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Influence of Green Risk Attitude on Green Investment: Moderating Role of Financial Anxiety

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Abstract
Purpose – With the growing emphasis on sustainability in financial markets, it is increasingly important to understand how psychological and financial factors shape investment behavior. Hence, this study investigates the influence of green risk attitude on green investment behavior, with financial anxiety as a moderating variable, thereby enriching the current understanding of behavioral drivers behind sustainable investing.
Design/methodology/approach – The study follows a quantitative, cross-sectional design, utilizing survey data from 216 Indian retail individual investors across Tricity region of Chandigarh, Panchkula, and Mohali. Data were collected through a structured questionnaire and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to assess the hypothesized relationships among green risk attitude, green investment, and financial anxiety.
Findings – The results reveal a significant positive relationship between green risk attitude and green investment behavior, indicating that individuals with a higher tolerance for environmental and financial risks are more inclined to invest in sustainable financial instruments. However, financial anxiety was found to negatively moderate this relationship, suggesting that even risk-tolerant investors may refrain from green investing when experiencing high levels of financial stress.
Practical implications – The findings highlight the need for targeted financial education and anxiety-reduction strategies to enhance investor confidence and participation in green finance. Policymakers, financial institutions, and educators can play a crucial role in promoting financial literacy and emotional resilience, thereby enabling broader adoption of sustainable investment practices.
Originality/value – This study advances the literature on behavioral finance and green investment by integrating the role of green risk attitude and financial anxiety into the investment decision-making framework. By examining financial anxiety as a psychological moderator, the study offers a nuanced perspective on the barriers to sustainable investing, particularly within the evolving Indian investment landscape.

Keywords – Green Risk Attitude, Green Investment, Financial Anxiety, Sustainable Finance, Retail Investors, Behavioral Finance.

1. Introduction

The increasing urgency of climate change and environmental concerns has significantly influenced financial markets, prompting a shift toward green investments. Green finance has emerged as a critical tool in fostering sustainable economic growth, integrating environmental, social, and governance (ESG) criteria into investment decisions (Abbas et al., 2023; Pasupuleti & Ayyagari, 2023). The growing emphasis on sustainability has led to a heightened interest in understanding the behavioral determinants of green investment decisions, particularly the role of investors' risk attitudes and financial psychology (Kaustia et al., 2023; Tiwari, 2023).

Investor risk attitude plays a crucial role in shaping financial decision-making, influencing both stock market participation and sustainable investment preferences (Bakar & Yi, 2016; Dar et al., 2024; Dasgupta & Singh, 2019). Traditional finance theories argue that investors make rational decisions based on expected returns and risk assessments; however, behavioral finance suggests that psychological factors, including financial anxiety, significantly impact investment choices (Archuleta et al., 2013a; Nadeem et al., 2020a). Green risk attitude, an extension of traditional risk preferences, reflects an investor's willingness to engage in sustainable investments despite potential financial uncertainties (Arbis et al., 2016; Marfatia, 2020). This evolving perspective underscores the need to examine the interplay between risk attitudes and sustainable investment behavior.

Furthermore, financial anxiety has been identified as a critical moderator in financial decision-making, often inhibiting investment activity and reducing market participation (Archuleta et al., 2013a; Bhowmik et al., 2022). Research suggests that financial anxiety can significantly deter individuals from investing in higher-risk assets, even when they exhibit a strong inclination toward sustainability-driven investments (Bhowmik et al., 2022). Given the rising uncertainties in global financial markets, understanding the moderating role of financial anxiety in green investment decisions becomes increasingly relevant (Grable et al., 2020).

Existing literature explores various determinants of green investment behavior, including financial literacy, social influences, and policy interventions (Chan et al., 2022; Tran et al., 2020). However, limited research has examined how investors' green risk attitudes drive stock market participation and subsequent green investment decisions, particularly in the presence of financial anxiety (Kar & Patro, 2024; Yang et al., 2024). This study aims to bridge this gap by investigating the influence of green risk attitude on stock market participation, leading to green investment, while assessing the moderating impact of financial anxiety.

