

Awareness of investors toward green finance initiatives

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ABSTRACT

The study investigates investors' knowledge and understanding of green finance initiatives and how these initiatives support environmental sustainability and sustainable development goals (SDGs). In an era of growing global focus on sustainability, knowledge of investor perspectives is critical in moving green finance practices forward. The research uses a one-sample t-test to determine whether investor views on green finance are a catalyst for eco-friendly business and investment strategies based on data from 463 investors. Strong consensus among investors is that green finance can help promote sustainable development through the use of energy efficient production methods, clean energy efforts and lessening environmental impacts. Investors understand that green financial instruments, such as green credits, green banks and specialty funds, perform a function in facilitating environmental responsibility and encouraging the implementation of climate friendly industrial practices. The study also underscores the value of supportive platform and financial incentives, and the incentives for green finance adoption and innovation. Investors are also perceived to increasingly see sustainability integration into investment portfolios as a financial opportunity and as a means to achieve long term environmental goals, the results also show. This paper also concludes the importance of green finance awareness for investors. It urges that green finance initiatives continue to be promoted and integrated into mainstream investment practices to facilitate the global effort in realizing SDGs and promoting sustainable development in all industries.

Keywords: Green Finance, Investor Awareness, Sustainable Development, Green investments

1. Introduction

Recently, green finance has become an important force in promoting sustainable development by allocating investments to sustainable projects. This is a shift in the coordination of investors, financial institutions and the government in combining economic development and sustainability. Awareness of green finance initiatives has increased as its growing prominence of combining environmentally friendly practices and investment decisions has highlighted the importance of green finance in managing global sustainability challenges. The drafting of this research article was driven by the rise of the global emphasis on sustainable development and green finances contribution to fulfilling this objective. To tackle growing environmental problems such as climate change, resource depletion and emission of greenhouse gases, the financial system with sustainable practices should be further strengthened.

It is important to understand the perspectives of investors in advancing sustainable finance and environmentally friendly business practices which is explored in the present study. The study highlights a gap in prevailing literature by emphasizing the importance of combining green finance into general financial streams to boost broader adoption. This study fills a gap of the existing literature by emphasizing the need to integrate green finance into mainstream financial systems and promote broader adoption. It is believed that increased awareness and investments in green finance initiatives will act as an important tool towards innovation in clean technologies, long-term economic stability, and sustainable industrialization. Ultimately, the study aims to

contribute to the global concern on sustainability by providing practical suggestions for improvising green finance initiatives to ensure a better future.

Green finance encompasses a diverse array of financial tools and strategies, supporting practices of sustainability, inclusive of renewable green bonds, energy projects, and sustainable investment funds. Initiatives like this are designed to mitigate environmental risks and also capitalize on opportunities that enhance long-term ecological resilience and societal well-being. With global awareness of climate change on the rise, the focus is on how financial resources can lead to a green future and greenery.

The study looks into investors awareness about green finance initiatives, and their perceptions, motivations, and understanding of the environmental and financial implications associated with it. Through these dynamics, the research seeks to shed light on how investor attitudes toward green finance are influencing the evolution of sustainable finance. Given enhanced understanding of these financing systems, policymakers, financial regulators, and market participants alike aim to leverage green finance to mitigate environmental problems, while also contributing to inclusive economic growth.

2. Literature review

Green finance products need to be taken up by consumers. Studies have examined consumer awareness of green finance products in China, emphasizing the importance of environmental education and outreach activities to further build consumer knowledge and understanding of sustainable financial options [8]. Similarly, research has investigated the awareness levels of consumers regarding services in the financial aspects in Vietnam, highlighting the need for communication strategies for the targeted promotion of the use of green finance products among different consumer segments [27].

Other studies have explored the determinants of consumer awareness of green banking in Pakistan, emphasizing the influence of financial literacy programs and regulatory interventions on awareness of green financial products [2]. Meanwhile, research has examined how China's corporate communication and marketing strategies can help promote consumer awareness of green finance options, asserting that greater transparency enhances the credibility of green financial services [33].

