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The Theory of Planned Behavior and Green Investment A Behavioral Perspective on Individual Investors

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Abstract

Countries around the world are actively developing strategies and implementing initiatives to transition their financial systems toward sustainability and achieve net-zero targets by 2050. This green transition involves promoting green finance and fostering investments that support environmentally sustainable projects. Governments are focusing on creating a conducive ecosystem and building infrastructure to attract green investments. However, understanding the factors influencing investors' decision-making processes has become a significant area of research. In this article, we explore green investment decision-making from a behavioral finance perspective, utilizing the Theory of Planned Behavior for examining the factors shaping investment choices during the decision-making process. The findings show Investment knowledge was found to play a crucial role in strengthening the nexus between positive attitudes, perceived controlled behavior, and participation. However, its effect on subjective norms was minimal, indicating that while knowledge enhances psychological motivators of investment, it does not affect social influences. These findings highlight the importance of psychological and contextual factors such as attitudes, norms, and perceived control in shaping green investment decisions.

Keywords: *Green Investment, Behavioral Finance, Theory of Planned Behavior, Investors Perspective*

1. Introduction

Green innovation and sustainabl Finance are the prominent steps for sustainable or green economy (Bhatnagar et al., 2024). Recognizing the importance for environmental sustainability and need for green development, policymakers are emphasizing the shift from traditional energy sources like oil, coal and gas to clean energy alternatives. For instance, nuclear energy, wind energy, solar and biofuel. This energy transformation is initially driven by green financing (Mo et al., 2023). The strategy for investment is not only to safe guard the environment, also to encourage the social equality, increases economic success and protects the society and banks against the financial risks in future, like instability in global economic, change in climate and scams in business (Ziolo et al., 2019). Green finance is an investment in green bond, decreasing the CO2 emission, and efficiency of the tax related to environment by each countries (Gharleghi et al., 2024). This thought of green finance has arised into a very established set of policies and guidelines in the sector of financial services (Al Amin et al., 2023).

Being an object of research green or sustainable finance, has been receiving very much attention. The main focus of researchers is varied, but the history of research is not yet rich. Some research is conducted in an attempt to describe the concepts of related to green investment and financing (Eyraud et al., 2011). Green investing emphasizes environmental protection while integrating financial returns

with ethical and ecological priorities (Amenc et al., 2010). Green investments refer to those investments designed to minimize emissions of gas from greenhouse and pollution from air while production and consumption levels of non-energy products (Du et al., 2019). It almost covers so many different instruments and tools related to finance, like, green stocks, bonds, loans and mortgages, derivatives and venture capital (investing in green ventures), subsidies from government such as grants, lending amount, compensations, guarantees, tariffs, taxes (carbon), pollution related permits, tax credits, public procurement related to green, and much more (Aleknevičienė & Bendoraitytė, 2023) .

Trust between market participants remains one of the key challenges in green investment. It is often difficult to verify the extent to which investments are aimed at achieving environmental goals (Khalegi et al., 2024).

Bank employees' attitudes, subjective norms, perceived behavioral control, and internal measures for implementing green finance have a significant and positive influence on their behavioral intentions (Gharleghi et al., 2024b).

Behahavioral intentions toward green investment are significantly influenced by factors like subjective norm, attitude, and perceived behavioral control. Additionally, the moderating effect of social media platform usage among individual investors has been figured out that to play the significance role in shaping these intentions, particularly in the context of Egypt (Hemdan & Zhang, 2024b).

The literature highlights the critical roles of green investment, financial institutions, and markets in fostering green growth, particularly in the context of addressing environmental pollution. This study explores the dynamic effects of these factors on green growth by utilizing a time-series dataset from four heavily polluted Asian countries-China, India, Japan, and Russia-covering the period from 1995 to 2019. The findings, derived from the ARDL bounds testing approach, reveal several important insights: green investment has a positive long-term impact on green growth in China, India, and Russia; financial institutions significantly influence long-term green growth in China, India, and Japan; and financial markets contribute positively to green growth in China and Russia (Mo et al., 2023b).

