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Factors Affecting Impact Investment among Generation Z: The Moderating Role of Behavioral Biases

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ABSTRACT

This study explores the determinants that affect impact investment behavior, with a particular emphasis on the moderating influence of behavioral biases. The inquiry examines principal factors influencing impact investment, encompassing environmental concern, environmental awareness, social norms, perceived behavioral control, and attitudes. Additionally, the study investigates how behavioral biases affect the relationship between these factors and impact investment decisions. Employing SmartPLS, structural equation modeling analysis demonstrates that environmental concern, social norms, and perceived behavioral control exert a significant influence on investment behaviors. However, behavioral biases do not appear to moderate the association between attitudes and investment behavior.

Keywords: Impact Investment, Behavioral Biases, Environmental Concern, Environmental Awareness, Social Norms, Perceived Behavioral Control
JEL Classifications: G0, G4, O1

1. INTRODUCTION

The increasing global awareness of environmental issues, including climate change, resource exhaustion, and social disparities has led to the rise of impact investing as a notable phenomenon within financial markets. Impact investing represents an investment paradigm that seeks to yield both financial gains and quantifiable positive social or environmental effects. This investment modality has experienced significant momentum in recent years, driven by the increasing appetite for ethical investment methodologies and the acknowledgment that financial markets can assume a crucial role in fostering sustainability. Investors are increasingly shifting their focus from merely maximizing profits to ensure that their investment portfolios align with their individual values and societal objectives. This transformation has been particularly pronounced among younger cohorts and socially aware individuals who prioritize sustainability in their investment choices (Busch et al., 2021).

Despite the increasing attention towards impact investing, comprehending the fundamental determinants that shape investors' decision-making processes in this domain continues to pose significant challenges. The motivations of investors can exhibit considerable complexity, influenced not solely by the prospect of financial returns but also by their underlying attitudes, beliefs, and value systems (Bacuilima et al., 2023). Concerns regarding the environment, as well as the level of environmental awareness, constitute pivotal factors, as they signify an individual's dedication to environmental issues and their understanding of ecological issues. Individuals showing a higher degree of environmental concern are more inclined to pursue investments that yield favourable environmental outcomes, whereas those possessing

a deeper awareness of environmental matters may demonstrate a greater familiar behavior with the implications of their investments on sustainability (Harder and Scheepers, 2023).

In addition to environmental determinants, social norms give a considerable influence on the formation of investment behaviors. Social norms pertain to the implicit regulations and anticipations that govern individual conduct within a community. Within the framework of impact investing, societal norms may be exhibited as communal pressure to allocate resources in a responsible manner or in accordance with ethical principles. Comprehending the impact of societal norms on investment behavior is essential for developing methodologies that foster responsible and sustainable investment practices (Mishra et al., 2023).

The field of behavioral finance has demonstrated that cognitive distortions and psychological predispositions frequently impact decision-making processes, resulting in deviations from conventional economic rationality. Investors do not consistently operate as rational agents who base their decisions solely on quantitative financial data and anticipated returns. Such biases may skew individuals' perceptions of the risks and benefits associated with impact investing, potentially resulting in suboptimal investment outcomes (Juddoo et al., 2023).

The principal aim of this research is to investigate the extent to which psychological and social determinants affect the propensity to participate in impact investing. More specifically, the study seeks to evaluate the correlation between environmental concern, environmental awareness, social norms, and behavioral biases, as well as their collective influence on the behavior associated with impact investing. Furthermore, this research examines the possibility that behavioral biases may moderate the association between investor attitudes and investment choices, thereby potentially enhancing or mitigating the probability of engaging in impact investment (Shome et al., 2023).

In summary, a comprehensive understanding of the interrelations among environmental concerns, social dynamics, and behavioral biases is crucial for fostering more informed and responsible investment choices. This research aspires to furnish significant insights that may inform the development of future policies and strategies aimed at advancing sustainability through impact investing.

2. LITERATURE REVIEW

2.1. Background of Impact Investment

In recent years, impact investing has grown as an innovative and expanding modality of sustainable capital deployment. The Global Impact Investing Network (GIIN) explains impact investing as "investments made with the intention to generate positive, measurable social and environmental impact alongside a financial return." Consequently, impact investing refers to the allocation of resources to organizations and/or initiatives designed to deliberately create tangible and quantifiable social or environmental outcomes while concurrently seeking favourable financial returns (Busch et al., 2021).

In light of the heightened interest in impact investing across various sectors in recent years, it is not unexpected that scholarly inquiry in this domain is growing in diverse directions. Indeed, various academic communities, occasionally conflicting backgrounds (e.g., socio-economic versus financial; public versus market-oriented), are rigorously exploring the field of impact investing, thereby producing a multitude of investigative methodologies and themes. Theoretical contributions are compared with both qualitative and quantitative empirical methodologies, while studies that incorporate a social viewpoint are balanced against those that maintain a strictly financial approach (Md Husin et al., 2021).

The academic literature emphasizes the distinct paradigm of impact investing within social sector organizations, indicating four principal research streams in the realm of impact investing: "(i) decision-making processes associated with impact investment, (ii) methodologies for impact evaluation, (iii) psychological dimensions influencing behavior in impact investing, and (iv) the ecosystem of impact investing" (Juddoo et al., 2023).

2.2. Environmental Concern, Theory of Planned Behavior and Impact Investment

One of the most extensively used frameworks for the examination of human behavior, particularly in the context of investment decision-making, is the Theory of Planned Behavior (TPB), which was formulated by Ajzen in 1985 (Sobaih and Elshaer, 2023). The TPB is an extension of the Theory of Reasoned Action (TRA) put forth by Fishbein and Ajzen in 1975, thereby enabling scholars to forecast behavioral intentions predicated on three principal variables: Attitude (ATT), Subjective Norm (SN), and Perceived Behavioral Control (PBC). ATT pertains to an individual's position regarding a specific issue, while SN denotes the societal pressures exerted upon them to engage in a particular behavior. PBC reflects the degree to which an individual perceives they possess the requisite resources, competencies, and opportunities to execute the desired behavior. Collectively, these three variables form the foundation of an individual's intention, with PBC believed to exert a direct impact on their behavioral outcomes.