By integrating insights from behavioral finance and sustainability research, this study provides a comprehensive framework for understanding how psychological factors shape green investment behavior (Dóci & Vasileiadou, 2015; Hong et al., 2022). The findings contribute to the broader discourse on sustainable finance by offering empirical evidence on the role of financial anxiety in moderating risk-driven investment decisions. This research holds practical significance for policymakers, financial advisors, and investment firms seeking to enhance green investment participation through tailored financial education and psychological interventions (Aristei et al., 2024; Huang & Huang, 2023).

The remainder of this paper is organized as follows. Section 2 presents the revie of literature and proposed hypothesis. Section 3 describes the research methodology, followed by Section 4, which reports the data analysis; Section 5 deals with the discussion; Section 6 the implications; and Section 7 the conclusion.

2. Review of Literature

1. Green Risk Attitude and Green Investments

Green Risk Attitude refers to an investor’s psychological predisposition to accept financial uncertainty and potential loss in exchange for supporting environmentally sustainable ventures. In recent years, this concept has gained traction as investors increasingly align their portfolios with environmental, social, and governance (ESG) criteria (Arbis et al., 2016; Elshaer & Sobaih, 2023). Individuals who exhibit a strong green risk attitude are more likely to consider green bonds, ESG stocks, renewable energy startups, and other environmentally focused instruments as viable investment options (Alsmadi et al., 2023; Bužinskė & Stankevičienė, 2023). Chan et al. Chan et al. (2022) developed a model of green investment decision-making that highlights the psychological and economic components influencing sustainable financial behavior. Their findings suggest that investors who believe in the long-term viability and ethical impact of green assets are more inclined to participate in green markets, even in the face of uncertainty. Abbas et al. (2023), in their

empirical study on China's renewable energy sector, identified that factors such as green finance availability, environmental taxes, and geopolitical risks significantly affect investors' willingness to fund eco-friendly projects. This implies that structural incentives can reinforce or weaken the expression of green risk attitudes (Dasgupta & Singh, 2019; Elshaer & Sobaih, 2023). Dóci & Vasileiadou (2015) provided a micro-level perspective, showing how community-based renewable energy projects succeed when individuals are socially motivated and trust collective environmental goals—highlighting that green risk attitude can be influenced not just by personal beliefs but also by social belonging. Furthermore, it was emphasized that green investment intentions in emerging economies like India are mediated by financial literacy and social self-efficacy, suggesting that an individual's confidence in navigating green finance directly affects their risk orientation (Hong et al., 2022; Kar & Patro, 2024; Marfatia, 2020). The literature suggests that green risk attitude is a critical antecedent to sustainable investment behavior, and its development depends on a mix of personal values, financial awareness, regulatory support, and social influence (Alhejaili, 2024; Mehboob et al., 2024).

H1: Green Risk Attitude has a significant positive impact on Green Investments.

2. Financial Anxiety

Financial anxiety is a psychological state characterized by chronic worry, fear, or stress related to financial matters and future economic stability (Archuleta et al., 2013a). It significantly impairs rational decision-making and is known to reduce an individual's willingness to engage in investment activities—particularly those perceived as risky or unfamiliar, such as green financial instruments. Shapiro & Burchell (2012) first drew attention to financial anxiety among college students, linking it to financial distress and reduced satisfaction with financial planning outcomes. More recent studies have explored the broader implications of financial anxiety in adult populations, finding it to be a key determinant of avoidance behavior and emotional disengagement from financial markets (Anderson & Robinson, 2022; Beny et al., 2023). Financial anxiety in the context of job insecurity during the COVID-19 pandemic and concluded that financially anxious individuals tend to exhibit heightened risk aversion and diminished trust in volatile investment environments (Bhowmik et al., 2022; Niyogi & Dinda, 2024). This is particularly relevant to green investing, which often involves innovative sectors with limited historical performance data and market volatility. Nadeem et al. (2020b) identified financial self-efficacy as a critical buffer against anxiety, arguing that investors with greater confidence in their financial knowledge and management skills are less likely to succumb to fear-driven decisions. Grable et al. (2020) expanded on this by demonstrating that financial literacy moderates the impact of anxiety, empowering investors to make informed decisions despite emotional discomfort. Additionally, research by Xiao & Meng (2024) highlighted that financial trauma—such as previous investment losses—can produce long-lasting anxiety, further inhibiting future financial participation. In the context of green finance, this anxiety can be especially prohibitive, as the fear of uncertain returns or emerging markets often outweighs the perceived ethical benefits. Therefore, financial anxiety acts as a powerful psychological barrier, potentially suppressing environmentally motivated investment behavior, even among individuals with a favorable risk attitude (Aristei & Gallo, 2021; Chiang, 2021; Nadeem et al., 2020a).

