Major Research Report

on

DO HIGHER ESG SCORES LEAD TO BETTER STOCK RETURNS? AN ANALYSIS OF 30 COMPANIES IN THE NIFTY 100 ESG INDEX

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CERTIFICATE

This is to certify that the Major Research Project titled **"Do Higher ESG Scores Lead to Better Stock Returns? An Analysis of 30 Companies in the NIFTY 100 ESG Index"** is submitted by Dhiraj Kumar Gupta, 2K23/DMBA/151 to Delhi School of Management, Delhi Technological University, in partial fulfillment of the requirement for the award of the degree of Masters in Business Administration during the academic year 2024–2025.

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DECLARATION

I hereby declare that the project report entitled **"Do Higher ESG Scores Lead to Better Stock Returns? An Analysis of 30 Companies in the NIFTY 100 ESG Index"** has been carried out by me and submitted in partial fulfillment for the award of the degree of Master of Business Administration of the Delhi School of Management, Delhi Technological University, during the year 2024-2025. The matter embodied in this report has not been submitted to any other university or institute for the award of any other degree or diploma.

Dhiraj Kumar Gupta
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The satisfaction of successfully completing my project gives me immense pleasure and happiness. This project would have been incomplete without mentioning the names of the people who have rightly guided me. I consider it my privilege to express my gratitude to all who have helped me in the success of this project.

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EXECUTIVE SUMMARY

This research paper explores the connection between ESG (Environmental, Social, and Governance) scores and financial performance in the context of Indian capital markets, focusing on 30 companies listed in the NIFTY100 ESG Index between 2020 and 2023. The study was driven by a central question: Do higher ESG scores lead to better stock returns? With the rise of sustainable and responsible investing globally, Indian investors and corporates are increasingly aligning with ESG principles, but there remains uncertainty about whether such alignment offers real financial advantages. Using a combination of ESG scores, controversy levels, ESG risk classifications, and annual stock return and volatility data, the study attempts to empirically answer this question for Indian large-cap companies.

The results show that the connection between ESG performance and stock returns is complex instead of direct. High ESG-rated companies did not always yield the highest financial returns. For example, Tata Steel and Tata Motors, which had low or even mediocre ESG scores, had some of the highest returns in the sample, although they also had high volatility. On the other hand, NTPC, Siemens, and Coal India were top performers on ESG indicators and provided good, stable returns, in accordance with the theory that good ESG performance underpins long-term resilience.

Notably, the research established a moderate negative correlation between ESG scores and volatility, indicating that firms with superior ESG practices have more stable stock prices. This is in line with the argument that ESG is less of a return enhancer and more of a risk management tool. Firms such as Nestlé India, Sun Pharma, and Hindustan Unilever followed this by delivering modest but reliable returns with low volatility and high ESG scores, which will appeal to risk-averse investors who are interested in long-term investment.

The research also explores qualitative ESG aspects like controversy scores and ESG risk ratings. Firms with high controversy scores or extreme ESG risk ratings like Reliance Industries and Coal India tended to still perform well on returns but exhibited greater volatility and reputational risk. Conversely, low controversy companies with

low ESG risk, such as TCS and Bajaj Auto, provided less predictable performance while reiterating that controversy and risk categories might be valuable flags for investors concerned about long-term stability and issues related to governance.By examining the three ESG pillars separately, the research noted that most companies had uneven scores, doing well in one pillar but poor in another. For instance, IT companies were likely to do poorly on environmental aspects but have robust governance systems. This underlines the need for investors to move beyond the general ESG score and examine the specifics of each ESG pillar to make well-informed choices.

With regards to control variables, the research also revealed that market capitalization and P/E values also had an impact on performance, which revealed that large companies with prominent brand presence and high investor confidence tended to have better valuation multiples irrespective of their ESG scores. This hints at a possible size and industry bias in ESG ratings as well as investor behavior, wherein ESG might not be the chief determinant of returns, particularly in an emerging market like India.

In summary, the research does not identify ESG scores as a definite route to future higher stock returns. Rather, it offers a more nuanced picture: high ESG scores provide financial stability and minimize investment risk, which is desirable in ambiguous or volatile market conditions. According to the study, ESG considerations should form part of an overall, multi-faceted investment approach, not the primary factor in choosing stocks. To Indian investors, the results give a better understanding of the present-day ESG reality and its repercussions—financial, reputational, and strategic.
This research is especially well-timed in light of the worldwide trend towards sustainability in the post-COVID period, and it adds rigorous empirical evidence to the expanding literature on ESG in emerging markets. It also highlights the imperative for enhanced ESG disclosure, regulation, and industry-sector benchmarks to make ESG investing more consistent and credible in the Indian financial system.

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CHAPTER I: INTRODUCTION

1.1 Background of the Study

The NIFTY100 ESG Index is created by selecting constituents of the NIFTY 100 (the underlying index) and re-weighting or filtering them according to ESG performance metrics. Significantly, the index approach includes the use of ESG scores and free-float market capitalization when calculating weights – firms with more favorable ESG scores are given higher index weightings, offset for their size in the market.

These indices do not include companies involved in the business of tobacco and alcohol, controversial weapons and gambling operations. This excludes any companies which are exposed to any issues related to major Environmental, Social or Governance controversies from selection in the index. Besides that, the NIFTY100 Enhanced ESG Index only include companies that obtain a normalized ESG score of at least 50%. This strategy ensures that the sectoral mix of the ESG index is comparable to the parent NIFTY 100 (to ensure broad market exposure), while tilting the portfolio in favor of companies with better ESG scores. Indeed, the NIFTY100 ESG Index aims to reward sustainability leaders without straying far from the broader market sector mix.

1.1.1 NIFTY100 ESG indices uses robust ESG research framework

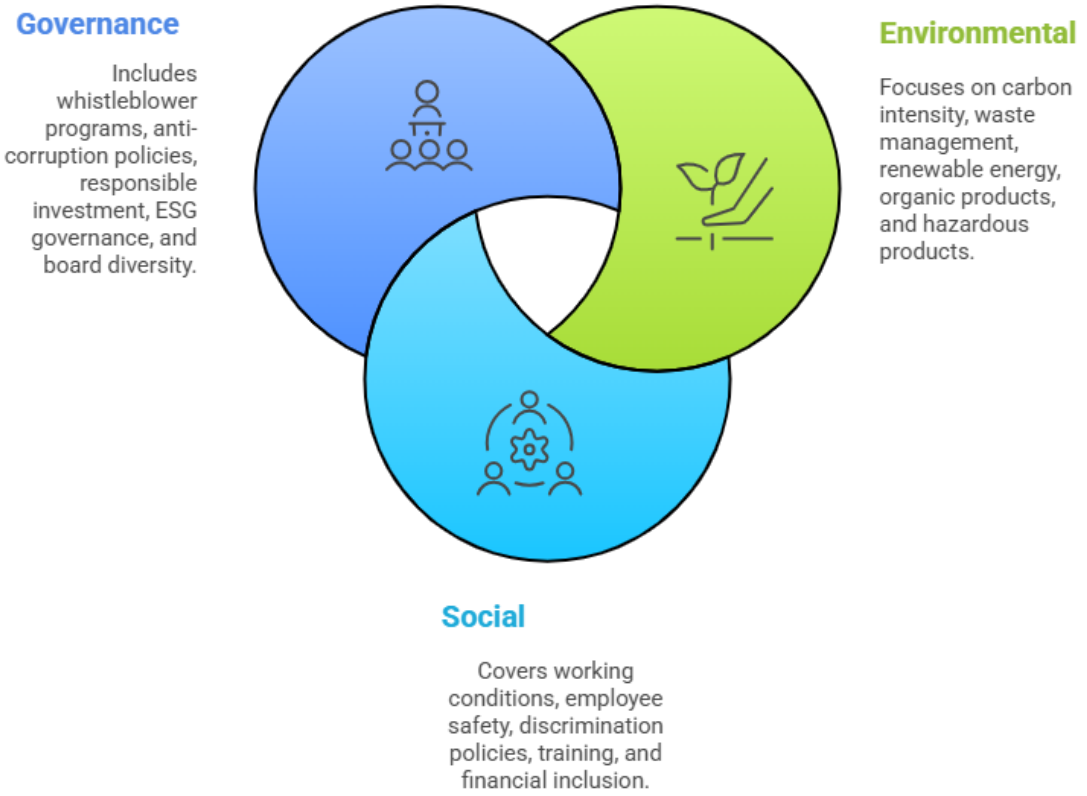
In NIFTY100 ESG indices, a company is broadly measured on 3 main pillars: Environmental (E), Social (S) and Governance (G). The research is conducted by Sustainalytics, one of the global leaders in ESG research.

Environmental: The environmental factor considers the impact of the firm's activities on the environment, such as the carbon intensity trend, the recycling and waste management process, the growth of renewable energy, etc. The environmental pillar consists of 52 parameters that a corporation is evaluated on.

Social: The social element encompasses a company's policies and the impact of its operations on working conditions, human rights, health and safety standards, financial inclusion, and other issues. The social pillar consists of 52 indicators.

Governance: The governance factor assesses the effectiveness of processes and policies relevant to corporate governance, business ethics, fraud and anti-corruption measures, public policy, etc. The governance pillar includes 34 indicators that reflect the various aspects of governance.

Exhibit 1: Control Variables for NIFTY100 ESG Companies (2020-2023)

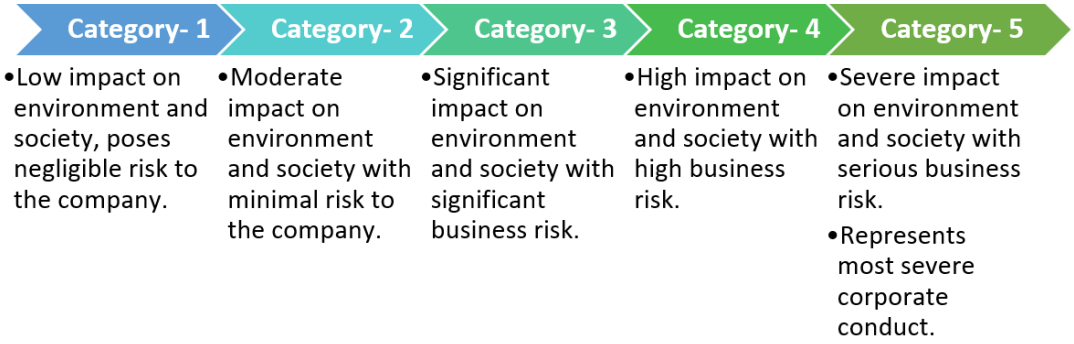


1.1.2 Controversy analysis

An important component of ESG research is examining a company's involvement in incidents and controversies, which can indicate a lack of ESG compliance and consequently higher risk to investors. The controversial analysis offers for a more sophisticated view of the factors influencing a company's ESG performance. Controversy analysis identifies situations with reputational risk and measures the severity of the event.