The theory of planned behavior (TPB) provides a framework for scholars to identify the determinants underlying environmental behavior and, consequently, to direct interventions towards these specific factors (Ajzen, 1985; Rathee and Aggarwal, 2022).

Several research studies focused on conservation practices have recently utilized this theoretical approach in the contexts of organizations and households. Following its inception nearly thirty years prior, the Theory of Planned Behavior (TPB) has been routinely utilized to understand the determinants influencing a range of pro-environmental actions: the adoption of alternative transportation methods, the practices of waste recycling, water and energy conservation, the reduction of carbon footprints, and various other relevant areas. Recently, there has been a significant increase in the volume of academic publications utilizing the Theory of Planned Behavior (TPB) to examine the environmentally responsible behaviors displayed by employees (Raut et al., 2018).

However, there exist significant apprehensions related to the comprehensiveness and efficacy of the Theory of Planned Behavior (TPB) in forecasting environmentally sustainable actions. For example, a considerable number of scholarly articles grounded in the TPB appear to assess the intention to engage in eco-friendly practices rather than the actual behaviors, largely due to the absence of validated metrics for numerous pro-environmental actions (Sobaih and Elshaer, 2023).

Moreover, empirical research suggests that the Theory of Planned Behavior (TPB) emphasizes the significance of attitude, whereas personal environmentally sustainable behaviors are predominantly shaped by knowledge and habitual practices, which are not encompassed within the theoretical framework. Numerous additional elements exert an influence on pro-environmental conduct, yet they do not form a fundamental component of the Theory of Planned Behavior (TPB), such as the requisite exertion, self-concept, affinity with the natural environment, and ethical responsibility. In addition, the determinants manifest variability across distinct contexts, which may compromise the predictive effectiveness of the theoretical framework. For instance, the pro-environmental conduct of individuals within the workplace is influenced by several factors that are not present in domestic settings—such as organizational values, managerial endorsement, peer attitudes, and the prevailing internal culture (Wulandari et al., 2024).

The Theory of Planned Behavior (TPB) incorporates an additional variable that enhances the predictive capacity regarding the choices that individuals are inclined to make: Perceived Behavioral Control. Specifically, whereas the Theory of Reasoned Action predominantly emphasizes volitional personal and social determinants in explaining the formation of an individual's intention, the Theory of Planned Behavior further investigates the anticipations regarding "the ease or difficulty in executing a particular behavior," which reflects individuals' beliefs or "self-efficacy regarding their capability to undertake" a specific action, in addition to serving as a reflection of the "resources and opportunities at their disposal." The validity of the Theory of Reasoned Action (TRA) has been subjected to scrutiny, as it may occasionally fall short in accurately forecasting an individual's intention or behavior, particularly in instances where such behaviors are influenced by non-volitional factors. (e.g., resources) (Yucel et al., 2023).

An additional extension of the Theory of Reasoned Action (TRA), which bears conceptual similarities to the Theory of Planned Behavior (TPB), is the Integrative Model (IM) of behavioral prediction. This model integrates the construct of self-efficacy, which pertains to an individual's perceived capability to execute a behavior in the face of certain obstacles, rather than solely relying on the Perceived Behavioral Control variable. Due to its robust predictive capacity, the TPB has been extensively employed as a framework for forecasting intentions and behaviors across diverse domains, including dietary choices and health-related practices. Nevertheless, particularly within the domain of environmental science, the Theory of Planned Behavior (TPB) is increasingly championed as a pivotal framework for forecasting and encouraging a diverse array of Pro-Environmental Behaviors. As indicated by the research, the primary areas of investigation where TPB is utilized encompass waste management, sustainable consumption, climate and environmental concerns, resource saving and conservation, as well as sustainable transportation initiatives. Prior scholarly work addressing TPB in the context of environmental discourse has illustrated that Attitudes, Subjective Norms, and Perceived Behavioral Control are fundamental factors influencing the Intention to partake in Pro-Environmental Behaviors, with such dynamics being further encouraged by individuals' moral imperatives to engage in Pro-Environmental Behavior (PEB). Furthermore, a segment of researchers has introduced an Extended Theory of Planned Behavior (ETPB), which incorporates additional behavioral predictors into the original TPB framework, thereby enhancing, in certain instances, the predictive capacity of Intentions.

2.3. Attitude and Impact Investment

ATT denotes an individual's comprehensive assessment or sentiment regarding a specific object, concept, individual, or circumstance, which may vary along a spectrum from positive to negative (Ajzen, 1985). Within the parameters of this investigation, ATT pertains to the extent to which the individual regards investments in ESG funds as advantageous or disadvantageous. The relationship between ATT and impact investment has been recognized for an extended period and has been substantiated through empirical investigations, as demonstrated by research within the domain of traditional investing. and sustainable investing (Shehzad et al., 2023). Nevertheless, there exist several investigations that have failed to establish a statistically significant predictive relationship between investors' attitudes towards ESG investing and their intention to invest in such funds. The ongoing debate concerning the association between attitudes and the intention to engage in ESG investment highlights the necessity of incorporating findings from empirical research in the domain of environmentally sustainable consumer behavior. An examination of pertinent scholarly literature reveals that researchers have consistently identified a positive association between attitudes and the intention to partake in environmentally responsible. This observation is equally applicable to the body of literature addressing green consumption intentions and attitudes among members of Generation Z (Yucel et al., 2023). It is noteworthy that Generation Z has been characterized as one of the most environmentally aware cohorts in recent history (Yucel et al., 2023).

2.4. Subjective Norms and Impact Investment

In the framework of this study, Subjective Norm refers to an individual's assessment regarding whether a significant other perceives the investment in Environmental, Social, and Governance (ESG) funds as advantageous, in conjunction with the individual's own investment decisions. This construct encapsulates the social pressures that individuals may encounter, which may consequently enhance their propensity to participate in Socially Responsible Investing (Prasetyo and Kurniasari, 2023). A substantial body of scholarly work indicates that SN serves as a robust predictor of an individual's intentions, which includes both conventional and ESG-related investment decisions Conversely, a limited number of researchers have posited that SN

possesses constrained or negligible predictive capabilities within the Theory of Planned Behavior (TPB) framework (Prasetyo and Kurniasari, 2023).

