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STUDY OF INTEGRATION OF ESG SCORE IN PORTFOLIO CONSTRUCTION OF INDIAN MUTUAL FUNDS

Sachin Kumar & Nishi Bala

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Essay & Comments

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Sachin Kumar & Nishi Bala***

Abstract

In light of the increased interest in sustainable investment and the global regulatory reforms, this study investigates the application of Fama-French factor models to include ESG scores in portfolios with the goal of improving their efficacy. The purpose of the study is to look into how portfolio performance in Indian ESG mutual funds is affected by ESG integration. The study concluded that ESG integration improves portfolio performance, and higher-rated ESG mutual funds have a positive impact on the portfolio

Keywords: *ESG, Sustainable investment, Fama French, Mutual Fund*]

I

Introduction

Milton Friedman argued that businesses want to maximise profits for shareholders,[1] but this is being challenged by investors who are turning their attention to sustainable operations. Critics contest the conventional wisdom that says businesses only care about shareholder value by arguing that they have duties that go beyond making money, such as corporate social responsibility (CSR) for social and environmental welfare. According to a study by Schaefer[2], Orlitzky *et al.*[3], and Russo and Fouts,[4] a company's financial success and its social and environmental

* Assistant Professor, PG Department of Commerce S D College, Hoshiarpur, Punjab.
** Principal and Professor, Ludhiana Group of Colleges, Ludhiana, Punjab.

[1] Milton Friedman, *A Friedman Doctrine*: The Social Responsibility of Business Is to Increase Its Profits, N.Y. Times Mag., Sept. 13, 1970, at 32.

[2] B.P. Schaefer, *Shareholders and Social Responsibility*, 81 J. Bus. Ethics 297 (2008).

[3] Marc Orlitzky, Frank L. Schmidt & Sara L. Rynes, Corporate Social and Financial Performance: A Meta-Analysis, 24 Org. Stud. 403 (2003).

[4] M Michael V. Russo & Paul A. Fouts, *A Resource-Based Perspective on Corporate Environmental Performance and Profitability*, 40 Acad. Mgmt. J. 534 (1997)

contributions are positively correlated. This suggests that organisations that actively report on ESG should perform better than those that don't.

The United Nations' Millennium Development Goals, which sought to eradicate poverty, promote equality, and promote sustainable development, have had a substantial impact on investor mood since the 1970s. Human rights, sustainability, and social responsibility are further emphasised in the 2015 Sustainable Development Goals. Sustainable investing, sometimes referred to as Environmental Social Governance (ESG) or Socially Responsible Investment (SRI), is becoming more and more popular among investors who want to serve society as well as make money. By either eliminating businesses that don't adhere to particular criteria or investing in organisations that benefit society, it seeks to strike a balance between ethical considerations and investment decisions. This strategy might boost returns and bring in more funding for socially conscious businesses. Socially responsible investing (SRI) is the practice of making investments in businesses that exhibit "ethical" corporate behaviour toward all stakeholders, including shareholders, society, employees, customers, the government, and the environment. Investments that have passed a favourable screening procedure for the environmental, social, and governance criteria that indicate a company's degree of corporate sustainability are referred to as socially responsible (SR) investments. Investors can increase their wealth and satisfy their own unique ethical and value systems by implementing social and financial screening into their investment process through SRI. Sustainable firms are expected to outperform their competitors financially for a number of reasons, including higher revenues through innovation, more efficiency, and a decreased chance of environmental expenditures like fines and lawsuits. A company's environmental effect, social ties, and governance procedures are all assessed by the ESG score, which offers insights into sustainability initiatives and the function of corporate governance in attaining stable long-term returns and sustainable growth.[5] Environmental, social, and governance, or ESG, is a phrase that many stakeholders and shareholders use today, and evaluating a company's ESG score has become a standard method of determining the sustainability and impact of global organisations. This study investigates the connection between unusual mutual fund returns and sustainable company practices. To explain this phenomenon, theories such as the Fama-French factor model and the three-factor model are used. The study also emphasises the increasing awareness of how investors affect a company's sustainability profile because their choices can have a big impact on business operations and promote the use of ethical and sustainable business models.

