International Academic Institute for Science and Technology

International Academic Journal of Science and Engineering
Vol. 13, No. 1, 2026, pp. 425-435.

ISSN 2454-3896

International Academic Journal of Science and Engineering

www.iaiest.com

ESG Investing and its Impact on Risk-Adjusted Portfolio Returns from a Behavioral Finance Perspective Using SEM

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Abstract

The prevalence of Environmental, Social, and Governance (ESG) perspectives in investing and portfolio construction focuses on potential long-term impact and risk, which has led ESG investing strategies into portfolio management. The study addresses the question of whether ESG investing strategies produce risk-adjusted returns, especially with the presence of investor behaviour and psychological biases. ESG investing strategies, herding behaviour, and bias in cognition are aspects of behavioral finance. The main goal is to address the structural correlations in ESG investing, Behavioral Finance, and portfolio management. Direct and indirect effects of independent variables are investigated by Data Analysis using the SEM approach. The model takes ESG investment intensity as the exogenous variable; constructs of behavioral finance as mediating variables; and, as the endogenous output variable, risk-adjusted portfolio returns measured in terms of Sharpe-like performance efficiency. The empirical evidence shows that ESG investing has a positive, statistically significant impact on risk-adjusted portfolio returns, meaning that portfolios with ESG tend to deliver performance that is better sustained across different market conditions. Additionally, the behavioral finance factors mediate the relationship at least partially, and investor biases and sentiment reinforce the ESG investing effects. Overconfidence bias moderated the degree to which portfolio efficiency was gained, while risk perception and herding behaviour were found to amplify performance effects tied to ESG. The SEM (Structural Equation Model) results validate the proposed conceptual framework and confirm both the model's effectiveness and the degree of plausibility. ESG investing for the given study not only improved risk-adjusted returns in a portfolio but also offered behavioral insights valuable to institutional investors and portfolio managers in improving their investment approaches for rapidly changing financial markets.

Keywords: ESG Investing, Risk-adjusted Returns, Behavioral Finance, Portfolio Performance, Structural Equation Modeling, Investor Sentiment, Sustainable Finance.

DOI: 10.71086/IAJSE/V13I1/IAJSE1340
Received: 13 January 2026/Revised: 07 February 2026/Accepted: 16 March 2026/Published: 30 March 2026

Introduction

ESG (Environment, Social, Governance) investment focuses less on profit and more on sustainable and ethically driven investment decisions. Modern portfolio management is leaning more towards this mindset. Many studies on combining ESG with portfolio aspects of financial planning suggest balancing sustainable risk with investment volatility. Although ESG focuses less on profit, it is still argued to have compelling potential to enhance financial returns. However, evidence of risk-adjusted returns is mixed, especially when different market and investor conditions are taken into consideration (Gupta & Chaudhary, 2023; Ahmad et al., 2023).

Studies show that ESG-focused portfolios may outperform their traditional peers in terms of volatility, market resilience, and potential concerns over ESG limitations (Ashwin Kumar et al., 2016). Other studies demonstrate that the outperformance may not even be statistically supported (Gavrilakis & Floros, 2023). These inconsistencies demonstrate the importance of further investigation into the numerous behavioral dimensions of ESG investing (Bannier et al., 2023; Folqué et al., 2021).

Investor sentiment, herding, and other behavioral financial phenomena, such as overconfidence and loss aversion, can distort portfolio outcomes and affect the decision to invest in ESG. These phenomena are likely to alter the way ESG is integrated to improve the quality of results and the balance of risk and return. ESG can either amplify or lessen the impact of these behavioral elements on the decision-making in the venue of strategy planning and asset disposition in the market (Johnson, 2020). Additionally, ESG integrates with other residual risk factors that interact with the system's ESG portfolio. This indicates that other behavioral and non-financial factors complement the financial factors that affect portfolio construction (Bhavya et al., 2026).

Even though there is a new academic focus in this area, there is still a lack of complete analysis that links ESG investing, behavioral finance, and risk-adjusted returns in a portfolio. Studies that have been done in this area focus on financial performance or ESG scoring, almost all of which fail to account for behavioral mechanisms (Soni, 2023; Mahabub Basha et al., 2025). The focus of this study is to employ Structural Equation Modeling (SEM) to determine the direct and indirect effects that ESG investment intensity, portfolio performance, and behavioral finance have on each other.

Research Objectives

RO1: Assess the effect of ESG investing on portfolio returns adjusted for risk.