H2: ***Financial Anxiety negatively moderates the relationship between Green Risk Attitude and Green Investment, such that individuals with high financial anxiety exhibit weaker risk attitude towards Green Investments.***

Fig. 1 shows the hypothesized research framework.

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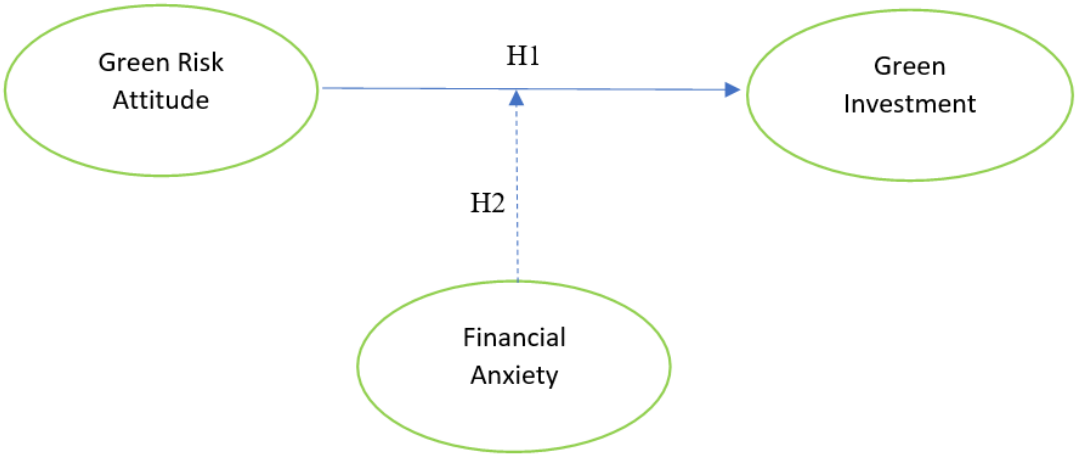

Figure 1: Hypothetical Framework

3. Research Methodology

3.1 Research Design

This study adopts a quantitative, cross-sectional research design to investigate the relationship between green risk attitude, green investment behavior, and financial anxiety among retail individual investors. The rationale behind selecting a quantitative approach is to enable objective measurement of the latent constructs and their interrelationships, which can be statistically validated . Quantitative methods are particularly suitable for hypothesis testing and drawing generalizable conclusions from empirical data. To achieve this, a structured and standardized questionnaire was developed and administered to the target population For data analysis, the study employs Partial Least Squares Structural Equation Modeling (PLS-SEM), which is well-suited for models involving latent variables, especially when the focus is on prediction and theory development. PLS-SEM is preferred over covariance-based SEM in this context due to its flexibility in handling non-normal data, complex model structures, and smaller sample sizes.

3.2 Data Collection and Sampling

Data for the study were gathered from retail individual investors residing in the Tricity region of Chandigarh, Panchkula, and Mohali. The population was chosen due to the region's growing base of educated, financially aware individuals with access to investment opportunities. The study employed a non-probability convenience sampling technique, which is commonly used in behavioral research when the target population is accessible but a complete sampling frame is unavailable. This approach allowed the researcher to directly approach individuals who are more likely to have prior investment experience and awareness of financial markets, which was necessary for the context of this study.