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[5] Jin Park, Wooyoung Choi & Seung Uk Jung, *Exploring Trends in Environmental, Social, and Governance Themes and Their Sentimental Value over Time,* 13 Front. Psychol. 890435 (2022)

A company's reaction to issues such as climate change, pollution, biodiversity loss, deforestation, water scarcity, and energy is assessed under the "Environmental" component of ESG. [6]ESG is an extension and enhancement of the ideas of the green economy, corporate social responsibility, and ethical investing. It refers to significant benchmarks for the modern world society to measure the degree of sustainable development. [7]Environmental factors, such as policies, sustainable products and services, waste management, and resource efficiency, evaluate a company's environmental commitment. By addressing global concerns about the health of the earth, these criteria assist stakeholders in identifying businesses that prioritise sustainable operations. The social component of ESG looks at how a business handles its relationships with its workers, clients, and neighbours, taking into account things like diversity in the workplace, health and safety protocols, working conditions, and the effects on the neighbourhood. This aspect is crucial for assessing ethical standards and creating a supportive corporate culture. Governance assesses a business's internal controls, leadership, compensation, audits, and shareholder rights. It places a strong emphasis on board diversity, accountability, and transparency. It evaluates the diversity of the board and the calibre of management, guaranteeing impartiality, openness, and honesty. By doing this, conflicts of interest are avoided, responsible management is practised, and a company culture that values moral conduct and adherence to legal requirements is fostered.

Value of ESG

Because of the growing awareness of the long-term impacts of social inequality, climate change, and corporate governance on social stability and economic stability, ethical business practices and sustainability are gaining popularity worldwide and drawing in talent, investors, and customers.[8] Evidence suggests[9] that companies with good ESG profiles will likely outperform less sustainable ones over the long run, giving reduced risks and higher profits, which is why ESG investment is becoming more popular. This trend is impacted by a generational shift in investment preferences, with more investors choosing assets that reflect their values

[6] M. Qiu & H. Yin, *An Analysis of Enterprises' Financing Cost with ESG Performance Under the Background of Ecological Civilization Construction,* 36 J. Quant. Tech. Econ. 108 (2019).
[7] Wan Mohammad W. Mohd & Shaharinah Wasiuzzaman, *Environmental, Social and Governance (ESG) Disclosure, Competitive Advantage and Performance of Firms in Malaysia,* 2 Cleaner Envtl. Sys. 100015 (2021).
[8] Elena Petrova, *Organizational Culture and Employee Engagement: Case of Industrial Enterprises,* 118 SHS Web Conf. 01064 (2023).in Park, Wooyoung Choi & Seung Uk Jung, *Exploring Trends in Environmental, Social, and Governance Themes and Their Sentimental Value over Time,* 13 Front. Psychol. 890435 (2022)
[9]

and environmental concerns, as well as regulatory changes and policy measures supporting sustainable finance, such as impact funds.[10] According to Srinivasan and Singh,[11] analysis of ESG factors pertaining to different companies' goodwill, the Indian stock market is unable to adequately reflect the influence of environmental rating. [12]Institutional investors, asset management firms, pension funds, financial institutions, and other stakeholders are increasingly using ESG reports and indices to assess and contrast a company's performance over time with that of its rivals.

In order to comprehend the connection between industry dynamics, share pricing, and the requirement for customised adjustment factors for green stocks, this literature review will examine studies, theories, and empirical data. It seeks to add to the continuing discussion about the financial assessment of Indian mutual funds. According to Ameer and Othman,[13] businesses that implement CSR policies may see an increase in valuation as a result of better governance, social, and environmental performance, all of which have an immediate effect on the cost of equity capital. The cost of equity may be lowered by improving CSR disclosure. Sahut and Pasquini-Descomps,[14] investigated the impact of Environmental, Social, and Governance (ESG) on performance in Switzerland, the United States, and the United Kingdom between 2007 and 2011. The study employed a non-parametric kernel regression to discover that stock performance based on ESG-score changes is nonlinear.

The study was done in response to the widely accepted SRI idea of "the cost of capital" reduction, which states that socially responsible structures generate higher value for enterprises by lowering the cost of capital. [15]The study also investigates the knowledge effect, which proposes that high ESG ratings result in decreased residual risk. An analysis of Korean enterprises,[16] from 2011 to 2019, discovered that,

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[10] Monika Mijal & Karolina Niewińska, *Is It Worth Imitating Other Investors? Determinants of Effective Investment Strategies Among Students*, 2024 Studia i Materiały Wydz. Zarządzania UW 141 (2024).

[11] S. Srinivasan & R.K. Singh, *The Persistence of Green Goodwill*, 12 Env't Dev. & Sustainability 825 (2010).

[12] B.M. Huber, M. Comstock, D. Polk & L.L.P. Wardwell, *ESG Reports and Ratings: What They Are, Why They Matter*, Harv. L. Sch. F. on Corp. Governance & Fin. Reg. (July 27, 2017), https://corpgov.law.harvard.edu/2017/07/27/esg.

