



The Future of Finance: Designing Investment Strategies Through the Lens of SDG 12

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Abstract: Business development and environmental preservation are the two aspects of today’s global concerns. Sustainable Development Goal’s (SDG’s) implementation at the root level is the only solution to achieve the two ends. This has created an urge for green investment, which can contribute to SDGs. The present research focuses on finding the impact of Green Investment Capacity, Green Risk Tolerance and green risk appetite on Environmental Stewardship Investment Focus and Green Portfolio Strategy. Furthermore, the current study also attempts to analyse the influence of Environmental Stewardship Investment Focus and Green Portfolio Strategy on SDG-12-aligned investment decisions. Based on responses collected through the questionnaire and application of SMART PLS-4, it was found that a significant relationship exists between the variables. The present study provides a framework for achieving SDG-12 through appropriate investment pathways.

Keywords: Green Investment Capacity; Green Risk Tolerance; Green risk appetite on Environmental Stewardship Investment Focus; Green Portfolio Strategy; Structural Equation Model (SEM); Investment; Behavioral finance

1 Introduction

In the rapidly evolving landscape of global finance [1], where the urgency of addressing environmental challenges has never been more pressing, the integration of Sustainable Development Goal 12 (SDG 12) [2] into investment strategies has emerged as a critical framework, guiding investors towards the adoption of Green Investment Capacity [3], Green Risk Tolerance [4], and green risk appetite [5], all of which are pivotal in shaping Environmental Stewardship Investment Focus [6] and Green Portfolio Strategies that not only aim to achieve substantial financial returns but also ensure that these returns are aligned with sustainable consumption and production patterns [7], thereby fostering long-term environmental sustainability, reducing the ecological footprint, and driving a more resilient and responsible investment landscape that is attuned to the principles of sustainable development and responsible environmental stewardship [8].

The population of the globe is increasing very rapidly [9]. The aggregate demand and population have a direct relationship with each other [10]. Hence consumption is increasing at a very large scale that is being balanced with parallel production. This creates an urge for responsible consumption. Making consumption responsible and eco-friendly is important because production can be made greener only when it meets demand [11]. Moreover, investment and production again are positively related [12]. Green investment can drive sustainable production and consumption by providing the financial resources needed to innovate eco-friendly technologies, incentivizing businesses to adopt sustainable practices, and encouraging consumers to prioritize environmentally conscious products and services [13]. If investors are persuaded to develop green risk appetite, then it would be easier for the producers to meet rise in consumption through greener means [14].

This research is essential in advancing a profound understanding of how the integration of SDG 12—focused on responsible consumption and production—within investment strategies can engender transformative financial models

that transcend traditional economic growth metrics, enabling a paradigm shift towards an intricate, interdependent framework where capital flows are intricately synchronized with environmental stewardship, resource conservation, and the overarching pursuit of sustainability, thereby fostering a holistic approach to economic development that prioritizes the equilibrium between profitability, environmental integrity, and societal well-being on a global scale.

The majority of nations on the planet are developing. Development seems to come at the cost of the deterioration of the environment [15]. This has to change by any means. SDGs can be achieved only when there is no other option except being green in all human activities (investment, production and consumption) [16].

The increase in the urgency of the environmental issues along with global commitments to attain the SDG 12 on the responsible consumption and production, requires a further insight into what financial, behavioral, and strategic factors influence sustainable investment decisions; thus, the current research is quite timely and inevitable. Even though there is rising consciousness about green finance, there has been a continued inconsistency in the actual execution of green stewardship as it applies to investment strategies. The practicality has mostly been affected by low risk appetite, limited financial resources, and non-compatibility of portfolio management approaches and sustainability goals. Previous research has principally studied these aspects on a standalone basis, and has neglected the relationship between behavioral drivers (e.g. risk tolerance and risk appetite), structural enablers (e.g. investment capacity), and strategic mediators (e.g. green portfolio design). What is more, the practical application of such factors into tangible SDG 12 results is underdeveloped which creates a shortcoming between the policy and investor concrete activity. The study manages to fill that gap when tested empirically the role of financial and behavioral constructs in informing the investment focus on environmental stewardship and portfolio choices and how such choices can serve the SDG 12 aligned investment options.

The study is able to achieve and go beyond the theoretical contribution in the fields of sustainable finance and behavioral investment as stemming by the capture of these relationships within a powerful set of PLS SEM, but also to derive practical implications and actionable recommendations to policy makers, financial institutions, and individual investors, therefore, contributing to its mismatch between the theory and the practice of sustainability in the capital market.

Table 1. Interrogatives and theoretical paradigms: Mapping the nexus

Research Question	Theoretical Framework	Explanation	References
RQ 1. How does Green Investment Capacity influence Environmental Stewardship Investment Focus and Green Portfolio Strategy?	Resource-Based View (RBV)	The RBV posits that an entity's idiosyncratic resource endowments—specifically its green investment capital—serve as strategic levers that facilitate its competitive advantage in environmental stewardship and portfolio alignment, premised on the heterogeneity of resource allocation efficacy.	[17–22]
	Stakeholder Theory	Stakeholder Theory elucidates the intrinsic link between organizational green investment capacities and stakeholder exigencies, wherein entities respond to multi-faceted stakeholder pressures by orchestrating their stewardship and Green Portfolio Strategies to maintain legitimacy and operational congruence.	[23–27]
	Dynamic Capabilities Theory	This theory underscores the institution's ability to reconfigure and deploy its green investment capital dynamically, thereby enabling strategic responses to volatile environmental imperatives and evolving stewardship mandates within green portfolio management frameworks.	[28–30]
RQ 2. What is the impact of Green Risk Tolerance on the formulation of Green Portfolio Strategy and the alignment with Environmental Stewardship Investment Focus?	Risk Management Theory	Under Risk Management Theory, the delineation of risk tolerance thresholds allows firms to modulate their exposure to environmental contingencies, thereby facilitating the articulation of Green Portfolio Strategies that are both resilient and consonant with long-term stewardship investment trajectories.	[31–35]
	Prospect Theory	Prospect Theory contends that investor aversion to losses, particularly in the environmental context, shapes decision heuristics, thus impacting green portfolio formulation as firms navigate uncertain sustainability trade-offs in light of fluctuating risk thresholds.	[36–38]
	Behavioral Finance	This framework explicates how cognitive biases, investor sentiment, and psychological predispositions toward Green Risk Tolerance alter the fiduciary calculus underpinning portfolio stratagems, precipitating deviations from rational stewardship objectives and engendering misalignments in investment focus.	[39–41]

