

Investing in green bonds and its impact on stock prices and profitability for banks**A study of his analysis of a sample of Canadian banks, Royal Bank, as a model****For the period (2005-2022)****Hawraa Zaki Hameed**Hawraa.z@uokerbala.edu.iq

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Abstract. Investing in clean energy projects requires non-traditional tools, including green bonds, as they provide a set of advantages that qualify the projects to obtain financing. Therefore, this study aims to demonstrate the impact of Canadian banks introducing green bonds in their list of investments and the extent of their impact on the prices and returns of their shares. In the financial market , The study relied on the most important test for normal distribution, which is the Kolmogorov-Smirnov test, and a time series for a period of (18) years, from (2005 - 2022), as the bank did not deal in green bonds for the period (2005 - 2013), that is, for a period of (9) years. Green bonds were dealt with for the period (2014-2022), The results of the study showed that there was a clear increase in the stock price and its profitability after investing in green bonds over the previous period of this investment. In order to test the significance of this increase, the statistical program (Statgraphics V.18) was used.

Keywords: green bonds, clean energy, green financial markets, green finance.

First: Introduction

Countries face many challenges in light of current environmental developments, and green finance provides innovative solutions to build strong economies, as most institutions, including financial institutions, have an incentive to move to investing in green financial instruments and introducing them into their field of work, including green bonds, green sukuk, green loans, and investment funds. Green and others, which have received the attention of governments and banks because of their economic and societal importance It is hoped that it will be a major source of energy in the future. It is a source that is inexhaustible

in nature, as it is derived from sunlight that reaches the earth. It includes investment in building hydroelectric stations, solar energy stations, and wind energy, in addition to underground energy and some renewable combustible waste.

In order to keep pace with this global trend, it is necessary to provide financing sources suitable for these characteristics. Green financing was one of those important financing sources undertaken by financial and banking institutions that are keen to integrate and introduce sustainability standards into their products through the available green loans, accounts and bonds allocated and designed to finance environmentally friendly projects. Foremost among them are sustainable energy projects.

Second: The concept of green bonds

Green bonds are fixed-income financial instruments that exclusively finance green projects or climate-related projects, as the year 1947 is the first year of their launch by the World Bank, and the term green bonds cannot be applied by the issuer to any bonds unless they comply with the main principles of issuing green bonds or the principles of the Bank. The Canadian Central Bank or the national regulations governing its issuance, It is an opportunity to provide financing for projects and thus it is an attractive investment, as one of the reasons for its attractiveness to the majority of investors is that it is a classified financial instrument known for financing environmental issues (Mathews & Kidney, 2012: 340), Therefore, it is known as an innovative financing tool that is usually tax-exempt to encourage the financing of green investment or green projects, so it is called as investment bonds with social responsibility or environmental bonds (Bakdi & Khabbazi, 2020:), as they are bonds that finance climate change activities and are issued Usually through a number of exporters, such as multilateral development banks, municipalities, and companies that aim to raise their environmental reputation, as well as those that aim to preserve water or biological diversity (Chen Rui, 2020: 67), The green bond market has grown rapidly over the past decade, starting with the climate awareness bonds issued by the European Investment Bank in 2007 as the first green bond. The main impetus for the development of the green market was the International Capital Market Association's introduction of green bond principles in 2014 (Hyun, et al, 2019: 129).

Third: Types of green bonds

Green bonds diversify with the diversity of investors' activities, increasing cooperation among them, raising awareness of the issuer's activities, and contributing to building a green market that helps mobilize and prepare financing for climate-focused activities. Therefore, according to this diversity, there are four types of green bonds: (Dunia & Maryam, 2021:118 :), (Bakari, 2020:130):-

- 1- **Green government bonds:** These are bonds issued by a government entity, the proceeds of which are used to finance the construction of bridges and roads for which fees are collected as a result of their use in the region, and their improvement and equipment.
- 2- **Green corporate bonds:** These are bonds issued by companies and directed to individual investors or companies such as insurance companies, banks, and hedge funds.
- 3- **Green Multilateral Development Bank Bonds:** Other parties concerned with issuing green bonds include international institutions.

Fourth: Principles regulating green bonds

There is a set of guidelines governing the issuance of green bonds, which were established by investment banks and insurance companies in 2014. These principles are under the supervision of the International Capital Market Association, which were updated in 2018 and are reviewed by the Center for International Environmental and Climate Research as well as managers of the largest banks. Global

environmental consulting companies and owners of climate bond initiatives. Among these principles are the following (Bin Zaidan et al., 2020: 69), (Fatima et al., 2021: 12), (Shaaban, 2017: 3): -

- 1- Criteria for using proceeds: It is required that bond proceeds be used to finance projects or support projects of a green nature so that they contribute to achieving the goals of sustainable development and protecting the environment.
- 2- Project evaluation and selection process: - Through this standard, green bond issuers must communicate transparently, fairly, and clearly with investors.
- 3- Managing green bond returns: The net bond returns are added to a subaccount and the process of managing it is carried out by the auditor or any other party in order to verify the internal tracking method and allocate the bond returns.
- 4- Preparing reports and reporting on the actual use of funds: Bond issuers must report the allocation and use of proceeds for green projects and specify a list of projects that have been supported by bond proceeds, as well as a brief description of those projects and the amounts allocated to each project and its impact on the environment and climate.