To maximize participation and ensure broader reach, the questionnaire was administered through both online platforms (Google Forms, email) and offline modes (printed forms distributed in financial workshops, investment clubs, and banks). The inclusion criteria required respondents to be at least 18 years old, possess basic financial knowledge, and have prior experience or interest in investing, especially in mutual funds, stocks, or other financial instruments. Informed consent was obtained from all participants, and responses were collected anonymously to ensure confidentiality and ethical compliance.

3.3 Measurement of Constructs

This study examines three central constructs: Green Risk Attitude (GRA), Green Investment (GI), and Financial Anxiety (FA). Each construct was measured using multiple items adapted from

previously validated scales in scholarly literature to ensure both content validity and conceptual alignment with the research objectives. The construct of Green Risk Attitude was measured through six items designed to assess an individual's willingness to accept financial uncertainty when investing in environmentally sustainable assets. These items reflected personal attitudes toward risk in the context of green finance and were adapted from the scale developed by Bakar & Yi (2016), which has been widely applied in behavioral finance research. Green Investment was measured using three items that captured both the behavioral intention and actual participation in green financial instruments, such as green bonds, ESG funds, and shares of environmentally responsible companies. These items were adapted from the work of Chan et al. (2022), which focuses on investor behavior in sustainable finance. Financial Anxiety, the third construct, was measured using five items that assessed an individual's emotional stress, discomfort, and apprehension related to financial matters and decision-making. These items were derived from the financial anxiety scale proposed by Archuleta et al.(2013), which has been widely cited in personal finance and psychological studies.

All items across the three constructs were rated on a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), allowing respondents to express the intensity of their agreement with each statement (Table 2). This scale is commonly used in attitudinal research and provides an effective measure of latent variables. Prior to final data collection, the questionnaire was pre-tested on a pilot sample of 20 respondents to assess the clarity, relevance, and reliability of the items. Based on feedback, minor revisions were made to enhance the comprehensibility and coherence of the questions. This careful development and validation of measurement items ensured that the constructs were appropriately operationalized for empirical testing within the context of green investment behavior among retail investors.

Table 1: Descriptive Statistics

Category	Sub-Category	Frequency	%
Gender	Male	119	55.1
	Female	97	44.9
Age Group	20-29	147	68.1
	30-39	48	22.2
	40-49	17	7.9
	≥ 50	4	1.8
Education Level	Undergraduate	19	8.8
	Postgraduate	63	29.2
	Doctorate	38	17.6
	Others	96	44.4
Occupation	Private Sector employee	110	50.9
	Self-Employed	60	27.8
	Student	45	20.8
	Retired/Unemployed	1	0.5
Annual Income	<₹5,00,000	79	36.5
	₹5,00,000-₹10,00,000	50	23.3
	₹10,00,000-₹20,00,000	23	10.6
	>₹20,00,000	64	29.6
Investment Experience	Less than 1 year	57	26.4
	1-5 years	108	50

	6-10 years	45	20.8
	More than 10 years	6	2.8

Source: Author's Own Work

To explore how investors' green risk attitude affect their green investments, 216 responses were obtained. Table 1 illustrates the demographic composition of the survey participants. It was found that the predominant portion of respondents were women (55.1%). Concerning age distribution, majority of the respondents (68.1%) fall within the under-30 years age group. This highlights a substantial contribution of young investors in the stock market. Regarding educational qualification, a significant proportion of investors were post-graduates (44.4%). As far as monthly income is concerned, it was observed that a considerable number of investors earned more than Rs.1,00,000 per month (29.6%).

Table 2: Constructs and items

Construct	Item Code	Survey Items	Source
Green Risk Attitude	GRA1	I am willing to take financial risks to invest in green projects.	Bakar & Yi (2016)
	GRA2	I believe that green investments will provide stable returns in the future.	
	GRA3	Investing in green financial products aligns with my long-term goals.	
	GRA4	I am more likely to invest in sustainable assets despite potential risks.	
	GRA5	Investing in green financial products aligns with my long-term goals.	
	GRA6	I am willing to invest in green financial products despite the high costs.	
Green Investment	GI1	I have invested in green environmentally friendly financial products.	Archuleta et al (2020).
	GI2	I plan to increase my green investments in the future.	
	GI3	I actively seek information about green financial opportunities.	
Financial Anxiety	FA2	I feel anxious when thinking about financial decisions.	Grable et al. (2020)
	FA3	I avoid investments due to fear of financial loss.	
	FA4	My financial worries affect my daily life and decision-making.	
	FA5	I feel uncomfortable taking financial risks, even when potential gains are high.	
	FA6	I feel anxious while taking investment decisions.	
Source: Authors' Compilation			