Research Question	Theoretical Framework	Explanation	References
RQ 3. In what ways does green risk appetite affect the prioritization of Environmental Stewardship Investment Focus and the development of a Green Portfolio Strategy?	Agency Theory	Agency Theory provides insight into the principal-agent dichotomy, wherein risk appetite disparities between investors and managers lead to discordant prioritization of environmental stewardship, potentially destabilizing Green Portfolio Strategies through misaligned governance structures and fiduciary incentives.	[42–45]
	Institutional Theory	Institutional Theory postulates that external coercive, mimetic, and normative pressures exerted by regulatory bodies and peer organizations modulate firms' green risk appetites, thus directing their stewardship investment priorities within the contours of institutional legitimacy and social conformity.	[46–49]
	Sustainability Transitions Theory	This framework examines the systemic evolution of economic paradigms toward sustainability, positing that risk appetite influences the prioritization of stewardship within portfolios as firms pivot to accommodate transformative ecological imperatives, ultimately recalibrating the investment landscape in favor of green strategies.	[50–52]
RQ 4. How do Environmental Stewardship Investment Focus and Green Portfolio Strategy contribute to achieving SDG 12-Aligned Investment Decisions?	Triple Bottom Line (TBL)	The TBL framework advances a tri-dimensional assessment of corporate performance, contending that the integration of environmental, social, and economic metrics in stewardship focus catalyzes the realization of SDG 12 through a balanced optimization of planetary, societal, and financial imperatives in investment decision-making.	[53–57]
	Sustainable Development Theory	This theory emphasizes the interplay between ecological sustainability, economic growth, and social equity, suggesting that adherence to these principles in environmental stewardship and green portfolio construction enhances alignment with SDG 12 by fostering a symbiotic relationship between development and environmental preservation.	[58, 59]
	Ecological Modernization Theory	Ecological Modernization Theory posits that advanced economies can reconcile economic expansion with ecological prudence, wherein green portfolios configured through a stewardship lens propel the transition to SDG 12 compliance, leveraging technological and institutional innovations to drive sustainable development initiatives.	[60–62]

This research paper is indispensable for those seeking to delve into the multifaceted intricacies of how embedding SDG 12 into investment strategies can precipitate a transformative reorientation of financial paradigms, fostering an era where capital deployment is meticulously harmonized with principles of resource efficiency, environmental stewardship, and ethical governance, thereby offering profound insights into the nexus between economic growth, sustainability, and corporate responsibility, which are poised to redefine the very contours of global financial ecosystems in the decades to come.

The current study first presents the research questions it aims to address and its theoretical foundations in Table 1, followed by a literature review of related studies. After discussing the methodology, an in-depth data analysis is made by using the software of SMART PLS 4 followed by discussion and conclusion.

1.1 Important Definitions

- **Green Investment Capacity:** Green Investment Capacity refers to an investor's ability to allocate financial resources towards environmentally sustainable projects and investments while effectively managing the potential risks involved, ensuring that they have both the financial stability and risk tolerance necessary to support green initiatives that contribute to long-term environmental sustainability and generate meaningful returns [63].

- **Green Risk Tolerance:** Green Risk Tolerance refers to an investor's willingness and ability to endure potential financial losses or uncertainties specifically associated with environmentally sustainable investments, such as those in renewable energy, green technologies, or other eco-friendly initiatives, while maintaining a commitment to long-term environmental goals, recognizing that these investments may carry higher risks due to market volatility, regulatory changes, or the nascent nature of certain sustainable sectors [64].

- **Green Risk Appetite:** Green risk appetite refers to an investor's willingness and enthusiasm to take on higher levels of financial risk in pursuit of environmentally sustainable investments, driven by the potential for significant positive environmental impact and the belief that these green projects, though potentially volatile or uncertain, can offer substantial long-term returns and contribute meaningfully to global sustainability goals.

- **Environmental Stewardship Investment Focus:** Environmental Stewardship Investment Focus refers to the strategic emphasis within an investment portfolio on prioritising and supporting projects, companies, and initiatives that actively promote the preservation, protection, and responsible management of the environment, ensuring that

investments are aligned with long-term ecological sustainability, resource conservation, and the minimization of environmental impact, thereby integrating environmental stewardship as a core objective in the pursuit of both financial returns and global sustainability goals [6].

- **Green Portfolio Strategy:** Green Portfolio Strategy refers to the deliberate approach to constructing and managing an investment portfolio that prioritizes environmentally sustainable assets, sectors, and companies, aiming to achieve financial returns while simultaneously advancing environmental goals such as reducing carbon emissions, promoting renewable energy, and supporting responsible resource management, thereby aligning the portfolio with long-term sustainability objectives and contributing to global ecological well-being [65].

- **SDG-12 Aligned Investment Decision:** SDG-12 Aligned Investment Decision refers to the process of making investment choices that are specifically guided by the principles and targets of SDG 12, which focuses on responsible consumption and production, ensuring that investments are directed towards projects, companies, and initiatives that promote resource efficiency, reduce waste, minimize environmental impact, and support sustainable practices, thereby contributing to the achievement of global sustainability objectives while also generating financial returns.

The clarity in the above definitions is relevant for grasping the appropriate idea of the research carried out in upcoming sections of the paper. These terms will be repetitively used in the analysis, which creates a need for understanding the context in which they are used and conveyed to the study respondents. After discussing the important terms, the relationship between these terms, as per previous studies, has been discussed in the next section.

2 Related Studies

The inclusion of a comprehensive literature review in a research paper is of paramount significance as it establishes a critical foundation by synthesizing existing scholarly discourse, enabling the identification of research gaps, contextualizing the current inquiry within the broader intellectual landscape, and providing a nuanced framework through which new theoretical and empirical contributions can be meticulously juxtaposed against established knowledge, thereby fortifying the academic rigor, intellectual continuity, and epistemological relevance of the research endeavor.

The past development in green investment studies has demonstrated a nuanced interplay between the financial decision-making framework and environmental goals, particularly in the context of behavioral finance [66]. Recent literature demonstrates that other factors, including cognitive biases of investors such as loss aversion [67], overconfidence [68], and herding [69], play a significant role in the proliferation of sustainable portfolios compared to distortions at the macroeconomic level [70]. The decision to move toward proactive impact investing and away from exclusionary screening highlights an emerging understanding that green investments need not trade off against financial returns: they may very well be competitive, and even fit more traditional financial profiles [71]. Additionally, the adoption of ESG metrics in real-time portfolio management, based on AI-powered analytics, has enhanced the speed and precision with which investment strategies are aligned with the SDGs, at least concerning SDG 12. Nonetheless, significant knowledge gaps remain regarding the relationship between environmental stewardship intent and reality, particularly in terms of resource capital allocation, as influenced by psychological risk perceptions [72]. This disparity is especially accentuated in the case of emerging markets, where a policy framework and market maturity enhance the accessibility and perceived credibility of green financial products [73]. Therefore, integrating behavioral finance research ideas with their technological and regulatory counterparts provides a more comprehensive theoretical framework to anticipate and enhance sustainable investment behavior.