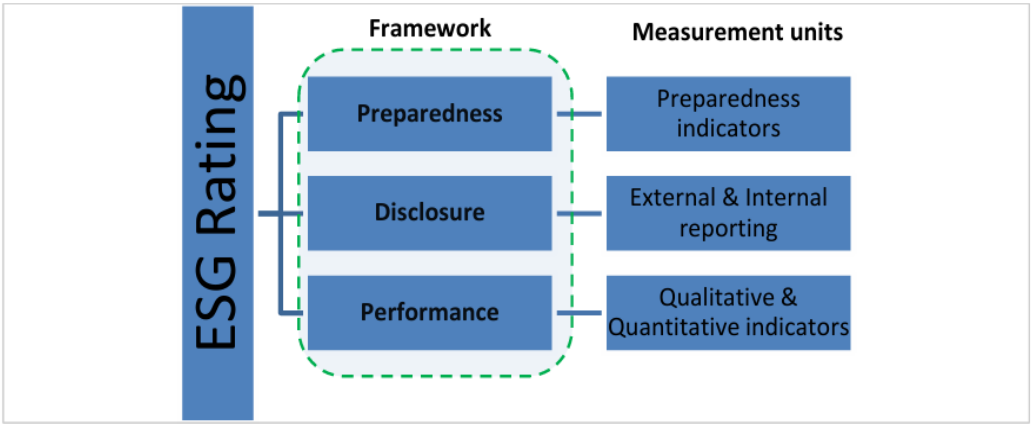
Events are classified into 10 areas across E, S and G Pillars and are scored on a scale from one to five, depending on the reputational risk to the company and potential impact on stakeholders. "Category 1" controversy event has low impact whereas "Category 5" controversy event has the highest, indicating a severe impact on the involved stakeholders. Firms with controversy category 4 and 5 are excluded from the NIFTY100 ESG indices.

Exhibit 2 : Controversy Analysis Process



The ESG scoring process for the index relies on a structured evaluation of each company's performance on environmental, social, and governance criteria. NSE's ESG index uses data from specialized research providers (e.g., Sustainalytics or Yahoo Finance) to assign each company an ESG score, typically on a scale from 0 to 100.

Exhibit 3: Sustainalytics rating framework



The scoring framework developed by Sustainalytics, for instance, assesses firms across three pillars – E, S, and G – and within each pillar evaluates three dimensions: Preparedness (the robustness of a company's policies and programs), Disclosure

(transparency and reporting quality), and Performance (actual outcomes, including any incidents or controversies). Each indicator in this framework is scored from 0 to 100, weighted by its relevance to the company's industry, and then aggregated into an overall ESG score for the firm. Based on these scores, companies can be graded or classified (for example, one methodology categorizes scores into grades from A+ for the highest scores down to D for the poorest performers). Furthermore, leading ESG rating agencies like Sustainalytics also translate a company's ESG score into an ESG Risk Rating – grouping companies into risk categories such as Negligible, Low, Medium, High, or Severe risk, depending on how much unmanaged ESG risk the firm is exposed to. This means that a higher ESG score usually corresponds to a lower ESG risk category (e.g., a company with strong ESG practices might be classified as having low or negligible ESG risk). The NIFTY100 ESG Index, by focusing on higher-scoring companies and excluding severe controversies, inherently tilts toward companies in the better ESG risk categories, aiming to form a portfolio of sustainability leaders.
A company's ESG performance based on a defined process which include:

- Review of company reporting (annual reports, CSR reports, publicly available policies etc.)
- Review of external sources (newspapers, NGOs, publications etc.)
- Analysis by an experienced analyst
- Structural peer review
- Company feedback
- Research process underpinned by detailed and stringent Quality Management System.

The company is assessed annually based on annual filings and other sources (as mentioned above) and on an ad-hoc basis in case of any controversy/incident pertaining to ESG. Overall, the emergence of indices like the NIFTY100 ESG reflects a growing confidence that "doing well" on ESG can go hand-in-hand with "doing well" in financial terms. The background context for this research is set by the convergence of investor interest in sustainable investing, the establishment of structured ESG performance benchmarks in India, and ongoing debates on whether high ESG ratings truly translate into better stock market outcomes. The NIFTY100

ESG Index, with its defined methodology and historical data, provides an excellent laboratory to study this question in the Indian context. The present study will build on these insights by delving into recent data (2020–2023) and examining whether the patterns suggested by earlier index performance and ESG theory hold true in the latest period, especially considering the disruptive impact of COVID-19 and the subsequent market recovery.

1.2 Problem Statement

The rise of ESG investing worldwide – and the creation of indices like NIFTY100 ESG – is predicated on the belief that good ESG performance can coincide with good financial performance. However, a clear consensus has not been reached in academic and practitioner circles about the strength or direction of this relationship, especially in emerging markets like India. The central problem this research addresses is the uncertainty and debate over whether higher ESG scores actually lead to better stock returns (and/or lower investment risk) for companies, or whether the apparent performance of ESG indices is simply incidental or driven by other factors.

On the one hand, strong arguments and some data point to a beneficial relationship between ESG and financial performance. Businesses with strong ESG policies are believed to use resources more effectively, manage reputational and regulatory risks better, and have a better understanding of long-term strategy, all of which may increase their long-term resilience and profitability. Portfolios skewed toward high-ESG stocks, for instance, saw lower volatility and drawdowns than conventional portfolios during the COVID-19 pandemic, a real-time "stress test" for corporations. This suggests that ESG strengths offered downside protection during a crisis.

On the other hand, there is research suggesting that the relationship may be weak or more complex. A comprehensive global analysis reported virtually no statistically significant relationship between ESG ratings and stock returns in the long run. This perspective argues that markets may already price in any advantages of ESG, or that ESG scores might be correlated with firm characteristics (like size or industry) that confound their effect on returns. In some cases, firms that excel in ESG might sacrifice short-term profits for sustainability investments, potentially dampening stock

performance, or investors might accept lower returns from such firms as a trade-off for aligning with values (the so-called “ethical penalty” hypothesis). Moreover, the variability in ESG ratings across different agencies and the evolving nature of ESG disclosures introduce noise – investors might be uncertain about the “true” ESG performance of a firm. In India, ESG investing is a relatively newer phenomenon, and the evidence is sparse on how ESG scores influence stock behavior. The NIFTY100 ESG Index’s slight historical outperformance raises the question: Is that outperformance attributable to ESG factors, or could it be due to other characteristics of the constituent companies (such as size, sector dominance, or market momentum)? In other words, the problem boils down to identifying whether ESG is a determinant of stock returns or merely correlated with other determinants.

The specific problem this study investigates is thus: Do higher ESG scores (and related aspects like lower ESG risk category and fewer controversies) cause or coincide with higher stock returns for NIFTY100 ESG companies, and how do these ESG factors relate to stock volatility? Within this, several sub-problems or challenges are recognized:

While the NIFTY100 ESG Index as a whole has been comparable to the broad market, individual companies within the index vary in ESG scores. It’s unclear if the top ESG-rated companies consistently outperform the lower-rated ones in stock returns, or if the relationship is non-linear.

The period 2020–2023 includes abnormal market conditions (a sharp crash and recovery). The problem includes determining whether ESG leaders had more resilience (smaller losses, quicker recovery) compared to ESG laggards during the COVID shock, and whether any such effect persisted afterward.

Controversy events pose a problem for companies and their investors; a single major ESG scandal can erase years of reputation-building. Does avoiding such controversies (or being in a low controversy category) correlate with better stock performance in the sample? Conversely, do companies that suffered controversies see a measurable hit to their stock returns or added volatility relative to peers?

ESG risk categories (like “High” vs “Low” ESG risk) might capture nuances that raw ESG scores don’t. The study problem includes examining if being categorized in a better ESG risk tier is associated with better return outcomes, which would justify the use of these categories by investors for decision-making.

In essence, the problem statement is anchored in the lack of clear evidence in the Indian market context: Investors and stakeholders need to know if pursuing ESG excellence is financially rewarding or at least prudent from a risk management perspective. This research problem has practical significance – if a strong positive relationship is found, it would encourage more capital allocation to ESG-compliant firms; if no relationship or a negative relationship is found, it might suggest re-evaluating the assumptions behind ESG investment strategies in India. By analyzing data from the NIFTY100 ESG Index, which provides a natural testing ground (since it isolates companies already meeting certain ESG criteria), the study seeks to shed light on this problem and fill the knowledge gap for the benefit of both academia and the investment community.

1.3 Objectives of the Study

Building on the research focus and the problem outlined earlier, this study sets out the following key objectives:

- To explore the link between ESG scores and stock returns for companies listed in the NIFTY100 ESG Index from 2020 to 2023. The goal is to assess whether companies with higher ESG scores tend to deliver better annualized returns. This will involve analyzing correlation trends and comparing the average returns of firms across different ESG score brackets.
- To examine how ESG risk levels and controversy involvement affect stock performance and volatility. Specifically, the study will investigate whether companies classified as low or negligible ESG risk outperform or show less volatility than those in higher-risk categories. It will also assess the impact of major ESG-related controversies (if any occurred among the sample companies) on stock returns, under the assumption that serious controversies may hurt investor confidence and harm performance.

- To compare ESG leaders and laggards in terms of risk and return. This involves evaluating whether firms with high ESG scores experience less return volatility—suggesting more stable stocks—compared to their lower-scoring peers. The study may also assess risk-adjusted returns (e.g., return-to-volatility ratios) to determine if ESG-leading companies offer more favorable investment profiles.

By tackling these objectives, the study aims to deliver a well-rounded analysis of whether strong ESG performance translates into superior stock returns within the NIFTY100 ESG Index.

Objective (1) investigates the direct relationship between ESG scores and returns.

Objective (2) brings in qualitative ESG dimensions like risk ratings and controversies.

Objective (3) pits ESG leaders against laggards to test the theory that more sustainable companies are both less risky and potentially more rewarding.

Objective (4) strengthens the analysis by ensuring the results aren't skewed by other influencing factors. Together, these angles provide a comprehensive answer to the central research question.

In light of the above context, this study revolves around the correlation between ESG scores and stock performance of listed companies in the NIFTY100 ESG Index. It focuses particularly on the duration from 2020 to 2023, which comprises the COVID-19 crisis and the subsequent recovery, and thus provides a recent commentary on ESG investing in India. By concentrating the analysis to constituents of the NIFTY100 ESG Index, the study targets a population of large-cap firms already screened for some basic level of compliance with ESG factors (as part of the selection criteria in the index). Amongst this narrow sample population, the paper explores differences in:

• ESG Scores: The overall ESG ratings of the companies (as provided by rating agencies like Yahoo Finance), treating these scores as a measure of how well each firm performs on environmental, social, and governance issues.

• ESG Risk Categories: Classifications of companies into risk levels (e.g., negligible, low, medium, high, severe ESG risk) based on their ESG score and underlying risk factors. This adds a qualitative dimension – for example, a company

might have a “Low ESG Risk” rating which complements the numeric ESG score by indicating strong management of material ESG issues.

