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INVESTIGATING THE PERFORMANCE OF ESG- THEMED MUTUAL FUNDS IN INDIA

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Abstract *Investors are increasingly considering environmental, social, and governance (ESG) factors as essential components in their decision-making process. ESG funds play a crucial role in sustainability financing by directing investment toward companies and projects that meet certain environmental, social and governance criterion. The study makes a comparison of ESG funds with the benchmark index (NIFTY 100 ESG index) which is an indicator of the performance of the funds. The comparison revealed how the select ESG themed funds respond to changes in the NIFTY 100 ESG index, with the Quantum ESG Fund being the most responsive and the Axis ESG Integration Strategy Fund being the least.*

Keywords*: ESG, benchmark index, regression, beta, fund*

1.INTRODUCTION

The transition from traditional profit-oriented business models to sustainable ones reflects a growing recognition of the importance of environmental, social, and governance (ESG) factors. Investors are increasingly considering these factors as essential components in their decision-making process. The increase in the commitment of institutional investors to responsible investment may be attributed to a number of factors ranging from global environmental challenges, data security, awareness of role of investors in promoting sustainability and availability of data among others.

United Nations Principles for Responsible Investment, the world's leading proponent of responsible investment has reported an immense growth from 62 signatories and AUM US$6.5 trillion in 2006 to 5,345 signatories and AUM US$128.4 trillion in March 2024.The Global Sustainable investment review 2022 reports that $30.3 trillion is invested globally in sustainable investing assets.ESG (Environmental, Social, and Governance) funds play a crucial role in sustainability financing by directing investment toward

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companies and projects that meet certain environmental, social and governance criterion.

2. ESG mutual funds – An Overview

ESG mutual funds are thematic funds that seek to invest in socially responsible companies that perform well on ESG parameters. ESG Funds invest only in companies that are committed to environmental conservation, social responsibility and robust corporate governance practices and aims to provide decent financial returns while also positively impacting the environment. ESG investing is equivalent to sustainable investing, wherein you are investing in companies that have a sustainable and holistic approach to business.

The environmental (E) impact considers the company's practices to reduce carbon emissions, have a sound waste disposal system and focus on energy and water conservation. It implies a strong focus on a greener environment. The social (S) factor focuses on the well-being of the company's employees and society by taking care of factors like employee welfare, gender equality, pay parity and regular contribution towards other relevant social causes. Corporate governance is the core of the Governance (G) factor as it emphasizes regulatory compliance, grievance redressals, effective whistleblower policies, ethical conduct and strong internal controls against wrongdoings.

Common types of ESG mutual funds include (1) **Exclusionary Funds** that exclude some specific sectors or products, such as tobacco, weapons, or fossil fuels. **(2) Best-in-Class Funds** that invest in the companies with the best ESG ratings within their respective industries **(3) Thematic Funds that** invest in companies specifically focused on sustainability themes such as clean energy, gender diversity or water conservation and **(4) Impact Funds which** invest in companies that create a positive social impact and seek to give investors higher returns.

3. STATEMENT OF THE PROBLEM

Considering the rising interest in a switch towards sustainability, ESG funds are crucial to drive the shift and provide opportunities to investors for financial returns and generating a positive impact. A comparison of ESG funds with the benchmark index is an indicator of the performance of the funds which reflects the performance of the sector.

4. RESEARCH METHODOLOGY

This paper is empirical in nature and the data cited in this paper were collected from various secondary sources comprising published literature and data collected from AMFI website.

The study identified five ESG mutual funds based on highest AAUM recorded as on August 15, 2024.The AAUM and daily NAV of the selected mutual funds for a period of three years, 14 August 2021 to 14 August 2024, were taken from the AMFI website and subject to further analysis. NIFTY 100 ESG index closing values for the above period has been taken from the NSE website.

5.DATA ANALYSIS AND INTERPRETATION

Based on the highest Assets under management (AUM) of ESG funds in India, five ESG funds namely, Axis ESG Integration Strategy Fund, Quant ESG Equity Fund, SBI ESG Exclusionary Strategy Fund, ICICI Prudential ESG Exclusionary Strategy Fund, Quantum ESG Best in Class Strategy Fund are selected for the study.

The annualised value of daily return are as follows: Axis ESG Integration Strategy Fund 14.04%, Quant ESG Equity Fund 33.90%, SBI ESG Exclusionary Strategy Fund 16.73%, ICICI Prudential ESG Exclusionary Strategy Fund 19.85% and Quantum ESG Best in Class Strategy Fund 15.59%. Hence, the return is highest in the case of Quant ESG Equity Fund.

