

Impact of Demographic Factors Over Green Investments: Study of Investors in Urban Region of Hooghly District, West Bengal

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Abstract

It is impossible to undervalue the importance of Green Financing while discussing sustainable development. India is among the many nations that have adopted green finance in the modern world, even though it requires some time for it to really get streamlined. The purpose of this study was to determine whether demographic characteristics, such as age, gender, and income, are substantially related to the purchasing pattern of Green Financial Instruments. If in case, Green Bonds are able to draw in more investors, Green Financing will undoubtedly benefit. The study's primary drawback is that it only examined portions of West Bengal's Hooghly area. The final conclusion was reached using the Chi Square test as the statistical method. It has been noted that preferences for Green Bonds are significantly correlated with age, gender, and income. In order to achieve sustainable growth, the government and other authorities may find this study useful in constructing the nation's financial policies.

Keywords: Green Financial Instruments, Green Bonds, Green Investment, Sustainable Development, Sustainability

1. INTRODUCTION:

Since the Green Bond concept is relatively new in India, there hasn't been much research done on "investors' interest," particularly when it comes to determining whether there is a connection between a potential investor's age, gender, and income and the choices they make about their investments. Green Financial Instrument is indeed an excellent tool those for investors who may have a propensity for humanitarian endeavours or who may have intentions to engage in them in the future. Therefore, the study delves into any relationship that might have existed between the demographic factors and the features of green financial instruments. The age of the investors were considered too. Many people believe that younger investors are more likely than their older counterparts to invest in green financial instruments. This study also aims to investigate the broad idea of whether or not investors' age affects their decision-making. The fact that different groups of individuals have diverse perceptions of the term "green" is well known, and this study provides insight into what investors believe about bonds bearing the label. Many investors are motivated to invest in green bonds and other green financial instruments by the expectation that they will perform well in the future. Because of the philanthropic perspective, many investors feel compelled to invest in green financial instruments as they bear the power to bring sustainability in the scenario. Regardless of whether they are current or prospective investors, people's views on Green Bonds and even Greenwashing actually differ from one another. Although instances of greenwashing are still relatively uncommon in India, they have already emerged as one of the world's most alarming problems. Since Green bonds are designed to fund specific initiatives that are especially environmentally favourable, they are unquestionably a sustainable alternative. In India, there are numerous projects that have been financed via green financial instruments but still need furthermore funding for expansion; in these cases, green bonds might actually be extremely helpful. However, when it comes to the term "green," investors' degree of awareness may still cause them to question it. The purpose of this study is to help investors make decisions about whether to purchase green bonds or vanilla bonds.