Further investigations into what determines consumer awareness of green banking in Nepal indicate that socio-economic factors, education, and information access are major determinants [29]. Taking together, these outcomes emphasize the need for targeted educational campaigns and capacity-building efforts to enhance awareness among unserved populations regarding sustainable financial behavior. The role of education campaigns and financial literacy programs in improving consumer attitudes toward green banking services has also been analyzed [24]. In this regard, the interplay between green finance and sustainable development has been examined, demonstrating the significance of awareness-building initiatives in encouraging environmentally responsible investment behavior [5].

Research on the impact of green banking on Vietnam's sustainable development suggests comprehensive awareness campaigns targeting consumers in green financial services [13]. Additionally, studies have highlighted the integration of green finance with environmental supply chain management, emphasizing the importance of raising awareness among stakeholders regarding the synergy between environmental and financial objectives [17]. The link between economic and green finance in emerging economies has been explored, with findings suggesting that increasing consumer awareness and understanding of green financial products can support sustainable economic development [36]. Similarly, research on the adoption of green banking in China focuses on the critical role of consumer awareness in influencing adoption behavior [34].

Other studies highlight the need to develop innovative instruments in green finance to offer more attractive opportunities to investors. Additionally, suggestions have been made to foster partnerships between financial institutions, academia, government, and other stakeholders to address the requirements of green finance investors [12]. The crucial function of green finance in resolving global sustainability problems has also been

investigated. Research has assessed the integration of ESG principles into financial decision-making, facilitating sustainable development. Findings suggest that green bonds and sustainable tools are vital channels to initiate green-focused projects [31]. Furthermore, challenges and barriers that hinder the widespread adoption of green finance worldwide have been discussed, emphasizing the need for regulatory support and policy frameworks to promote sustainable investments [36]. Likewise, technological interventions in smart city initiatives have been evaluated, linking them to urban governance and sustainable development, which aligns with the broader scope of green finance in fostering environmentally conscious urban projects [37].

3. Research methodology

The scope of the study is to analyze how investors perceive, respond to, and form their attitudes toward sustainable investment practices. Investors' perceptions of how environmentally friendly industrial activities contribute to sustainability, the promotion of sustainable production methods, and the impact of increased investment on environmental sustainability were explored in various dimensions of the research. It examined investors' views on green finance as the future of investment, its alignment with sustainability goals, and how it can be utilized in clean energy green projects. The study aimed to provide a complete understanding of investor awareness and its implications for sustainable finance by synthesizing insights from the literature on investor perception [30], green finance in sustainable production [19], investment and environmental sustainability [21], the future of green finance [1], and their alignment with SDGs.

The need for the study arises from the growing significance of reconciling financial investments with sustainable growth objectives and environmental stewardship, prompting an investigation into the state of knowledge among investors regarding green finance initiatives. Financial markets play a key role in directing capital toward environmentally compliant projects while addressing the heightened global awareness of climate change and resource depletion [11]. Understanding investors' perceptions and knowledge gaps regarding green finance is critical for fueling its growth [23].

Empirical research has indicated that integrating environmental, social, and governance (ESG) funds into corporate financial performance enhances long-term value [7], [13]. This study aimed to evaluate the extent to which green finance principles are embedded in mainstream investment strategies and to identify key aspects of investor behavior in green finance [6], [18]. Furthermore, the research sought to contribute to the literature on sustainable finance and provide insights for policymakers, financial institutions, and investors on how financial markets can support sustainable development objectives [10], [28].

The research gap lies in the existing studies that have expanded our understanding of investors' preferences and perceptions regarding sustainable investments while focusing on increasing awareness of green finance initiatives. However, gaps remain in literature. Although evidence suggests that investor awareness of the environmental and social benefits of green finance has increased [22], more empirical studies in various financial markets are needed to confirm these findings [4], [20].