Furthermore, an analysis of scholarly work concerning green consumption behaviors among Generation Z reveals a significant positive correlation between social norms (SN) and environmentally sustainable behavioral intentions. This finding indicates that familiar and peer influences are critical determinants in shaping the purchasing behaviors of this particular demographic. Members of Generation Z frequently seek financial and investment guidance through social media platforms and depend on the encouragement of their social circles and digital influencers, thereby establishing a positive association between SN and Environmental, Social, and Governance (ESG) criteria (Ibrahim and Arshad, 2017).

2.5. Perceived Behavioral Control and Impact Investment

The concept of Perceived Behavioral Control (PBC) denotes an individual's assessment of the relative ease or difficulty associated with undertaking a particular behavior. From a conceptual standpoint, PBC can be interpreted through two distinct lenses: first, as a function of the contingent availability of essential resources and opportunities that are requisite for the execution of the intended behavior; or alternatively, as an indication of constraining factors that may inhibit the individual's capacity to engage in the desired behavior (Ajzen, 1991). In the context of impact investing, contemporary research suggests that PBC encompasses the investor's access to pertinent investment opportunities as well as their capacity to engage in this specific behaviour (Ibrahim and Arshad, 2017). In addition, an understanding of limited resources, including financial capital or recognizing the availability of ESG investment opportunities, is a vital aspect of perceived behavioral control within the context of impact investing. It is important to note that modern research has shown that Perceived Behavioral Control (PBC) represents a considerable share of the variances identified in individuals' intentions to participate in specific activities (Armitage and Conner, 2001). Furthermore, it exerts a direct influence on the ensuing behaviors of individuals. This proposition is supported by the investigations conducted by numerous scholars who have recognized PBC as a critical predictor of impact investment (Ibrahim and Arshad, 2017). Within the framework of environmentally sustainable consumption, it has been established that Generation Z exhibits a heightened propensity to engage in environmentally responsible behaviors when they ascertain that such actions are readily achievable (Rathee and Aggarwal, 2022).

2.6. Behavioral Biases and Investment Decisions

Previous literatures have identified several prevalent behavioral biases shown by investors within the domains of behavioral psychology and finance. Such behavioral biases often cause irregularities in the decision-making processes of investors. Academics have examined the impact of cognitive biases on individual investor decision-making across diverse nations and communities (John Wiley and Sons, Inc., 2007). It has been ascertained that, due to human psychology, investors frequently engage in suboptimal decision-making. Behavioral biases, including heuristics and herding phenomena, significantly sway investment decisions during the formulation of investment portfolios and other disturbing factors that influence investment choices (Mushinada and Veluri, 2019). The initial assertion was made that females exhibit major biased prone decisions to engage in impact investing compared to their male counterparts. This proposition has received both support and opposition in the years that followed. For instance, various academic publications have provided supporting evidence that validates this claim.

On the other side, studies indicate that women, in general, exhibit greater risk aversion and are less overconfident than men (Ahmed et al., 2022).

The existing literature has established that behavioral elements are influenced by two principal domains, namely prospect theory and heuristics. The attributes of these domains are delineated through various biases, which include loss aversion bias, risk aversion bias, regret aversion bias, mental accounting, overconfidence, self-control bias, herding behavior, among others (Din et al., 2021).

Investigations have revealed that the biases associated with overconfidence, expert bias, and self-control bias exert a statistically significant positive influence on the behavior of individual investors, thereby affecting their levels of financial satisfaction. A recent investigation, conducted utilizing an analytical hierarchy process, examined behavioral biases such as overconfidence bias, representative bias, regret aversion, mental accounting, and herd behavior that impact investment decisions. The findings indicated that the effects of overconfidence bias and regret aversion were substantially more pronounced than those of other biases (Koo and Yang, 2018).

2.7. Hypotheses Development

H_1: Environmental concern has a positive impact on impact investment behavior.

H_2: Environmental awareness positively influences engagement in impact investment.

H_3: Social norms positively affect decisions to engage in impact investment.

H_4: Perceived behavioral control positively influences impact investment behavior.

H_5: Attitude toward impact investment positively affects the likelihood of engaging in impact investment.

H_6: Behavioral biases moderate the relationship between attitude and impact investment behaviour.

3. RESEARCH METHODOLOGY

This study adopts a quantitative research design, focusing on the examination of factors affecting impact investment among Generation Z individuals in Lucknow, India. The research primarily utilizes a survey method for data collection, enabling the systematic gathering of information regarding the attitudes, perceptions, and behaviours of the target demographic towards impact investment.

3.1. Instrument Development

To measure the constructs of interest, a structured questionnaire was developed, incorporating a five-point Likert scale with response anchors ranging from "strongly disagree" to "strongly agree." This scale provides a comprehensive framework for capturing the intensity of respondents' attitudes towards the various items included in the survey. The official scale comprised a total of 35 items, which were meticulously crafted to ensure alignment with the study's objectives.

In order to enhance the relevance and clarity of the survey items, several modifications were made to the original scales and item phrasing. This adaptation process was guided by the specific context of the study, ensuring that the items accurately reflected the nuances of impact investment among Generation Z.

3.2. Pilot Testing

Prior to the distribution of the official survey, a pilot test was conducted involving 35 individuals who actively invest in shares and mutual funds. This preliminary testing phase served to validate the questionnaire, allowing for the identification of any ambiguities or potential areas of confusion within the survey items. Feedback from pilot respondents facilitated essential modifications to the scale and model, enhancing the clarity and comprehensibility of the questions. This iterative process aimed to achieve a high level of precision in the survey instrument, thereby bolstering the reliability of the findings.

3.3. Data Collection Procedure

Participants were assured of their voluntary participation and the confidentiality of their responses. This ethical consideration was clearly articulated to all respondents in a dedicated opening section of the survey, emphasizing that the information collected would be used solely for research purposes and would not be disclosed for any other reason. Participants were only directed to the main survey after providing their informed consent.