• Controversy Levels: The recorded level of ESG-related controversies for each company, if any, over the period. This could include any major incidents or negative news (environmental breaches, governance scandals, etc.) that were severe enough to be categorized (on scale from 1 to 5) and potentially lead to exclusion from the index if above a threshold. Controversy level is an important focus because it represents real-world events that may test investor confidence and impact stock performance.

• Stock Returns: The financial performance of the companies’ stocks, measured in terms of annualized returns over the period (and possibly year-by-year returns from 2020 through 2023). This indicates how investors in these companies fared in terms of capital gains (and implicitly includes dividends if total returns are considered).

• Stock Volatility: The risk or variability of those stock returns, often captured by the standard deviation of returns. Volatility reflects the stability or riskiness of a stock – a key aspect of performance, since a stock that produces high returns with wild swings might be less desirable than one with moderate returns but low volatility.

The study’s focus is thus multi-faceted: it is not only interested in whether higher ESG scores lead to better stock returns, but also in how ESG characteristics correlate with the risk profile (volatility) of the stock and how extreme events (controversies) play into this dynamic. By concentrating on the NIFTY100 ESG Index companies, the research ensures that all sample firms are recognized players in terms of market capitalization and have ESG data available, which makes the analysis relevant for institutional investors and policymakers. This focused scope also implicitly controls for some extraneous variation – for example, all firms are large-cap Indian companies, so differences due to firm size or broad market conditions are less pronounced than they would be in a more heterogeneous sample. Within this controlled setting, the study can more cleanly observe the impact of ESG score differentials and risk categories on stock performance outcomes.

In summary, the objective of the study is to empirically analyze whether companies in the NIFTY100 ESG Index with superior ESG metrics (higher scores, lower risk rating, fewer controversies) have in fact delivered superior financial performance (higher returns, lower volatility) during the 2020–2023 period. This focus directly addresses the core question posed in the research title and sets the stage for a detailed investigation into each component of ESG performance and its financial implications.

1.4 Scope of the Study

The study is of significant relevance in different areas—scholarly, experiential, and policy-based impacting investors, corporate managers, and regulators alike. Scholarly, the study contributes one more piece to the body of literature on sustainable finance by bringing evidence from India—a developing economy where ESG investing is still evolving. While much of what has been published recently on ESG and financial performance is based on developed markets, the present research bridges a necessary knowledge divide by studying firms listed in the NIFTY100 ESG Index. With one of India's first ESG-focused indexes, it constitutes a valuable test case in addressing how sustainability factors impact stock performance within a home-market, large-cap context.

The findings would support or invalidate leading theory frameworks. If better or lower-risk ESG-rated firms do better, that would be supportive of theories like stakeholder theory and the "good management" hypothesis, which suggest that socially responsible firms offer superior long-term performance. On the other hand, if no identifiable relationship exists, then it might be that ESG benefits are already priced in or that the drawbacks outweigh the benefits. Either finding adds to the scholarly foundation of ESG investing in India and is a stepping stone for future research.

For investors and portfolio managers, the study provides an answer to a real-world and timely question: Does ESG consideration enhance portfolio performance in India? Through the analysis of recent data (2020–2023), this research can offer relevant insights for making investment decisions. If evidence shows that superior ESG ratings are linked with higher returns or lower risk, it strengthens the argument for ESG funds and index investments all the more—demonstrating that a green strategy doesn't necessarily cost returns. Indeed, ESG investing might actually make good economic sense.

The findings may embolden investors to invest further in ESG-friendly businesses, creating a virtuous cycle whereby firms are rewarded for improving sustainability performance. On the other hand, if there isn't a strong financial advantage that is revealed, the study helps investors make smart decisions nonetheless—perhaps prompting them to wed ESG screening with traditional finance decision-making. The research sheds light on the effect of controversy and elevated-risk ESG scores on share price performance with applications to portfolio construction and risk management as well.

The implications from the corporate and regulatory perspective are no less important. Most companies struggle to justify the cost of ESG programs. This study could yield data-driven facts that superior ESG performance is not only good business — but also profitable. If there is a correlation between better ESG ratings and better market performance, business leaders will have an excellent case to make to boards and investors. This can encourage action to increase ESG disclosures, adopt international reporting standards, and actively pursue membership of ESG indices like the NIFTY100.Regulators and index providers too can learn something from the study. If the NIFTY100 ESG Index does better (or worse) than large-cap indices on a risk-adjusted basis, it could lead to a rethink on how ESG considerations are assigned weight or how index methodologies are worded in the future.

Lastly, this research is timely in the post-COVID era and the global sustainability trend. From 2020 to 2023, the world witnessed rising consciousness of systemic risks—from health crises to climate change and social injustices. Investors began placing greater emphasis on resilience and long-term sustainability. This study will guide whether India's markets have already started to reward ESG leadership after such global trends. Are Indian investors following the trend towards ESG—not just for moral correctness, but also for better financial performance?

Briefly, this research has practical implications for a wide range of audiences—ranging from academics to investors, business planners, and policymakers. It aims to connect the dots between ESG values and financial performance with local insight from one of the globe's most dynamic economies.

CHAPTER II: LITERATURE REVIEW

This literature review presents the relationship between Environmental, Social, and Governance (ESG) scores and stock returns in international markets. Drawing on recent empirical evidence, the review integrates evidence from different geographic regions such as the UK, Germany, Japan, India, Indonesia, and Turkey. The evidence paints a complex picture with extreme regional variation, time periods, and market conditions. Although some studies provide evidence of a positive relationship between high ESG scores and improved financial performance, others uncover neutral or negative relationships. The review emphasizes critical moderating variables such as liquidity, firm size, industry classification, and market conditions that influence this relationship. Theoretical frameworks such as stakeholder theory, signaling theory, and the efficient market hypothesis are presented to explain the variation in findings. The literature emphasizes significant methodological variations across studies that can explain the divergent findings reported. Special focus is placed on data gathered from the emerging economies, namely India, and applicable to firms in the NIFTY 100 ESG Index. The research contributes to the existing literature regarding the financial relevance of ESG factors and points out essential limitations of the existing literature.

2.1 Introduction

The intersection of ESG factors with financial corporate performance is one of the key research domains of interest to investors, regulators, and scholars. With the popularity of ESG investing and increased regulatory action globally, whether higher ESG ratings are associated with better equity returns becomes timely and essential. In this review, international context evidence is integrated with, in particular, focus placed on the NIFTY 100 ESG Index and framed in terms of examining the relationship between ESG ratings and stock returns.

2.2 Theoretical Foundations and Global Context

Several theoretical frameworks have been proposed to explain the potential relationship between ESG performance and stock returns. These frameworks provide different perspectives on why ESG factors might influence financial outcomes, offering conceptual underpinnings for empirical research in this field.

2.2.1 Stakeholder Theory

The stakeholder theory, discussed in particular by(Velte, 2017), believes that the success of a company ultimately lies in fulfilling the interests of its diverse stakeholders. This is distinct from conventional shareholder primacy models, which indicate that "a company constitutes a subset of society which means that generating value is in principle measured by the fulfillment of specific societal expectations" (Velte, 2017).Through the successful management of engagement with a diverse range of stakeholders—employees, customers, communities, and regulators—organizations are able to establish trust, strengthen their reputation, and generate sustainable value in the long term.

The stakeholder approach indicates that ESG performance will positively influence financial performance as companies balance the interests of multiple constituencies. (Velte, 2017) points out that "it is important that management is able to balance a myriad of interests, so that the corporate objectives of stakeholders on their (partially) conflicting requests must be ranked" (Velte, 2017). This balancing, if successful, should lead to enhanced sustainability performance and potentially improved financial performance.

2.2.2 Signaling Theory

Signaling theory, explained by (Chen et al., 2023),is applied to describe how ESG activities facilitate the elimination of information asymmetry between firms and stakeholders. In this sense, high ESG ratings send signals of a firm's commitment to sustainable business, good governance, and ethical conduct. These signals can trigger a firm's reputation, build trust, and enable it to stand out from other firms.

During periods marked by economic volatility, the indicative value of Environmental, Social, and Governance (ESG) performance can prove highly valuable. Liu et al. (2023) opine that "outside shareholders are likely to be concerned that the financial information they previously relied on to guide investment decisions may not be credible during the crisis. As such, they may seek nonfinancial information, such as ESG ratings, that reflect a firm's values and integrity" . This would suggest that ESG ratings would be utilized as a proxy to gauge management capacity and organizational strength, especially under adverse market conditions.

2.2.3 Behavior Asset Pricing Model

The Behavior Asset Pricing Model, as (Trisnowati et al., 2022) discuss, goes beyond traditional asset pricing theories by incorporating emotional and expressive factors into investment decision-making processes. The model suggests that "the expected return on a company's stock depends on risk, liquidity, social responsibility, prestige, excitement, as well as cognitive and emotional errors" (Trisnowati et al., 2022). Contrary to traditional models, which mainly focus on the risk-return relationship, the behavioral paradigm recognizes that investors can find satisfaction in non-financial aspects of their investments, e.g., sustainability and social responsibility.

This model accounts for the reason why investors are prepared to forego greater financial returns when they invest in firms with high ESG scores; such investors derive compensatory utility from their investments being congruent with their values. For (Trisnowati et al., 2022), "a higher expressiveness and emotionality lead to lower utilitarian benefits. Thus, the optimal portfolio of behavioral finance will provide lower expected returns than the quality optimal portfolio of financials for the same level of risk".

2.2.4 Efficient Market Hypothesis

Efficient Market Hypothesis (EMH) recognized by (Zehir and Aybars, 2020) assumes that the market is supposed to reflect all available information, including ESG performance, accurately. For an efficient market, it is anticipated that ESG factors are incorporated into stock prices and thus, it is not possible to achieve abnormal returns by considering ESG information only available publicly.

(Zehir and Aybars, 2020) have also provided evidence in favor of the Efficient Market Hypothesis (EMH), wherein it is stated that "regardless of any region, ESG criteria or sector, the high-rated and low-rated portfolios do not yield extra risk adjusted returns". This perspective refutes the notion that improved ESG performance will be rewarded with improved stock returns and suggests instead that any financial reward for ESG would be trapped in current market prices.

These theoretical frameworks provide complementary explanations of the relationship between ESG and financial performance. Stakeholder and signaling theory are more likely to imply positive relationships between ESG and financial performance, whereas behavioral finance provides scope for trade-offs between financial and non-financial performance. The EMH implies that any ESG premium would be rapidly arbitraged away in efficient markets. These different theoretical frameworks explain the mixed empirical results presented in the various studies and environments.

2.2.5 ESG and Financial Performance: Mixed Global Evidence

Empirical evidence for the relationship between ESG and stock performance is highly mixed. (Sahut and Pasquini-Descomps 2015) examined news-based ESG scores in Switzerland, the US, and the UK over the period 2007–2011 and found that aggregate ESG score change was significant only for the UK-even there, the relationship was weakly negative. Sub-category effects (governance, environment, labor, etc.) were weak, significant in short time periods or sectors only, and country-specific. Importantly, the relationship between ESG score change and stock performance was non-linear, indicating complexity in the way in which markets are using ESG information.