Additionally, the study explored how regulatory frameworks and policy interventions influence investors' green investment behavior [35], [9]. Another gap pertains to the role of financial intermediaries in promoting green finance initiatives, which remains underexplored [16], [26]. The potential of green finance instruments, such as green bonds and funds, in achieving sustainable development goals has been critically reviewed [3], [15]. Moreover, understanding the impact of cognitive biases and risk perception on investor decision-making in green finance may help enhance investor confidence in green investment [32].

3.1 Objectives

The primary aim was to evaluate investors' awareness about green finance initiatives and to examine the influence of demographic factors, such as age, income, investment experience, and education, on investor awareness of green finance initiatives through regression and correlation analysis.

3.2 Research design

The research employed a quantitative approach to evaluate investors' awareness of green finance initiatives. Using regression and correlation techniques relationships between demographic factors, awareness levels, and the perceived importance of green finance were analyzed. Additionally, a one-sample t-test was conducted to assess the overall level of awareness among investors.

The study adopted a cross-sectional design, encompassing investors' perceptions and attitudes towards green finance at a specific point of time. Data was collected from 463 respondents through a structured survey questionnaire, which included questions about perceptions of green finance initiatives as well as demographic details such as age, income, investment experience, and education. The collected data was subjected to statistical analysis, including regression and correlation, to identify significant relationships between key variables and assess factors influencing investor awareness.

Sampling for the study has been drawn from the target population of investors in financial markets who were exposed to or interested in green finance, with a specific focus on individuals actively engaged in sustainable finance practices. To ensure relevance, a non-random purposive sampling method was employed, selecting participants with a demonstrated interest or involvement in green finance initiatives, such as those familiar with environmental performance metrics or sustainability reporting. [25] supports the use of purposive sampling in green finance research, emphasizing the importance of including participants with adequate knowledge or experience in green investments. The sample consisted of 463 respondents, providing sufficient representation for robust statistical analysis. This sample size facilitated the use of regression and correlation analysis, enabling reliable conclusions about the factors influencing investor awareness of green finance initiatives.

The key instrument for the study is a structured questionnaire which was basically developed using literature review. Expert opinions were sought to capture relevant dimensions of investors' awareness about green finance. Likert scale was used to measure respondents' agreement or disagreement to statements regarding green finance perceptions. Questions about knowledge of green finance, attitudes towards sustainable investments, and perceived barriers to green investment adoption were included on the scale. A small sample was pilot-tested on the questionnaire to improve the clarity and relevance of the questions. The pilot test showed that the questions were comprehensible and relevant to the target demographic.

Data was collected from potential respondents using an online survey. The online format made it easier to reach and collect responses from a wide range of investors. Respondents were screened to ensure that the data was complete and consistent before analysis. Another way, the study filtered out incomplete or inconsistent data that could have made the results of the study unreliable.

The first step of the data analysis was to perform a one-sample t-test of each item in the survey to determine if the mean awareness score was significantly different from the hypothesized test value of 3. Regression analysis was performed to determine how demographic factors (age, education, and investment experience) affected investor awareness. Relationships between awareness levels and perceptions of the importance of green finance initiatives were examined using correlation analysis.

4. Analysis and interpretation

Statistical significance was based on a p-value of 0.05, or a confidence level of 95 %. The data was analyzed using statistical software SPSS, namely the computation of t-test statistics, regression coefficients, correlation coefficients, confidence intervals, and p values.

4.1 Demographic Analysis

The distribution of respondents concerning key demographic characteristics such as age, gender, education, income, and investment experience was analyzed to understand the sample population. The analysis enables a

detailed examination of demographic segments more likely to be aware and concerned about green finance initiatives.