Fiscal decentralization, green investments, and renewable energy consumption significantly contribute to reducing ecological footprints. However, their impact varies notably across lower, medium, and higher quantiles, with the effects being most pronounced from the middle to the highest quantiles (Sun et al., 2022). Green investment in Malaysia remains in its nascent stages, largely due to limited awareness and understanding of the concept among the general population. The study applied the Theory of Planned Behavior (TPB) framework, examining factors such as attitude, subjective norms, perceived behavioral control, knowledge, reputation, and religious values. The results indicated that attitude, perceived behavioral control, knowledge, reputation, and religious values significantly influence the intention to engage in green investment, with religious values emerging as the most influential factor. These findings offer valuable insights for promoting green investment and suggest avenues for future research (Eaw et al., 2024).

2. Research Gap

Although environmental consciousness has led to a rise in interest in green investments, it is unclear what exactly drives individual investors to make these kinds of

investments. The majority of previous study has concentrated on institutional investors, or broad market trends, which has left a vacuum in our knowledge. Furthermore, although the individual behavioral components of the TPB has been extensively employed to elucidate diverse financial behaviors, its utilization in relation to green investments is still restricted. Furthermore, there hasn't been enough research done on how investment expertise affects an individual investor's decision to make green investments. By combining investment expertise with TPB, this study seeks to close this gap by investigating the ways in which these variables interact to influence the involvement of individual investors in green investments.

3. Research Objectives

The present study focuses on the green investment decisions of individual investors in connection with the theory of planned behavior. With reference to the previous literatures, the study has conducted by using the range of indicators which influences the green investors decisions.

4. Research Methodology

The current article aims on the green investment decisions of individual investors in connection with the theory of planned behavior. Though there will be range of indicators which influences the green investors decisions, based on those indicators a structured questionnaire was framed and floated to the researcher’s friends and associates in and around Bangalore. Then our friends and associates were helped us to send the questionnaire in their surroundings, in their respective places and so on. The primary data were collected through online google form. The study employed convenient sampling technique for collecting the data and received from 393 responses. SPSS software was used to analyze the response using T-test, Chi-square and ANOVA.

5. Hypothesis Development

The pre-assumptions, developed based on the primary research on the content, are defined as the hypothesis (Scheel et al., 2021).

H1: There is a significant difference in individual investor intention towards green investment between male and female investors.

H2: Education level and confidence in making green investments are independent.

H3: Positive attitude towards green investments significantly increases individual investor participation.

H4: Subjective norms significantly influence individual investor participation in green investments.

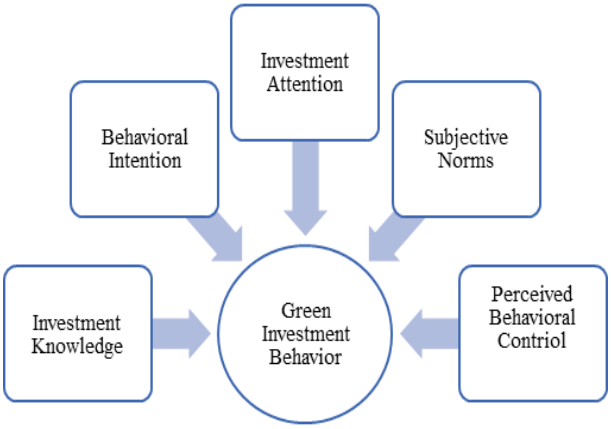
H5: Perceived behavioural control significantly enhances individual investor participation in green investments.

H6: Investment knowledge significantly strengthens the attitudes, subjective norms, perceived behavioural control, and individual investor participation relationship in green investments.