Fifth: - Clean project portfolio

The World Bank has set a set of criteria for eligible projects that the green bond market can support, which are called green projects and are known as projects included in the ten sectors identified by the United Nations Environment Programme, which include the energy sector, construction, transportation, agriculture, tourism, forestry, and biodiversity. , industry, waste, cities and water (Al-Sheryani & Nobanee, 2020:90), as there is a group of projects that are financed with green bonds, including the following (Bakdi & Khabbazi, 2020:11), (REGlobal, 2020:45):-

- 1- Financing green bonds for investments related to the field of clean energy: These investments include projects related to renewable energy, such as building stations to generate renewable energy, such as solar energy, and providing it on a large scale in buildings, cities, shops, and factories.
- 2- Financing green bonds for investments related to the field of clean transportation: - That is, investments related to supporting projects that aim to reduce air pollution and develop infrastructure such as the subway, cable cars, electric buses, and electric cars.
- 3- Financing green bonds for sustainable use of land and water: such as projects related to sanitation operations, water desalination, rainwater harvesting, sustainable forest management, and organic agriculture.
- 4- Green bond financing for air-conditioned manufacturing operations: - which is represented by production processes such as developing and introducing environmentally friendly product technologies and highly efficient packaging and distribution.
- 5- Financing the field of health: Green bonds are used to finance the treatment of public health cases.

Sixth: The returns achieved on the shares of banks issuing green bonds

The achieved return on the share represents the return that the investor actually receives (capital return only), which is achieved from the increase in the price of the share when sold over what it was at the time of purchase, due to the lack of a dividend distribution, as it reflects the percentage change in the investor's wealth at the end of the period of his holding of the shares. This return represents a basic indicator that is relied upon when deciding whether or not to invest in these shares, as well as when making comparisons between shares, as this return achieved per share comes from the sum of the capital gains and the dividend return.

Seventh: The applied aspect of the research

In order to test the hypothesis of the study that includes the extent of the impact of the use of green bonds on the profit and price of the share, the researcher benefited from the data of the Royal Bank and a time series for a period of (18) years, from (2005) until (2022), as the bank did not deal in green bonds for the period from (2005) until (2013), that is, for a period of (9) years, then green bonds were dealt with for the period from (2014) until (2022). The researcher will adopt the following steps in order to test the research hypothesis.

1- Testing the normal distribution of data

As the researcher will adopt the (t) test for the difference between two independent samples, and one of the most important conditions for this test is that the data be subject to a normal distribution, especially since the sample size is small (18) observations, so the data was subjected to the most important test for normal distribution, which is the (Kolmogorov-Smirnov) test, as in The table below-:

Table (1) Test of normal distribution of study data

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Earnings per share	.128	18	.200*	.939	18	.281
Share price	.167	18	.198	.933	18	.222
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

Source: Prepared by the researcher

It is clear from the table above that the value of the Kolmogorov-Smirnov test for earnings per share reached (0.128), which is a significant value at the level of (20%) and is greater than the target value, which is (5%). The Kolmogorov-Smirnov test value for the stock price reached (0.167), which is a significant value at approximately (20%) and is greater than the target value, which is (5%). From the above analysis, the researcher infers that the data is subject to a normal distribution, which allows the appropriate statistical test to be conducted.

2- Descriptive statistics for the study variables

Table (2) below includes the study data and descriptive statistics as follows:

Table (2): Study data

Share price	Earnings per share	The value of green bonds	the year
45.4	0.002639016	0	2005

55.5	0.003693877	0	2006
50.74	0.004313592	0	2007
36.1	0.003488534	0	2008
56.4	0.002758325	0	2009
52.32	0.003676308	0	2010
51.98	0.00450402	0	2011
59.88	0.00522755	0	2012
71.41	0.005778069	0	2013
80.24	0.006241712	1,500 000 000 000	2014
74.15	0.006948338	2,800 000 000 000	2015
90.87	0.007038272	2,300 000 000 000	2016
102.65	0.00781806	5,100 000 000 000	2017
93.44	0.008609358	2,589 000 000	2018
102.75	0.00897072	4,800 000 000 000	2019
93.16	0.008032081	5,900 000 000 000	2020
128.82	0.011268353	15,600 000 000 000	2021
127.3	0.011261322	12,000 000 000	2022
76.3	0.006	-	Arithmetic mean
27.7	0.007	-	standard deviation