H1: Green Investment Capacity and Environmental Stewardship Investment Focus: The literature on the impact of Green Investment Capacity on Environmental Stewardship Investment Focus extensively discusses how an investor's ability to allocate resources towards environmentally sustainable projects [74]—driven by financial stability, knowledge, and commitment to green principles—plays a crucial role in determining the extent to which these investments prioritize environmental stewardship [75], with studies highlighting that a higher capacity for green investments often leads to more focused and effective strategies in environmental preservation [76], sustainability initiatives, and responsible resource management, ultimately contributing to stronger alignment with SDGs and enhancing the overall impact of investments on ecological outcomes [77].

H2: Green Investment Capacity and Green Portfolio Strategy: The review of literature on the impact of Green Investment Capacity on Green Portfolio Strategy reveals that an investor's ability to allocate significant financial resources and their commitment to sustainable practices are pivotal in shaping a Green Portfolio Strategy [78, 79] that prioritizes investments in eco-friendly and sustainable assets, with research consistently indicating that higher Green Investment Capacity enables investors to diversify their portfolios towards more sustainable sectors [80], enhance risk management in alignment with environmental goals, and implement strategies that are resilient to environmental risks while also contributing to long-term sustainability [81], thus reinforcing the importance of financial capacity in driving effective and impactful green investment strategies that align with global sustainability standards and environmental stewardship [82].

H3: Green Risk Tolerance and Environmental Stewardship Investment Focus: The literature on the impact

of Green Risk Tolerance on Environmental Stewardship Investment Focus highlights that an investor's willingness to endure potential financial losses in pursuit of sustainable and environmentally responsible investments significantly influences their commitment to environmental stewardship [83], with studies showing that higher Green Risk Tolerance allows investors to engage more deeply in green investments that may have uncertain or long-term returns but offer substantial environmental benefits, thereby enabling a more concentrated focus on strategies that prioritize ecological sustainability [84], responsible resource management, and alignment with broader environmental and sustainability goals, ultimately reinforcing the role of risk tolerance in driving the effectiveness and scope of environmental stewardship within investment portfolios [64].

H4: Green Risk Tolerance and Green Portfolio Strategy: The literature on the impact of Green Risk Tolerance on Green Portfolio Strategy suggests that an investor's capacity to accept and manage the risks associated with sustainable investments plays a crucial role in shaping the structure and composition of a Green Portfolio Strategy [85], with research indicating that higher Green Risk Tolerance enables investors to incorporate a broader range of sustainable assets, including those with higher volatility or longer time horizons [86], into their portfolios, thereby fostering a more diversified and resilient investment strategy that is aligned with environmental goals, supports innovative and potentially disruptive green technologies, and enhances the overall sustainability impact of the portfolio, ultimately underscoring the importance of risk tolerance in crafting investment strategies that balance financial returns with environmental stewardship [65].

H5: Green Risk Appetite and Environmental Stewardship Investment Focus: The literature on green risk appetite's impact on Environmental Stewardship Investment Focus reveals that investors with a high appetite for risk are more likely to commit resources to emerging and innovative green technologies [87], sustainable projects [88], and companies with uncertain or long-term returns [41, 89], which significantly enhances their portfolio's focus on environmental stewardship by prioritizing investments that offer substantial potential for environmental impact [63], thereby aligning their investment strategies with broader ecological goals and contributing to the advancement of sustainable development, as supported by studies emphasizing the critical role of risk appetite in driving investment decisions that balance financial returns with environmental benefits [90].

H6: Green Risk Appetite and Green Portfolio Strategy: The literature on the impact of green risk appetite on Green Portfolio Strategy highlights that investors with a strong inclination towards higher-risk investments are more likely to incorporate a diverse range of sustainable and innovative assets into their portfolios [85], including those associated with higher volatility or longer-term payoffs, which in turn drives the development of a Green Portfolio Strategy that not only seeks financial returns but also prioritizes substantial environmental benefits [91], thereby reinforcing the role of risk appetite in crafting investment strategies that are both resilient and aligned with long-term sustainability goals [92], as supported by research indicating that a higher green risk appetite leads to more aggressive and forward-thinking approaches in green investing [93].

H7: Environmental Stewardship Investment Focus and SDG-12 Aligned Investment Decision: The literature on the impact of Environmental Stewardship Investment Focus on SDG-12 Aligned Investment Decision emphasizes that a strong commitment to environmental stewardship within an investment portfolio significantly influences the alignment of investment decisions with SDG-12 goals [94], as investors who prioritize sustainable resource management, waste reduction, and responsible consumption are more likely to make decisions [95] that directly contribute to the achievement of SDG-12, thereby integrating sustainability into their core investment strategies and enhancing the overall impact of their portfolios on global sustainability efforts [96], as supported by studies that highlight the crucial role of environmental stewardship in driving investments towards responsible and sustainable outcomes [97, 98].

H8: Green Portfolio Strategy and SDG-12 Aligned Investment Decision: The literature on the impact of Green Portfolio Strategy on SDG-12 Aligned Investment Decision highlights that the deliberate integration of environmentally sustainable assets and practices within a portfolio directly contributes to aligning investment decisions with the objectives of SDG-12 [99], as investors who adopt a Green Portfolio Strategy are more inclined to prioritize investments in sectors and companies that promote responsible consumption [100], resource efficiency [101], and waste minimization [102], thereby ensuring that their investment choices not only generate financial returns but also advance the global agenda of sustainable consumption and production, as supported by research demonstrating that green investment strategies play a critical role in achieving SDG-12 targets [103].

3 Material and Methods

Making Green Portfolio Strategies to trigger green investments has become crucial for achieving the SDGs. The increase in investors' green risk appetite has led to a rapid evolution in the field of Green Investments. India's unique blend of rapid economic growth, vast green investment potential, diverse socio-economic conditions, and a strong policy focus on sustainability and SDG 12 makes it an ideal setting to explore the interplay of Green Risk Tolerance, green appetite, and innovative investment strategies. Hence, the present research has the scope to answer questions through responses collected from Indian Demography.

A questionnaire related to variables identified as research gaps was framed to answer the research questions. The questionnaire was changed through three rounds of expert discussion. Five professors from the field of finance were on the expert panel, and after three revisions, they finalised the fourth version of the questionnaire. Before forwarding the questionnaire to a more extensive respondent database, a pilot study was conducted by forwarding the questionnaire to 50 respondents. Out of 50, 17 met the criteria for being green investors. As per the threshold limit of a minimum of 10 respondents in the pilot study, the feedback of 17 respondents was considered sufficient to move to further research processes. Respondents suggested some changes in the questions in the pilot study. After making those changes, a questionnaire was deemed ready to be forwarded to a larger sample size.