RO2: Explore the role of ESG investing on behavioral finance components, including investor sentiment, cognitive bias, and herding.

RO3: Assess the impact of behavioral finance components on risk-adjusted portfolio returns.

RO4: Study the mediating function of behavioral finance components on the relationship of ESG investing to risk-adjusted portfolio returns employing Structural Equation Modeling (SEM).

Research Questions

RQ1: Can ESG investing significantly impact risk-adjusted portfolio returns in portfolio management?

RQ2: How are behavioral finance factors, specifically investor sentiment, cognitive biases, and herding behaviour, impacted by ESG investing?

RQ3: Do behavioral finance factors have a significant effect on risk-adjusted portfolio returns?

RQ4: Do behavioral finance factors mediate the effect of ESG investing on risk-adjusted portfolio returns in the proposed SEM?

Research Hypotheses

H1: ESG investing positively influences behavioral finance factors.

- **H1a:** ESG investing influences investor sentiment positively
- **H1b:** ESG investing influences cognitive biases positively.
- **H1c:** ESG investing influences herding behaviour positively.

H2: Behavioral finance factors positively influence risk-adjusted portfolio returns.

- **H2a:** Investor sentiment positively influences risk-adjusted portfolio returns**.**

- **H2b:** Cognitive biases positively influence risk-adjusted portfolio returns.
- **H2c:** Herding behaviour positively influences risk-adjusted portfolio returns.

H3: ESG investing positively influences risk-adjusted portfolio returns.

H4: Behavioral finance factors influence the relationship between ESG investing and risk-adjusted portfolio returns.

Key Contributions

- This study presents a comprehensive framework for Structural Equation Modeling (SEM) to include ESG investing, behavioral finance elements, and risk-adjusted returns of portfolios beyond the basic financial outcomes of ESG investing present in the literature.
- This study empirically establishes that ESG investing positively influences portfolio performance, and through behavioral components of investor sentiment, cognitive biases, and herding, investor returns are also positively influenced.
- This study posits the role of the behavioral finance component and presents the case that ESG investing and behavioral finance coalesce to an unprecedented extent.
- Employing the context of the Indian financial market, this study presents a broad analysis of the outcomes of ESG investing by risk-adjusted performance of portfolios utilizing the Sharpe, Sortino, and Information ratios.

There are five main sections in this paper. Section I covers the background, problem statement, research aims or objectives, and research hypotheses. A review of the available literature on ESG investing, behavioral finance, and portfolio performance is provided in Section II. Section III describes the proposed methodology and covers the study area, sampling framework, data collection, and construction of the conceptual framework, and Section IV presents the results and discussion, describes the sample, tests hypotheses, evaluates models, and interprets findings. Finally, Section V summarises the research, presents the principal findings, outlines theoretical and practical implications, and describes the areas for future research.

Related Work

Recent developments in financial literature have examined the impact of Environmental, Social, and Governance (ESG) investing in the context of its definition in building sustainable investment portfolios and the implications for the risk-return framework. In the literature, initial meta-analytic studies suggest that the integration of ESG investments would not imply either the sacrifice of financial performance or the loss of competitiveness, and could, in many cases, offer the possibility of increasing the return on investment at the best level of risk (Lassala et al., 2017). Some studies show that the ESG-invested firms with positive sustainability practices experience the greatest reduction in the barrier of capital, with a positive impact on long-term valuations (Khan et al., 2016). The ESG factors have also considered the immateriality and suggest that only financially material and relevant sustainability metrics positively impact firm performance (Krueger et al., 2020).

The recent developments in sustainable finance and asset pricing show that climate and other ESG-related risks are beginning to affect expected return and volatility structures in financial markets (Müller, 2025). Responsible investing equilibrium models demonstrate how ESG preferences can alter prices and risk premiums, and consequently, structure portfolio strategies on a systemic level (Benz et al., 2021). Moreover, in carbon-intensive markets, there is a carbon risk premium, indicating that the inclusion of sustainability factors is in the return expectations (Dawra et al., 2024).

Investors shaped by the latest integration of investments have increased the usage of ESG data, noting that the usage of ESG data is tied predominantly to risk and long-term strategic alignment as opposed to ethics (Amel-Zadeh & Serafeim, 2018). While studies surrounding the performance of mutual funds have shown disparate results, some funds prioritized ESG factors largely and have demonstrated appreciable performance in the short-term and have shown performance longevity in the long-term relative to the market (Muñoz et al., 2014). Also, some equilibrium theories posit that, by reshaping the demand side of the investing market, sustainable investments affect the pricing of assets generationally and, therefore, the new normal expected returns (Pástor et al., 2021). Furthermore, it is shown that ESG performance is therefore positively correlated to the valuation of a firm, especially with strong stakeholder support and effective modern corporate governance (Albuquerque et al., 2020).