Source: Prepared by the researcher

It is evident from the above table that:

- 1- The value of the arithmetic mean for the variable earnings per share was (0.006) dollars, with a standard deviation of (0.007) dollars. It is noted that the earnings per share are close to the arithmetic meaning and began to rise as of the year 2014, which is the year in which the bank began implementing the policy of dealing in green bonds.
- 2- The arithmetic mean value of the share value variable was \$76.3, with a standard deviation of \$27.7. It is noted that the value of the stock began to rise significantly starting in 2014, which is the year in which the bank began implementing the policy of dealing in green bonds.
- 3- Testing the research hypothesis regarding the effect of green bonds on earnings per share
 H0) There are no significant differences in earnings per share due to dealing in green bonds.
 H1) There are significant differences in earnings per share due to dealing in green bonds.

The researcher used the (t) test for the difference between two independent samples for the purpose of testing the effect of the bank's dealings with the study sample on earnings per share, as in Table (3) below:

Table (3) Testing the effect of dealing in green bonds on earnings per share

Group Statistics					
	the group	N	Mean	Std. Deviation	Std. Error Mean
Earnings per share	Before the bond	9	.0040	.00105	.00035
	After the bond	9	.0085	.00180	.00060

Source: Prepared by the researcher

It appears from the above table that the average value of earnings per share before dealing in green bonds is \$0.004, with a standard deviation of \$0.001. After dealing in green bonds, the average value of earnings per share was \$0.0085, with a standard deviation of \$0.0018. It appears that there is an increase in the average value of earnings per share when dealing with green bonds. In order to test the significance of this increase, the statistical program (Statgraphics V.18) was used for the purpose of calculating the value of (t) for the difference between the means of the two samples. The value of (t) reached (-5.29), which is a significant value at the level of (1%), which indicates There are significant differences in earnings per share due to dealing in green bonds. Which prompts the researcher to reject the null hypothesis (H0) and accept the alternative hypothesis (H1), meaning (there are significant differences in earnings per share due to dealing in green bonds).

4- Testing the research hypothesis regarding the effect of green bonds on stock price

H0) There are no significant differences in the stock price due to dealing in green bonds.

H1) There are significant differences in the stock price due to dealing in green bonds.

The researcher used the (t) test for the difference between two independent samples for the purpose of testing the effect of the bank's dealings in the study sample on the stock price, as in Table (4) below:

Table (4) Testing the effect of dealing in green bonds on the stock price

Group Statistics					
	the group	N	Mean	Std. Deviation	Std. Error Mean
Share price	Before the bond	9	53.3033	9.70325	3.23442
	After the bond	9	99.2644	18.76651	6.25550

Source: Prepared by the researcher

It appears from the above table that the average value of the stock price before dealing in green bonds is \$53.30, with a standard deviation of \$9.70. After dealing in green bonds, the average share price reached \$99.26, with a standard deviation of \$7.18. It appears that there is a significant increase in the value of the average share price when dealing in green bonds, and in order to test the significance of this increase, the

statistical program (Statgraphics V.18) was used for the purpose of calculating the value of (t) for the difference between the averages of the two samples, and the value of (t) was (-6.53) which is a significant value at the level of (1%), which indicates the presence of significant differences in the share price attributable to dealing in green bonds. Which prompts the researcher to reject the null hypothesis (H0) and accept the alternative hypothesis (H1), meaning (there are significant differences in the stock price due to dealing in green bonds).

Conclusions

There is no doubt that the world is constantly developing and changing, and this certainly leads to positive and negative changes. One of the negative changes that accompanied the development of the industrial environment is the huge amount of environmental pollution, as shown by the results that were obtained, which caused environmental and health problems, which prompted policy makers around the world to search for tools. And investments that contribute to preserving the environment and public health, and one of these unconventional tools is green investments, and the turning point began in the world and green investments became one of the pillars of economic development and gained great popularity and took up a large space, which facilitated the shift towards them and prompted investors to continuously search for green investments, one of the most important of which is Are green bonds? The current study sought to test whether investment in green bonds affects the stock price of the banks sample of the current study , By dividing the study sample into two parts, the first part contains a pre-test, that is, before investing in green bonds, and then a post-test, after the introduction of bonds or dealing in green bonds by the banks in the current study sample. The study concluded that investing in green bonds has had a positive impact. On the share price as well as its profitability for the banks sampled in the study, and this rise indicates positive expectations for decisions to finance clean energy projects, which encourages investors to deal with these banks by depositing or buying their shares as they are profitable institutions. It also encourages banks to expand their green investments and diversify them in a way that serves their interests as well as to protect society.

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