The study employed a non-probability sampling method, specifically purposive sampling, to target respondents who are representative of Generation Z and have a vested interest in impact investment. Ultimately, a total of 475 valid responses were obtained, providing a robust dataset for analysis.

3.4. Data Analysis

Data analysis was conducted using SPSS version 26 and SMART PLS software. The analytical procedures included Exploratory Factor Analysis (EFA) to identify the underlying structure of the data, Confirmatory Factor Analysis (CFA) to validate the measurement model, and Structural Equation Modeling (SEM) to assess the hypothesized relationships between the variables within the proposed framework. These statistical techniques enabled a comprehensive examination of the data, facilitating insights into the factors influencing impact investment decisions among Generation Z.

3.5. Ethical Considerations

The authors affirm the integrity of this manuscript, emphasizing that the research has been conducted with honesty, transparency, and ethical rigor. All key aspects of the investigation have been reported, and any deviations from the original study plan have been explicitly clarified. The commitment to ethical research practices ensures that the findings contribute meaningfully to the understanding of impact investment behaviors among the target population.

4. ANALYSIS AND RESULTS

4.1. Demographic Profile of Respondents

The demographic profile of the participants indicates a relatively equitable gender distribution, with 53.5% male (254 individuals) and 46.5% female (221 individuals) (Table 1). In terms of age, the predominant cohorts are those within the 18-26 years and 27-42 years brackets, each constituting 27.6% (131 individuals) of the sample. Participants aged 43-58 years comprise 24.6% (117 individuals), while those aged 59 and above constitute 20.2% (96 individuals).

Regarding educational qualifications, 27.8% (132 individuals) are at the undergraduate level, closely followed by 27.6% (131 individuals) who have attained graduate degrees. Individuals holding postgraduate qualifications account for 25.1% (119 individuals), and 19.6% (93 individuals) possess doctoral degrees.

When analyzing annual income, the predominant segment of respondents (42.1%, or 200 individuals) earn between 6 lakhs and 10 lakhs, whereas 28.2% (134 individuals) report an income of 10 lakhs or more. In contrast, 15% (71 individuals) earn below 3 lakhs, and 14.7% (70 individuals) have an income ranging from 3 lakhs to 6 lakhs. This data underscores a heterogeneous and well-distributed population across various demographic dimensions.

4.2. Factor Analysis

4.2.1. KMO and Bartlett's test

As per the Table 2, the KMO value for variables is found to be 0.914, which is closer to 1. Hence, this value is adequate and validates the suitability of factor analysis.

Moreover, Bartlett's Test of Sphericity, exhibit an approximate Chi-square value of 9133.476 and 595 degrees of freedom,

Table 1: Demographic profile of respondents

Demographic profile	Sub-category	Frequency	Percentage
Gender	Male	254	53.5
	Female	221	46.5
Age	18-26 years	131	27.6
	27-42 years	131	27.6
	43-58 years	117	24.6
	59 years above	96	20.2
Education	Undergraduate	132	27.8
	Graduate	131	27.6
	Postgraduate	119	25.1
	Doctorate	93	19.6
Annual income	<3 lakhs	71	15
	3-6 lakhs	70	14.7
	6-10 lakhs	200	42.1
	10 lakhs and above	134	28.2

produces a statistically significant outcome (Sig. = 0.000). This signifies that the correlations between variables are notably distinct from zero, thereby supporting the appropriateness of the data for factor analysis.

The Table 3 presents communalities for various items across different constructs within an exploratory factor analysis, underscoring the proportion of variance explained by the extracted factors. Items associated with environmental concern (EC) exhibit moderate communalities, ranging from 0.537 to 0.616, thereby indicating that the extracted factors account for a considerable portion of their variance. Conversely, items pertaining to environmental awareness (EA) display comparatively elevated communalities, particularly EA2 (0.698) and EA4 (0.641), implying that these items are effectively represented by the underlying factors.

Table 2: KMO and Bartlett's test

KMO and Bartlett's test		
Kaiser-Meyer-Olkin measure of sampling adequacy		0.914
Bartlett's test of sphericity	Approx. Chi-square	9133.476
	df	595
	Sig.	0.000

Table 3: Communalities

Communalities	Initial	Extraction
EC1	1.000	0.537
EC2	1.000	0.569
EC3	1.000	0.616
EC4	1.000	0.576
EC5	1.000	0.602
EA1	1.000	0.601
EA2	1.000	0.698
EA3	1.000	0.520
EA4	1.000	0.641
EA5	1.000	0.632
SN1	1.000	0.547
SN2	1.000	0.565
SN3	1.000	0.654
SN4	1.000	0.518
SN5	1.000	0.516
AT1	1.000	0.521
AT2	1.000	0.565
AT3	1.000	0.558
AT4	1.000	0.553
AT5	1.000	0.713
PBC1	1.000	0.647
PBC2	1.000	0.651
PBC3	1.000	0.688
PBC4	1.000	0.512
PBC5	1.000	0.513
IMI1	1.000	0.533
IMI2	1.000	0.677
IMI3	1.000	0.543
IMI4	1.000	0.705
IMI5	1.000	0.711
BB1	1.000	0.664
BB2	1.000	0.653
BB3	1.000	0.677
BB4	1.000	0.646
BB5	1.000	0.674

Items related to social norms (SN) manifest moderate communalities, with SN3 (0.654) demonstrating the highest proportion of explained variance, while SN5 (0.516) reveals the lowest. Items concerning attitude (AT) also exhibit variability, with AT5 distinguishing itself through a high extraction value of 0.713. Regarding perceived behavioral control (PBC), the majority of items are well-articulated, especially PBC3 (0.688).

Items associated with impact investment (IMI) reveal robust communalities, particularly IMI4 (0.705) and IMI5 (0.711), indicating that a substantial fraction of their variance is accounted for. Ultimately, items reflecting behavioral biases (BB) also display strong communalities, particularly BB1 (0.664) and BB5 (0.674), indicating a favorable alignment with the extracted factors. Collectively, the extracted factors account for a significant proportion of the variance in these items, particularly within constructs such as environmental attitudes, intrinsic motivation, and behavioral beliefs.