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4. Results

4.1 Data analysis

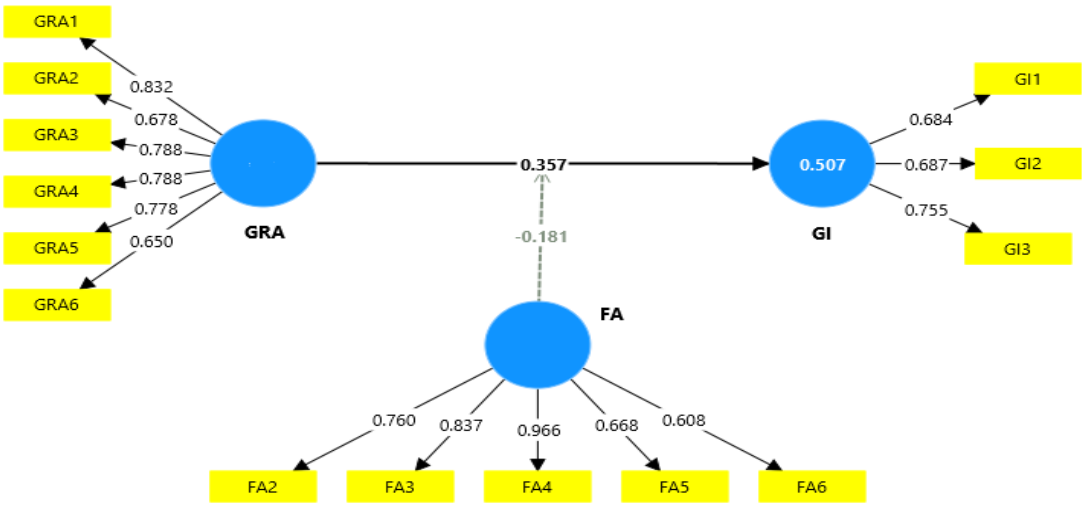
The analysis of data was performed using PLS-SEM that employs bootstrapping technique to derive statistical inferences. This approach is effective for exploratory research and in the evaluation of construct reliability and validity (Dash & Paul, 2021). The software package SmartPLS4 was used for analyzing the data. With the help of convergent, and discriminant validity, an assessment of the measurement model's quality was assessed. Route coefficients of the structural model were examined and used bootstrapping technique to evaluate the predictive significance of the model. To analyze the significance of the route coefficients, t-values were used.

4.1.1 Measurement model

The parameters of this model serve as critical indicators for the assessment of construct validity, encompassing both convergent and discriminant validity. All items displayed construct loadings exceeding the recommended value 0.6 (Hair et al., 2019) (Figure 2). Values of all the loadings, average variance extracted (AVE), Cronbach's alpha and composite reliability confirmed the model's convergent validity. Both cronbach alpha and composite reliability for each construct exceeded the prescribed value of 0.7, while AVE was also greater than the prescribed threshold of 0.5 (Hair et al., 2019). Therefore, it was concluded that the measurement model exhibited a favourable level of quality. Details of this model are provided in Table 2.

HTMT, or heterotrait - heteromethod correlation, was used to evaluate discriminant validity. When contrasted with the the Fornell-Larcker criterion, HTMT ratio for PLS-SEM is a more accurate indicator of discriminant validity (Franke & Sarstedt, 2019). The HTMT ratio were less than 0.90 for all constructs which indicated discriminant validity (Henseler et al., 2015).