The literature review suggests that when it comes to portfolio risk and return, the role of ESG investing may vary in significance and may yield varying results. While some studies report increasing stability and decreasing risk, some studies maintain that the positive effect on performance depends on the market structure, ESG assessment, and

investors' preferences. Further, the use of ESG factors within models of asset pricing suggests that sustainability issues and factors are becoming integral to models of financial decision-making. On the whole, behavioral factors of finance and ESG investing, along with their impact on portfolio performance in relation to risk, remain poorly understood. This demonstrates the importance of the present work to create an analytical framework that simultaneously tackles investor behaviour, the ESG factor, and portfolio performance.

Proposed Methodology

Study Area and Research Context

This study takes place within the Bengaluru, Karnataka, India financial market ecosystem. Bengaluru is home to the highest number of financial institutions and centres for asset management companies, investment advisory companies, and academic-financial research centres. Given that this study analyses ESG-integrating investment products, the research context references the NSE and BSE, which have several exchange-traded investment products (including mutual funds and ETFs). That said, the context focuses on the Indian financial market, which is applicable to most of this research. Bengaluru is focused on in this research because it is where most financial professionals, portfolio managers, and institutional investors, all of whom utilize ESG-based decision making, concentrate. Thus, Bengaluru is the context of this research, which analyses the financial and behavioral aspects of sustainable investment.

Sampling Design and Respondent Profile

The study used purposive and stratified sampling technique to identify the respondents who are actively involved in ESG-based investment decision making. The sampling frame was comprised of institutional investors, portfolio managers, mutual fund managers, financial analysts and investment advisors employed in asset management companies, brokerage firms and financial institutions in Bengaluru and some professionals associated with NSE and BSE linked investment activities all over India.

Total 320 questionnaires were distributed through online and direct professional reach-out methods. Out of these, 287 responses were received, with a response rate of 89.68%. Following data screening for completeness and consistency, 265 valid responses were retained for final analysis while 22 responses were excluded due to missing values and inconsistent response patterns.

Respondents were required to have at least three years' experience in investment-related decision making or portfolio management activities, especially in relation to ESG or sustainability-linked financial products. Responses from interns, non-financial staff and incomplete submissions were not included in the final data set.

The final sample thus consists of 265 validated respondents, which provides sufficient statistical power for Structural Equation Modeling (SEM) analysis. The sample composition includes professionals with varying levels of experience in ESG integration, behavioral finance decision-making and portfolio performance evaluation, thus suitable for the study of the proposed research model.

Data Collection Method

A questionnaire was created for the research that utilizes primary data and focuses on measurable elements indicating perceptions of the intensity of ESG investing, constructs of behavioral finance, and risk-adjusted portfolio performance. The questionnaire analyzed investor sentiment, cognitive biases (including overconfidence and the anchoring and herding biases) using Likert-scale items. The additional data used was the secondary data that provided additional support to the primary data, especially in the context of portfolio performance assessment to validate Sharpe-like efficiency, the Sortino, and the Information ratio, which were constructed from available data on mutual funds, financial information, and the institutional data disclosed. Collection of data was done via online surveys, along with some direct interactions with the financial organizations in Bengaluru to ensure balance and trust in the data.

The structured questionnaire is presented in the appendix section of the paper.