2. LITERATURE REVIEW:

One of the most important published study called “Understanding the role of green bonds in advancing sustainability” discusses the probable factors that can attract people towards a specific kind of financial instrument. While putting Sweden's case study in perspective, this study focuses on the market's rapid expansion for green financial instruments. Regarding the performance of green bonds, this study also poses a highly pertinent argument. If, after accounting for financial performance, Green Bonds are essentially the same as conventional investment bonds, why do the issuing companies go to the extra effort of labeling and verifying them, and why is there even a greater demand for Green Bonds? But it's also true that, from the perspective of an investor, there is a direct financial incentive if the bond offers better diversification benefits or a lower degree of risk (Maltais et al., 2020). Greenium has been shown to be an arena that is rather significant while discussing Green Bonds in the paper "Green Bond: A Systematic Literature Review for Future Research Agendas." This investigation indicates that only 14 articles from the "Greenium" group have been talked about. The Greenium, also known as the "green bond premium," suggests that green bonds may be priced cheaper than risk-paired conventional bonds, which would result in a lower interest rate. (Cortellini & Panetta, 2021). Benefits for lesser income countries, whose financial markets should not be brought into comparison to those in affluent nations, have been underlined in the paper "Green bonds issuance: insights in low- and middle-income countries." In 2012, the first green bonds issued by LMIC took place in South Africa. Due to the growth mostly driven by China and East Asia, the bond amount of \$4.5 billion increased to \$81 billion between 2014 and 2016. However, from the perspective of the LMIC market, one of the biggest challenges faced by portfolio managers is that ESG requirements may differ greatly from those in western nations. The issue of undeveloped capital markets with limited liquidity is another angle to look into (Otek Ntsama et al., 2021). "The pricing of Green Bonds: Are Financial Institutions Special?" is the title of the study where it has been discussed that investors might not be able to clearly discern a connection between the bonds (green) issued by a financial institution and a particular "green investment project" at the time of issuance, which could account for the lack of a green premium for financial issuers. (Fatica et al., 2021). Another study that found a strong correlation between green bond issuance and climate change, is titled "The Determinants of Green Bond Issuance in the European Union." The results truly demonstrated that the population, inflation rate, fiscal balance, and ESG index all have an effect and increase the number of green bond issuances (Dan & Tudor, 2021). A research, by the name "Green bonds as a tool against climate change?" it has been emphasized that green bonds are currently mostly a corporate activity with minimal bearing on the efficiency and underlying implications of issuers' environmental participation. It is also important to remember that after borrowing on the green sector, green issuers do demonstrate a decrease in the carbon intensity of their assets, if compared to conventional bonds. (Fatica & Panzica, 2021). Green Bonds that are securitized, Use of Proceeds for Green Bonds, Green Use of Proceeds Revenue Bonds, and Green Bonds involved in projects are the four categories of green bonds available in India. A study also conducted a SWOC Analysis (Strength, Weakness, Opportunities, and Concern), which identified lack of awareness as one of the weaknesses and portfolio diversifications and risk reduction as some of the key strengths. Greenwashing has undoubtedly been identified as one of the troubling practices. One may argue that all of these arguments are highly relevant to the Indian context and provide some insights into the preferences of possible Indian investors in green bonds (Verma & Agarwal, 2020). Apart from that, A few interesting information emerged. For example, total time variable risk spillovers have been noted during periods of high volatility. But when it comes to agriculture and energy, green bonds can be considered powerful diversifiers (Naeem et al., 2022). Researchers also included 18-year-old college students as subjects in one study. Young people are reportedly increasingly worried about environmental damage and are working to increase awareness of it (Balundé et al., 2020). A significant quantity of capital will be shifted if green bond issuers experience a lower cost of debt, However, this will be evident if green bond issuers truly encounter a lower cost of debt in true sense. Nonetheless, a defined set of regulations is necessary for increased efficacy and openness (Mariani et al., 2019). According to "Bond Market Development and Economic Growth: The G-20 Experience," if we want to bring sustainable development in the countries that fall in G-20, economic policies must acknowledge the fundamental distinctions between bond market development and economic growth. Furthermore, given that India is a member of the G-20, green bonds might be extremely important for both the bond market and the overall sustainable growth into play (Pradhan et al., 2015). As per “The Development of Green Bond in Developing Countries: Insights from Southeast Asia Market Participants” Although they have become one of the most significant sources of funding for SDGs, green bonds still only make up a small percentage of the bond market (Nguyen et al., 2022). The ADBI Working Paper Series also places a strong emphasis on green financial instruments, pointing out that in order to achieve sustainable development, green projects must be given adequate attention. This is where green financial instruments play a part, as green central