[13] R. Ameer & R. Othman, *Sustainability Practices and Corporate Financial Performance: A Study Based on the Top Global Corporations*, 108 J. Bus. Ethics 61 (2012).

[14] J.M. Sahut & H. Pasquini-Descomps, *ESG Impact on Market Performance of Firms: International Evidence,* 19 Mgmt. Int'l 40 (2015).

[15] M.P. Sharfman & C.S. Fernando*, Environmental Risk Management and the Cost of Capital*, 29 Strategic Mgmt. J. 569 (2008).

[16] J. Choi & H. Kim, *The Analysis of ESG Ratings Between Korean and Global Agencies from the*

depending on a firm's financial performance, ESG is generally favourably associated with firm value. However, this relationship lessens when performance deteriorates, emphasising the link between ESG policies and business value. The study also looked into information asymmetry, finding that the influence of ESG on business value is stronger in firms with more information asymmetry. This shows that organisations with an emphasis on ESG can provide superior investment prospects, resulting in higher valuation. Derwall *et al*.[17] discovered that socially responsible investing methods, including high-value US corporations with good environmental and social scores, generated a positive alpha of 4.155% per year. Other studies, such as Kempf and Osthoff,[18] Pollard, Sherwood and Klobus,[19] and Jin,[20] have discovered positive anomalous returns in ESG portfolios. Jin (2018) discovered that ESG risk variables were relevant for returns but varied over time. Researchers had also highlighted that it is difficult to assess the ESG performance of a corporation and suggested various innovative methods for assessment. Park and Ravenel,[21] discuss the problems of incorporating ESG techniques into business operations, such as standardized accounting schemes and information asymmetry.

Zeidan and Spitzeck,[22] presented the Sustainability Delta approach for evaluating the impact of ESG scenarios on business value. However, the methodology has limitations, such as information requirements, applicability to single-product organizations, and uncertainties in assumptions about Sustainable Business and Full Sustainable Business routes. Naffa and Fain,[23] found no significant evidence that ESG factors are relevant elements to supplement the FF5 model, however they did accept that ESG can quantify investment portfolio risks through performance attribution. Mercereau *et al*.[24] (2022) investigated the relationship between ESG

Sectoral Perspective, 18 Hanguk Hyoksin Hakhoeji 135 (2023).

[17] J. Derwall, N. Guenster, R. Bauer & K. Koedijk, *The Eco-Efficiency Premium Puzzle*, 61 Fin. Analysts J. 51 (2005).

[18] A. Kempf & P. Osthoff, *The Effect of Socially Responsible Investing on Portfolio Performance*, 13 Eur. Fin. Mgmt. 908 (2007).

[19] J.L. Pollard, M.W. Sherwood & R.G. Klobus, *Establishing ESG as Risk Premia,* 16 J. Inv. Mgmt. 32 (2018)

[20] I. Jin, *Is ESG a Systematic Risk Factor for U.S. Equity Mutual Funds?*, 8 J. Sustainable Fin. & Inv. 72 (2018).

[21] Park, J., Choi, W., & Jung, S. U. (2022). *Exploring trends in environmental, social, and governance themes and their sentimental value over time,* Frontiers in Psychology, 13, 890435

[22] R. Zeidan & H. Spitzeck, *The Sustainability Delta: Considering Sustainability Opportunities in Firm Valuation,* 23 Sustainable Dev. 329 (2015).

[23] H. Naffa & M. Fain, *A Factor Approach to the Performance of ESG Leaders and Laggards*, 44 Fin. Res. Letters 102073 (2022).

[24] B. Mercereau, L. Melin & M.M. Lugo, *Creating Shareholder Value Through ESG Engagement*, 23 J. Asset Mgmt. 550 (2022).

elements and shareholder value creation, employing substantial data on metrics, financial variables, and regional considerations.

The literature suggests that ESG score integration affects portfolio performance and risk characteristics in market using Fama-French factor models. ESG scores alter stock pricing globally and vary between regions. Empirical evidence from various markets, including the Nordic region, reveals a complex relationship between ESG scores and stock performance. Sustainability considerations significantly impact firm valuation. The proposed methodologies, such as the Sustainability Delta, aim to fill gaps in existing ESG methodologies and provide a deeper understanding of the relationship between sustainability and firm value.

