international evidence', *Journal of Risk and Financial Management*, 13(2), 25.
- Li, Z., Tang, Y., Wu, J., Zhang, J., & Lv, Q. (2020). The Interest Costs of Green Bonds: Credit Ratings, Corporate Social Responsibility, and Certification. *Emerging Markets Finance and Trade*, 56(12), 2679-2692. <https://doi.org/10.1080/1540496X.2018.1548350>
- Löffler, K. U., Petreski, A. and Stephan, A. (2021) 'Drivers of green bond issuance and new evidence on the "greenium"', *Eurasian Economic Review*, 11(1), 1-24.
- Maltais, A. and Nykvist, B. (2020) 'Understanding the role of green bonds in advancing sustainability', *Journal of Sustainable Finance & Investment*, 11(2), 1-20.
- Meng, Z., Sun, H. and Liu, X. (2022) 'Impact of green fiscal policy on the investment efficiency of renewable energy enterprises in China', *Environmental Science and Pollution Research*, 1-19.
- Naveed, H. M., HongXing, Y., Memon, B. A., Ali, S., Alhussam, M. I., & Sohu, J. M. (2023). Artificial neural network (ANN)-based estimation of the influence of COVID-19 pandemic on dynamic and emerging financial markets. *Technological Forecasting and Social Change*, 190(5), 122-151. <https://doi.org/10.1016/j.techfore.2023.122470>
- Partridge, C. and Medda, F. R. (2020) 'Green bond pricing: The search for greenium', *The Journal of Alternative Investments*, 23(1), 49-56.
- Saravade, et al. (2022) 'Impact of regulatory policies on green bond issuances in China: policy lessons from a top-down approach', *Climate Policy*, 22(8), 1-12. doi: 10.1080/14693062.2022.2064803.
- Sartzetakis, E. S. (2021) 'Green bonds as an instrument to finance low carbon transition', *Economic Change and Restructuring*, 54(3), 755-779.
- Shah, S. M. M., Sohu, J. M., Dakhan, S. A., Ali, R. S., Junejo, I., & Chouhan, I. M. (2021). The Reinvesting Impact of Promotional Activity and Store Atmosphere on Impulse Buying Behavior: The Mediating Role of Payment Facility. *TEM Journal*, 10(1), 221-225
- Sohu, J. M., Hongyun, T., Akbar, U. S., & Hussain, F. (2023). Digital Innovation, Digital Transformation, and Digital Platform Capability: Detrimental Impact of Big Data Analytics Capability on Innovation Performance. *International Research Journal of Management and Social Sciences*, 4(3), 265-281

- Sohu, J. M., Hongyun, T., Rahoo, L. A., Dakhan, S. A., Soomro, H. A., & Naveed, H. M. (2020). Feasibility Study of Knowledge Management Establishment in Private Degree Awarding Institute of Pakistan. *IJCSNS International Journal of Computer Science and Network Security*, 20(12), 177-183
- Sheng, Q., Zheng, X. and Zhong, N. (2021) 'Financing for sustainability: Empirical analysis of green bond premium and issuer heterogeneity', *Natural Hazards*, 107(3), 2641-2651.
- Sohu, J. M., Junejo, I., Khuwaja, F. M., Qureshi, N. A., & Dakhan, S. A. (2022). The Impact of Entrepreneurial Education on Entrepreneurial Intention During the COVID-19 Pandemic: An Empirical Study from Pakistan. *Sarfraz Ahmed DAKHAN / Journal of Asian Finance*, 9(3), 95-0103.
- Sohu, J. M., Mirani, M. A., Dakhan, S. A., & Junejo, I. (2020). Factors Influencing on Succession Planning: Evidence from Service Sector of Pakistan. *International Journal of Management (IJM)*, 11(12), 2629-2636. <https://doi.org/10.34218/IJM.11.12.2020.247>
- Tang, D. Y. and Zhang, Y. (2020) 'Do shareholders benefit from green bonds?', *Journal of Corporate Finance*, 61, 101427.
- The Paris Agreement* | UNFCCC. (2015). *United Nation Organization*. <https://unfccc.int/process-and>
- Sohu, J. M., Junejo, I., & Hussain, F. (2019). The Impact of Corruption on Exchange Rate: Empirical Evidence from Panel Data. *Sukkur IBA Journal of Management and Business*, 6(1), 34. <https://doi.org/10.30537/sijmb.v6i1.264>
- Verma, R. K. and Bansal, R. (2021) 'Stock Market Reaction on Green-Bond Issue: Evidence from Indian Green-Bond Issuers', *Vision*, 09722629211022523.
- Wang, D. and Li, P. (2020) 'The Benefits of Issuing Green Bonds: Evidence From China Green Bonds Market', *SSRN Electronic Journal*, (2018). doi: 10.2139/ssrn.3710646.
- Wang, M., Qiu, C. and Kong, D. (2011) 'Corporate social responsibility, investor behaviors, and stock market return evidence from a natural experiment in China,' *Journal of business ethics*, 101(1), 127-141.
- WMO. (2020, December). 2020 closes a decade of exceptional heat. *World Meteorological Organization*.
- Yeow, K. E. and Ng, S. H. (2021) 'The impact of green bonds on corporate environmental and financial performance', *Managerial Finance*, 47(10), 1486-1510. doi: 10.1108/MF-09-2020-0481.