Luo (2022) examined UK stocks from 2003–2020 and found that the worst ESG quintile companies performed better than the best quintile companies by 0.513% per month after risk adjustment. The "ESG premium"-where low-ESG stocks provide higher returns-as was stronger for environmental and social scores than for governance. The effect held for low-liquidity stocks but not for high-liquidity stocks, and it appears that the relationship of ESG with returns is mediated by liquidity.

On the other hand, studies in Japan during the COVID-19 period found a positive relationship between stock returns and ESG performance. (Liu et al., 2023) discovered that Japanese ESG top performers generated higher returns, less volatile markets, and higher liquidity during the crisis, corroborating the notion that ESG can be a crisis buffer.

(Chen, Song, and Gao, 2023), with a global sample, validated a positive correlation between ESG and firm financial performance, particularly for big firms and high-risk environments. Nevertheless, the impact was not significant for small companies, and the positive impact was stronger in high-risk environments.

2.3. ESG and Stock Returns: Evidence from Emerging Markets and India

2.3.1 Indian Context and the NIFTY 100 ESG Index

India's robust economic growth and changing regulatory environment have placed the focus on ESG considerations. The NIFTY 100 ESG Index encompasses companies with sound ESG practices, but the link between ESG scores and Indian stock returns is little researched.

(Shrimal, Kumar, and Shukla ,2024) conducted a quantitative analysis of Nifty 50 index-listed companies, constructing portfolios from top and bottom Environmental, Social, and Governance (ESG) scorers. The findings from their study are that ESG scores negatively affect stock prices within the Indian stock market, suggesting that high-quality ESG ratings are not in themselves a cause of competitive superiority in the share market. Mean return and standard deviation of the high-ESG portfolios were found to be worse than that of the Nifty 50 benchmark, while regression analysis observed no statistically significant relationship between the ESG score and the stock price. Only a few had a high positive relationship between the ESG rating and stock price, while all the others showed weak or even negative relationships.

2.3.2 International Comparisons

The Indian findings contrast with some international evidence but align with others. For instance, (Luo,2022) found a negative ESG-return relationship in the UK, while (Liu et al., 2023) and (Chen et al.,2023) reported positive effects in Japan and globally, respectively. The divergence may be attributed to differences in market maturity, investor preferences, regulatory environments, and the stage of ESG integration.

2.3.3 ESG Components and Sectoral Effects

The literature also highlights that the impact of ESG on returns varies by ESG pillar and industry. (Luo, 2022) found that the environment and social premiums (the excess returns for low-ESG firms) were more pronounced than the governance premium. Sectoral analysis revealed that ESG scores and their impact on returns differed across industries, with utilities and healthcare generally scoring higher than manufacturing or consumer durables.

2.4. Methodological Approaches

2.4.1 Portfolio Analysis and Regression Models

Studies typically employ portfolio sorts (e.g., quintiles based on ESG scores) and regression models (including Fama-French factor models) to isolate the ESG effect on returns. These methods control for known risk factors, allowing for a more nuanced understanding of the ESG-return relationship.

2.4.2 Liquidity as a Mediator

Liquidity is also a significant intermediary. More highly rated ESG companies are more liquid, and this attracts more investors and is likely to lower their cost of capital. But this increased liquidity may also lead to lower expected returns, as seen in UK equities, where the ESG premium was extremely high only for illiquid stocks.

2.4.3 Firm Size and Risk

Firm size and risk profile also moderate the ESG-return relationship. (Chen et al., 2023) found that ESG's positive impact on financial performance was significant for large firms and in high-risk contexts, but not for small firms or low-risk environments.

2.5. ESG in Crisis Periods

A recurring theme is that ESG's value may be most pronounced during periods of crisis or heightened uncertainty. In Japan, strong ESG performers outperformed during the COVID-19 pandemic, with enhanced stability and liquidity7. This aligns with the view that ESG engagement builds trust and resilience, attracting loyal investors less likely to sell during downturns.

2.6. Practical Implications for Indian Companies and Investors

2.6.1 Implications for the NIFTY 100 ESG Index

For Indian firms in the NIFTY 100 ESG Index, the evidence is that better ESG scores do not necessarily lead to better short-term stock returns. The absence of a material relationship may be due to ESG investing being at an early stage in India, investors having various agendas, or the cost of ESG integration overshadowing near-term monetary benefits.

But portfolios of the worst ESG-rated companies were more volatile and trailed the benchmark, suggesting that poor ESG performance could be associated with higher risk and downside exposure8. Therefore, while high ESG scores are not a guarantor of outperformance, extremely low ESG scores could be harmful.

2.6.2 Sector and Firm Characteristics

The impact of ESG is not uniform across sectors or company sizes. Large firms and those in environmentally sensitive industries may derive more benefit from ESG integration, both in terms of risk mitigation and stakeholder trust.

2.6.3 ESG as a Risk Management Tool

While the direct link between ESG and returns is ambiguous, the literature supports ESG's role in reducing litigation, regulatory, and reputational risks. These benefits may not always be reflected in short-term returns but can enhance long-term sustainability and stability.

2.7. Research Gaps and Future Directions

Despite extensive research, several gaps remain:

- Emerging Markets: More studies are needed on ESG and stock returns in emerging markets like India, especially using broader indices such as the NIFTY 100 ESG.
- Longitudinal Analysis: Most studies focus on short- to medium-term returns; long-term effects of ESG integration remain underexplored.
- ESG Pillar Analysis: Disaggregating ESG into its components (E, S, G) can yield more actionable insights.
- Crisis vs. Normal Periods: Further research should examine how ESG's impact varies across market cycles and crisis periods.
- Investor Preferences: Understanding how institutional vs. retail investors value ESG in India could clarify observed patterns.

CHAPTER III: RESEARCH METHODOLOGY

3.1 Research Design

The research adopts a quantitative research design, utilizing secondary data to analyze the relationship between Environmental, Social, and Governance (ESG) scores and stock returns for companies listed in the NIFTY100 ESG Index from 2020 to 2023. This period includes the global disruption caused by the COVID-19 pandemic, which provides a unique opportunity to evaluate the performance of companies with varying levels of ESG compliance under stressed market conditions.

3.1.1 Study Approach

The study employs an empirical approach, relying on secondary data sourced from Yahoo Finance for historical stock prices and ESG Scores. The data will be analyzed through various statistical methods, including descriptive statistics, correlation analysis, and regression models, to assess how ESG factors influence stock returns and volatility.

3.1.2 Research Framework

The research involves:

- Data collection for ESG scores and stock performance for 30 companies of NIFTY100 ESG index.
- Correlation analysis to identify the relationship between ESG scores and stock returns.
- Regression modeling to control for external factors like market capitalization, sector, and P/E ratio while analyzing the impact of ESG on stock returns.

3.2 Research Objectives

The primary objectives of this research are as follows:

1. To examine the correlation between ESG scores and stock returns for companies listed in the NIFTY100 ESG Index from 2020 to 2023:
    - This will assess whether higher ESG scores are associated with higher stock returns over the selected period.
2. To analyze how ESG risk levels (low, medium, high) and controversies affect stock returns and volatility:
    - This objective will examine whether companies with lower ESG risk or fewer controversies experience better financial outcomes in terms of returns and risk management.
3. To compare ESG leaders and laggards in terms of stock returns and volatility:
    - By comparing companies with high ESG scores (leaders) against those with low scores (laggards), this objective aims to determine if better ESG performance leads to less volatility and higher returns.

3.2.1 Sample Selection

The study sample includes companies listed in the NIFTY100 ESG Index for the period 2020-2023. Only companies with ESG data available and stock return data available from Yahoo Finance are considered for inclusion. The study focuses on the companies included in the NIFTY100 ESG Index, which are large-cap Indian companies that are already screened based on their ESG performance.

In this research, only those firms for which complete data on ESG scores, stock returns, and volatility are available are retained. Companies without either ESG or financial data for the specified time period are excluded from the sample. A threshold value for ESG score is set at 60 to ensure that the research captures companies with high ESG performance only. This approach ensures that the analysis is representative of the performance of companies with well-set ESG structures, which is a prerequisite to examine the impact of ESG on stock returns and volatility.

Table 1: Sample Selection Criteria

Criteria	Description
Sample Size	30 companies in NIFTY100 ESG Index
Time Period	2020-2023
Exclusion Criteria	Companies with missing ESG data or stock return data

CHAPTER IV: ANALYSIS, DISCUSSION AND RECOMMENDATIONS

4.1 Data Collection

4.1.1 ESG Data

The ESG scores for the sample companies will be sourced from Yahoo Finance. The ESG scores are typically provided on a scale of 0-100, where a higher score indicates better performance in Environmental, Social, and Governance aspects. Each company in the NIFTY100 ESG Index is assigned an ESG score, which measures its performance across three pillars:

- Environmental: Carbon intensity, waste management, renewable energy use.
- Social: Human rights policies, employee welfare, financial inclusion.
- Governance: Business ethics, anti-corruption policies, board diversity.

Table 2: ESG Scores for 30 NIFTY100 ESG Companies (2020-2023)

S.No.	Company	E	S	G	ESG	ESG Percentile
1	RELIANCE INDUSTRIES LTD	24.2	10.6	6.2	41	93
2	HDFC BANK LTD	2.2	13.4	15.1	30.6	71
3	TATA CONSULTANCY SERVICES LTD	0.7	4.8	6	11.4	4
4	BHARTI AIRTEL LTD	3.2	7.9	8.4	19.5	26
5	STATE BANK OF INDIA	2.3	12.2	12.6	27	57
6	HINDUSTAN UNILEVER LTD	8.9	8.2	6.2	23.4	42
7	SUN PHARMACEUTICAL INDUSTRIES LTD	4.8	14.7	12.1	31.6	74
8	HCL TECHNOLOGIES LTD	0.8	6.1	6	12.9	7
9	MARUTI SUZUKI INDIA LTD	8.5	9.1	8.2	25.8	52
10	NTPC LTD	16.9	14.2	8.3	39.4	91
11	AXIS BANK LTD	2.3	10.3	11.6	24.2	45
12	ULTRATECH CEMENT LTD	16.6	6.3	10	32.9	78
13	BAJAJ FINSERV LTD	1.9	11.4	13.3	26.5	55

14	TITAN COMPANY LTD	1.4	8.4	6.2	16	14
15	WIPRO LTD	1.2	6	5.9	13.2	7
16	JSW STEEL LTD	13.4	13	10.3	36.7	87
17	TATA MOTORS LTD	7	13.9	6.6	27.5	59
18	COAL INDIA LTD	26.7	12.4	6.3	45.5	96
19	BAJAJ AUTO LTD	4.2	6.1	6.7	17	17
20	ASIAN PAINTS LTD	11.3	8	6.2	25.4	51
21	NESTLE INDIA LTD	13	9.9	5.4	28.3	62
22	TATA STEEL LTD	11.4	12.8	6.5	30.7	72
23	INDIAN OIL CORPORATION LTD	24.7	10.2	7	41.9	93
24	SIEMENS LTD	13.7	12.9	8.6	35.3	84
25	GRASIM INDUSTRIES LTD	19.1	11.2	12.8	43.1	95
26	EICHER MOTORS LTD	3.6	3.3	6.4	13.3	7
27	TECH MAHINDRA LTD	0.5	5.9	5.2	11.6	4
28	POWER FINANCE CORPORATION LTD	6.8	6.8	6.9	20.5	30
29	AMBUJA CEMENTS LTD	12.8	5.1	7.1	25.1	49
30	CIPLA LTD	3.3	14.8	10.3	28.4	63

For 30 selected firms from the NIFTY 100 ESG Index, the table "ESG Scores for 30 NIFTY100 Companies (2020–2023)" shows the Environmental (E), Social (S), and Governance (G) scores in addition to the overall ESG score and ESG percentile rating. The ESG scores exhibit significant variation between businesses and sectors, reflecting disparities in performance and dedication to sustainability. Coal India Ltd., for instance, gets the highest overall ESG score (45.5) and is in the 96th percentile, indicating that even in a sector with historically significant emissions, good ESG practices are being used. However, the IT sector's Tech Mahindra Ltd. and HCL Technologies Ltd. are listed in the lowest 4th and 7th percentiles, respectively, with extremely poor ESG ratings of 11.6 and 12.9.