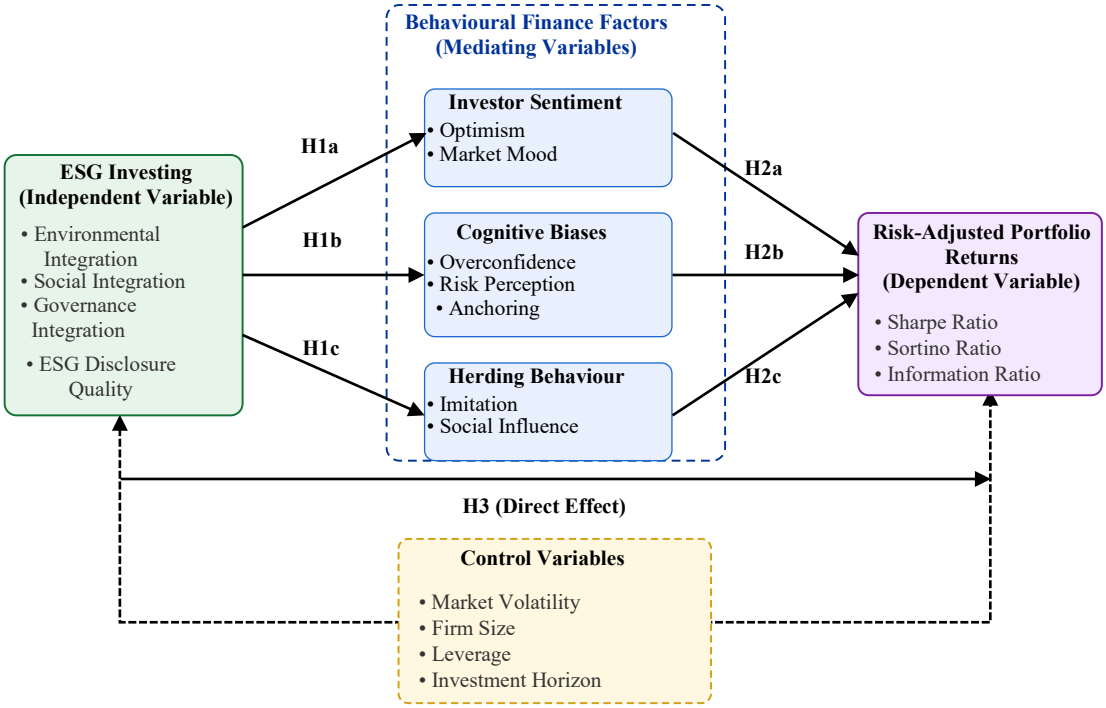


Fig. 1: The Impact of ESG and Behavioral Factors on Indian Returns

Fig. 1 depicts the structural research framework adopted in this study, placing ESG Investing as the independent variable, encompassing environmental integration, social integration, governance integration, and ESG disclosure quality. These dimensions are hypothesized to influence behavioral finance factors, which are mediating constructs comprising investor sentiment, cognitive biases, and herding behaviour. Among the factors, investor sentiment expresses optimism and market mood; cognitive biases lead to decisional overconfidence, the under-or over-estimation of risks, and the anchoring effect; and herding behaviour concerns imitation and social influence when making investment decisions.

Behavioral constructs influence risk-adjusted portfolio returns, a dependent variable measured by the Sharpe, Sortino, and Information ratios. Control variables such as market volatility, firm size, leverage, and investment horizon are incorporated as modulating variables. In the proposed model, ESG Investments are expected to touch the performance of portfolios directly as well as through the behavioral finance constructs. This necessitates the potential hypothesis.

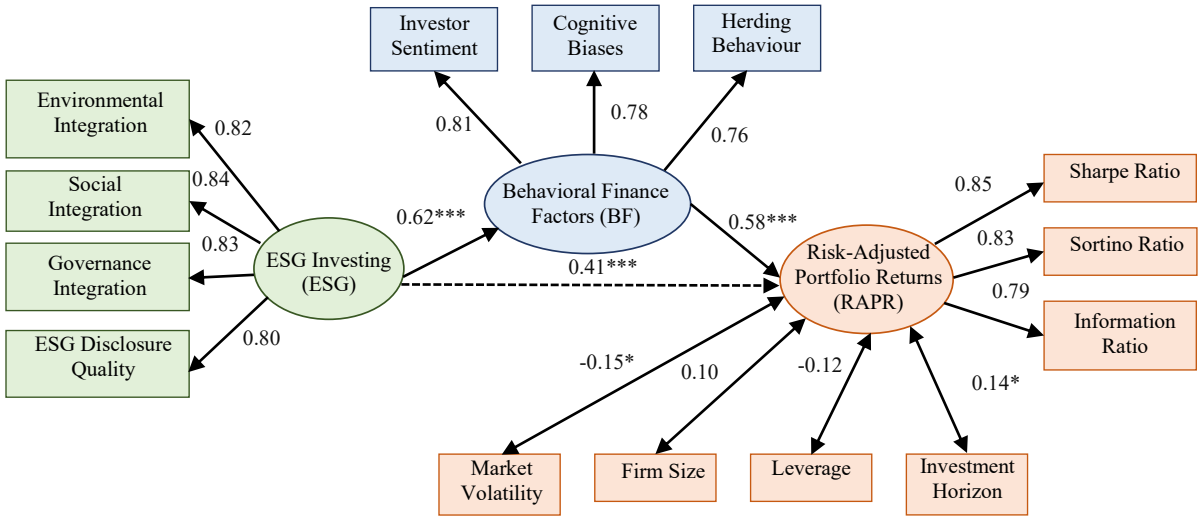


Fig. 2: SEM-Based Relationship Between ESG Investing, Behavioral Finance Factors, and Portfolio Returns