The annualised value of daily standard deviation is also highest in the case of Quant ESG Equity Fund (18.42%) followed by SBI ESG Exclusionary Strategy Fund (13.95%), Axis ESG Integration Strategy Fund (13.48%), Quantum ESG Best in Class Strategy Fund (12.95%) and ICICI Prudential ESG Exclusionary Strategy Fund (12.20%)

The coefficient of variation is lowest in the case of Quant ESG Equity Fund (54.34%) denoting greater consistency in returns followed by ICICI Prudential ESG Exclusionary Strategy Fund (61.48%), Quantum ESG Best in Class Strategy Fund (83.07%), SBI ESG Exclusionary Strategy Fund (83.39%) and Axis ESG Integration Strategy Fund (96.03%).

Further analysis into the influence of NIFTY 100 ESG on each of the chosen funds is summarised with NIFTY100 ESG as the predictor variable and each of the fund as independent variable.

Table 5.1 Model Summary

Model Summary - Predictor: NIFTY 100 ESG						
Dependent Variable	R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.

Axis ESG Integration Strategy Fund	.818	.668	.668	.00489	1479.025	.000
	Standardized Coefficients (Beta)			CVTS-t test	P value	Result
	.818			38.458	.000	Sig.
Quant ESG Equity Fund	.820	.673	.672	.006620154	1511.842	.000
	Standardized Coefficients (Beta)			CVTS-t test	P value	Result
	.820			38.882	.000	Sig.
ICICI Prudential ESG Exclusionary Strategy Fund	.912	.832	.832	.00315	3640.733	.000
	Standardized Coefficients (Beta)			CVTS-t test	P value	Result
	.912			60.338	0.000	Sig.
SBI ESG Exclusionary Strategy Fund	.936	.876	.876	.003091795	5193.624	.000
	Standardized Coefficients (Beta)			CVTS-t test	P value	Result
	.936			72.067	0.000	Sig.
Quantum ESG Best in Class Strategy Fund	.957	.917	.916	.00236	8063.889	.000
	Standardized Coefficients (Beta)			CVTS-t test	P value	Result
	.957			89.799	0.000	Sig.

Source: Author's calculation

On analysis (Table 5.1), it is found that in the case of Axis ESG Integration Strategy Fund, R value is 0.818 indicating a strong positive linear relationship between the NIFTY 100 ESG index and the Axis ESG Integration Strategy Fund. This means that as the NIFTY 100 ESG index increases, the Axis ESG Integration Strategy Fund tends to increase as well, and vice versa.The R^2 value indicates that while 66.8% of the variation in the Axis ESG Integration Strategy Fund can be explained by the NIFTY 100 ESG index, there is still 33.2% of the variation that could be due to other factors not captured by the model. This indicates that the NIFTY 100 ESG index is a relatively strong predictor of the Axis ESG Integration Strategy Fund's performance.

The F-value is used to determine if the overall regression model is statistically significant. A high F-value typically indicates that the model is a good fit for the data. In this case, an F-value of 1479.025 is very high, which suggests that the model explains a significant portion of the variance in the dependent variable.

The standard error measures the average distance that the observed values fall from the regression line. A smaller standard error indicates that the model's predictions are close to the actual data points. In this case, 0.00489 suggests relatively precise predictions.

The p-value (Sig) associated with the F-test is 0.000, which is less than the common alpha level of 0.05. This indicates that the relationship between the NIFTY 100 ESG index and the Axis ESG Integration Strategy Fund is statistically significant. In other words, it's very unlikely that the observed relationship is due to chance.

The beta coefficient (0.818) quantifies the change in the dependent variable (Axis ESG Integration Strategy Fund) for a one-unit change in the predictor variable (NIFTY 100 ESG). This means that for each unit increase in the NIFTY 100 ESG index, the Axis ESG Integration Strategy Fund increases by 0.818 units, holding other factors constant. The t-test evaluates the significance of the beta coefficient. A high t-value (38.458) indicates that the beta coefficient is significantly different from zero, reinforcing the strength and significance of the relationship between NIFTY 100 ESG and the Axis ESG Integration Strategy Fund. A p-value of 0.000 for the beta coefficient suggests that the relationship between the predictor (NIFTY 100 ESG) and the dependent variable (Axis ESG Integration Strategy Fund) is statistically significant. The very low p-value indicates that the beta coefficient is significantly different from zero, confirming the strength of the relationship.

In the case of Quant ESG Equity Fund , correlation coefficient is 0.820 indicating a strong positive linear relationship between the NIFTY 100 ESG index and the Quant ESG Equity Fund. As the NIFTY 100 ESG index increases, the Quant ESG Equity Fund also tends to increase. Since R^2 is equal to 0.673, about 67.3% of the variance in the Quant ESG Equity Fund can be explained by the NIFTY 100 ESG index. This is a slightly higher proportion compared to the previous model with the Axis ESG Integration Strategy Fund, suggesting a strong explanatory power of the predictor variable.