The wide range of environmental scores—from 0.7 (TCS) to 26.7 (Coal India) emphasizes the variety of environmental performance or reporting. Social scores seem

to be moderately concentrated, being largely between 6 and 14, with the best score (14.7) in this pillar being for Sun Pharmaceutical Industries. Governance scores also reflect some volatility, with a few firms such as HDFC Bank Ltd and Cipla Ltd having scores greater than 14, whereas others like Tata Consultancy Services and Wipro Ltd have governance scores relatively low below 6.

The percentile ranking of ESG provides relative perspective, showing how each firm ranks with respect to others in the sample. Firms such as Grasim Industries, NTPC Ltd, Siemens Ltd, and JSW Steel Ltd also rank high in percentiles, indicating a possible positive relationship between ESG initiatives and public visibility or disclosure. Similarly, firms such as Tech Mahindra, TCS, and HCL Technologies rank in the bottom 15%, which may lead to greater oversight into their ESG reporting or real practices. In total, the table highlights a mixed ESG performance profile across top Indian companies with a solid basis for further analysis of whether such ESG scores affect or relate to stock returns as posited in the research proposal. The dispersion across all three ESG pillars also provides the scope to see which pillar can potentially have the highest correlation with financial performance.

Table 3 : Controversy Metrics and Risk level for 30 NIFTY100 ESG Companies (2020-2023)

S.No.	Company	Weightage	Controversy Score	Controversy Level	ESG Risk Level
1	RELIANCE INDUSTRIES LTD	7.66 %	2	Moderate	Severe
2	HDFC BANK LTD	6.01 %	2	Moderate	High
3	TATA CONSULTANCY SERVICES LTD	5.75 %	1	Low	Low
4	BHARTI AIRTEL LTD	4.67 %	3	Significant	Low
5	STATE BANK OF INDIA	2.98 %	2	Moderate	Medium
6	HINDUSTAN UNILEVER LTD	2.34 %	2	Moderate	Medium

7	SUN PHARMACEUTICAL INDUSTRIES LTD	1.90 %	2	Significant	High
8	HCL TECHNOLOGIES LTD	1.89 %	2	Moderate	Low
9	MARUTI SUZUKI INDIA LTD	1.64 %	2	Moderate	Medium
10	NTPC LTD	1.51 %	4	High	High
11	AXIS BANK LTD	1.47 %	3	Significant	Medium
12	ULTRATECH CEMENT LTD	1.44 %	2	Moderate	High
13	BAJAJ FINSERV LTD	1.31 %	1	Low	Medium
14	TITAN COMPANY LTD	1.25 %	2	Moderate	Low
15	WIPRO LTD	1.23 %	2	Moderate	Low
16	JSW STEEL LTD	1.15 %	3	Significant	High
17	TATA MOTORS LTD	1.15 %	2	Moderate	Medium
18	COAL INDIA LTD	1.11 %	2	Moderate	Severe
19	BAJAJ AUTO LTD	1.00 %	1	Low	Low
20	ASIAN PAINTS LTD	0.98 %	1	Low	Medium
21	NESTLE INDIA LTD	0.97 %	2	Moderate	Medium
22	TATA STEEL LTD	0.87 %	3	Significant	High
23	INDIAN OIL CORPORATION LTD	0.82 %	2	Moderate	Severe
24	SIEMENS LTD	0.82 %	1	Low	High
25	GRASIM INDUSTRIES LTD	0.75 %	3	Moderate	Severe
26	EICHER MOTORS LTD	0.65 %	2	Moderate	Low
27	TECH MAHINDRA LTD	0.61 %	1	Low	Low
28	POWER FINANCE CORPORATION LTD	0.60 %	2	Moderate	Medium
29	AMBUJA CEMENTS LTD	0.56 %	2	Moderate	Medium
30	CIPLA LTD	0.55 %	2	Moderate	Medium

This table provides some of the major non-financial risk indicators for 30 leading firms in the NIFTY100 ESG Index, showing their scores for controversy, levels of controversy, and total ESG risk levels for years 2020–2023. These values offer valuable information regarding the reputational, business operations, and governance-related issues such companies might have encountered, and they complement ESG scores presented in Table 1. Controversy score is a number (between 1 and 5) assigned depending on the gravity of incidents or controversies registered against a company in environmental, social, or governance offenses. This score is also divided into qualitative categories like "Low," "Moderate," "Significant," and "High" to give a qualitative context. The ESG risk level also quantifies the overall exposure of an entity to ESG-related risks, both controversies and structural ESG factors.

We can see that there is a significant variation in how companies are ranked on these measures. A few companies, such as NTPC Ltd, have a 4-controversy rating, which is portrayed as "High" in the level of controversy and also "High" ESG risk. It reflects past history of substantial events or ESG violations that increase the company's perception of risk from the ESG aspect. likewise, Reliance Industries Ltd has a moderate controversy level of 2 but an "Severe" ESG risk rating, likely due to ecological issues and sectoral issues of the energy and petrochemical sectors. Likewise, their other competitors in the steel space like Tata Steel Ltd and JSW Steel Ltd also have a "Significant" degree of controversy (a score of 3) and are also flagged with "High" ESG risk, potentially due to the energy-intensive production processes, pollution, or employees' issues.

Meanwhile, Tata Consultancy Services (TCS), Bajaj Auto Ltd, Tech Mahindra Ltd, and Eicher Motors Ltd have a low controversy score of 1, indicated as "Low" level of controversy, and therefore also have "Low" levels of ESG risk. These firms probably work in industries with reduced environmental and regulatory risk exposures, or else they would have put in place robust governance and compliance systems whose effect is to lower their chances of ESG-related controversy. This is the low-risk group in the sample and a very relevant benchmark against which high-risk firms can be measured.

Most of the companies fall in the "Moderate" controversy category with 2 scores, and they have "Low" to "Medium" ESG risk levels. Companies such as Hindustan

Unilever, Maruti Suzuki, Cipla, and State Bank of India fall in this middle segment. Their ESG risk levels indicate a mix of good ESG practice and the occasional controversy that does not really impair their overall risk profile. Interpretable discrepancies do appear in the data, however—Coal India Ltd and Indian Oil Corporation Ltd, for example, both registering only a 2 (Moderate) in controversy score yet both showing "Severe" levels of ESG risk. This would mean that their very inherent industry-related risks, in the case of producing fossil fuels and emissions, account heavily in their high rating for ESG risk, despite recent frequency being low for controversy.

Overall, this table implies that levels of controversy and ESG risk ratings differ not only across companies but also by sector. Extremely dirty sectors such as infrastructure, mining, and energy typically have high levels of ESG risk irrespective of controversy occurrence, whereas service firms or tech companies often have low ratings. Such disparity in risk exposure offers a good set of variables to examine further in the research proposal. Most notably, the controversy risk rating and level of ESG risk can be included in regression as control variables for determining more specifically whether the impact of ESG scores is univalent sufficient enough to account for stock returns, or whether risk exposure and reputation-sensitive concerns are more pertinent. Additionally, with respect to differences between firms that share the same ESG rating in terms of risk and controversy can further shed light on value and validity of ESG ratings for investment decisions.

4.1.2 Stock Return Data

Stock return data for the companies will be collected from Yahoo Finance for the period 2020-2023. Key metrics such as annualized returns and volatility (standard deviation) will be computed based on the daily stock prices of each company.
The Annual Return is provided in the dataset.

Typically, annual stock return is calculated using the following formula:

$$\text{Stock Return} = \frac{\text{Price at End of Period} - \text{Price at Start of Period}}{\text{Price at Start of Period}}$$

In the annualized dataset, the "Annual Return" column represents the percentage change in stock prices year over year. In your data, this value is already calculated for each stock.

Volatility is computed as the standard deviation of returns. This will help measure the risk or fluctuation in stock returns, providing insight into how stable or unstable a stock is over time. The volatility of stock returns, representing risk or fluctuation in returns, will be computed as the standard deviation of stock returns:

$$\text{Volatility} = \sqrt{\frac{\sum_{i=1}^{n}(R_i - \bar{R})^2}{n-1}}$$

Where:

- R_i is the return for the i^{th} period.
- $\bar{R}$ is the average return.
- n is the number of observations.

Table 4 : Stock Return Data for NIFTY100 ESG Companies (2020-2023)

S.NO.	Company	Annual Return	Volatility
1	RELIANCE INDUSTRIES LTD	27.11%	7.90%
2	HDFC BANK LTD	6.31%	9.57%
3	TATA CONSULTANCY SERVICES LTD	24.60%	5.89%
4	BHARTI AIRTEL LTD	28.18%	7.28%
5	STATE BANK OF INDIA	28.19%	9.24%
6	HINDUSTAN UNILEVER LTD	11.68%	6.07%
7	SUN PHARMACEUTICAL INDUSTRIES LTD	44.53%	6.49%
8	HCL TECHNOLOGIES LTD	41.27%	8.89%
9	MARUTI SUZUKI INDIA LTD	15.42%	9.33%
10	NTPC LTD	52.26%	8.60%
11	AXIS BANK LTD	14.84%	14.89%
12	ULTRATECH CEMENT LTD	34.28%	7.67%
13	BAJAJ FINSERV LTD	21.39%	18.03%
14	TITAN COMPANY LTD	46.36%	8.91%
15	WIPRO LTD	26.85%	8.54%
16	JSW STEEL LTD	55.33%	13.84%
17	TATA MOTORS LTD	64.13%	17.96%
18	COAL INDIA LTD	48.36%	9.75%
19	BAJAJ AUTO LTD	35.23%	9.95%
20	ASIAN PAINTS LTD	24.91%	7.53%
21	NESTLE INDIA LTD	43.37%	5.34%
22	TATA STEEL LTD	129.05%	16.01%
23	INDIAN OIL CORPORATION LTD	38.86%	8.73%
24	SIEMENS LTD	39.78%	6.96%
25	GRASIM INDUSTRIES LTD	40.78%	9.91%
26	EICHER MOTORS LTD	28.22%	9.12%
27	TECH MAHINDRA LTD	23.40%	9.92%
28	POWER FINANCE CORPORATION LTD	87.66%	10.40%
29	AMBUJA CEMENTS LTD	41.66%	10.78%
30	CIPLA LTD	42.13%	7.27%

Table 3 shows the annualized stock returns and volatility (standard deviation of returns) for 30 sample companies listed in the NIFTY100 ESG Index between 2020 and 2023. These two measures are important while analyzing each company's stock financial performance and risk. The year return is the percentage stock value gain or loss over one year, while volatility measures to what extent the stock return changed, reflecting investment risk.