The Table 4 elaborates the findings of a principal component analysis (PCA) which explain the total variance elucidated by various components. The analysis identified seven components exhibiting eigenvalues exceeding 1, collectively explaining 54.84% of the overall variance. The initial component elucidates 27.71% of the variance, whereas the subsequent six components contribute diminishing segments, with the second accounting for 8.16%, the third for 5.81%, and so forth. Following the rotation, the initial seven components cumulatively represent 54.84% of the variance, with the contribution of the first component diminished to 11.55%, and the remaining components adjusting correspondingly to facilitate a more equitable distribution of variance across the components.

4.2.2. Rotated component matrix

The Rotated Component Matrix delineates the factor loadings, elucidating the interrelations of each item with the seven components that have been extracted (Table 5). Items related to Environmental Concern (EC) predominantly load onto item 2, with EC1 (0.628), EC2 (0.659), and EC3 (0.652) demonstrating pronounced correlations with this component. Items associated with Environmental Attitude (EA), including EA4 (0.737) and EA5 (0.699), exhibit robust loadings on item 1, which also serves as the locus for the Social Norms (SN) items, such as SN1 (0.668) and SN2 (0.691), that present significant loadings.

Items pertaining to Attitude (AT) are principally correlated with item 4, where AT2 exhibits the most substantial loading (0.697). Items reflecting Perceived Behavioral Control (PBC) demonstrate the highest correlations with item 6, as indicated by PBC2 (0.666) and PBC4 (0.694). Items linked to Intrinsic Motivation (IMI) are associated with item 7, wherein IMI1 (0.685) and IMI3 (0.626) reveal strong associations with this component. Behavioral Beliefs (BB) items are predominantly connected to item 3, with BB3 (0.761), BB4 (0.773), and BB5 (0.794) exhibiting the most elevated

Table 4: Eigen values and variance explained

Total variance explained									
Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	9.699	27.711	27.711	9.699	27.711	27.711	4.041	11.545	11.545
2	2.855	8.156	35.867	2.855	8.156	35.867	3.642	10.406	21.951
3	2.033	5.810	41.677	2.033	5.810	41.677	3.165	9.042	30.993
4	1.295	3.699	45.376	1.295	3.699	45.376	2.899	8.282	39.275
5	1.172	3.349	48.726	1.172	3.349	48.726	1.987	5.676	44.951
6	1.086	3.104	51.829	1.086	3.104	51.829	1.830	5.229	50.180
7	1.055	3.014	54.843	1.055	3.014	54.843	1.632	4.663	54.843
8	0.980	2.799	57.642						
9	0.899	2.568	60.210						
10	0.841	2.403	62.613						
11	0.807	2.306	64.919						
12	0.779	2.226	67.145						
13	0.761	2.175	69.320						
14	0.755	2.158	71.478						
15	0.725	2.070	73.549						
16	0.702	2.005	75.553						
17	0.680	1.943	77.497						
18	0.636	1.818	79.315						
19	0.612	1.747	81.063						
20	0.595	1.699	82.762						
21	0.589	1.682	84.443						
22	0.528	1.508	85.952						
23	0.512	1.464	87.415						
24	0.503	1.438	88.853						
25	0.476	1.360	90.213						
26	0.458	1.310	91.523						
27	0.434	1.241	92.764						
28	0.418	1.194	93.958						
29	0.392	1.119	95.076						
30	0.380	1.085	96.162						
31	0.326	0.931	97.093						
32	0.292	0.835	97.928						
33	0.268	0.767	98.694						
34	0.243	0.694	99.388						
35	0.214	0.612	100.000						

loadings on this factor. This distribution serves to elucidate the intricate relationships between items and their corresponding components.

4.3. Measurement Model

The Table 6 presents item−specific data for each construct, such as Construct Loadings, Composite Reliability, Average Variance Extracted (AVE), Cronbach's Alpha, and Variance Inflation Factor (VIF), which aid in assessing the reliability and validity of the constructs.

4.3.1. Environmental concern (EC)

The factor loadings for the respective items fall within the range of 0.733 to 0.883, with EC3 (0.883) and EC5 (0.876) demonstrating the highest values. The Composite Reliability is quantified at 0.803, signifying a robust internal consistency, while the Average Variance Extracted (AVE) is calculated at 0.649, indicating that 64.9% of the variance is accounted for by this construct. The Cronbach Alpha coefficient of 0.803 underscores commendable internal reliability, and the Variance Inflation Factor (VIF) values, which range from 1.355 to 1.667, imply a minimal degree of multicollinearity.

4.3.2. Environmental awareness (EA)

The loadings exhibit a range from 0.709 to 0.766, with EA3 (0.765) and EA5 (0.766) reflecting the most substantial correlation with the construct. The Composite Reliability is assessed at 0.763, accompanied by an AVE of 0.692, indicating a significant proportion of variance elucidated. The Cronbach Alpha is recorded at 0.763, suggesting an acceptable level of reliability, and the VIF values (spanning from 1.332 to 1.612) indicate a low presence of multicollinearity.