6. Conceptualization and structure of the questionnaire

The respondents age, gender, income, and educational attainment were all obtained in the first section's demographic data collection. The analysis of the respondents' backgrounds and the potential influences of these variables on intentions to make green investments were made possible by the availability of this demographic data. In Section B, based on the previous empirical studies and some relevant theories like TPB, we developed a conceptual framework. This study’s framework analyses the green investors intentions. Green investment intentions among individual investors were conceptualized as an integration of investment knowledge, investment behavior, and investment attitude. The questionnaire underwent a meticulous revision process based on respondent feedback. The survey instrument was systematically divided into five sections to cover all aspects as shown in the Figure

no.1.



Source: Author's own work

Figure 1: Conceptual Framework

7. Analysis and Results

Table 1 reveals that out of 393 respondents, 52.7% were male and 44% were female. The majority of respondents comes within the group of 25-44 years 36.9%, followed by the group under 25 years 32%, 45-64 years 25.2%, and the least represented group, aged 65 and above 5.6%. In terms of qualifications, the highest proportion of respondents held a degree in Bachelor's 33.6%, followed by Diploma 30%, a degree in Master's 25.7%, and the lowest representation from individuals with only a high school education 10.7%. Regarding occupation, salaried individuals comprised the largest group 40.5%, followed by business and professionals 20.1%, self-employed individuals 19.8%, and students 19.8%.

Table 1: Demographic Profile of Investors

Demographic profile		%
Gender	Male Female Prefer not to say	52.7 44 3.3
Age	Less than 25 25-44 45-64 65 and above	32.3 36.9 25.2 5.6
Education	High School or low Diploma Equivalent Bachelor's Degree Master Degree or High	10.7 30 33.6 25.7
Occupation	Professionals Salaried Individual Self-Employment Students	20.1 40.5 19.8 19.8

Souce: Author's own work

Attitude Towards Green Investment

Constructs and Variables

Investment Knowledge

- Familiarity with fundamental concepts of green investment.
- Awareness of green investment products and offerings
- Understanding of green financial planning and budgeting strategies.
- I am confident that the investments in green companies have a positive influence on the environment.
- Green investments represent a sound financial decision
- Investing in green initiatives gives me a sense of personal fulfillment

- I feel optimistic about the societal benefits of my green investments
- How strongly do you believe that green investments are a sustainable long-term strategy?

Subjective Norms

- How significant is the importance your friends and family place on your investment in environmentally friendly companies or projects
- Seeing individuals I admire, such as celebrities or influencers, invest in green initiatives motivates me to consider similar investments
- To what extent do your peers influence your investment choices
- Are you aware of societal trends promoting green investments
- To what degree do you agree that public opinion impacts your investment decisions?

Perceived Behavioral Control

- How significant is the importance your friends and family place on your investment in environmentally friendly companies or projects?
- Seeing individuals I admire, such as celebrities or influencers, invest in green initiatives motivates me to consider similar investments.
- To what extent do your peers influence your investment choices
- Are you aware of societal trends promoting green investments?
- To what degree do you agree that public opinion impacts your investment decisions?

Behavioral Intention Towards Green Investment

- I plan to gradually increase my investments in green initiatives.
- Given a choice between a green investment and a traditional investment with comparable returns, I would opt for the green option.
- How confident are you, considering all factors, that you will invest in green initiatives in the future?
- I aim to dedicate a portion of my investment portfolio to green investments.
- I am dedicated to expanding my knowledge about green investments.

Hypothesis 1 Analysis

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Intention towards Green investment	Equal variances assumed	1.180	.278	-1.381	378	.168	-.13638	.09871	-.33048	.05773
	Equal variances not assumed			-1.370	352.562	.171	-.13638	.09951	-.33207	.05934

Source: SPSS

Table 2: Independent Samples Test of Hypothesis 1

Levene's Test for Equality of Variances

Since the significance value (0.278) exceeds 0.05, it can be concluded that there is no significant difference in the variances between the male and female groups. Therefore, the t-test can proceed under the assumption of equal variances.

T-Test for Equality of Means

Assuming equal variances, the value of t-test is -1.381 with a value of p 0.168. Alternatively, the t-test value is -1.370 with the p-value of 0.171. Both p-values (0.168 and 0.171) exceed 0.05. Therefore, hypothesis 1 is accepted, which states a significant difference in individual investor intention towards green investment between male and female investors.