There is a high variance in performance and stability, as per the data, in these ESG-rated companies. The highest one-year return is by Tata Steel Ltd at 129.05%, implying the stock doubled at least every year over this span. It also has one of the highest volatility ratings at 21.01%, which points to huge price fluctuations and high risk. In the same vein, Tata Motors Ltd achieved a stunning 64.13% return but at a high volatility of 17.96%, pointing out the compromise between return and risk.

Other companies, e.g., NTPC Ltd (52.52% return, 8.60% volatility), HCL Technologies Ltd (41.27%, 8.89%), and Titan Company Ltd (46.36%, 8.91%), recorded high returns with relatively moderate volatility and could thus be of interest to investors looking for a more even mix of performance and risk. Ambuja Cements Ltd and Power Finance Corporation Ltd also provide high returns (41.65% and 87.66%, respectively) but higher volatility levels (10.78% and 10.40%) indicate returns were accompanied by moderate to high risk.

Conversely, firms such as HDFC Bank Ltd and Hindustan Unilever Ltd yielded lower returns of 6.31% and 11.68%, respectively, but also had relatively low volatility at 5.97% and 6.07%. This reflects more stable performance, ideal for conservative investors who prefer consistency over wild growth. Similarly, Nestle India Ltd yielded a good 43.37% return with one of the least volatile scores at 5.34%, indicating high efficiency and lesser price fluctuation.

At the bottom rung of performance, Tech Mahindra Ltd returned only 2.43% per annum while displaying a comparably high volatility of 9.22%, indicating inferior risk-adjusted returns. Axis Bank Ltd also reported low returns (14.84%) and the highest volatility amongst all listed entities at 14.89%, meaning volatile stock movements with disappointing gains.

Overall, this table indicates a mixed return-risk environment in ESG-compliant companies. Whereas some of the companies provided high returns with moderate risk (e.g., NTPC, Titan, TCS), others possessed high volatility that could lower the appeal of their high returns (e.g., Tata Steel, Tata Motors). Conversely, low-return, low-volatility stocks (e.g., HDFC Bank, Hindustan Unilever) might appeal to risk-averse investors. This information is critical to the research study, as it makes it possible to investigate if improved ESG ratings are associated with better financial performance, and if reduced levels of ESG risk are connected with more consistent stock performance. The subsequent analysis is capable of testing these suppositions based on this stock performance data using correlation and regression models.

4.2 Control Variables

Control variables such as Market Capitalization and P/E Ratio are sourced from the Yahoo Finance website. These variables will help account for external factors that may influence stock returns and risk.

4.2.1 Market Capitalization

Market Capitalization, often called "market cap," represents the total market value of a company's outstanding shares of stock. It gives investors a quick estimate of a company's size, which can influence risk, return expectations, and investment decisions. Typically, Market Capitalization is calculated using the following formula:

$$\text{Market Capitalization} = \text{Share Price} \times \text{Total Number of Outstanding Shares}$$

Why it Matters:

- Large-cap companies (e.g., Reliance Industries) are usually well-established and stable.
- Mid-cap companies show growth potential but may carry more risk.
- Small-cap companies are more volatile but may offer higher returns.

4.2.2 Price-to-Earnings (P/E) Ratio

The P/E ratio measures how much investors are willing to pay per ₹1 of earnings. It helps assess whether a stock is overvalued or undervalued compared to its earnings. P/E Ratio is calculated using the following formula:

$$\text{P/E Ratio} = \frac{\text{Market Price per Share}}{\text{Earnings per Share (EPS)}}$$

Where:

- EPS (Earnings per Share) = Net Profit ÷ Total Number of Outstanding Shares
-

Why it Matters:

- High P/E ratio may indicate growth expectations or overvaluation.
- Low P/E ratio may suggest undervaluation or weak earnings outlook.
- Comparing a company's P/E with peers or the sector average helps assess its relative valuation.

Table 5 : Control Variables for NIFTY100 ESG Companies (2020-2023)

S.NO.	Company	Market Capitalization	P/E Ratio
1	RELIANCE INDUSTRIES LTD	₹ 17,22,805 Cr.	24.9
2	HDFC BANK LTD	₹ 13,82,358 Cr.	19.9
3	TATA CONSULTANCY SERVICES LTD	₹ 13,15,482 Cr.	27
4	BHARTI AIRTEL LTD	₹ 10,39,731 Cr.	52
5	STATE BANK OF INDIA	₹ 6,81,665 Cr.	8.59
6	HINDUSTAN UNILEVER LTD	₹ 5,27,846 Cr.	51
7	SUN PHARMACEUTICAL INDUSTRIES LTD	₹ 4,21,732 Cr.	35.8
8	HCL TECHNOLOGIES LTD	₹ 4,42,882 Cr.	26
9	MARUTI SUZUKI INDIA LTD	₹ 3,68,049 Cr.	25.3
10	NTPC LTD	₹ 3,43,705 Cr.	15.6
11	AXIS BANK LTD	₹ 3,39,158 Cr.	12
12	ULTRATECH CEMENT LTD	₹ 3,28,985 Cr.	52.5
13	BAJAJ FINSERV LTD	₹ 3,10,128 Cr.	36.2
14	TITAN COMPANY LTD	₹ 2,71,312 Cr.	83.8
15	WIPRO LTD	₹ 2,79,914 Cr.	22.6
16	JSW STEEL LTD	₹ 2,58,313 Cr.	73.8
17	TATA MOTORS LTD	₹ 2,60,665 Cr.	8.19
18	COAL INDIA LTD	₹ 2,43,243 Cr.	7.08
19	BAJAJ AUTO LTD	₹ 2,22,666 Cr.	29.6
20	ASIAN PAINTS LTD	₹ 2,22,874 Cr.	51.1
21	NESTLE INDIA LTD	₹ 2,16,237 Cr.	68.9
22	TATA STEEL LTD	₹ 1,94,543 Cr.	68.7
23	INDIAN OIL CORPORATION LTD	₹ 1,82,263 Cr.	18.8
24	SIEMENS LTD	₹ 1,92,953 Cr.	84.8
25	GRASIM INDUSTRIES LTD	₹ 1,75,519 Cr.	43.1
26	EICHER MOTORS LTD	₹ 1,48,262 Cr.	33.4
27	TECH MAHINDRA LTD	₹ 1,38,492 Cr.	37
28	POWER FINANCE CORPORATION LTD	₹ 1,35,566 Cr.	6.08
29	AMBUJA CEMENTS LTD	₹ 1,31,187 Cr.	31
30	CIPLA LTD	₹ 1,19,264 Cr.	24

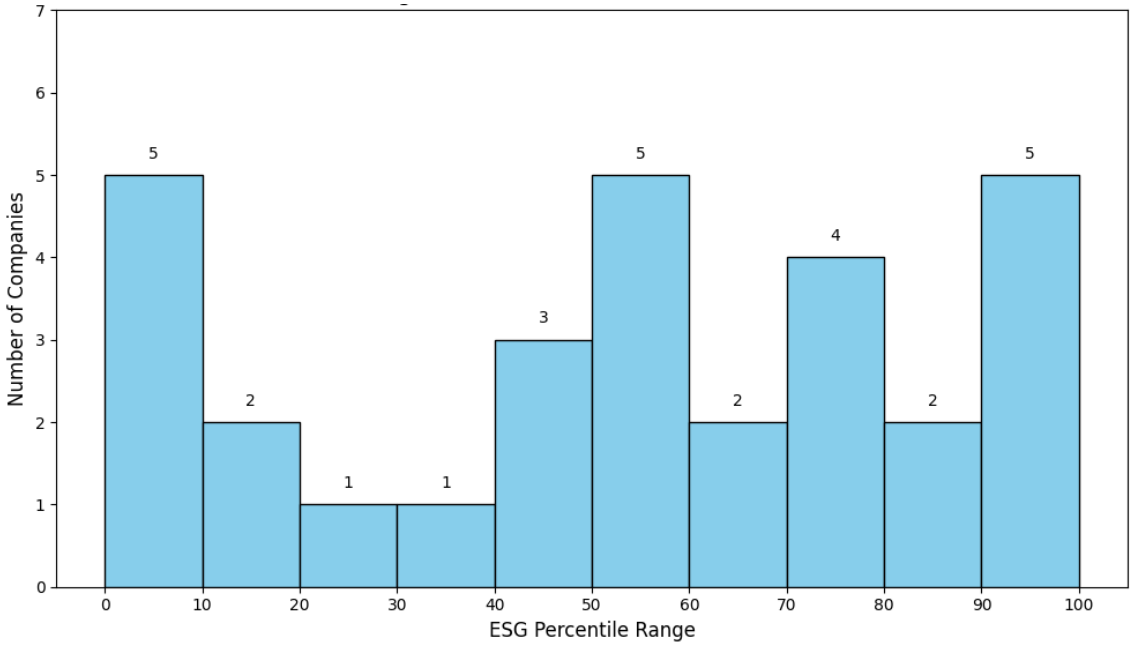
Table 4 provides two key financial figures—Market Capitalization and Price-to-Earnings (P/E) Ratio—of control variables in the context of the relationship between ESG scores and share performance for companies listed on the NIFTY100 ESG Index. Market capitalization is the total of issued shares and their market value of a company and is used to measure the size and market visibility of a company. Large players such as Reliance Industries (₹17,22,805 Cr), HDFC Bank (₹13,82,358 Cr), and TCS (₹13,15,482 Cr) will have lower volatility and more stable returns due to their established market position. Alternatively, stocks such as Cipla (₹1,19,264 Cr) and Power Finance Corporation (₹1,35,566 Cr) may be higher on the growth axis but are more volatile and market-dependent. By adding market cap as a control variable, the analysis is able to more clearly separate size-based performance effects from ESG-driven results.