After the questionnaire was set to collect responses from respondents, a group of investors was recognised as seed participants on social media apps such as Facebook, Telegram, LinkedIn, and WhatsApp and through emails. The identified group further submitted the questionnaire to its peers, and the process continued. We received a total of 476 responses. Out of 476, 77 responses were repetitive, so they were removed, and 48 were incomplete, so they were not considered. The final sample size was 342 respondents; the dissection of their demographic profile is shown in Table 2.

Applying SMART PLS 4 was valid in the study because it is well-suited to complex models with multiple latent constructs, small to medium-sized samples, and non-normal data distributions, which were the characteristics of our data. Since PLS SEM can simultaneously estimate both measurement and structural models, it is best suited for situations where one wishes to evaluate the reliability and validity of constructs as well as test the hypothesized relations. The selection of constructs, namely Green Investment Capacity, Green Risk Tolerance, green risk appetite, Environmental Stewardship Investment Focus, Green Portfolio Strategy, and SDG 12 aligned investment decision, was supported by both theory and past empirical research in the area of sustainable finance and behavioral investment models. All constructs were operationalized using established and well-established indicators from validated scales, adapted to fit the SDG 12 dimensions, to ensure content validity. The indicators were identified to encompass both measurable financial ones, such as portfolio allocation and strategy design, and intangible ones, including how environmental responsibility is perceived or how eager one is to take sustainability-linked risks. These two focal points ensured that the model can be used to characterize not only structural but also psychological features of the sustainable investment decision, thereby providing a more comprehensive picture of the routes toward SDG 12 compliance.

Table 2. Demographic statistics of respondents

Particulars	No. of Respondents	Percentage
Gender		
Male	203	59.36%
Female	139	40.64%
Total	342	100%
Age		
< 25 years	58	16.96%
25–30 Years	33	9.65%
30–35 Years	94	27.49%
35–40 Years	47	13.74%
40–45 Years	61	17.84%
45–50 Years	43	12.57%
≥ 50 years	6	1.75%
Total	342	100%
Annual Income		
≤ Rs 5,00,000	139	40.64%
> Rs 5,00,000	203	59.36%
Total	342	100%

4 Data Analysis

The current section holds a significant place in the current research as it provides mathematical calculations to support the claims made in in research questions. The present section has 2 major heads of calculations:

- PLS-Algorithm (Figure 1)
- Bootstrapping

The PLS-Algorithm is applied to the responses of respondents with the objective of checking the reliability and validity of the data collected and ensuring the dependency on data to make conclusions. Bootstrapping is applied to

check the statistical significance of the relationship between the variables.

Figure 1 illustrates a Structural Equation Model (SEM) that assesses the influence of three main factors—Green Investment Capacity, Green Risk Tolerance, and green risk appetite—on SDG 12-Aligned Investment Decisions, which in turn affects Green Portfolio Strategy, highlighting the direct and indirect relationships between various individual attributes such as Confidence in Allocation, Comfort Level with Risk, and Risk Perception, as well as their ultimate impact on Environmental Stewardship Investment Focus and the strategic actions taken in green portfolio management.

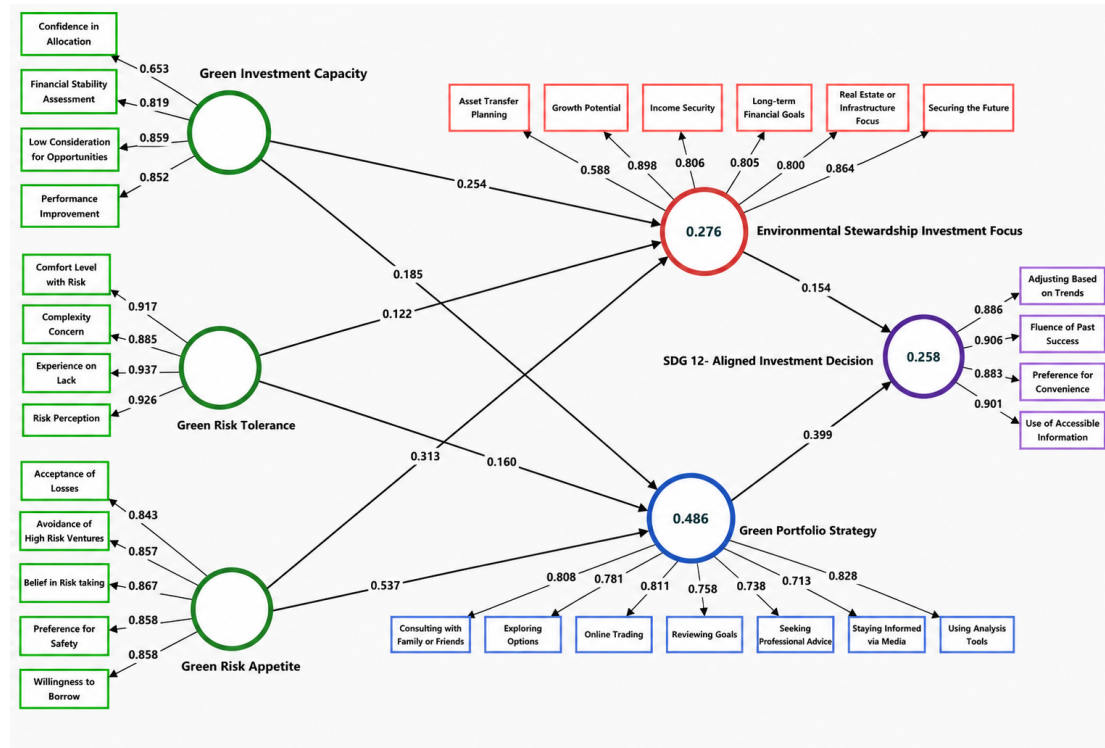


Figure 1. PLS algorithm on conceptual model

Table 3. HTMT

	Environmental Stewardship Investment Focus	Green Investment Capacity	Green Portfolio Strategy	Green Risk Appetite	Green Risk Tolerance
Green Investment Capacity	0.470				
Green Portfolio Strategy	0.704	0.490			
Green Risk Appetite	0.466	0.358	0.665		
Green Risk Tolerance	0.350	0.491	0.425	0.321	
SDG 12-Aligned Investment Decision	0.436	0.578	0.533	0.359	0.512

The HTMT inference analysis (Table 3) elucidates the discriminant validity across constructs, revealing moderate to high heterotrait-monotrait ratios, particularly between Green Portfolio Strategy and Environmental Stewardship Investment Focus (0.704) and between SDG 12-Aligned Investment Decision and Green Investment Capacity (0.578), while lower correlations between Green Risk Tolerance and green risk appetite (0.321) underscore the divergent conceptual underpinnings of risk assessment versus sustainability-centric financial strategies, thereby substantiating the nuanced interrelationships within the constructs, essential for robust theoretical modeling and empirical validation of investment behaviors aligned with environmental stewardship and risk appetite frameworks.