ESG investments have become increasingly important in recent decades, no longer limited to huge institutional investors. ESG-labelled mutual funds offer a mainstream alternative for regular investors.[25] ESG assets have proven resilient in the face of economic and regulatory instability, hitting $30 trillion in 2022, according to the Global Sustainable Investment Alliance's (GSIA) 2022 report, and we project them to exceed $40 trillion by 2030, at a CAGR of 3.5% as the market matures. In India, the ESG mutual fund AUM is also increasing. The total asset under management (AUM) of ESG funds in India was $1,176.6 million. This represents a huge gain from January 31, 2020, when the AUM was US$331.4 million. According to the research, ESG score integration influences portfolio performance and risk characteristics in markets using Fama-French factor models. ESG scores affect stock prices globally and vary by location. Empirical research from numerous markets indicates a complex relationship between ESG rankings and stock performance, but do ESG ratings of mutual funds also affect their performance? In this paper, we will study the behaviour of the ESG rating of mutual funds when it is combined as one of the factors with the Fama-French 3-factor model.

III

Data and Methodology

There are 9 ESG-themed mutual funds in India. The detail of which is provided in the following table.

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[25] T. Barko, M. Cremers & L. Renneboog, *Shareholder Engagement on Environmental, Social, and Governance Performance*, J. Bus. Ethics (2021), https://doi.org/10.1007/s10551-021-04850-z.

Table 1

AMC	Fund Scheme
Mirae Asset	Mirae Asset Nifty 100 ESG Sector Leaders ETF (MANESG)
Quantum India	Quantum India ESG Equity Fund - Regular Plan – Growth (QIESG)
Invesco India	Invesco India ESG Equity Fund - Regular Plan – Growth (IIESG)
Axis	Axis ESG Equity Fund - Regular Plan - Growth (AESG)
Aditya Birla Sun Life	Aditya Birla Sun Life ESG Fund - Regular Plan – Growth (ABSESG)
Kotak	Kotak ESG Opportunities Fund - Regular Plan – Growth (KESG)
ICICI Prudential	ICICI Prudential ESG Fund - Regular Plan – Growth (IPESG)
Quant	Quant ESG Equity Fund - Regular Plan (QESG)
SBI Magnum	SBI Magnum Equity ESG Fund - Regular Plan – IDCW (SMESG)

Data of daily Net Asset value (NAV) was collected from the official website of AMFI India. Most of these mutual fund schemes were started post-COVID period. The last mutual fund scheme IIESG has an inception date of 22nd March 2021. So the data on the NAV of all ESG Mutual funds was collected from 1st April 2021 till 30th November 2024.

Fama-French 3 Factors (FF3F)

The Fama-French model[26] seeks to describe stock returns using three criteria: (1) market risk, (2) outperformance of small-cap businesses relative to large-cap companies, and (3) outperformance of high book-to-market value companies over low book-to-market value companies. To determine the market risk premium, the BSE ESG100 index's daily closing price was taken as the base for the market performance of ESG stock. The 10-year government bond rate is considered the risk-free rate of return. The daily return of the BSE ESG 100 was calculated, and the risk-free rate of return was deducted from the daily index return. We collected the data on the AUM of all the ESG Indian mutual funds. The daily return of small AUM mutual funds is calculated, and the daily return of large AUM is also calculated. The

[26] E.F. Fama & K.R. French, *Common Risk Factors in the Returns on Stocks and Bonds*, 33 J. Fin. Econ. 3 (1993).

difference was calculated between the return of a small AUM mutual fund and a high AUM Mutual fund to find out the small minus big (SMB) effect. To find out the value factors, the NAV divided by the face value of the mutual fund was considered. Over and above return is calculated by reducing the small-value mutual fund returns from the higher-value mutual fund. The formula for Fama and French three-factor model is mentioned below

$$Rit-Rft=\alpha it+\beta 1(RMt-Rft)+\beta 2SMBt+\beta 3HMLt+\epsilon it$$

Where Rit = total return of a stock or portfolio i at time t

Rft = risk free rate of return at time t

RMt = total market portfolio return at time t

Rit−Rft = expected excess return

RMt−Rft = excess return on the market portfolio (index)

SMBt = size premium (small minus big)

HMLt = value premium (high minus low)

β1,2,3 = factor coefficients

One more factor of ESG return was added in FF3F. CRISIL have ranked the Indian ESG mutual funds according to their ESG score, which is given below

Table 2

Scheme	E Score	S Score	G score	Total Score
MANESG	62	61	75	67
QIESG	60	59	75	66
IIESG	58	58	74	64
AESG	57	57	74	64
ABSESG	57	57	73	63
KESG	57	59	72	63
IPESG	58	57	72	63
QESG	55	60	71	63
SMESG	57	56	70	62

The E score. S score and G score were calculated by CRISIL according to the score of the stock portfolio held by these ESG mutual funds. The weighted average score was generated by assigning 35% weight to E, 25 % weight to S Score and 40% weight to G score to arrive at the total score. The difference between the daily return of a higher-rated ESG mutual fund and a lower-rated mutual fund was computed to arrive at the fourth factor top minus bottom (TMB).