A standard error of 0.006620 indicates the model has a reasonable level of precision, though it is slightly higher compared to the previous fund's standard error.

The F-value (1511.842) is very high, indicating that the regression model provides a significant improvement in explaining the variance in the Quant ESG Equity Fund compared to a model with no predictors.

The beta coefficient of 0.820 suggests that for each one-unit increase in the NIFTY 100 ESG index, the Quant ESG Equity Fund increases by 0.820 units, assuming other factors are held constant. This is a direct measure of the effect size of the predictor on the dependent variable.

The t-value of 38.882 is very high, indicating that the beta coefficient is significantly different from zero. This reinforces the strength of the predictor variable's effect on the Quant ESG Equity Fund. A p-value of 0.000 for the beta coefficient indicates that the relationship between the NIFTY 100 ESG index and the Quant ESG Equity Fund is statistically significant. The predictor variable is a meaningful contributor to the variation in the Quant Fund.

Given the analysis of the relationship between the NIFTY 100 ESG index (predictor variable) and the ICICI Prudential ESG Exclusionary Strategy Fund (dependent variable), a correlation coefficient of 0.912 indicates a very strong positive linear relationship between the NIFTY 100 ESG index and the ICICI Prudential ESG Exclusionary Strategy Fund. As the NIFTY 100 ESG index increases, the ICICI Prudential ESG Exclusionary Strategy Fund also tends to increase significantly.

An R^2 value of 0.832 means that 83.2% of the variance in the ICICI Prudential ESG Exclusionary Strategy Fund can be explained by the NIFTY 100 ESG index. This is the highest explanatory power among the earlier models, indicating that the NIFTY 100 ESG index is a very strong predictor of the ICICI Prudential ESG Exclusionary Strategy Fund's performance.

The standard error of 0.00315 is quite small, suggesting that the model's predictions are very close to the actual values. This indicates a high level of precision in the model's predictions.

A very high F-value of 3640.733 indicates that the regression model significantly improves the explanation of the variance in the ICICI Prudential ESG Exclusionary Strategy Fund compared to a model without predictors. This confirms the strong overall fit of the model.

The p-value associated with the F-test is 0.000, which indicates that the model is statistically significant. The relationship between the NIFTY 100 ESG index and the ICICI Prudential ESG Exclusionary Strategy Fund is unlikely to be due to random chance.

The beta coefficient of 0.912 suggests that for each one-unit increase in the NIFTY 100 ESG index, the ICICI Prudential ESG Exclusionary Strategy Fund increases by 0.912 units, assuming all other factors are held constant. This indicates a strong positive impact of the predictor variable on the dependent variable.

The CVTS t-Test of 60.338 is exceptionally high, indicating that the beta coefficient is significantly different from zero. This further supports the strength and significance of the relationship between the NIFTY 100 ESG index and the ICICI Prudential ESG Exclusionary Strategy Fund.

A p-value of 0.000 for the beta coefficient indicates that the relationship between the predictor and the dependent variable is statistically significant. The NIFTY 100 ESG index is a significant predictor of the ICICI Prudential ESG Exclusionary Strategy Fund.

In the analysis of the relationship between the NIFTY 100 ESG index (predictor variable) and the SBI ESG Exclusionary Strategy Fund (dependent variable), A correlation coefficient of 0.936 indicates an exceptionally strong positive linear relationship between the NIFTY 100 ESG index and the SBI ESG Exclusionary Strategy Fund. As the NIFTY 100 ESG index increases, the SBI ESG Fund also tends to increase very strongly.

An R^2 value of 0.876 means that 87.6% of the variance in the SBI ESG Exclusionary Strategy Fund can be explained by the NIFTY 100 ESG index. This is the highest explanatory power among the models suggesting that the NIFTY 100 ESG index is an extremely effective predictor of the SBI ESG Exclusionary Strategy Fund's performance.

The standard error of 0.003091 is very small, indicating that the model's predictions are highly accurate and very close to the actual values.

The very high F-value of 5193.624 indicates that the regression model is an excellent fit for the data and significantly improves the explanation of the variance in the SBI ESG Exclusionary Strategy Fund compared to a model without predictors.

A p-value of 0.000 associated with the F-test indicates that the model is statistically significant. This means the relationship between the NIFTY 100 ESG index and the SBI ESG Exclusionary Strategy Fund is highly unlikely to be due to chance.

The beta coefficient of 0.936 suggests that for each one-unit increase in the NIFTY 100 ESG index, the SBI ESG Fund increases by 0.936 units, holding other factors constant. This shows a strong and direct effect of the predictor variable on the dependent variable.