Table 4 demonstrates the statistics related to the reliability and validity of the construct. Construct signifies the main variables of research. All the relevant values, such as Cronbach's alpha (threshold limit: 0.7) and Average variance extracted (AVE) (threshold limit: 0.5), are within the scope of the reliability and validity.

The Fornell and Larcker criterion (Table 5) assessment reveals that all constructs exhibit adequate discriminant validity, as evidenced by the higher square roots of the AVEs along the diagonal, with Environmental Stewardship

Table 4. Reliability and validity

Construct	Items	Outer Loadings	Outer Weights	Construct Reliability and Validity			
				Green Risk Tolerance	SDG 12-Aligned Investment Decision	SDG 12-Aligned Investment Decision	SDG 12-Aligned Investment Decision
Green Investment Capacity	Confidence in Allocation	0.653	0.272	0.809	0.824	0.876	0.64
	Financial Stability Assessment	0.819	0.282				
	Loan Consideration for Opportunities	0.859	0.359				
	Performance Improvement	0.852	0.332				
Green Risk Tolerance	Comfort Level with Risk	0.917	0.272	0.937	0.944	0.955	0.84
	Complexity Concern	0.885	0.235				
	Dependence on Luck	0.937	0.282				
	Risk Perception	0.926	0.3				
Green Risk Appetite	Acceptance of Losses	0.857	0.243	0.916	0.921	0.937	0.749
	Avoidance of High-Risk Ventures	0.887	0.229				
	Belief in Risk-taking	0.883	0.26				
	Preference for Safety	0.843	0.204				
	Willingness to Borrow	0.858	0.219				
Environmental Stewardship Investment Focus	Asset Transfer Planning	0.588	0.183	0.916	0.919	0.937	0.716
	Growth Potential	0.898	0.2				
	Income Security	0.896	0.193				
	Long-term Financial Goals	0.895	0.205				
	Real Estate or Infrastructure Focus	0.89	0.199				
Green Portfolio Strategy	Securing the Future	0.864	0.208	0.895	0.907	0.914	0.605
	Consulting with Family or Friends	0.808	0.228				
	Exploring Options	0.781	0.168				
	Online Trading	0.811	0.218				
	Reviewing Goals	0.758	0.156				
	Seeking Professional Advice	0.738	0.144				
	Staying Informed via Media	0.713	0.144				
SDG 12-Aligned Investment Decision	Using Analysis Tools	0.828	0.218	0.916	0.917	0.941	0.8
	Adjusting Based on Trends	0.886	0.266				
	Influence of Past Success	0.906	0.276				
	Preference for Convenience	0.883	0.29				
	Use of Accessible Information	0.901	0.286				

Table 5. Fornell and larcker criterion

	Environmental Stewardship Investment Focus	Green Investment Capacity	Green Portfolio Strategy	Green Risk Appetite	Green Risk Tolerance	SDG 12-Aligned Investment Decision
Environmental Stewardship Investment Focus	0.846					
Green Investment Capacity	0.403	0.800				
Green Portfolio Strategy	0.613	0.419	0.778			
Green Risk Appetite	0.429	0.311	0.643	0.866		
Green Risk Tolerance	0.323	0.419	0.399	0.301	0.917	
SDG 12-Aligned Investment Decision	0.399	0.491	0.493	0.333	0.480	0.894

Investment Focus (0.846) and SDG 12-Aligned Investment Decision (0.894) showcasing the most pronounced internal consistency, while inter-construct correlations, particularly between Green Portfolio Strategy and green risk appetite (0.643), alongside Green Investment Capacity and SDG 12-Aligned Investment Decision (0.491), demonstrate moderately strong associations, thereby reinforcing the theoretical delineation and empirical soundness of the constructs within the sustainability-driven investment framework.

Table 6. Cross loading

	Environmental Stewardship Investment Focus	Green Investment Capacity	Green Portfolio Strategy	Green Risk Appetite	Green Risk Tolerance	SDG 12- Aligned Investment Decision
Acceptance of Losses	0.413	0.296	0.565	0.857	0.292	0.322
Adjusting Based on Trends	0.350	0.455	0.415	0.286	0.349	0.886
Asset Transfer Planning	0.588	0.301	0.721	0.342	0.269	0.305
Avoidance of High-Risk Ventures	0.337	0.230	0.567	0.887	0.198	0.289
Belief in Risk-taking	0.415	0.328	0.624	0.883	0.279	0.333
Comfort Level with Risk	0.296	0.368	0.362	0.279	0.917	0.440
Complexity Concern	0.292	0.319	0.283	0.213	0.885	0.324
Confidence in Allocation	0.314	0.653	0.257	0.248	0.515	0.463
Consulting with Family or Friends	0.423	0.342	0.808	0.646	0.365	0.446
Dependence on Luck	0.302	0.422	0.379	0.280	0.937	0.508
Exploring Options	0.532	0.379	0.781	0.380	0.314	0.371
Financial Stability Assessment	0.294	0.819	0.297	0.219	0.264	0.379
Growth Potential	0.898	0.343	0.506	0.364	0.241	0.349
Income Security	0.896	0.334	0.493	0.334	0.248	0.344
Influence of Past Success	0.347	0.408	0.437	0.284	0.491	0.906
Loan Consideration for Opportunities	0.338	0.859	0.411	0.258	0.276	0.380
Long-term Financial Goals	0.895	0.328	0.477	0.374	0.321	0.348
Online Trading	0.409	0.296	0.811	0.646	0.320	0.422
Performance Improvement	0.340	0.852	0.354	0.268	0.316	0.366
Preference for Convenience	0.361	0.469	0.460	0.302	0.343	0.883
Preference for Safety	0.337	0.229	0.479	0.843	0.282	0.247
Real Estate or Infrastructure Focus	0.890	0.374	0.463	0.343	0.265	0.333
Reviewing Goals	0.567	0.328	0.758	0.375	0.231	0.353
Risk Perception	0.294	0.414	0.424	0.319	0.926	0.471
Securing the Future	0.864	0.351	0.458	0.407	0.285	0.332
Seeking Professional Advice	0.543	0.333	0.738	0.339	0.269	0.302
Staying Informed via Media	0.558	0.336	0.713	0.285	0.323	0.341
Use of Accessible Information	0.367	0.422	0.450	0.317	0.533	0.901
Using Analysis Tools	0.419	0.298	0.828	0.651	0.331	0.411
Willingness to Borrow	0.343	0.248	0.528	0.858	0.250	0.235