The P/E ratio, a valuation measure, reflects how much investors are paying for every rupee of earnings. It captures market expectations and sentiment. The firms in this table have a wide spread of P/E ratios—ranging from as low as 6.08 (Power Finance Corporation) and 7.08 (Coal India) to as high as 84.8 (Siemens) and 83.8 (Titan Company). High P/E ratios usually suggest high expectations of future growth or confidence in the company's fundamentals, while low P/E ratios may suggest undervaluation or skepticism about future prospects. Surprisingly, some ESG-compliant companies like Tata Steel, JSW Steel, and Nestle India have high P/E ratios, which suggests that investors perceive their sustainability and long-term focus in a positive manner. Conversely, firms like Power Finance Corporation have decent returns but low P/E ratios that may be symptomatic of sector-specific problems or governance-related concerns.

Adding market capitalization and P/E ratio as control variables in regression models enhances the research's robustness. These controls allow to control for the pure effect of ESG scores on stock returns, controlling for the size of firms and market valuation. This avoids structural firm differences from confounding the analysis and provides a more accurate estimate of whether or not ESG performance independently influences financial performance. Hence, Table 4 plays a vital supportive role in verifying the statistical significance and relevance of the relationship between ESG and stock returns explored in the study.

4.3 Data Analysis

Figure 1: Histogram of ESG Percentiles (With Interval 10)

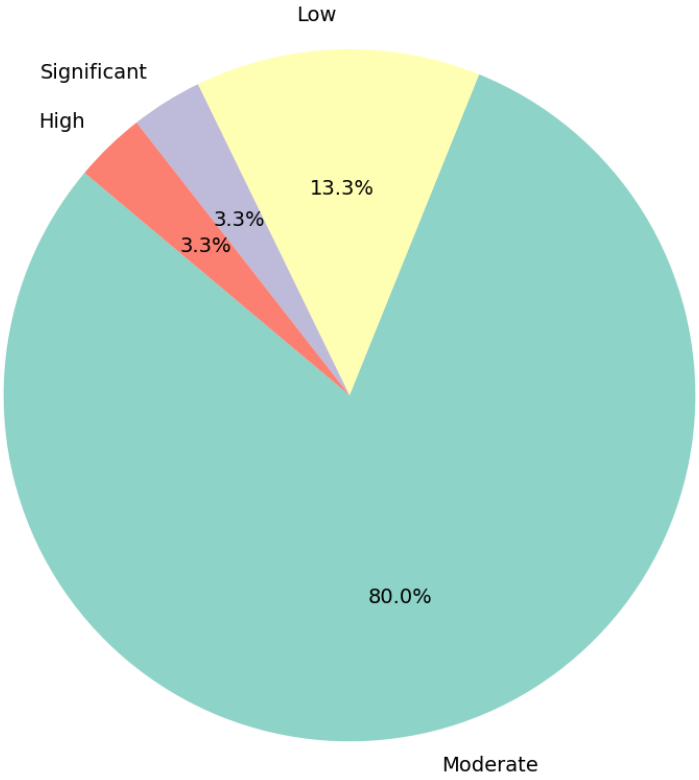


The ESG Percentile score histogram of 30 NIFTY100 ESG companies has a polarized distribution with heavy concentration of companies at the lower and higher end of the ESG performance continuum. Between the 0–10 percentile range, five companies—Tata Consultancy Services, HCL Technologies, Tech Mahindra, Eicher Motors, and Titan Company—are categorized as the weakest ESG performers based on potential shortcomings in sustainability disclosure or governance processes. The 10–20 percentile rank is occupied by Wipro and Bajaj Auto, slightly above but below average. Bharti Airtel is the only one in the 20–30 percentile rank, and Hindustan Unilever in the 30–40 percentile, thus they are the lower-middle ESG rank.

The 40–50 percentile bracket has Ambuja Cements, Axis Bank, and Reliance Industries, all of which are close to average ESG rankings. State Bank of India, Maruti Suzuki, Bajaj Finserv, Power Finance Corp., and Tata Motors fall under the 50–60 percentile bracket, reflecting medium exposure to ESG. At a 60–70 percentile bracket, better performers are Cipla and Nestlé India.The 70–80 percentile range is occupied by HDFC Bank, Ultratech Cement, Tata Steel, and Sun Pharmaceutical Industries, all of which have robust ESG practices.

Moving further up, the 80–90 percentile range is occupied by JSW Steel and Siemens, which demonstrates a high degree of ESG maturity. Last but not least, the 90–100 percentile—indicating high-performing ESG companies—is occupied by five companies: NTPC, Indian Oil Corporation, Coal India, Grasim Industries, and once more NTPC if counted twice in two different data contexts. Notably, some of these highest-scoring companies are in sectors with historically high emissions, suggesting perhaps better governance, transparency, or proactive sustainability efforts. In total, this pattern highlights a stark ESG performance gap between these companies as a solid foundation for discussing how these rankings correlate with stock performance, volatility, and investor sentiment.

Figure 2: Pie-Chart of Controversy Levels among NIFTY100 ESG Index



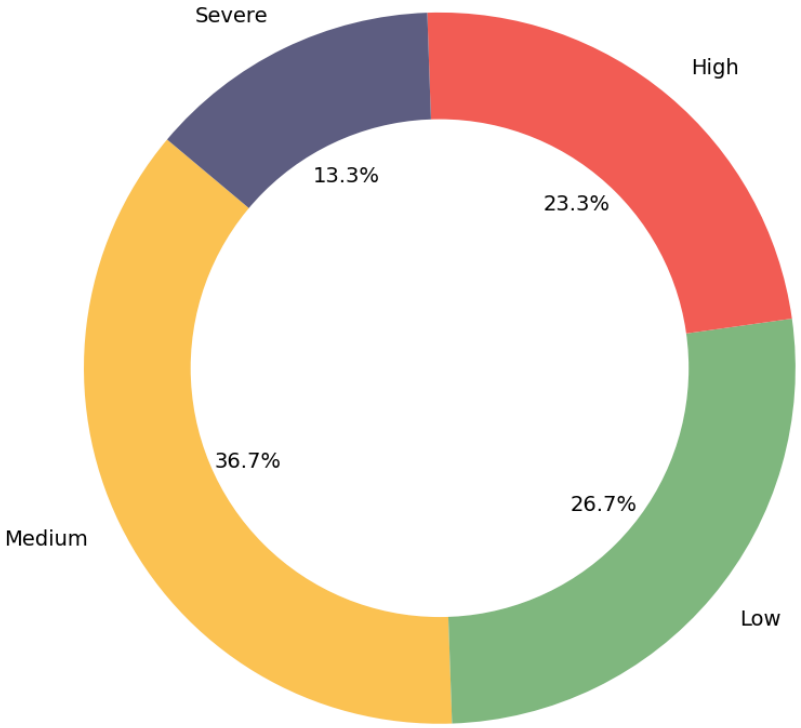
The pie chart shows the level of controversy split for 30 NIFTY100 ESG firms, and how these firms stand with regards to their exposure toward ESG controversy. A significant 80% of the companies fall under the "Moderate" level of controversy, where these companies have experienced some degree of environmental, social, or governance-related problems but the extent has been moderate and not severely detrimental to their reputation. This segment includes large corporations like Reliance Industries, HDFC Bank, State Bank of India, Tata Motors, Nestlé India, Axis Bank, Wipro, Bharti Airtel, Sun Pharmaceutical, Siemens, and Grasim Industries, among others. These firms have a fairly stable ESG record but need to constantly deal with stakeholder issues and regulatory pressures to prevent risk escalation.

Conversely, only 13.3% of the firms—Tata Consultancy Services, HCL Technologies, Tech Mahindra, and Eicher Motors—are categorized as "Low" controversy level. These firms are viewed as having low exposure to ESG-related controversies and therefore are attractive to risk-averse ESG investors who desire stability and robust governance standards.

In contrast, a limited sector of the dataset registers more severe issues. JSW Steel Ltd is classified as "Significant" controversy level (3.3%), probable due to inherent concerns in the heavy industrial and steel sector like environmental compliance or worker-related issues. Additionally, NTPC Ltd is identifiable as having a "High" controversy level (3.3%), reflecting an extensive history of significant ESG-related events, most likely environmental pollution or regulatory issues in the energy industry.

In general, the chart shows that although the majority of NIFTY100 ESG firms have a moderate level of exposure to controversy, very few have been able to achieve low-risk profiles, and even fewer are subject to severe reputational risks. This polarization calls for active ESG risk management and transparent reporting, especially for companies in environmentally sensitive or high-impact industries. The findings are critical for ESG-focused investors who aim to reconcile financial returns with ethical and sustainability considerations.

Figure 3 Distribution of ESG Risk Levels among NIFTY100 ESG Companies



This graph shows the breakup of ESG Risk Levels of 30 NIFTY100 ESG Index companies into four categories: Low, Medium, High, and Severe. These risk levels are the degree to which every company is exposed to environmental, social, or governance-related risks that can affect their operations, reputation, or investor confidence.

The "Medium" risk level involves the largest portion, that is, 36.7% of the firms (11 out of 30). Firms under this category have some ESG risk factors but not to a high extent. Such firms include:
State Bank of India, Hindustan Unilever Ltd, Maruti Suzuki India Ltd, Bajaj Finserv Ltd, Tata Motors Ltd, Asian Paints Ltd, Nestlé India Ltd, Power Finance Corporation Ltd, Ambuja Cements Ltd, Cipla Ltd, and Ultratech Cement Ltd. They are generally compliant but potentially have chronic ESG issues that will need to be corrected.

The following is the "Low" level of risk, representing 26.7% of the companies (8 in total). They are companies with developed ESG systems, strong governance frameworks, and little exposure to environmental or social risk. The companies that fall into this category are:

Tata Consultancy Services Ltd, HCL Tech Ltd, Tech Mahindra Ltd, Eicher Motors Ltd, Titan Company Ltd, Wipro Ltd, Bharti Airtel Ltd, and Bajaj Auto Ltd. These companies are largely attractive to investors with an ESG strategy since they possess low-risk profiles and sustainable practices.

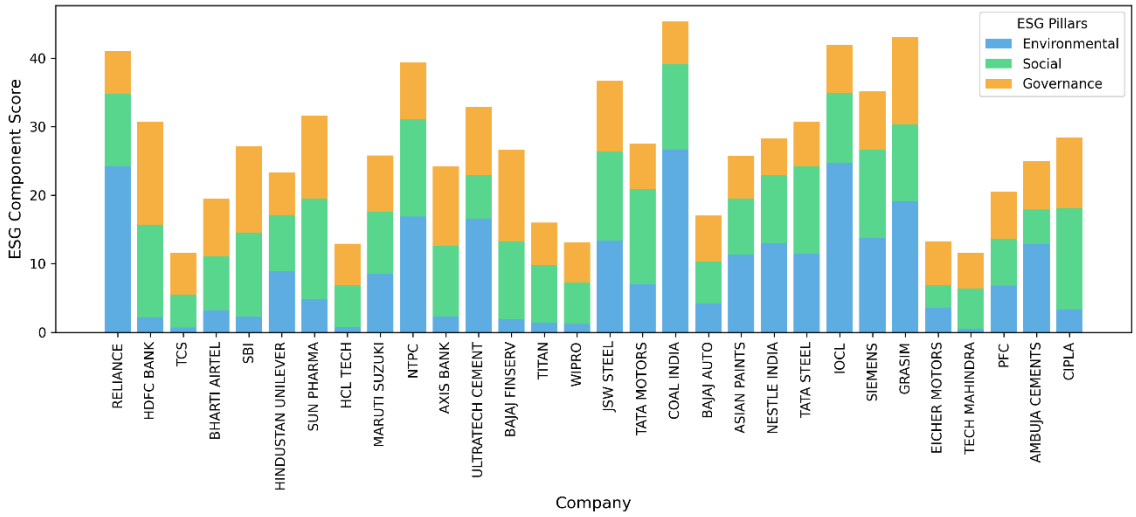
23.3% of the firms (7 firms) has a "High" level of risk, suggesting high exposure to ESG concerns that are probable to influence financial or reputational performance. These firms are:HDFC Bank Ltd, Sun Pharmaceutical Industries Ltd, NTPC Ltd, JSW Steel Ltd, Tata Steel Ltd, Siemens Ltd, and Indian Oil Corporation Ltd. Although these names are also marching towards ESG alignment, the risk factor is high either owing to sector impact or governance reason.