IV

Results and Analysis

We analyse the data collected from April 2021 to November 2024 for 9 ESG mutual funds to examine the effect of ESG score on the mutual fund portfolio. The basic descriptive statistics are presented in Table 3 below

Table 3

	Risk Premium RETBSE_RF	**Size effect SMB**	**Value effect HML**	**ESG effect TMB**
Mean	0.029858	0.011895	0.020276	-0.013859
Median	0.056480	0.051997	-0.005329	-0.017344
Maximum	13.01072	2.531612	2.415711	1.092277
Minimum	-7.717620	-4.970884	-1.548347	-1.222468
Std. Dev.	1.010461	0.729970	0.451411	0.283117
Skewness	1.404246	-0.836273	0.226375	0.061286
Kurtosis	37.95032	7.510014	5.003105	3.961939
Jarque-Bera	46000.53	865.7333	157.8016	35.18481
Probability	0.000000	0.000000	0.000000	0.000000
Sum	26.81240	10.68187	18.20782	-12.44568
Sum Sq.	916.6657	478.0992	183.1528	72.07193
Sum Sq. Dev.	915.8651	477.9722	182.7836	71.89944
Observations	898	898	898	898

The above table shows the results of descriptive statistics. Daily data for 898 days were considered for observation. Risk premium is the return of the BSE ESG index over and above the risk-free rate of return. The size effect reflects how small-sized mutual funds perform better than large mutual funds. Value effect shows how higher valued mutual fund performs over and above lower valued mutual funds. The TMB shows how top ESG-scored mutual funds perform over bottom-rated mutual funds.

Table 4

αit	0.019905	0.1284
Market Premium RETBSE_RF	0.459547	0.0000
Size effect SMB	0.346839	0.0000
Value Effect HML	0.053697	0.2756
ESG Effect TMB	0.357573	0.0000

Table 4 shows the results of FF3F with the ESG rating factor of Indian mutual funds. Constant value is not significant, but the coefficient 0.019905 is very low. Alpha or constant is insignificant, but a low coefficient still indicates that the model covers most of the variables. Marlet premium 0.459547 is significant, which reflects that ESG mutual funds generate better returns than BSEESG100 returns. The size effect , 0.346839, is also significant, which reflects that small-sized mutual funds perform better than large-sized mutual funds. Value effect HML is not significant. ESG score factor TMB 0.357573 is also significant, which reflects that top-rated ESG firms generate more return than lower-rated mutual funds. These data suggest that ESG considerations can improve portfolio performance, particularly in mutual fund portfolios. Investors and portfolio managers should prioritise ESG factors while making long-term investments to maximise value. The portfolio manager can add ESG mutual funds to their portfolios, and higher ESG-rated mutual funds have an edge over lower-rated mutual funds.

V

Conclusion

The COVID-19 pandemic caused economic difficulties, including volatility and falls in global financial markets. Lockdowns and supply chain interruptions reduced earnings, which impacted stock prices. Despite the fact that market morale and economic stability have improved, the pandemic remains a major concern. Central banks have raised interest rates in response to inflationary pressures, which can limit corporate earnings and consumer spending, weighing on stock values. The protracted conflict in Ukraine has produced worldwide economic uncertainty, affected energy supply and generated rises in oil and gas prices. The crisis in Gaza has increased geopolitical risks, causing investor caution and limited market liquidity, affecting returns. In this period of turbulence, mutual funds seem to be a safer investment for retail investors and portfolio managers. In our study, we had included one more factor of ESG score in the FF3F model to examine its effect on the portfolio. The results indicate that, in the post-COVID period, better ESG-scored mutual funds perform better than lower-rated mutual funds. Better ESG-scored firms are expected to outperform their competitors financially for a number of reasons, including higher revenues through innovation, more efficiency, and a decreased chance of environmental expenditures like fines and lawsuits. A company's environmental effect, social ties, and governance procedures are all assessed by the ESG score, which offers insights into sustainability initiatives and the function of corporate governance in attaining stable long-term returns and sustainable growth. Environmental, social, and governance. The study has a limitation in that post-COVID period data is used for analysis.