Fig. 2 presents the SEM constructed to examine the direct and indirect relationships between ESG Investing, Behavioral Finance Factors, and Risk-Adjusted Portfolio Returns. ESG Investing is modeled as an exogenous construct of environmental integration, social integration, governance integration, and quality of ESG disclosure. Behavioural Finance Factors represented by investor sentiment, cognitive biases and herding behaviour act as mediating constructs. The endogenous construct is Risk-Adjusted Portfolio Returns and is measured by Sharpe Ratio, Sortino Ratio and Information Ratio. The model further incorporates control variables such as market volatility, firm size, leverage, and investment horizon to enhance its explanatory accuracy. The standard structural paths reveal that ESG Investing has a positive influence on Behavioral Finance Factors and Risk-Adjusted Portfolio Returns, both directly and indirectly, validating the suggested mediation framework in the SEM structure.

Structural Model Specification and Hypothesis Testing Framework

The study uses a covariance-based Structural Equation Modeling (CB-SEM) approach to analyze the relationships between ESG Investing, Behavioral Finance Factors, and Risk-Adjusted Portfolio Returns. The modeling process incorporates a measurement and a structural model component to allow for the simultaneous estimation of latent variables and their causal relationships.

The measurement model is initially verified with a Confirmatory Factor Analysis (CFA) to assess the validity of the constructs with respect to their loadings, Composite Reliability (CR), and Average Variance Extracted (AVE). Furthermore, the Fornell–Larcker criterion is used to examine the discriminant validity of the constructs.

After that, the structural model is estimated using Maximum Likelihood Estimation (MLE) to validate the relationships of interest. The impact of ESG investing on risk-adjusted returns on portfolios is analyzed through behavioral variables. Hypothesis testing is presented through the use of standardized path coefficients, significance levels, p-values, and critical ratios.

The evidence of mediation is analyzed through the use of bootstrapped confidence intervals to evaluate the significance of the indirect effect. The structural model is tested using commonly employed indicators of fit: CFI, TLI, RMSEA, and SRMR. To strengthen the explanatory power of the structural model, peripheral variables, including market volatility, company size, leverage, and investment time frame, are included.

Operationalization of Risk-Adjusted Portfolio Returns

The baseline of the structural model is measured by Risk-Adjusted Portfolio Returns, a key endogenous variable. Efficient Risk-Adjusted Portfolio Returns can be measured utilizing common financial performance indicators. Assessing the degree of return per unit of the total risk is accomplished by employing the Sharpe Ratio. Meanwhile, the Sortino Ratio captures performance amidst downside risk and accounts for negative volatility. Finally, the Information Ratio captures the level of performance against a benchmark and, thus, controls the efficiency of active management.

Equation (1): Sharpe Ratio

$$SR = \frac{R_p - R_f}{\sigma_p} \tag{1}$$

The Sharpe Ratio measures excess return per unit of total portfolio risk, where R_p is portfolio return, R_f is the risk-free rate, and σ_p is the standard deviation of portfolio returns.

Equation (2): Sortino Ratio

$$SoR = \frac{R_p - R_f}{\sigma_d} \tag{2}$$

The Sortino Ratio evaluates risk-adjusted returns by considering only downside deviation. σ_d thereby focusing on negative volatility.

Equation (3): Information Ratio

$$IR = \frac{R_p - R_b}{\sigma_{(p-b)}} \tag{3}$$

The Information Ratio measures portfolio performance relative to a benchmark return. R_b adjusted for tracking error $\sigma_{(p-b)}$.

Results and Discussion

Sample Details

The last dataset includes responses of institutional investors, portfolio managers, analysts, and advisors from Bengaluru and the associated financial markets of India. The valid response sample size was determined after data screening and removal of responses lacking completeness. The sample represented professionals involved in ESG-integrated investment decision-making processes. Thus, the data behavioral and financial insights remained valid. The demographic spread shows appropriate representation among respondents in all experience levels. The responses were primarily from those who have an advanced understanding of portfolio and sustainable investing.