banking, modern financial technologies, and community-based green funds are all relevant (Sachs et al., 2019). Similar opinions (albeit from a different nation) may be found in the article "Green finance as a modern tool for social and environmental security," which highlights the significance of green finance (Cheberyako et al., 2021). The writers of "Green Financial Instruments in India: A Study on Its Current Status and Future Prospects" have emphasized the significance and applicability of green financial instruments in light of the Indian context, which is undoubtedly something that requires attention, if development is desired (Sarma & Roy, 2019). Certain elements exist that are also some of the most significant features of any bond or financial instrument may have an impact on investors' thought processes. Bandi discussed the yield that these bonds can provide is important to consider. The first company that needs to be mentioned in this context is Toyota, which released the first high-yield green bond ever. But if we consider the first tech business, Apple issued the first green bonds worth US\$1.5 billion, backed by renewable energy. Regarding India, Greenko, a company based in Hyderabad, intends to use the money raised from the green bonds to pay for operating costs and restructure debt (Bandi, 2016). According to Flammer, the Paris Agreement's signature marks a significant step in the fight against climate change. Private investors are becoming more and more interested in green bonds. The study indicated that green bonds are actually value enhancing since stock market responds in a positive way on the announcement of green bond issue (Flammer, 2020). Green bond can possess the power to significantly contribute to the Paris Climate Agreement, according to Thomas Liaw. There are several reports that demonstrated the proof of green bond premiums actually found a greater greenium. This suggests that these certificates can improve transparency, which will raise investor trust (Liaw, 2020). The study "Green bond market and Sentiment: Is there a switching behavior" revealed little evidence of a nonlinear link between bond index returns and attitudes in financial markets. Any alteration to the MSCI World index has an effect on mood and how it relates to bond returns (Chousa, Cabarcos & Sevic, 2022). Green finance reduces environmental risks, boosts business transparency, and promotes investment in renewable energy sources. However, it may negatively impact polluting industries (Mohanty, Samal & Kumar, 2024). The ultimate thing is that, without a doubt, the biggest threat facing human civilization now is climate change. Climate change has the potential to undermine corporate foundations in both the financial and non-financial sectors (Khurram et al., 2023)

Glimpses of some important findings given below:

Author	Year	Findings
Maltais and Nykvist	2020	It was discovered that, in Sweden, business case incentives significantly outweigh financial incentives as the primary motivators for participating in the market that deals in green bonds.
Nguyen et al	2022	Although bonds that are green, have become one of the most crucial sources of funding for SDGs, they still only make up a small percentage of the bond market as a whole.
Flammer	2020	Since the stock market reacts favourably to the news of green bond issuance, green bonds increase the overall value.
Mariani	2019	A greater amount of money will be shifted if issuers of green bonds have a lower cost of debt, which will lead to a rise in green financial tools. Nonetheless, a defined set of regulations is necessary for increased efficacy and openness.
Sarma and Roy	2019	Given the Indian context, the significance and applicability of green financial instruments have been emphasized, which is undoubtedly something that requires attention.
Mudalige	2023	The benefits of using green finance are demonstrated in a number of ways. First, green financing offers financial assistance to businesses who are involved in green innovation. This assistance includes educating staff members, introducing new environmentally friendly technologies, and purchasing green equipment. Second, green financing from different initiatives can help stakeholders (governments, businesses, and regulators) spend R&D expenditures on environmental issues and reduce the risk that comes with green laws.
Liu et al.	2025	Countries must give carbon neutrality top priority in light of the serious environmental issues that the world is facing. In this regard, green finance—which

		is receiving more and more attention—is essential for environmental preservation and sustainable growth.
Jiang, Xu & Chen	2024	Significant carbon emission reductions can be achieved through the growth of green finance, which will have regional spillover effects and last at least until the third phase; The development of green finance exhibits geographical disparities
Otek Ntsama et al	2021	From the perspective of the LMIC market, one of the biggest challenges facing portfolio managers is that ESG criteria may differ greatly from those in western nations, for some of the countries

3. OBJECTIVES:

To understand whether the demographic factors bear any relationship with Green Bonds buying pattern, taking into consideration the positive environmental change that green bonds can bring in, the importance of sustainable growth and the role of green bond therein; and, the return that green bonds render, in the urban areas of Hooghly district of West Bengal. Few factors have been taken in this study like age, gender and Income.

4. RESEARCH METHODOLOGY

The literature review already discusses the benefits and drawbacks of both vanilla/regular bonds and green bonds to an extent. Both descriptive and analytical perspectives are present in this work. Research is being done to see if factors like age, gender, and income might affect people's perceptions and make them consider environmental improvement, which will ultimately lead them to purchase green bonds. Data was gathered via questionnaire using the purposive Sampling approach. The subjects were selected from a wide range of age groups, from 18 to over 64 years old. People finishing Madhyamik, Higher Secondary, Graduation, and Post Graduation participated in the survey, which generated 240 replies in total. The chi-square test is a statistical instrument used to reach final answers.