Hypothesis 2 Analysis

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	32.758[a]	12	.001
Likelihood Ratio	41.041	12	.000
Linear-by-Linear Association	.071	1	.790
N of Valid Cases	393		
a. 2 cells (10.0%) have expected count less than 5. The minimum expected count is 2.35			

Source: SPSS

Table 3: Pearson Chi-Square test of Hypothesis 2

The p-value (0.001) is below the standard significance level of 0.05, indicating a statistically significant correlation between confidence in green investments and education level. Hence, we accept the alternative hypothesis which states Education level and confidence in making green investments are independent.

Hypothesis 3 Analysis

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	127.278	1	127.278	203.575	.000[b]
	Residual	244.459	391	.625		
	Total	371.737	392			
a. Dependent Variable: Individual investor participation						
b. Predictors: (Constant), Attitude						

Source: SPSS

Table 4: ANOVA test of Hypothesis 3

The value of p 0.000 is below the 0.05 threshold, says the model is significant statistically. This signifies a meaningful relationship between attitudes toward green investments and individual investor participation. Specifically, the p-value of 0.000 for attitude confirms the statistical significance of this association.

Hypothesis 4 Analysis

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	127.574	1	127.574	204.296	.000[b]
	Residual	244.163	391	.624		
	Total	371.737	392			
a. Dependent Variable: Individual investor participation						
b. Predictors: (Constant), Subjective Norms						

Source: SPSS

Table 5: ANOVA test of Hypothesis 4

With a value of p-test 0.000, which is below 0.05, shows there is a statistically significant relationship in between an individual investor engagement and subjective norms in the model. Therefore, the alternative hypothesis (H1) is accepted, indicating that subjective norms play an important role in shaping individual investor participation in green investments.

Hypothesis 5 Analysis

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	206.734	1	206.734	489.888	.000[b]
	Residual	165.003	391	.422		
	Total	371.737	392			
a. Dependent Variable: Individual investor participation						
b. Predictors: (Constant), Perceived Behavioural Control						

Source: SPSS

Table 6: ANOVA test of Hypothesis 5

The p-value of 0.000, being less than 0.05, demonstrates a significant relationship between perceived behavioral control and individual investor participation in the model. Consequently, the alternative hypothesis (H1) is accepted. Hence, the individual investor participation in green investments significantly increases when perceived behavioral control is present.

Hypothesis 6 Analysis

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	240.826	3	80.275	238.536	.000[b]
	Residual	130.911	389	.337		
	Total	371.737	392			

a. Dependent Variable: Individual investor participation

b. Predictors: (Constant), PBC and Investment Knowledge, Attitude and Investment Knowledge, Social Norms and Investment Knowledge

Source: SPSS

Table 4: ANOVA test of Hypothesis 6

The value of p-test is 0.000, which is below 0.05, indicates that the model is significant, establishing a significant relationship in between the independent variables and individual investor participation. Consequently, the alternative hypothesis (H1) is accepted. Specifically, investment knowledge significantly enhances individual investor participation in green investments when mediated by attitudes and perceived behavioral control. However, its influence on subjective norms is minimal.

8. Discussions

The article provides several important insights about the factors which influences individual investor participation in green investments. Gender does not appear to significantly affect green investment intentions, as both male and female investors exhibit similar levels of participation. On the other hand, education level is significantly associated with confidence in making green investments, with those possessing higher education levels showing greater confidence in their financial decisions related to green investments.

The findings further emphasize the crucial roles of positive attitudes and subjective norms in driving investor participation. A moderate positive correlation (R = 0.585) was observed between positive attitudes and participation in green investments, accounting for 34.2% of the variation. Likewise, subjective norms also displayed a positive correlation with investor participation (R = 0.586), explaining 34.3% of the variation. Both factors were found to significantly influence participation, as reflected in their low p-values (0.000) and high t-values (14.268 for attitudes, 14.293 for subjective norms).