The cross-loading analysis in Table 6 underscores the discriminant validity of the model, as observed in the substantial factor loadings of indicators such as “Growth Potential” (0.898), “Long-term Financial Goals” (0.895), and “Comfort Level with Risk” (0.917) within their respective constructs, while items like “Acceptance of Losses” (0.857) and “Belief in Risk-taking” (0.883) reflect a strong alignment within green risk appetite, illustrating clear differentiation across latent variables; moreover, constructs such as Green Investment Capacity, represented by “Loan Consideration for Opportunities” (0.859), and SDG 12-Aligned Investment Decision, represented by “Use of Accessible Information” (0.901), further affirm the model’s structural robustness, with cross-loadings remaining consistently lower on non-corresponding constructs, thereby validating the theoretical distinctions inherent in the sustainability-driven investment landscape. The table shows how different investor behaviors and beliefs (“Acceptance of Losses”, “Belief in Risk-taking,” etc.) are most strongly connected to specific investment strategies and outcomes. For example, an investor’s Acceptance of Losses is most closely tied to their Green Portfolio Strategy (0.565) and an investors Belief in Risk-taking is most strongly linked to their green risk appetite (0.883). Similarly, Comfort Level with Risk and Complexity Concern are primarily related to Green Risk Tolerance (0.917 and 0.885, respectively), while a Financial Stability Assessment is most connected to their Green Investment Capacity (0.819). This means that different aspects of an investor’s mindset predict which part of a sustainable investing approach they’ll adopt, such as building a green portfolio or being more comfortable with green-related risks.

The cross-loading table indicates how various investor attitudes, including the Real Estate or Infrastructure Focus and Willingness to Borrow, and general investment strategy, e.g. Green Investment Capacity and Green Risk Tolerance were related. Consider a score-card such that the higher the number (the loading) the stronger the relationship. As an example, when you peek at the line for Real Estate or Infrastructure Focus, the maximum is 0.890 in the column of Environmental Stewardship Investment Focus. It implies that those investors who focus more on real estate or infrastructure are the strongest in terms of the interest in environmental stewardship. It is equivalent to saying that this kind of investor is most probably an environmental steward.

Table 7. Variance inflation factor

	VIF
Acceptance of Losses	2.452
Adjusting Based on Trends	2.911
Asset Transfer Planning	1.299
Avoidance of High-Risk Ventures	3.084
Belief in Risk-taking	2.834
Comfort Level with Risk	3.664
Complexity Concern	3.078
Confidence in Allocation	1.272
Consulting with Family or Friends	5.436
Dependence on Luck	4.580
Exploring Options	3.976
Financial Stability Assessment	1.879
Growth Potential	3.779
Income Security	4.078
Influence of Past Success	3.636
Loan Consideration for Opportunities	2.134
Long-term Financial Goals	3.591
Online Trading	4.639
Performance Improvement	2.153
Preference for Convenience	2.781
Preference for Safety	2.461
Real Estate or Infrastructure Focus	3.526
Reviewing Goals	4.342
Risk Perception	3.856
Securing the Future	3.133
Seeking Professional Advice	4.193
Staying Informed via Media	4.013
Use of Accessible Information	3.502
Using Analysis Tools	5.280
Willingness to Borrow	2.578

In the same light, the maximum value (0.828) is recorded under Green Portfolio Strategy upon checking the row under Using Analysis Tools. This indicates a high connection between the fact that the investor comes to the analysis tools and his willingness to create a diversified green portfolio. This table allows us to understand which particular investor behaviors and interests are most useful in determining the various lines of attack that they take concerning green investing. It practically informs us, that whenever an investor does X, he is likely most of the time to find himself doing Y.

The Variance Inflation Factor (VIF) analysis in Table 7 reveals critical multicollinearity considerations within the model, with particularly elevated VIF scores for constructs such as “Consulting with Family or Friends” (5.436), “Using Analysis Tools” (5.280), and “Dependence on Luck” (4.580), indicating potential redundancies in predictor variables, while more moderate VIF values for indicators like “Confidence in Allocation” (1.272) and “Asset Transfer Planning” (1.299) suggest minimal collinearity issues in those areas, thus highlighting the necessity for model optimisation to mitigate potential overfitting risks and enhance predictive validity across the spectrum of sustainability-oriented investment behaviours.

Table 6 concludes the PLS algorithm application to the Conceptual Model. Starting with Bootstrapping, Figure 2 shows the results of the application of Bootstrapping to the conceptual model, followed by Table 7. The purpose of the figure and table of bootstrapping is to perform hypothesis testing to check the statistical significance of the relationship between variables.

The hypothesis testing results in Table 8 reveal statistically significant relationships across all proposed paths, with particularly robust effects observed between green risk appetite and Green Portfolio Strategy (H6, $\beta = 0.537$, $t = 10.563$, $p < 0.001$) and moderate effects in the linkage between Green Investment Capacity and Environmental Stewardship Investment Focus (H1, $\beta = 0.254$, $t = 3.983$, $p < 0.001$), underscoring the pivotal role of risk tolerance and appetite in shaping both portfolio strategy and stewardship investment behaviors, while the significant influence of Environmental Stewardship Investment Focus and Green Portfolio Strategy on SDG 12-Aligned Investment Decision (H7, H8) further corroborates the theoretical integration of sustainability principles within strategic investment

frameworks.