Table 1. Demographic profile of respondents

Demographic Factor	Category	Percentage (%)
Age	18-24	18.3%
	25-34	35.2%
	35-44	22.6%
	45-54	13.1%
	55+	10.8%
Gender	Male	62.4%
	Female	37.6%
Education Level	High School	10.5%
	Undergraduate Degree	45.2%
	Graduate Degree	44.3%
Income Level	Below \$30,000	15.7%
	\$30,000-\$50,000	33.5%
	\$50,000-\$80,000	29.1%
	Above \$80,000	21.7%
Investment Experience	Less than 1 year	5.1%
	1-3 years	18.5%
	4-6 years	31.7%
	More than 6 years	44.7%

Demographic analysis shows a variety of investors with 35.2% and 22.6% from the 25 to 34 and 35 to 44 age groups respectively. The respondents included 62.4% males, and more than half (45.2%) had at least an undergraduate degree. Income levels were varied, with 33.5% of respondents earning between \$30,000 and \$50,000. A large majority (44.7%) of respondents had more than 6 years of investment experience, perhaps revealing that more experienced investors are more knowledgeable about green finance products.

4.2 Analysis of investor awareness towards green finance initiatives: A one-sample t-test evaluation

Investor perception of green finance products hinges on multiple factors. Evaluating investor awareness is essential to ascertain their familiarity with green finance products and initiatives. This evaluation helps in comprehending the substantial influence that perception has on investor preferences for green finance products. In statistics, the application of a one-sample t-test serves as a method to analyze these factors, as illustrated in the Table below.

H_{01} : There is no awareness of investors towards green finance initiatives.

H_{11} : There is an awareness of investors towards green finance initiatives.

Table 2. One-sample test (Awareness)

	Test Value = 3					
	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Environmentally friendly industrial activity brings sustainability to the environment.	37.904	462	.000	1.298	1.23	1.37
Investment in green finance is nothing but investment in sustainable methods of production.	25.044	462	.000	1.043	.96	1.13
Higher investment in green finance would be sustainable environmentally friendly industrial activity.	26.892	462	.000	1.084	1.01	1.16
Investment in green finance is the future of investment.	31.556	462	.000	1.186	1.11	1.26
Investment is needed to make the future of industrialization more secure.	32.986	462	.000	1.184	1.11	1.25
Investment in Green Projects reduces Green House Gas Emission	31.943	462	.000	1.210	1.14	1.28
Investment in Green Credit is effectively contributing towards Sustainable Development Goals	23.532	462	.000	.955	.87	1.03
Investment in Green Banks contributes towards Green Projects	28.335	462	.000	1.052	.98	1.12
Investment in Green Fund is beneficial when they only focus on companies that carry responsibilities towards the environment	29.440	462	.000	1.106	1.03	1.18
Investment in Green Projects Support Clean Energy	32.280	462	.000	1.147	1.08	1.22

Source: Authors' Calculation using One-Sample t-test calculations from primary data.

A one-sample t-test was utilized to assess investors' awareness of green finance initiatives, employing a test value of 3. The findings indicate a robust and statistically significant awareness among investors across various dimensions of green finance. Firstly, investors recognize that environmentally friendly industrial activities contribute significantly to environmental sustainability, as evidenced by a mean difference of 1.298 ($t(462) = 37.904$, $p = .000$, 95% CI [1.23, 1.37]). They also acknowledge that investing in green finance aligns with sustainable production methods, demonstrated by a mean difference of 1.043 ($t(462) = 25.044$, $p = .000$, 95% CI [.96, 1.13]). There is a consensus that higher investment in green finance leads to more sustainable industrial practices, with a mean difference of 1.084 ($t(462) = 26.892$, $p = .000$, 95% CI [1.01, 1.16]). Investors view green finance as pivotal for future investments, as reflected in a mean difference of 1.186 ($t(462) = 31.556$, $p = .000$, 95% CI [1.11, 1.26]), and essential for securing the future of industrialization, indicated by a mean difference of 1.184 ($t(462) = 32.986$, $p = .000$, 95% CI [1.11, 1.25]). There is a strong perception that investment in green projects effectively reduces greenhouse gas emissions, with a mean difference of 1.210 ($t(462) = 31.943$, $p = .000$, 95% CI [1.14, 1.28]). Investment in green credit is seen as contributing significantly to Sustainable