Perceived behavioral control emerged as an even stronger factor, with a strong positive correlation (R = 0.746) and accounting for 55.6% of the variation in participation. The significant p-value (0.000) and high t-value (22.133) reinforce the critical role of perceived behavioral control in promoting participation in green investments.

Investment knowledge also plays a significant role in shaping investor engagement. It notably strengthens the relationship between positive attitudes and participation, as well as the link between perceived behavioral control and participation, with p-values of 0.001 and 0.000, respectively. However, investment knowledge does not appear to have a meaningful effect on the relationship between subjective norms and participation, as indicated by a p-value of 0.872.

Finally, while investment knowledge enhances the effects of positive attitudes and perceived behavioral control, it does not substantially alter the impact of subjective norms. This suggests that while knowledge amplifies the psychological factors driving investment decisions, it does not modify the social influences exerted by subjective norms.

9. Recommendations

To enhance individual investor participation in green investments, a combination of educational initiatives, gender-inclusive strategies, and supportive policies is essential. Educational programs should focus on the benefits and opportunities of green investments, targeting various educational levels. Gender-inclusive

marketing campaigns and mentorship programs can increase female participation. Policymakers and financial institutions can offer incentives, while transparent information about investment options will boost confidence. Leveraging social norms through community leaders and environmental organizations can further encourage participation. Additionally, enhancing investment knowledge through targeted content and integrating green investment topics into financial literacy programs will strengthen perceived behavioral control. Customized investment platforms, emphasizing long-term benefits and partnerships with environmental organizations, will provide the necessary tools and credibility for investors. Together, these strategies will foster a more inclusive, informed, and motivated community of green investors, contributing to both financial and environmental sustainability.

10. Conclusion

This study explored factors such as attitude, subjective norm, and perceived behavioral control, which are key elements of the TPB, to assess the individual investors' intention on green investment. A review of previous studies was also conducted to evaluate the relevance of the TPB to investment intentions.

In conclusion, this study provides valuable insights into the key factors that influence individual investor participation in green investments. Gender, surprisingly, does not have a significant impact on investment intentions, as both male and female investors exhibit similar levels of participation. However, educational attainment emerges as a critical determinant, with higher education correlating with greater confidence in making green investment decisions. Both positive attitudes and subjective norms are found to significantly influence investor behavior, with moderate positive correlations between these factors and green investment participation. Notably, perceived behavioral control stands out as the most significant factor, with a robust positive correlation and substantial influence on investment participation.

Furthermore, investment knowledge is demonstrated to play a pivotal role in strengthening the relationships between positive attitudes, perceived behavioral control, and participation. While its impact on subjective norms is minimal, indicating that investment knowledge primarily enhances psychological factors rather than social influences, these findings underscore the importance of psychological and contextual factors in shaping green investment decisions. In light of these results, future efforts to increase participation in green investments should focus on enhancing financial literacy, cultivating positive attitudes, and promoting supportive social norms, while recognizing the critical role of perceived behavioral control in shaping investor behavior.

11. Limitations and further research

Several limitations must be considered for future research in this field. While the results of this study provide a strong foundation for encouraging investor interest in green investments, caution is needed when interpreting these findings. The data was specifically collected in the context of Bangalore and surroundings, which limits the generalizability of the results to other cultural contexts. Investors across different places may use varying concepts simultaneously, and their preferences for these concepts are influenced by factors such as historical, cultural, and legal differences.

Additionally, this study focused on individual investors, and future research could expand by examining institutional investors. While this study relied on the Theory of Planned Behavior (TPB), future research may explore alternative frameworks such as social cognitive theory, the theory of reasoned action, institutional theory, and the resource-based view. Furthermore, examin-

ing moderating factors like gender, age, education level, and income could provide valuable insights into how these variables influence the acceptance of green investments, including their impact on investor risk tolerance. Future studies could also compare individuals' intentions with their actual behavior to better understand how to convert intentions into concrete actions. Lastly, future research could investigate additional factors such as trust, moral obligation, values, government support, fear of failure, and institutional support.

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