4.3.3. Social norms (SN)

The item loadings exhibit robust values, varying from 0.780 to 0.872, with SN4 (0.872) representing the apex of this range. The Composite Reliability is quantified at 0.778, accompanied by an Average Variance Extracted (AVE) of 0.718, which signifies that 71.8% of the variance is elucidated. The Cronbach Alpha is recorded at 0.783, reflecting commendable internal consistency,

Table 5: Factor loading and rotated component matrix

	Component						
Component	1	2	3	4	5	6	7
EC1	0.218	0.628	0.178	0.134	0.211	0.018	−0.034
EC2	0.181	0.659	0.063	0.237	0.190	−0.059	0.050
EC3	0.192	0.652	0.076	0.141	0.333	0.128	0.029
EC4	0.217	0.628	0.024	0.168	0.307	0.045	0.097
EC5	0.307	0.257	0.164	0.156	0.619	0.050	0.073
EA1	0.143	0.221	0.197	0.372	0.591	0.042	0.061
EA2	0.304	0.250	0.232	0.227	0.450	0.004	0.189
EA3	0.442	0.139	0.024	0.099	0.532	0.105	0.007
EA4	0.737	0.160	0.071	0.105	0.229	0.055	0.002
EA5	0.699	0.197	0.027	0.310	0.035	0.031	0.073
SN1	0.668	0.133	0.060	0.233	0.142	0.073	0.023
SN2	0.691	0.102	0.096	0.229	0.113	0.010	0.046
SN3	0.600	0.202	0.038	0.165	0.110	0.034	0.103
SN4	0.653	0.166	0.055	0.188	0.070	0.077	0.122
SN5	0.359	0.250	0.082	0.503	0.201	0.086	0.131
AT1	0.282	0.220	0.120	0.563	0.212	0.071	0.110
AT2	0.251	0.074	0.092	0.697	0.025	−0.045	0.005
AT3	0.233	0.144	−0.009	0.609	0.082	0.050	−0.049
AT4	0.197	0.217	0.108	0.552	0.187	0.126	0.002
AT5	0.266	0.314	0.082	0.335	0.123	0.097	0.007
PBC1	0.226	0.304	−0.036	0.230	0.180	−0.168	0.434
PBC2	0.007	−0.017	0.018	0.084	0.017	0.666	0.008
PBC3	0.203	0.144	−0.002	0.352	0.071	0.342	0.283
PBC4	0.069	−0.009	0.029	−0.019	0.145	0.694	0.063
PBC5	0.090	0.055	0.019	0.049	−0.056	0.681	0.181
IMI1	−0.010	−0.022	−0.031	0.048	0.129	0.206	0.685
IMI2	0.009	−0.096	0.016	0.130	−0.109	0.330	0.574
IMI3	0.140	0.067	0.091	−0.132	0.027	−0.028	0.626
IMI4	0.061	0.450	0.681	−0.095	−0.109	0.112	−0.033
IMI5	0.263	0.630	0.369	0.282	−0.132	−0.112	0.011
BB1	−0.021	0.491	0.618	−0.050	−0.160	0.112	0.017
BB2	0.261	0.610	0.362	0.276	−0.060	−0.054	0.000
BB3	0.149	0.067	0.761	0.137	0.203	−0.024	0.101
BB4	0.001	0.029	0.773	0.135	0.163	−0.051	−0.005
BB5	0.087	0.077	0.794	0.081	0.142	0.060	0.007

while the Variance Inflation Factor (VIF) values, ranging from 1.405 to 1.551, suggest the absence of multicollinearity complications.

4.3.4. Attitude (AT)

The item loadings span from 0.719 to 0.770, signifying a considerable degree of correlation. The Composite Reliability is assessed at 0.780, coupled with an AVE of 0.617, indicating a moderate proportion of variance elucidated. The Cronbach Alpha is determined to be 0.780, which denotes a strong degree of internal consistency, with VIF values fluctuating between 1.283 and 1.555.

4.3.5. Perceived behavioral control (PBC)

The item loadings exhibit a range from 0.469 to 0.896, with PBC4 (0.896) representing the apex. The Composite Reliability is quantified at 0.790, while the Average Variance Extracted (AVE) is assessed at 0.719, thereby signifying a commendable proportion of explained variance. The Cronbach Alpha value of 0.711 reflects a moderate degree of reliability, and the Variance Inflation Factor (VIF) values, ranging from 1.172 to 1.356, indicate a minimal presence of multicollinearity.

4.3.6. Impact investment

All items demonstrate robust loadings, spanning from 0.804 to 0.889, with IMI3 (0.889) marking the highest loading. The Composite Reliability is established at 0.887, and the AVE is determined to be 0.748, thereby indicating an elevated level of explained variance. The Cronbach Alpha score of 0.788 suggests a reliable measure, while the VIF values, ranging from 1.175 to 1.960, are deemed acceptable.

4.3.7. Behavioral biases

The item loadings are notably robust, ranging from 0.733 to 0.851. The Composite Reliability is calculated at 0.866, and the AVE is recorded at 0.570, indicating that 57% of the variance is elucidated. The Cronbach Alpha score of 0.867 reflects a strong level of reliability, although the VIF values, spanning from 1.594 to 2.310, imply that some degree of multicollinearity may exist.

4.4. Discriminant Validity

4.4.1. HTMT criterion

The HTMT Table 7 indicates that all constructs exhibit acceptable discriminant validity, as their HTMT values remain below the established threshold of 0.85. Attitude (AT) reveals moderate correlations with other constructs, including Behavioral Biases (BB) (0.756), Environmental Concern (EC) (0.659), and Social Norms (SN) (0.733), all of which reside within the acceptable range. Likewise, Behavioral Biases (BB) and Environmental Awareness (EA) preserve their distinctiveness, with their most elevated correlations recorded at 0.81 and 0.796, respectively. Although Social Norms (SN) presents a higher correlation with Impact Investment (IMI) (0.833), it nonetheless fulfills the criteria for discriminant validity. In summary, all constructs are distinctly characterized from one another, thereby affirming robust discriminant validity.

4.4.2. Fornell larker

The Fornell–Larcker Table 8 presents the square roots of the Average Variance Extracted (AVE) values (represented on the diagonal) in juxtaposition with the inter-construct correlations (represented off-diagonal). For discriminant validity to be affirmed, the values along the diagonal must surpass the corresponding off-diagonal values within their respective rows and columns.