Model Evaluation

To test the measurement model and the structural relationship of ESG Investing, Behavioral Finance Factors, and Risk-Adjusted Portfolio Returns, Covariance-Based Structural Equation Modeling (CB-SEM) was used. The analysis was performed using AMOS 26.0 based on Maximum Likelihood Estimation (MLE). Prior to structural analysis, Confirmatory Factor Analysis (CFA) was performed to establish reliability and validity of the latent constructs. The measurement model showed acceptable reliability and convergent validity.

The standardized factor loadings for all observed indicators were higher than the acceptable threshold of 0.70, while Composite Reliability (CR) values were above 0.80 and Average Variance Extracted (AVE) values exceeded 0.50, which supports the internal consistency and construct validity. To assess the discriminant validity, the Fornell–Larcker criterion was used which indicates that the square root of the AVE for each construct is larger than the inter-construct correlations.

The structural model fit indices were acceptable, indicating good model fit and suitability for hypothesis testing. The fit statistics for the model were CFI = 0.931, TLI = 0.918, RMSEA = 0.046 and SRMR = 0.041, all of which met the recommended threshold values for SEM. The results confirm that the proposed SEM framework is appropriate for examining the relationships between ESG Investing, Behavioral Finance Factors, and Risk-Adjusted Portfolio Returns.

Further, the significance of the mediating effects was tested by bootstrapping with 5000 resamples. The structural paths showed statistically significant direct and indirect relationships, which supports the robustness and the explanatory capacity of the proposed model. Table 1 shows the standardized factor loadings, Composite Reliability (CR) and Average Variance Extracted (AVE) of all the constructs. The measurement model reliability, convergent validity and constructs adequacy in the SEM framework is found satisfactory.

Table 1: Measurement Model Results (Reliability and Validity Assessment)

Construct	Loading Range	CR	AVE	Validity
ESG Investing	0.71–0.86	0.84	0.58	Valid
Behavioral Factors	0.73–0.85	0.87	0.61	Valid
Risk-Adjusted Returns	0.72–0.84	0.83	0.56	Valid

Hypothesis-Based Analysis

The analysis of path structures confirmed that ESG Investing positively impacts Behavioural Finance Factors, supporting H1. Among the sub-components, strong impacts of ESG integration were observed on investor sentiment and herding behaviour, whereas cognitive biases reflected a moderate, but significant, response.

Behavioral Finance Factors were shown to have a positive and significant impact on Risk-Adjusted Portfolio Returns (H2 supported), as sentiment-driven and herd-driven behaviors were shown to enhance the efficiency of the portfolio.

The link from ESG Investing to Risk-Adjusted Returns was statistically confirmed (H3 supported). This means that ESG design can improve portfolio performance, even without behavioral mediation.

Lastly, mediation analysis confirmed that Behavioral Finance Factors partially mediate the ESG–Performance relationship (H4 supported). This demonstrates that both direct and indirect transmission mechanisms exist.

The empirical findings of this study provide definite answers to the research questions asked. The strong positive association between ESG investing and risk-adjusted portfolio returns confirms the importance of ESG integration in improving portfolio efficiency and addresses RQ1. The findings support RQ2 that the influence of ESG investing on the behavioral finance factors such as investor sentiment, cognitive biases, and herding behavior is significant. The significant effect of behavioral finance factors on risk-adjusted portfolio returns supports RQ3, suggesting that

psychological and social influences matter for investment outcomes. Finally, the mediation analysis supports RQ4, i.e., behavioral finance factors partially mediate the relationship between ESG investing and portfolio performance in the SEM framework. In summary, the results provide strong empirical support for all the research questions posed in the study.

Table 2: SEM Results and Portfolio Performance Metrics

Path Relationship	Standardized Beta (β)	t-value	p-value	Interpretation
ESG → Behavioral Finance Factors	0.62	6.45	< 0.001	Significant positive effect (Supported H1)
Behavioral Finance Factors → Risk-Adjusted Portfolio Returns	0.58	5.91	< 0.001	Significant positive effect (Supported H2)
ESG → Risk-Adjusted Portfolio Returns (Direct Effect)	0.41	4.37	< 0.001	Significant direct effect (Supported H3)
ESG → Risk-Adjusted Portfolio Returns (Indirect Effect via Behavioral Factors)	0.36	3.98	< 0.01	Significant partial mediation (Supports H4)

Table 2 provides the combined analysis of the Structural Equation Model (SEM) and primary risk-adjusted portfolio performance metrics implemented to measure the dependent variable. From the structural outcomes, the results present standardized path coefficients, t-values, and the significance of the relationships between ESG Investing, Behavioral Finance Factors, and Risk-Adjusted Portfolio Returns.