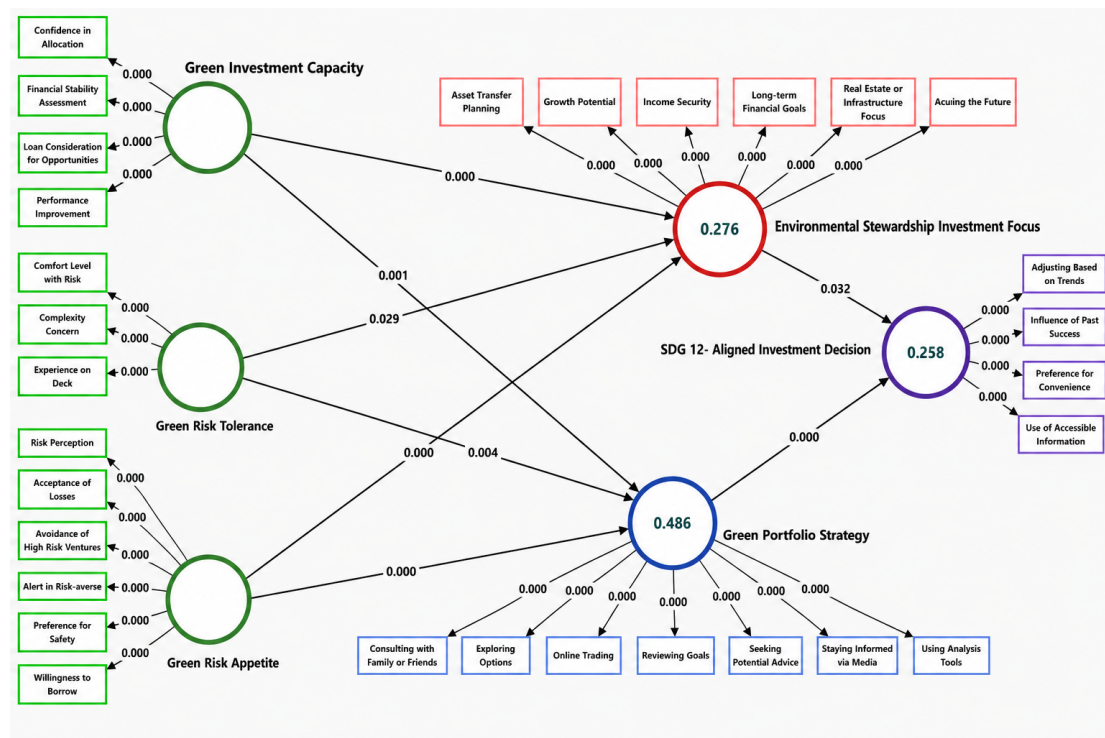


Figure 2. Bootstrapping

Table 8. Hypothesis testing

	Relationship	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values	Supported
H1	Green Investment Capacity → Environmental Stewardship Investment Focus	0.254	0.257	0.064	3.983	0	Yes
H2	Green Investment Capacity → Green Portfolio Strategy	0.185	0.187	0.054	3.438	0.001	Yes
H3	Green Risk Tolerance → Environmental Stewardship Investment Focus	0.122	0.122	0.056	2.188	0.029	Yes
H4	Green Risk Tolerance → Green Portfolio Strategy	0.16	0.161	0.055	2.906	0.004	Yes
H5	Green Risk Appetite → Environmental Stewardship Investment Focus	0.313	0.315	0.062	5.043	0	Yes
H6	Green Risk Appetite → Green Portfolio Strategy	0.537	0.537	0.051	10.563	0	Yes
H7	Environmental Stewardship Investment Focus → SDG 12- Aligned Investment Decision	0.154	0.154	0.072	2.146	0.032	Yes
H8	Green Portfolio Strategy → SDG 12- Aligned Investment Decision	0.399	0.401	0.062	6.394	0	Yes

The R² values of this research have shown that the model is relevant to predictive significance of the core constructs, such as sustainable investment behavior. Although the R² value of the Environmental Stewardship Investment Focus is 0.276, the key variance in this environmental aspect is 27.6 percent, which highlights the role that Green Investment Capacity, Green Risk Tolerance, and green risk appetite play in determining environmentally related investment focus. The R² of 0.486 in the Green Portfolio Strategy indicates a moderate level of explanatory power, suggesting that approximately half of the variance in action relating to the portfolio can be explained by the same predictors, indicating their practicality in shaping the strategy. Although this R² value of 0.258 is small, it is significant in the context of behavioral finance research, as numerous external factors influence human decisions. This finding suggests that environmental stewardship and portfolio strategy are two factors that, together, represent a

realistic approach to further developing the concept of sustainable consumption and production. In total, these values indicate that the model explains a substantial proportion of variance in all dependent constructs, making it possible to translate them into actionable implications for designing policies and investment strategies that can influence capital to align with SDG 12 goals.

The statistical analysis shows that being ready to invest in green projects (having the capacity), being okay with new or higher risks in these projects (risk tolerance), and actively wanting to take on these risks (risk appetite) all make investors more likely to focus on environmental stewardship and create a green portfolio. In simpler terms, if an investor has the money, the courage, and the drive to fund environmentally friendly ideas, they will naturally prioritize companies that are good stewards of the environment and build a mix of investments that reflect this. Ultimately, having an environmental focus and creating a green portfolio directly lead to investment decisions that align with SDG 12, which focuses on ensuring that what we consume and produce is sustainable for the planet. Based on this analysis, the research questions will be answered in Table 9.

Table 9. Answers and implications to research questions

Research Questions	Answers to Research Questions	Implications
RQ 1. How does Green Investment Capacity Influence Environmental Stewardship Investment Focus and Green Portfolio Strategy?	The analysis shows that Green Investment Capacity impacts Environmental Stewardship and Green Portfolio Strategy positively ($\beta=0.254$ and 0.185 , respectively) and significantly ($p\text{-value}=0.000$ and 0.001 , respectively).	Investors and policymakers should recognize that enhancing Green Investment Capacity plays a vital role in strengthening environmental stewardship and fostering effective Green Portfolio Strategies, highlighting the importance of prioritizing sustainable financial practices for long-term ecological and economic benefits.
RQ 2. What is the impact of Green Risk Tolerance on the formulation of Green Portfolio Strategy and the alignment with Environmental Stewardship Investment Focus?	The analysis shows that Green Risk Tolerance impacts Environmental Stewardship and Green Portfolio Strategy positively ($\beta=0.122$ and 0.160 , respectively) and significantly ($p\text{-value}=0.029$ and 0.004 , respectively).	Investors and policymakers should understand that fostering a higher tolerance for green risks significantly contributes to improving environmental stewardship and advancing Green Portfolio Strategies, emphasizing the need for embracing sustainable risks to achieve broader ecological and financial goals.
RQ 3. In what ways does green risk appetite affect the prioritization of Environmental Stewardship Investment Focus and the development of a Green Portfolio Strategy?	The analysis shows that green risk appetite impacts Environmental Stewardship and Green Portfolio Strategy positively ($\beta=0.313$ and 0.537 , respectively) and significantly ($p\text{-value}=0.000$ and 0.000 , respectively).	Investors and policymakers should recognize that cultivating a strong appetite for green investments significantly enhances environmental stewardship and drives the success of Green Portfolio Strategies, underscoring the value of proactively pursuing sustainable opportunities for impactful outcomes.
RQ 4. How do Environmental Stewardship Investment Focus and Green Portfolio Strategy contribute to achieving SDG 12-Aligned Investment Decisions?	The analysis shows that Environmental Stewardship Investment Focus and Green Portfolio Strategy impact SDG 12-Aligned Investment Decisions positively ($\beta=0.154$ and 0.399 , respectively) and significantly ($p\text{-value}=0.032$ and 0.000 , respectively).	Investors and policymakers must discern that an unwavering commitment to environmental stewardship and the meticulous orchestration of Green Portfolio Strategies serve as pivotal catalysts in galvanizing investment paradigms that harmonize with SDG 12, epitomizing the intricate synergy between ecological responsibility and strategic financial alignment.