Development Goals, evidenced by a mean difference of .955 ($t(462) = 23.532, p = .000, 95\% \text{ CI } [.87, 1.03]$). Investors also believe that green banks have an important role in supporting green projects, with a mean difference of 1.052 ($t(462) = 28.335, p = .000, 95\% \text{ CI } [.98, 1.12]$), and find investment in green funds beneficial when focusing on environmentally responsible companies, demonstrated by a mean difference of 1.106 ($t(462) = 29.440, p = .000, 95\% \text{ CI } [1.03, 1.18]$). Overall, these results underscore a significant and positive awareness among investors towards initiatives of green finance, highlighting their recognition of the importance and the gain of investing in environmentally friendly and sustainable projects.

4.3 Regression analysis

A multiple regression analysis was carried out to further investigate the relationship between investors' awareness and their perception of green finance initiatives. For assessing how different factors (e.g., the awareness of environmentally friendly industrial activities, green investment, and the perceived contribution to Sustainable Development Goals) affect overall investor perception of green finance, a regression model was used.

4.3.1 Regression model

Dependent Variable: Investor Awareness of Green Finance Initiatives

Independent Variables:

Knowledge of environmentally friendly industrial activities

Sustainable production methods investment

Greenhouse gas reduction impact

Contribution to Sustainable Development Goals (SDGs)

Investment in green projects

Table 3. Regression results

Independent Variables	Unstandardized Coefficients (B)	Standardized Coefficients (β)	t-Value	p-Value
Constant	2.395	-	15.320	0.000
Awareness of environmentally friendly activity	0.712	0.310	4.215	0.000
Investment in sustainable production	0.561	0.245	3.134	0.002
Contribution to reducing greenhouse gases	0.438	0.215	2.736	0.006
Impact on SDGs	0.492	0.218	3.215	0.001
Investment in green projects	0.535	0.226	3.650	0.000

The regression analysis results indicate that all independent variables have a statistically significant positive effect on investor awareness of green finance initiatives. The variable 'Awareness of environmentally friendly industrial activities' showed the highest impact factor ($\beta = 0.310, p = 0.000$), which means that investors who are aware of the environmentally friendly activities impact are more likely to be familiar with green finance. Other important variables include 'Investment in sustainable production methods' ($\beta = 0.245, p = 0.002$) and 'Impact on greenhouse gas reduction' ($\beta = 0.215, p = 0.006$).

4.4 Correlation Analysis

The study performed a Pearson correlation analysis of the variables concerning green finance awareness and investor perception to determine the strength and direction of the relationships between key variables.

Table 4. Correlation matrix

Variables	1	2	3	4	5
1. Awareness of Green Finance Initiatives	1.000	-	-	-	-
2. Awareness of Environmentally Friendly Activity	0.748**	1.000	-	-	-
3. Investment in Sustainable Production	0.725**	0.635**	1.000	-	-
4. Impact on SDGs	0.712**	0.598**	0.640**	1.000	-
5. Investment in Green Projects	0.766**	0.682**	0.701**	0.660**	1.000

The correlation analysis shows strong positive relationships between all the key variables. "Investment in Green Projects" is significantly correlated to all other variables, reflecting that investors who are more informed about green finance also recognize the importance of investing in green projects ($r = 0.766$, $p < 0.01$). The level of awareness of environmentally friendly activities and the perceived impact on SDGs is positively correlated ($r = 0.712$, $p < 0.01$) indicating that investors who put a premium on sustainability are also cognizant of the broader consequences of achieving global sustainability goals

5. Discussion

Investor awareness and perceptions towards green finance initiatives are analysed to gain insights into their understanding and attitudes. Demographic analysis highlights that respondents are in the age group of 25-34 (35.2%) and 35-44 (22.6%) in large numbers. The sample is predominantly male (62.4%), and 45.2% of the sample have an undergraduate degree or greater. Of those making over \$30,000, 33.5% earn between \$30,000 and \$50,000, and 44.7% have over six years of investment experience, indicating that more experienced investors are probably more experienced with green finance.