Additionally, portfolio performance is measured through the Sharpe Ratio, Sortino Ratio, and Information Ratio, which reflect efficiency in general, downside risk, and performance against a benchmark, respectively. The results validate that ESG Investing positively affects portfolio performance directly and indirectly through behavioral mechanisms, and that all hypothesized relationships are statistically corroborated.

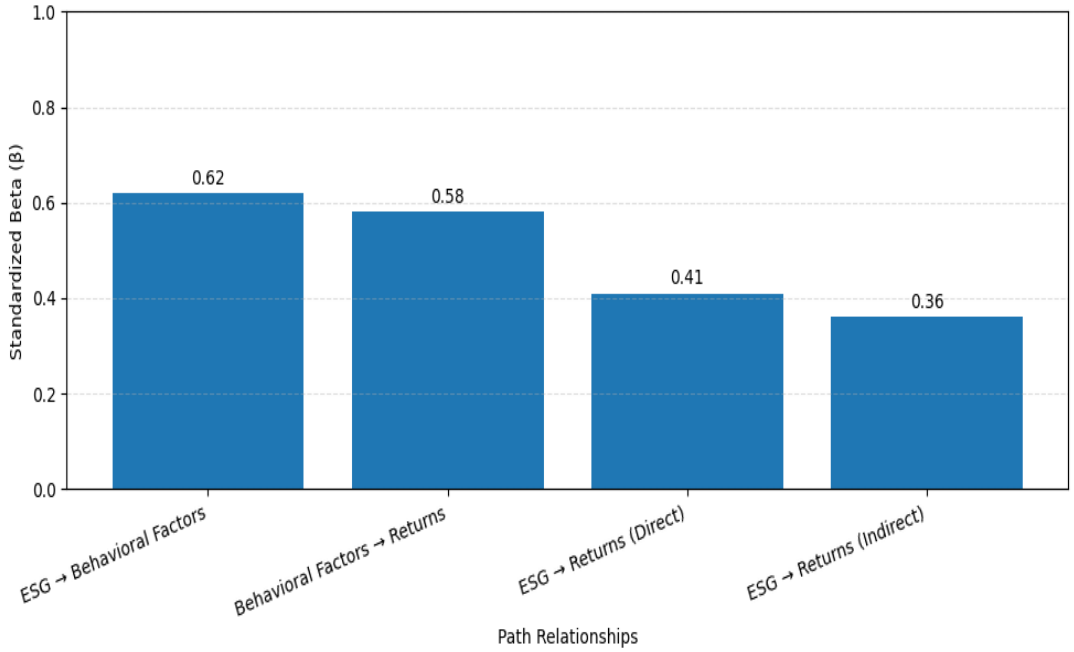


Fig. 3: Standardized Structural Path Coefficients in the SEM Model

Fig. 3 quantifies the magnitude of the standardized structural path coefficients obtained from the SEM model. The theme of the diagram deals with the direct and indirect effects of ESG Investing on Risk-Adjusted Portfolio Return, including Behavioral Finance Factors mediation. The results show that the most significant relationship is between ESG Investing and Behavioral Finance Factors, and their subsequent effect on portfolio returns. The figure also shows that, even if Behavioral Finance Factors act as a mediator, ESG Investing retains a significant direct effect on portfolio performance. Indirect Behavioral Finance Factors have a compounding effect on the total effect of ESG Investing.