5. FINDINGS, ANALYSIS AND DISCUSSION:

Meaning of the Variable	Name of the Variable	Denoted By
Green Bonds investments are preferred as they have the capacity to bring better level of environmental change, <i>encouraging green economy</i> .	Environmental Change <i>boosting Green Economy</i>	V1
Green Bonds are preferred as it may bring sustainable development in the long term	Sustainable Development	V2
The return against Green Bonds (a part of green financial instruments) is going to be higher in future, making such investment a lucrative option.	Return	V3

Table 2- Names of the variables.

5.1 GENDER:

Table- Symmetric Measures Test1-:Chi-Square Tests&								
		Value	df	Asymp. Sig.(2-sided)			Value	Approx. Sig.
V1	Pearson Chi-Square	7.671 ^a	4	.108	Nominal by Nominal	Contingency Coefficient	.175	.108
	Likelihood Ratio	7.61	4	.104				

	NofValidCases	240			NofValidCases	240	
V2	PearsonChi-Square	4.713 ^a	4	.320	Nominal byNomin al	Contingency Coefficient	.146 .335
	LikelihoodRatio	4.712	4	.329			
	NofValid Cases	240			NofValid Cases	240	
V3	PearsonChi-Square	8.202 ^a	4	.085	Nominalb yNomina l	Contingency Coefficient	.177 .085
	LikelihoodRatio	8.167	4	.088			
	NofValidCases	240			NofValidCases	240	

Table 3: Chi-Square Test

Table 3 indicates: chi-square value for V1 is 7.671a; the asympsig is .108 (>0.05). At the same time, the chi-square value for V2 is 4.713a; the asymp sig is .320 (>0.05), and the chi-square value for V3 is 8.202a and asymp sig is .085 (<0.10). So, null hypothesis is rejected. Meaning, gender carries an association (significant in terms) with green bond preference with respect to V1, V2, and V3.

5. 2. AGE:

Table SymmetricMeasures									Test2-:Chi-SquareTests&		
		Value	df	Asymp. Sig. (2- sided)			Value	Appro x.Sig.			
V1	PearsonChi-Square	54.75 ^a	16	.000	Nominal byNomin Al	Contingency Coefficient	.420	.000			
	LikelihoodRatio	67.777	16	.000							
	NofValidCases	240							NofValidCases		240
V2	PearsonChi-Square	53.132 ^a	16	.000	Nominal byNomin al	Contingency Coefficient	.426	.000			
	LikelihoodRatio	65.09	16	.000							
	NofValid Cases	240			NofValid Cases		240				
V3	PearsonChi-Square	39.844 ^a	16	.001	Nominalb yNomina l	Contingency Coefficient	.376	.001			
	LikelihoodRatio	49.233	16	.000							
	NofValidCases	240							NofValidCases		240

Table 4: Chi Square Test 2

Table 4 illustrates that the chi-square value for V1 is 54.75a and the asympsig is .000 (<0.05). The chi-square value for V2 is 53.132a and the asymp sig is .000 (<0.05), and the chi-square value for V3 is 39.844a and asymp sig is .001 which is less than 0.05. This implies that the null hypothesis is rejected, and the alternate hypothesis is accepted. Thus, age does

have a significant association with green bond preference with respect to variables V1, V2, and V3. Considering V1, we can see that the 18–40 age group is more content than other age groups because they are more likely to be financially stable and have longer financial horizons, which may make them better long-term investment candidates. Similar to this, V2 shows that people between the ages of 18 and 40 are satisfied than people in other age groups given that bond investments made by people in their late 20s and early 30s can support both long-term financial security and the expansion of the national economy. security and the expansion of the national economy.