In this instance, the diagonal values for each construct exceed the correlations with other constructs, thereby substantiating the presence of discriminant validity. For instance, the Attitude (AT) construct possesses a diagonal value of 0.646, which exceeds its correlations with Behavioral Beliefs (BB) (0.656), Engagement Attitude (EA) (0.854), and additional constructs. Likewise, Environmental Concern (EC) exhibits a diagonal value of 0.67, surpassing its correlations with Intention to Motivate Individuals (IMI) (0.839) and other constructs. This pattern of results is uniformly observed across all constructs, thereby

Table 6: Measurement model

Construct	Item code	Construct loadings	Composite reliability	AVE	Cronbach alpha	VIF
Environmental concern	EC1	0.733	0.803	0.649	0.803	1.535
	EC2	0.785				1.634
	EC3	0.883				1.667
	EC4	0.873				1.61
	EC5	0.876				1.355
Environmental awareness	EA1	0.752	0.763	0.692	0.763	1.354
	EA2	0.736				1.426
	EA3	0.765				1.332
	EA4	0.709				1.612
	EA5	0.766				1.542
Social norms	SN1	0.797	0.778	0.718	0.783	1.51
	SN2	0.822				1.551
	SN3	0.78				1.405
	SN4	0.872				1.479
	SN5	0.825				1.411
Attitude	AT1	0.732	0.78	0.617	0.78	1.439
	AT2	0.719				1.525
	AT3	0.733				1.549
	AT4	0.763				1.555
	AT5	0.77				1.283
Perceived behavioral control	PBC1	0.764	0.79	0.719	0.711	1.172
	PBC2	0.877				1.356
	PBC3	0.469				1.346
	PBC4	0.896				1.305
	PBC5	0.847				1.317
Impact investment	IMI1	0.869	0.887	0.748	0.788	1.275
	IMI2	0.888				1.175
	IMI3	0.889				1.351
	IMI4	0.825				1.894
	IMI5	0.804				1.96
Behavioral biases	BB1	0.851	0.866	0.57	0.867	2.267
	BB2	0.848				2.183
	BB3	0.753				2.31
	BB4	0.733				1.594
	BB5	0.744				2.268

Table 7: HTMT ratio for discriminant validity

	AT	BB	EA	EC	IMI	PBC	SN
AT							
BB	0.756						
EA	0.652	0.81					
EC	0.659	0.764	0.796				
IMI	0.662	0.696	0.707	0.741			
PBC	0.775	0.535	0.691	0.656	0.708		
SN	0.733	0.643	0.777	0.759	0.833	0.8	
BB x AT	0.26	0.463	0.261	0.255	0.373	0.214	0.298

Table 8: Fornell Larcker criteria for discriminant validity

	AT	BB	EA	EC	IMI	PBC	SN
AT	0.646						
BB	0.656	0.755					
EA	0.854	0.708	0.626				
EC	0.759	0.771	0.876	0.67			
IMI	0.706	0.955	0.753	0.839	0.59		
PBC	0.807	0.557	0.806	0.683	0.732	0.565	
SN	0.845	0.645	0.969	0.762	0.751	0.821	0.646

ensuring the distinctiveness of each construct from the others within the model.

4.5. Structural Model

4.5.1. Hypothesis testing

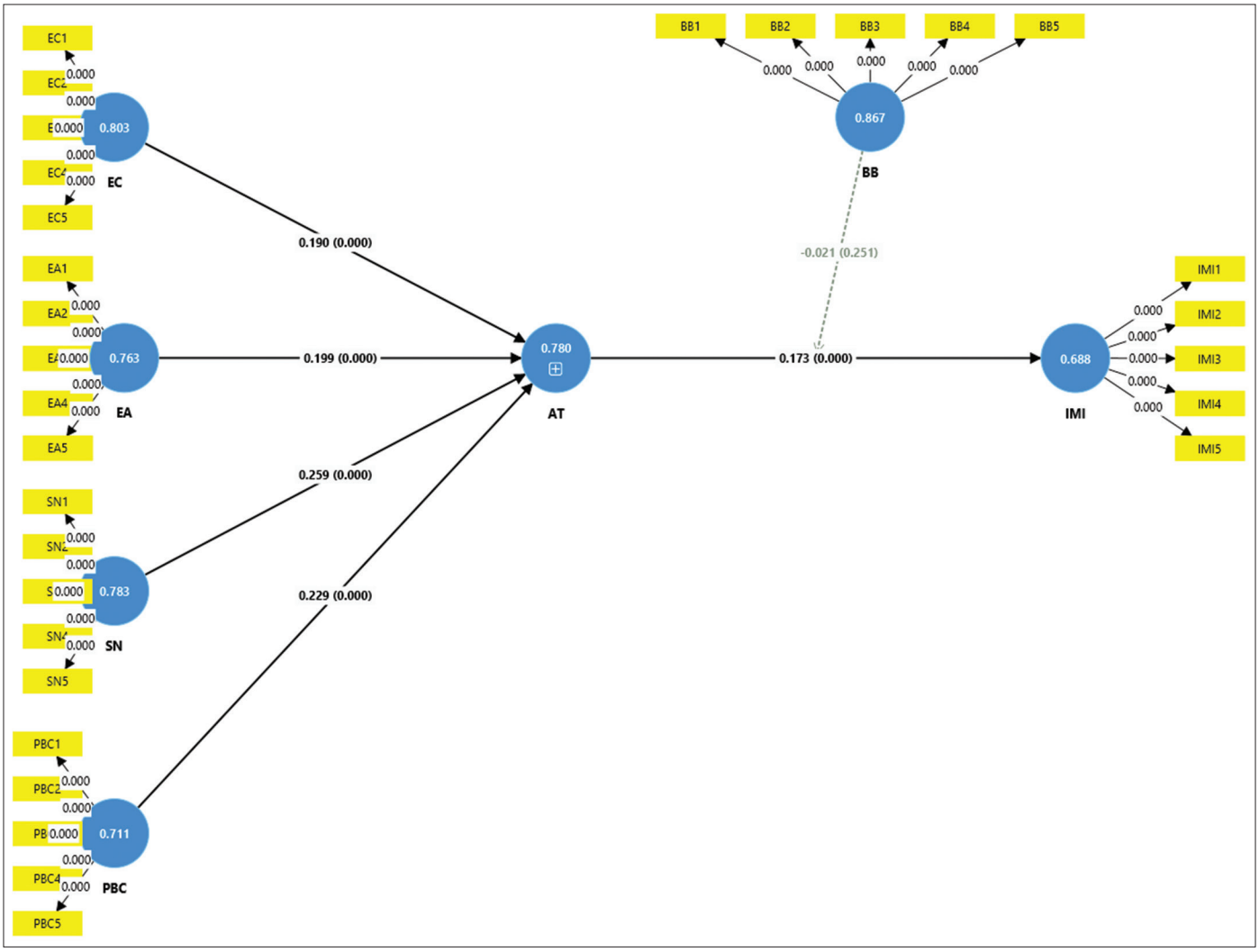
The Table 9 and Figure 1 represents the outcomes of hypothesis testing for diverse interrelations among constructs. A majority of the hypotheses receive empirical support, as evidenced by the statistically significant P-values (0.000) and high T-statistics. For example, Attitude (AT) exerts a positive influence on Impact Investment (IMI) ($\beta = 0.173$, $T = 5.815$, $P < 0.001$), and Behavioral Biases (BB) exerts a substantial impact on IMI ($\beta = 0.693$, $T = 27.586$, $P < 0.001$). Furthermore, Environmental Awareness (EA), Environmental Concern (EC), Perceived Behavioral Control (PBC), and Social Norms (SN) all exert positive effects on Attitude (AT), yielding significant results.