Figure 2- Structural Equation Model



Source: Data Processed

Table 2. Evaluation of measurement model (Reflective constructs)

Construct	Items	Outer Factor Loadings (FL)	Composite Reliability (CR)	Rho_a	Cronbach's α (CA)	Average Variance Extracted (AVE)
Green Risk	GRA1	0.832	0.888	0.899	0.851	0.570

Attitude	GRA2 GRA3 GRA4 GRA5 GRA6	0.678 0.788 0.788 0.778 0.650				
Green Investment	GI1 GI2 GI3	0.684 0.687 0.755	0.752	0.507	0.507	0.503
Financial Anxiety	FA2 FA3 FA4 FA5 FA6	0.760 0.837 0.966 0.668 0.608	0.882	0.727	0.901	0.606

Source: Data Processed

4.1.2 Structural model

The structural model assesses the importance of path coefficients for both exogenous and endogenous components. In PLS-SEM, bootstrapping is utilized to validate the predictive significance of the model. According to theories, the statistical significance of these coefficients was calculated using a one-sided t-test. A path coefficient is deemed significant at the 95 percent confidence interval when the standardized coefficients' t-value exceeds 1.64 (Hair et al., 2019). Fitness of the model is indicated by the Standardised Root Mean Square Residual (SRMR). Its value is 0.08, which indicates an adequate fit.

The first hypothesis (H1) examines the effect of Green Risk Attitude on Green Investment. The results reveal a significant positive path coefficient ($\beta = 0.357$, $t = 3.544$, $p < 0.001$), demonstrating that investors with a higher green risk attitude are more inclined to engage in green investments. The effect size ($f^2 = 0.156$) suggests a moderate impact, confirming the significance of green risk attitude in shaping investment decisions. Thus, H1 is supported (Table 3).

The second hypothesis (H2) investigates the moderating role of Financial Anxiety in the relationship between Green Risk Attitude and Green Investment. The analysis indicates a negative moderating effect, with a path coefficient of $\beta = -0.181$ ($t = 1.658$, $p < 0.001$), signifying that higher levels of financial anxiety weaken the impact of green risk attitude on green investment decisions. The effect size ($f^2 = 0.054$) suggests a small but meaningful moderation effect. These findings reinforce the notion that individuals experiencing higher financial anxiety tend to be more hesitant in making green investment decisions, despite having a positive green risk attitude. Therefore, H2 is also supported.

Overall, the findings indicate that green risk attitude is a key driver of green investment, while financial anxiety acts as a negative moderator in this relationship. The model demonstrates an adequate fit with SRMR = 0.073, validating its robustness in explaining green investment behavior.

Table 3. Results of Structural Model

Hypothesis	Constructs	Path Coefficients	T statistics	P values	Decision
H1	**Green Risk attitude → Green Investment**	0.357	3.544	0.000	Supported
H2	**Financial anxiety x Green Risk attitude → Green Investment**	-0.181	1.658	0.001	Supported

Source: Authors' own work

5. Discussion

The findings of this study provide significant insights into the relationship between green risk attitude, financial anxiety, and green investment behavior among retail investors in the Tricity region (Chandigarh, Panchkula, and Mohali). The results indicate that green risk attitude positively influences green investment decisions, while financial anxiety negatively moderates this relationship. These insights contribute to the existing literature on sustainable finance by integrating behavioral finance theories with green investment decision-making.

The positive and significant impact of green risk attitude on green investment (H1: $\beta = 0.357$, $t = 3.544$, $p < 0.001$, $f^2 = 0.156$) suggests that investors who are more willing to accept financial risks in environmentally sustainable ventures are more likely to engage in green financial instruments. This finding is consistent with previous research indicating that individuals with a higher risk tolerance recognize the long-term benefits of sustainable investing and are more open to the potential volatility associated with green financial products (Chan et al., 2022; Abbas et al., 2023). The results reinforce the idea that investor confidence in green markets is growing, reflecting an increasing awareness of the economic and environmental value of green finance.