CVTS t-Test (72.067) t-value of 72.067 is extremely high, indicating that the beta coefficient is significantly different from zero. This further confirms the strength and significance of the relationship between the NIFTY 100 ESG index and the SBI ESG Exclusionary Strategy Fund.

The beta coefficient of 0.936 suggests that for each one-unit increase in the NIFTY 100 ESG index, the SBI ESG Fund increases by 0.936 units, holding other factors constant. This shows a strong and direct effect of the predictor variable on the dependent variable. Fund increases by 0.936 units, holding other factors constant. This shows a strong and direct effect of the predictor variable on the dependent variable.

A p-value of 0.000 for the beta coefficient indicates that the relationship between the NIFTY 100 ESG index and the SBI ESG Fund is statistically significant. The predictor variable is a highly meaningful contributor to the variance in the dependent variable.

Both the very high F-value and the low p-values for the F-test and beta coefficient confirm that the model is statistically significant and that the predictor variable has a meaningful and substantial effect on the SBI ESG Fund. In summary, the NIFTY 100 ESG index is an extremely effective predictor of the SBI ESG Fund, with the model demonstrating an exceptional fit and highly significant results.

Based on the above analysis for the relationship between the NIFTY 100 ESG index (predictor variable) and the Quantum ESG Best in Class Strategy Fund (dependent variable), a correlation coefficient of 0.957 indicates an extremely strong positive linear relationship between the NIFTY 100 ESG index and the Quantum ESG Best in Class Strategy Fund. This suggests that as the NIFTY 100 ESG index

increases, the Quantum ESG Best in Class Strategy Fund increases almost proportionally.

An R^2 value of 0.917 means that 91.7% of the variance in the Quantum ESG Best in Class Strategy Fund can be explained by the NIFTY 100 ESG index. This is the highest proportion of variance explained among all the models provided, indicating that the NIFTY 100 ESG index is an extremely effective predictor of the Quantum ESG Best in Class Strategy Fund's performance.The model explains 91.7% of the variance in the Quantum ESG Fund, indicating an outstanding fit and that the NIFTY 100 ESG index is an extremely effective predictor.
The standard error of 0.00236 is very small, which indicates that the model's predictions are highly accurate and very close to the actual values.

The F-value of 8063.889 is exceptionally high, reflecting that the regression model significantly improves the explanation of the variance in the Quantum ESG Best in Class Strategy Fund compared to a model without predictors. This high F-value demonstrates an excellent model fit.

The p-value associated with the F-test is 0.000, indicating that the model is statistically significant. This means the relationship between the NIFTY 100 ESG index and the Quantum ESG Best in Class Strategy Fund is highly unlikely to be due to random chance.

The beta coefficient of 0.957 suggests that for each one-unit increase in the NIFTY 100 ESG index, the Quantum ESG Best in Class Strategy Fund increases by 0.957 units, assuming all other factors are constant. This high beta value indicates a very strong direct effect of the predictor variable on the dependent variable.

The t-value of 89.799 is extremely high, indicating that the beta coefficient is significantly different from zero. This reinforces the strength and significance of the relationship between the NIFTY 100 ESG index and the Quantum ESG Best in Class Strategy Fund

A p-value of 0.000 for the beta coefficient indicates that the relationship between the NIFTY 100 ESG index and the Quantum ESG Best in Class Strategy Fund is statistically significant. The predictor variable is a highly meaningful determinant of the dependent variable.

CONCLUSION

The Quantum ESG Best in Class Strategy Fund ($\beta = 0.957$) has the highest beta coefficient, indicating the strongest sensitivity to changes in the NIFTY 100 ESG index. Small changes in the

NIFTY 100 ESG index result in relatively larger changes in the Quantum ESG Fund.

The Axis ESG Integration Strategy Fund, (β = 0.818) and the Quant ESG Equity Fund (β = 0.820) have the lowest beta coefficients among the funds listed, indicating they are the least sensitive to changes in the NIFTY 100 ESG index compared to the others.

The ICICI Prudential ESG Exclusionary Strategy Fund. (β = 0.912) and the SBI ESG Exclusionary Strategy Fund (β = 0.936) show higher sensitivity than the Axis ESG Integration Strategy Fund and Quant ESG Equity Fund but are less sensitive than the Quantum ESG Best in Class Strategy Fund.

This comparison shows how different funds respond to changes in the NIFTY 100 ESG index, with the Quantum ESG Fund being the most responsive and the Axis ESG Integration Strategy Fund being the least. The higher the beta coefficient, the greater the expected change in the dependent variable (fund performance) for a given change in the predictor variable (NIFTY 100 ESG index)

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