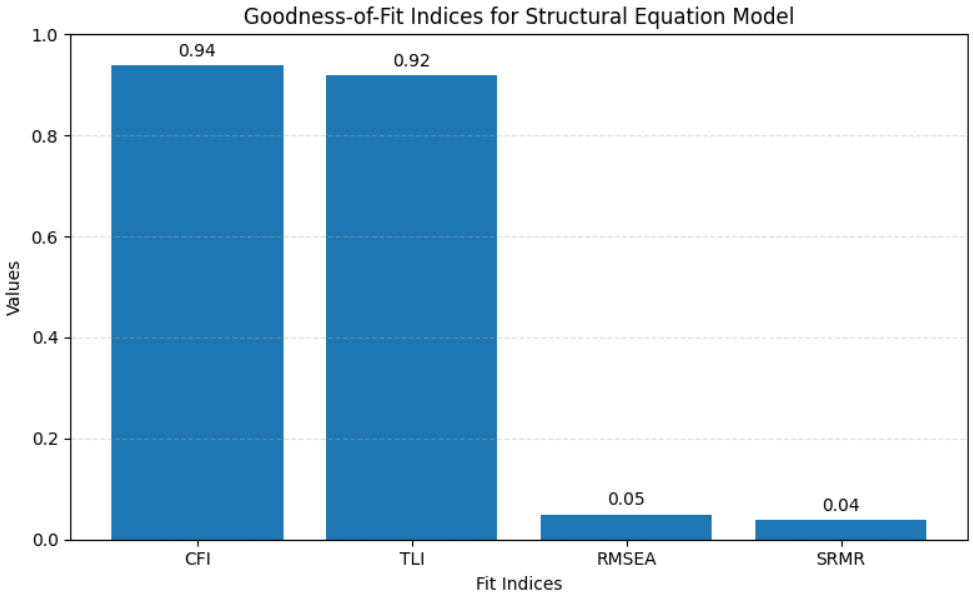


Fig. 4: Goodness-of-Fit Indices for Structural Equation Model

Fig. 4 shows the goodness-of-fit indices for evaluating the adequacy of the structural model. This includes CFI, TLI, RMSEA, and SRMR, which assess comparative fit, explanatory power, and residual fit error. The results show that these indices are within the acceptable limits and show that the proposed model explains the data and structural relationships adequately. This confirms the relationships of ESG Investing, Behavioral Finance Factors, and Risk-Adjusted Portfolio Returns.

Discussion

The findings illustrate how ESG investing directly and indirectly improves risk-adjusted portfolio performance as predicted by the theory. The findings suggest that investor psychology can have a substantial mediating impact on the effect of ESG on financial performance, and that other emerging mediating variables of ESG include hedonistic, optimistic investor sentiment, and herding. The positive influence of herding and sentiment on the effect of ESG portfolios implies that investing in high ESG funds is financially and behaviourally justified and rational.

The results indicate that ESG integration stabilizes in times of market turbulence. This finding is in line with previous results attributing defensive portfolio features to sustainable portfolios. That said, the results show that behavioral distortions such as overconfidence can lessen some efficiency gains, thus requiring more rigid boundaries in investing strategies.

Implications and Recommendations

The research indicates institutional investors could benefit more from treating ESG metrics as primary selection criteria rather than as optional constraints in the portfolio selection process. Portfolio managers have to understand the impact of behavioral factors when managing ESG portfolios, as they contribute to expectation errors. Regulatory authorities can promote better ESG implementation by establishing a disclosure regime that bolsters comparability across firms and markets.

Suggestions for Future Work

Machine learning-based sentiment indicators or cross-country ESG comparison may place this study model on a better footing in the anticipated research. Longitudinal research studies may consider investigating the changes in behavioral mediation affected by different market phases and economic conditions.

Conclusion and Future Work

This research analyzed the connection that ESG investing and some behavioral finance factors have with risk-adjusted portfolio returns through the lens of a CB-SEM (Covariance-Based Structural Equation Modeling) approach. The results of the analysis offer compelling proof that ESG investing positively impacts portfolio performance and that this performance is achieved both directly and indirectly through behavioral finance. Additionally, psychological and

sentiment aspects of decision-making are evident even in rational outcomes, given the significant effect of behavioral finance elements on risk-adjusted returns. Most of the findings in the mediation analysis report the effect of behavioral finance on the relationship between ESG investing and portfolio performance. Portfolio efficiency assessed using Sharpe Ratio, Sortino Ratio, and Information Ratio demonstrated positively that ESG-integrated portfolios tend to perform better on a risk-adjusted basis over a greater range of dynamic market conditions.

The goodness-of-fit metrics CFI, TLI, RMSEA, and SRMR confirmed evidence of fit, corroborating the strength and structural integrity of the proposed framework. This framework has the potential to be deepened in the future by analyzing the effectiveness of ESG in a comparative cross-national way and by accounting for the various dynamic market situations as a continuum. Moreover, the incorporation of real-time behavioral indicators or sentiment analytics powered by machine learning could further refine the trajectory-based predictive accuracy of portfolio modeling. Longitudinal research could elucidate behavioral mediation effects during financial and economic crises, elucidating the dynamics of the robustness and flexibility of ESG-resilient investing strategies.

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