The moderating effect of financial anxiety on the relationship between green risk attitude and green investment (H3: $\beta = -0.181$, $t = 1.658$, $p < 0.001$, $f^2 = 0.054$) highlights a key psychological factor influencing investment behavior. The findings reveal that higher financial anxiety weakens the positive impact of green risk attitude on green investment decisions, meaning that even investors who are inclined toward sustainable investments may hesitate if they experience financial stress. This aligns with prior research indicating that financial distress leads to risk-averse behavior, limiting participation in investment opportunities (Bhowmik et al., 2022). Financial anxiety creates uncertainty, leading individuals to prioritize financial security over long-term returns, ultimately reducing their willingness to invest in green assets despite their positive attitude toward sustainability.

These findings provide a deeper understanding of how risk perception and financial stress interact in shaping investment decisions. While green risk attitudes encourage investors to participate in sustainable finance, financial anxiety serves as a significant deterrent, reinforcing the importance of addressing psychological barriers to enhance green investment participation. Addressing this challenge is crucial for fostering a more stable and growth-oriented green finance market.

6. Implications

6.1 Theoretical Implications

This study contributes to the growing body of behavioral finance literature by establishing the role of green risk attitude in influencing green investment decisions. The findings reinforce the Theory of Planned Behavior (TPB) by demonstrating that an investor's willingness to take risks in sustainable investments significantly determines their market participation. The significant positive relationship between green risk attitude and green investment ($\beta = 0.357$, $p = 0.000$) supports the idea that individuals with a stronger inclination towards sustainability are more likely to engage in green financial instruments. Moreover, the study highlights the moderating role of financial anxiety ($\beta = -0.181$, $p = 0.001$), which underscores the impact of psychological barriers on sustainable investment behavior. By integrating financial anxiety into this framework, the study expands existing models of investor decision-making, illustrating that while green risk-taking fosters investment behavior, psychological stress can inhibit participation in green finance. This novel integration provides a deeper understanding of how cognitive and emotional factors shape green investment decisions, offering a foundation for future research to explore additional behavioral moderators, such as financial literacy or government incentives.

6.2 Practical Implications

The study's findings hold substantial relevance for financial institutions, policymakers, and stock market regulators aiming to enhance participation in sustainable investments. The evidence that financial anxiety weakens the impact of green risk attitude on investment behavior suggests a need for targeted interventions to address psychological barriers. Financial institutions can develop educational programs and personalized risk management tools to help retail investors manage their financial anxiety and make more informed green investment decisions. Investment advisory firms should focus on integrating behavioral finance strategies, such as tailored financial coaching and emotional risk assessment frameworks, to support investors with high financial anxiety. Additionally, stock market regulators and policymakers should introduce incentive-based mechanisms—such as lower transaction costs or tax benefits for green investments—to encourage wider adoption despite financial anxiety concerns. Lastly, the findings suggest that financial literacy campaigns tailored toward sustainable investing can foster a more resilient investor mindset, ensuring that green investments continue to grow as a mainstream financial choice despite economic uncertainties.

7. Conclusion

This study examined the impact of green risk attitude and financial anxiety on green investment behavior among retail individual investors in the Tricity region (Chandigarh, Panchkula, and Mohali). The findings indicate that green risk attitude has a significant positive effect on green investment, suggesting that investors who are willing to take financial risks are more inclined toward sustainable investment opportunities. However, financial anxiety moderates this relationship negatively, implying that heightened financial stress reduces the likelihood of investment, even among individuals with a strong inclination toward green finance. These results highlight the importance of both financial confidence and risk perception in shaping sustainable investment decisions, reinforcing the need for financial education, market stability, and policy support to encourage green finance participation.

7.1 Limitations and Future Research Directions

Although this study provides valuable insights into green risk attitude, financial anxiety, and green investment behavior, certain limitations should be acknowledged. The focus on retail individual investors in the Tricity region (Chandigarh, Panchkula, and Mohali) may limit the generalizability of the findings to other populations. Additionally, the reliance on self-reported survey data poses a risk of response bias, which future research could address by incorporating behavioral experiments or real investment data. While this study examines green risk attitude and financial anxiety, other factors such as financial literacy, regulatory policies, and market conditions may also influence green investment behavior. Future research could further explore these aspects and employ longitudinal studies or predictive models to analyze how financial anxiety and investment decisions evolve over time in response to economic or policy changes.

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