5 Discussion

The results from the inferences present fascinating discernment into the dynamics of sustainable finance, mainly how different green characteristics impact investment behaviour aligned with SDG 12. Here's a more in-depth plunge into the outcomes. The outcomes emphasise that Green Investment Capacity significantly influences both Environmental Stewardship Investment Focus and Green Portfolio Strategy. The more substantial consequence of

Environmental Stewardship Investment Focus indicates that organisations with higher Green Investment Capacity manage to prioritise investments that concentrate on environmental stewardship. These conclusions align with previous examinations, underscoring economic capability's crucial role in helming green initiatives [104–106].

Green Risk Tolerance places a reasonable consequence on both Environmental Stewardship Investment Focus and Green Portfolio Strategy. This result reflects analysis indicating that while risk tolerance plays a function, it is often mediated by other factors, such as organisational culture or external market conditions. Green risk appetite demonstrates the most substantial influence among all predictors, significantly impacting both Environmental Stewardship Investment Focus. The exceptionally high T-statistics emphasise the robustness of this connection, notably with Green Portfolio Strategy, where green risk appetite influence is nearly dual that of Green Investment Capacity or Green Risk Tolerance. This aligns with contemporaneous publications underlining that an aggressive appetite for sustainable risks is a crucial enabler for organisations striving to innovate and diversify their portfolios in connection with SDG's [107–109].

The trails from Environmental Stewardship Investment Focus to SDG 12 indicate the layered configuration of green decision-making. The stronger impact of Green Portfolio Strategy compared to Environmental Stewardship Investment Focus implies that strategic integration of sustainable lodestars into more comprehensive portfolios is a more assertive characteristic in attaining SDG 12. This finding constructs on earlier investigations, which highlight the strategic transformation from unattended stewardship investments to exhaustive portfolio alignment as a hallmark of advanced green frameworks [110].

The outcomes reverberate with contemporary analyses that emphasise the transformative function of sustainable finance in attaining SDG-aligned purposes. For example, previous research has also pinpointed Green Investment Capacity as a foundational driver [111, 112].

The superiority of green risk appetite corresponds with global conclusions indicating that organisations with a bold standpoint toward sustainable risks surpass their conventional counterparts in green innovation. This is specifically applicable in developing countries, where first-mover benefits in green portfolios can generate considerable financial and reputational rewards. The path calculation through SEM to SDG-12 emphasises an development from stewardship-focused acquisitions to strategic portfolio alignment, reflecting sensations in developed economies. Nevertheless, the subtle role of Environmental Stewardship Investment Focus as a complementary rather than immediate pathway demonstrates space for policy-driven enhancements to strengthen its consequence [113, 114].

This paper demonstrates that diversification of green investment ability, risk tolerance, and risk appetite directly enhances environmental management and green portfolio management, which subsequently contribute significantly to SDG 12-inspired investment strategies, thereby affording a measurable path towards sustainable consumption and production. The results of Green Investment Capacity in terms of SDG 12-consistent investment decisions are the direct facilitation of sustainable consumption and production patterns since Green Investment Capacity funds resource-efficient and circular economy projects. Green Risk Tolerance also adds value to SDG 12-compliant investment judgments, as it enables investors to deploy capital in innovative, start-up sustainable consumption and production projects. These projects may involve higher short-term risks but offer considerable longer-term positive environmental and societal impacts. Furthermore, the existence of a green risk appetite provides a functional complement to SDG 12-aligned investment preferences, as it encourages investors to proactively recognize and finance initiatives that stimulate sustainable consumption and production, even in the facade of greater apprehension or a non-traditional bearing. Above, a Green Portfolio Strategy adds considerable depth to the content of SDG 12-compatible investment decisions because it encompasses a portfolio of companies and projects with intensive waste-minimization criteria, while also supporting the circular economy model and optimizing resource efficiency across their operations. As a source of investment, environmental stewardship offers a protective aspect that can contribute positively to SDG 12, as it channels capital to companies that are engaged in minimizing and managing their environmental impact through the streamlined utilization of resources, reduction of waste, and recycling/regeneration activities. These efforts directly support the transition towards a sustainable pattern of consumption and production.

The findings of this study offer clear, actionable strategies for advancing SDG 12 across multiple stakeholder groups by directly linking Green Investment Capacity, risk tolerance, and risk appetite to measurable sustainability outcomes [115]. Policymakers can operationalize these insights by introducing targeted tax incentives, green bond subsidies and tiered rebates for institutional investors maintaining significant exposure to certified SDG 12 aligned assets while embedding behavioral finance principles such as framing sustainability as a low regret decision into public campaigns to overcome investor inertia [116]. Financial institutions can embed ESG metrics and SDG 12 alignment scores into their credit risk and portfolio assessment frameworks, offer preferential loan terms to SMEs adopting closed loop production and launch SDG 12 Index Funds to attract sustainability conscious capital [117]. Individual investors can progressively reallocate portions of their portfolios into green ETFs, mutual funds and impact bonds screened for SDG 12 compliance while using robo advisors or AI driven platforms to optimize allocations in line with their green risk appetite [118]. By coordinating these interventions through policy level incentives, institutional product innovations and informed retail participation the ecosystem can generate a compounding effect

that accelerates sustainable consumption and production while delivering competitive financial returns.

6 Conclusions

The study comprehensively reveals that green risk appetite and Green Investment Capacity significantly influence both Green Portfolio Strategy and Environmental Stewardship Investment Focus, with strong support for the pivotal role of these constructs in shaping SDG 12-Aligned Investment Decisions, while robust discriminant validity and minimal collinearity issues enhance the reliability of the model, though opportunities for model refinement remain, particularly in addressing moderate model fit indices, aligning our findings with prior literature, which consistently emphasizes the criticality of risk tolerance, investment behaviors, and sustainability-driven financial strategies, thus underscoring the necessity for further exploration of external factors impacting green investment dynamics.

According to this study, the enhancement of environmental stewardship and Green Portfolio Strategies can be directly improved by the development of Green Investment Capacity, a more risk-accepting approach, and an increase in appetite for sustainability financing, which will ultimately be reflected in more informed investment decisions aligned with SDG 12. The findings point a clear way forward in implementing sustainability in the daily financial practice. In the future, there may be opportunities to conduct research on the influence of culture, social norms, and local market dynamics on investors' attitudes toward green finance, particularly through a comparative study of emerging economies and more developed markets. It is also interesting to learn how more recent financial instruments, including green bonds, sustainability-linked loans, and tokenized carbon credits, are gaining momentum and whether they contribute to faster achievement of the goal of sustainable consumption and production. The level of investment in future sustainability research, including the changing rules and regulations, adequate disclosure of ESG practices, and technological advancements, could provide more insight and shape approaches to ensuring sustainability becomes core to the investment environment.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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