Nevertheless, the interaction between Behavioral Biases and Attitude in relation to IMI (BB × AT -> IMI) was not supported ($\beta = -0.021$, $T = 1.149$, $P = 0.251$), as it failed to reach statistical significance. In summary, the majority of hypotheses are accepted, except for the moderating influence of BB on AT concerning IMI.

Table 9: Hypothesis testing

Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P-values	Result
AT -> IMI	0.173	0.173	0.03	5.815	0	Accepted
BB -> IMI	0.693	0.695	0.025	27.586	0	Accepted
EA -> AT	0.199	0.2	0.048	4.125	0	Accepted
EC -> AT	0.19	0.192	0.041	4.676	0	Accepted
PBC -> AT	0.229	0.23	0.032	7.101	0	Accepted
SN -> AT	0.259	0.257	0.046	5.592	0	Accepted
BB × AT -> IMI	−0.021	−0.021	0.018	1.149	0.251	Rejected

Figure 1: SEM model for hypothesis testing



5. CONCLUSION

Based on the comprehensive analysis of the collected data, several pivotal conclusions can be derived concerning the interrelationships among environmental concerns, attitudes, social norms, and impact investment behavior. The empirical results elucidate that Attitude (AT), Behavioral Biases (BB), Environmental Awareness (EA), Environmental Concern (EC), Perceived Behavioral Control (PBC), and Social Norms (SN) exert a substantial influence on Impact Investment (IMI) and Attitude, with P-values consistently below 0.001, thereby underscoring their significance in shaping impact investment behavior.

Behavioral Biases (BB) are identified as the most robust predictor of IMI, signifying that individual cognitive biases and perceptions considerably affect investment decisions. Moreover, environmental variables such as Environmental Awareness and Environmental Concern play a crucial role in shaping Attitude towards sustainable investment, which subsequently influences investment behavior.

Nonetheless, the interaction between Behavioral Biases and Attitude (BB × AT -> IMI) did not achieve statistical significance, indicating that biases do not exert a strong moderating effect on the relationship between attitudes and investment behavior. This

suggests that while biases may directly affect investment decisions, they do not modify the impact of attitude on investment choices.

In conclusion, the findings underscore the essential role of Behavioral Biases and environmental factors in driving Impact Investment behavior, with Attitude acting as a significant intermediary construct. These insights hold considerable value for the development of interventions and policies aimed at promoting sustainable investment by addressing cognitive biases and cultivating favourable environmental attitudes.

6. IMPLICATIONS

6.1. Theoretical Implications

This investigation contributes to the growing literature related to the impact investment by incorporating behavioral biases as a moderating variable within the framework of investment decision-making. It extends to the theories surrounded by sustainable and responsible investment by highlighting the interaction between individual psychological factors and fundamental constructs including environmental concern, social norms, and perceived behavioral control. By employing constructs derived from the Theory of Planned Behavior (TPB), this study enhances comprehension regarding the influence of attitude and subjective norms on investment behaviors. Furthermore, it introduces a novel dimension by exploring how behavioral biases mitigate the effects of these factors. This underscores the applicability of behavioral finance theories, traditionally associated with conventional investment practices, to the field of sustainable finance.

6.2. Practical Implications

This research provides insights for policymakers, financial entities, and institutions promoting impact investment initiatives. A comprehensive understanding of the influence of behavioral biases on investment choices enables practitioners to formulate enhanced strategies that effectively promote favourable investment behaviors.

The results further indicate that higher environmental consciousness and constructive social norms can increase the probability of individuals participating in impact investments. Policymakers may utilize these findings to develop initiatives that underscore the societal and ecological advantages of sustainable investment, thereby rendering it a more appealing alternative for a wider demographic.

7. LIMITATIONS

This investigation includes various constraints that deserve attention. Initially, the sample size and its composition may influence the external validity of the findings. If the sample does not adequately reflect a broader population, the findings may lack applicability to other demographic cohorts or geographic regions. Furthermore, the dependence on self-reported data engenders the potential for bias, as participants might offer socially desirable answers rather than accurately representing their genuine behaviors or convictions. Additionally, the cross-sectional design employed in this investigation captures data at a singular moment, thereby complicating the establishment of causal relationships among variables. A longitudinal methodology would be more appropriate for monitoring changes over time. Finally, significant variables such as financial literacy or risk tolerance were omitted from the model, which could have added further insights into investment behavior.

8. AREA FOR FUTURE RESEARCH

Future research may greatly benefit from the implementation of longitudinal studies to systematically investigate the evolution of environmental attitudes, behavioral biases, and investment behaviors over time, particularly in relation to societal or market fluctuations. Considering the current study's observation of an insignificant moderation effect of behavioral biases, future research activities could examine specific biases, like loss aversion and overconfidence, and their intricate effects on investment decision-making processes. Furthermore, an examination of cross-cultural and regional disparities could elucidate whether the outcomes of this study are applicable across diverse contexts or if cultural determinants significantly influence attitudes towards impact investing.

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