Results of the one-sample t-test show robust and statistically significant awareness of green finance initiatives. Respondents have strong recognition of the role that environmentally friendly industrial activities play in promoting sustainability (Mean Difference = 1.298, $p < 0.001$). Respondents also perceive investments in green finance as a critical factor in the promotion of sustainable production (Mean Difference = 1.0430, $p < 0.001$) and ensures eco-friendly industrialization practices (Mean Difference = 1.084, $p < 0.001$). Investing in green finance, they agree, is an investment in sustainable production methods, and such investments are necessary to reduce greenhouse gas emissions and help meet the Sustainable Development Goals (SDGs) (Mean Difference = 1.210, $p < 0.001$). They also credit green projects and green credit for helping to advance clean energy and green business practices.

The factors influencing investor awareness are further highlighted by regression analysis. The highest impact factor is awareness of environmentally friendly industrial activities ($\beta = 0.310$), followed by investment in sustainable production methods ($\beta = 0.245$), and perceived impact on greenhouse gas reduction ($\beta = 0.215$). Correlation analysis shows strong positive connections among all the variables, particularly the recognition of SDGs ($r = 0.712$) with 'Investment in Green Projects' has a high correlation with other awareness factors. The results underscore the role that such investor education and experience can play in developing awareness and engagement with green finance.

6. Findings

The research finding draws a significant positive perception and awareness towards the green finance projects. The demographical study indicates that most of the respondents are between 25-34 and 35-44 years of age,

greater part being male with higher education qualification such as undergraduate degrees. Investors who have an average experience of more than 6 years and considerable comprehension towards eco-friendly industrial practices encourage green finance initiatives. Investors perceive green finance as a vital mechanism in assisting the practices of sustainable production, with the reduction of green-house gas emission, adding to the achievement of Sustainable Development Goals (SDGs). The correlation analysis revealed a strong positive relationship among the acknowledgement of the SDGs and green finance initiatives. The regression analysis further highlighted that the awareness towards environmentally friendly industrial practices is the most significant factor in the success of sustainable production investments and reduced emissions. The findings also highlighted that the education and experience of the investors play a prominent role in combining investor engagement with sustainable finance initiatives.

7. Conclusion

The correlation analysis revealed a strong positive relationship among the acknowledgement of the SDGs and green finance initiatives. The regression analysis further highlighted that awareness towards environmentally friendly industrial practices as the most significant factor in the success of sustainable production investments and reduced emission

Investors' awareness and perceptions of green finance initiatives have been studied as they have begun to recognize the role that sustainable financial practices can play in creating long-term environmental and economic stability. Recent heightened global attention to the need to sustainably value the Earth through the rise of green finance suggests that investors are coming to appreciate the significance of incorporating environmental variables into financial decision-making. The findings show that investors understand the great value of green finance in bolstering sustainable industrial behavior, lowering greenhouse gas emissions, and supporting clean energy. These perceptions are consistent with the general objectives of sustainable development, indicating that financial commitments to environmentally responsible projects are critical to the realization of ecological resilience and social sustainability.

Incorporating green finance more fundamentally into the mainstream financial system is vital to its broader adoption, the study underscores. Existing literature highlights that consumer and investor awareness is critical to the success of green finance and that targeted educational initiatives are crucial to raising knowledge of sustainable financial products. Investor responses to green finance initiatives show a positive attitude toward investing, a strong indication of a promising pathway towards more sustainable investment practices that would both promote the environment and are also profitable in the long run.

Policymakers, financial institutions, and regulators can help spur greater awareness and more innovation in green financial instruments to speed up the adoption of green finance practices. It will ultimately help to tackle the main environmental challenges facing our time and help in the global movement towards a low-carbon, sustainable economy. The future will be better when the economy and the planet alike benefit if green finance is integrated into the mainstream financial practices moving forward, driving innovation, economic stability, and sustainable industrialization.

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