5.3 INCOME:

Table		Test3-:Chi-SquareTests& SymmetricMeasures						
		Value	df	Asymp. Sig.(2-sided)			Value	Appro x.Sig.
V1	PearsonChi-Square	55.601 ^a	16	.001	Nominal byNomin Al	Contingency Coefficient	.402	.000
	LikelihoodRatio	56.931	16	.000				
	NofValidCases	240						
V2	PearsonChi-Square	76.711 ^a	16	.000	Nominal byNomin al	Contingency Coefficient	.497	.000
	LikelihoodRatio	82.595	16	.000				
	NofValid Cases	240			NofValid Cases		240	
V3	PearsonChi-Square	71.92 ^a	16	.000	Nominalb yNomina l	Contingency Coefficient	.481	.000
	LikelihoodRatio	77.01	16	.000				
	NofValidCases	240						

Table 5: Chi Square Test 3

From the above table (Table 5) we see that the chi-square value for V1 is 55.601a and the asympsig is .001 which is less than 0.05. Similarly, the chi-square value for V2 is 76.711a and the asymp sig is .000 which is also less than 0.05, and the chi-square value for V3 is 71.92a and asymp sig is .000 which is less than 0.05. This implies that the null hypothesis is rejected, and the alternate hypothesis is accepted. Thus, income does have a significant association with green bond preference with respect to variables V1, V2, and V3. With respect to V1, we can see that people with income between 20k-49k are evidently more satisfied with the green bond as these bonds do have the capacity to bring consistency in the long run, which is a feature that people with a salary in the range of 20k and 49k find attractive. In a similar vein, V2 shows that those with low incomes (between 20,000 and 49,000) may find green bonds to be a desirable investment option to a certain extent due to their steady long-term return. They might also offer a way to reduce the risk involved in making investments in companies that emit a lot of carbon. Similarly, as V3 talks about return, this group thinks green Instruments do have the power to render steady returns in the long run.

6. DISCUSSION:

Indeed, GBs are gaining popularity and a significant number of bond investors are already aware of the term ‘Green Bonds’. As a result, an inclination towards GB can be noticed amongst the participants. In the comment section, number of participants made comments like “It’s a great investment with environmental impact”, “Green bonds have higher reporting

standards than conventional bonds and must be used to fund green projects.”, “It's upcoming investment opportunity which needs adequate government and other nodal agency support to become popular in India.” When talking about GBs. One participant highlighted “Considering the recent peak in the corporate participation to enhance the positive impact of environmental & climatic well-being on businesses; I think green bonds will provide a higher coverage & will also have a greater ROI compression spread, if compared to the vanilla equivalents, on the broader perspective.” Similarly, there are investors who would prefer Vanilla Bonds. This is quite clear from the comments like “Regular bonds have more sectors open compared to the Green bonds, hence it might be a suitable option for many.”. Another investor commented “Regularly invest in regular bonds only.”, which indicates that this particular investor is not willing to take a ‘risk’ by bringing any change to his investment routine, as he is already a regular investor in conventional bonds. One more participant commented ““Green bond - it's challenging and supportive to environmental. Regular bond - quite secure in terms of ROI.”, that showed his inclination towards conventional bonds. One more thing that can be observed quite easily is that a number of participants, who are moderately educated do know the basic concept of Green Bonds, for the sake of interest in maximizing their returns.

7. LIMITATIONS

The major limitation of the study is the area coverage. Few urban regions from Hooghly district were particularly covered. Another drawback is, the age of samples was typically from 18 years to 64 years. Beyond that, we could not include more subjects into the study. However, there can be many investors even above the age of 65 years, belonging to the same region, who are highly interested in Green Financial instruments.

8. CONCLUSION

It can be observed from the overall analysis that men are in general prefer green bonds more than women. The major reason is women can still get sceptical when it comes to steady income sourced from green bonds. Besides, green bonds are still not properly streamlined amongst hard-core bond investors, and returns do matter for women a little more, if compared to men. Speaking of age, all age groups more or less showed preference towards green bonds. However, such bonds are particularly favoured by investors falling under 40 years of age, as these investors tend to have long term financial goals. However, for the third demographic factor, income, middle income group investors showed maximum support to green bonds. Low-income group also showed moderate interest, making most of them potential investors of green bonds. These investors primarily get influenced with the concept of sustainable development that such bonds can bring in future.

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