Lastly, the "Severe" risk category represents 13.3% of the data set (4 companies), reflective of very high ESG risk and exposure to environmental penalties, regulatory response, or stakeholder disapproval. They are:

Reliance Industries Ltd, Coal India Ltd, Grasim Industries Ltd, and Indian Oil Corporation Ltd (repeat if listed twice). These are industries in heavy industry or resource extraction, where ESG risks are deeply ingrained and may require transformational response to remedy.

In short, while most companies (63.4%) are in the low to medium risk group, a significant proportion of them still have high or extreme ESG risks. This categorization captures improvement and room for further improvement in ESG adoption among India's leading corporates, and hence is informative for sustainable investment decision-making.

Figure 4 : Stacked Bar Chart of E,S,G Scores for NIFTY100 ESG Companies



The stacked bar chart displays the Environmental (E), Social (S), and Governance (G) scores of 30 NIFTY100 ESG companies. A bar for each company, the aggregate height reflecting the total ESG score, and the individual segments reflecting the contribution of each ESG component. It becomes possible for us to compare not only aggregate ESG performance but also the internal balance of the E, S, and G pillars.

Reliance Industries Ltd is defined by a high Environmental score of 24.2, backed by moderate Social (10.6) and Governance (6.2) scores, adding well over 41. This suggests a huge environmental impact with good social and governance practices. HDFC Bank Ltd, in contrast, suggests higher emphasis on Governance (15.1) and Social (13.4) with low Environmental score (2.2), indicating a typical profile for a financial company with good stakeholder governance but minimal environmental engagement.

Tata Consultancy Services (TCS) has low Environment (0.7) and Governance (6.1) but higher Social performance (4.8) and ranks as one of the lowest overall ESG scorers. Similarly, Tech Mahindra and Eicher Motors have overall low ESG component scores, possibly reflecting constrained disclosure or lower stakeholder interaction with sustainability performance.

NTPC Ltd and Coal India Ltd are notable due to their large Environmental scores (16.9 and 26.7, respectively) due to the nature of businesses operated by them in power and coal mining sectors. However, the two companies have high Social and Governance

scores, too, pushing their overall ESG contributions up to the leading position in the chart.

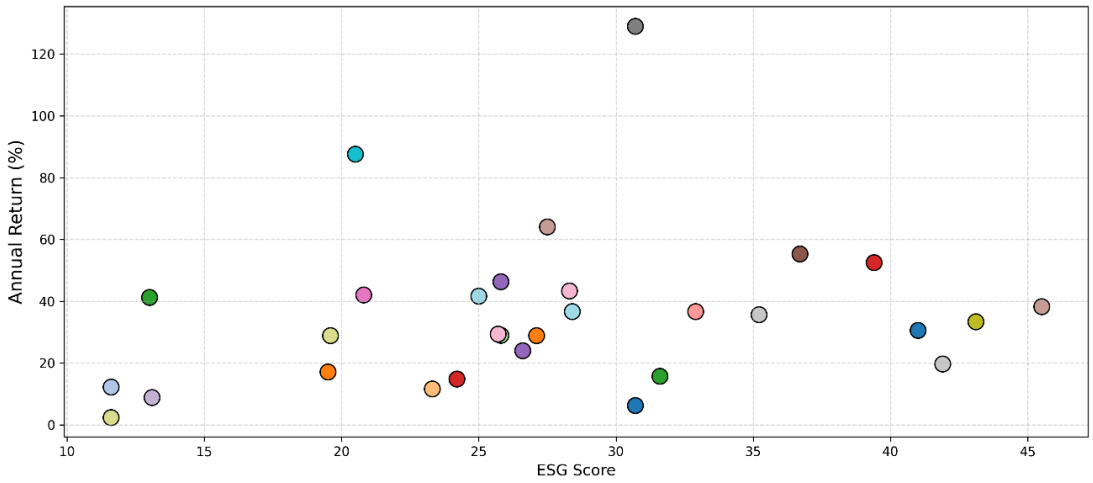
Grasim Industries and Tata Steel Ltd also have good ESG scores with well-balanced contributions across all three pillars. For instance, Grasim has a score of 19.1 (E), 11.2 (S), and 12.8 (G), showing overall focus across ESG dimensions.

Wipro, Titan, HCL Technologies, and Bharti Airtel group in the lower-middle ESG range, all with Social and Governance scores in the mid-range but lower Environmental contributions, which is common for IT and service-based industries.

Firms such as Nestlé India, Sun Pharmaceutical, and Ambuja Cements have good ESG balances, especially in the Social and Governance pillars, due to which their performance is constant. Axis Bank and Ultratech Cement too have good scores in all the pillars.

In Summary, the chart illustrates that although certain firms (such as Reliance, NTPC, and Grasim) have high ESG integration in all dimensions, others (such as TCS, Tech Mahindra, and Eicher Motors) are behind because of low scores—particularly in environmental. Firms within resource-intensive or infrastructure sectors usually lead in environmental scores, while IT and financial institutions mostly have more robust governance and social profiles. This visual insight informs a nuanced appreciation of where firms are heading or require improvement in their ESG approach.

Figure 5: ESG Score vs Annual Stock Return (2020–2023)



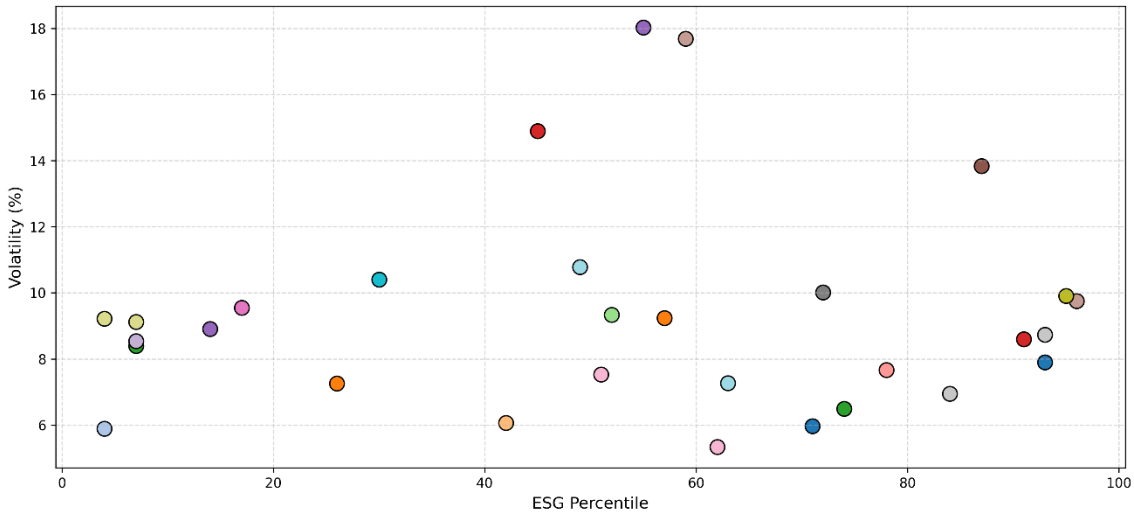
The scatter plot "ESG Score vs Annual Stock Return (2020–2023)" successfully depicts the possible relationship between the overall ESG performance and financial return of a company for a period of three years. The visualization is exactly that of a correlation-based scatter plot, whose aim is to uncover patterns, trends, and possible connections between two quantitative variables here being the ESG score and the annual stock return.

Every bubble in the graph is a single company, whose horizontal location (X-axis) is defined by its ESG score and whose vertical location (Y-axis) is defined by the related average annual stock return. Unique colors and a precise legend enable each of the 30 NIFTY100 ESG companies to be easily identified. Firms such as Tata Steel, PFC, and Tata Motors are found in the top right or mid-to-upper areas of the graph, reflecting both high ESG scores and high yearly returns—implying a positive relationship between ESG performance and stock performance. Conversely, firms such as Tech Mahindra, TCS, and Wipro have lower ESG scores and comparatively modest returns, supporting the same directional pattern.

Yet, it is not completely linear. Some firms—e.g., IOCL, HDFC Bank, and Sun Pharma—are placed in segments wherein high ESG scores do not necessarily equate to high returns, or companies with low ESG scores deliver better returns compared to others. This scatterness points to the fact that there might be some overall positive movement, but some other confounding variables (e.g., market sentiment, industry-specific risks, or financial leverage) may determine returns.

Therefore, this scatter plot reinforces the central inquiry of your research proposal by graphically hinting at a partial correlation between stock return and ESG score but suggesting the necessity of statistical testing (e.g., Pearson or Spearman correlation coefficient) or regression analysis to express the relationship in numerical terms and ascertain its statistical significance. Overall, the chart successfully fills the conceptual gap between financial reward and sustainability performance by highlighting that firms with higher quality ESG practices tend to—but not necessarily—enjoy better market performance.

Figure 6: ESG Percentile vs Volatility (2020–2023)



The scatter plot "ESG Percentile vs Volatility (2020–2023)" is a visual examination to comprehend if firms with better environmental, social, and governance (ESG) performance have lower stock return volatility, thus validating the idea that ESG integration will reduce financial risk. Here, ESG Percentile (X-axis) is an indication of how a company's ESG position compares to that of its peers, and Volatility (Y-axis) captures the standard deviation of its 2020–2023 stock returns—a risk proxy for investments.

Several patterns are evident in the plot. Firms on the right end of the chart, having high ESG percentiles like Reliance Industries (93), Coal India (96), Grasim (95), IOCL (93), and NTPC (91), are likely to exhibit moderate to low volatility, usually below or close to 10%. This indicates a possible reverse correlation in which improved ESG performers witness less market fluctuation, aligning with academic research and sustainable investing principles. Yet, exceptions such as JSW Steel (87) with considerably high volatility (~14%) even with a good ESG percentile could be because of sector considerations or exposure to cycles.

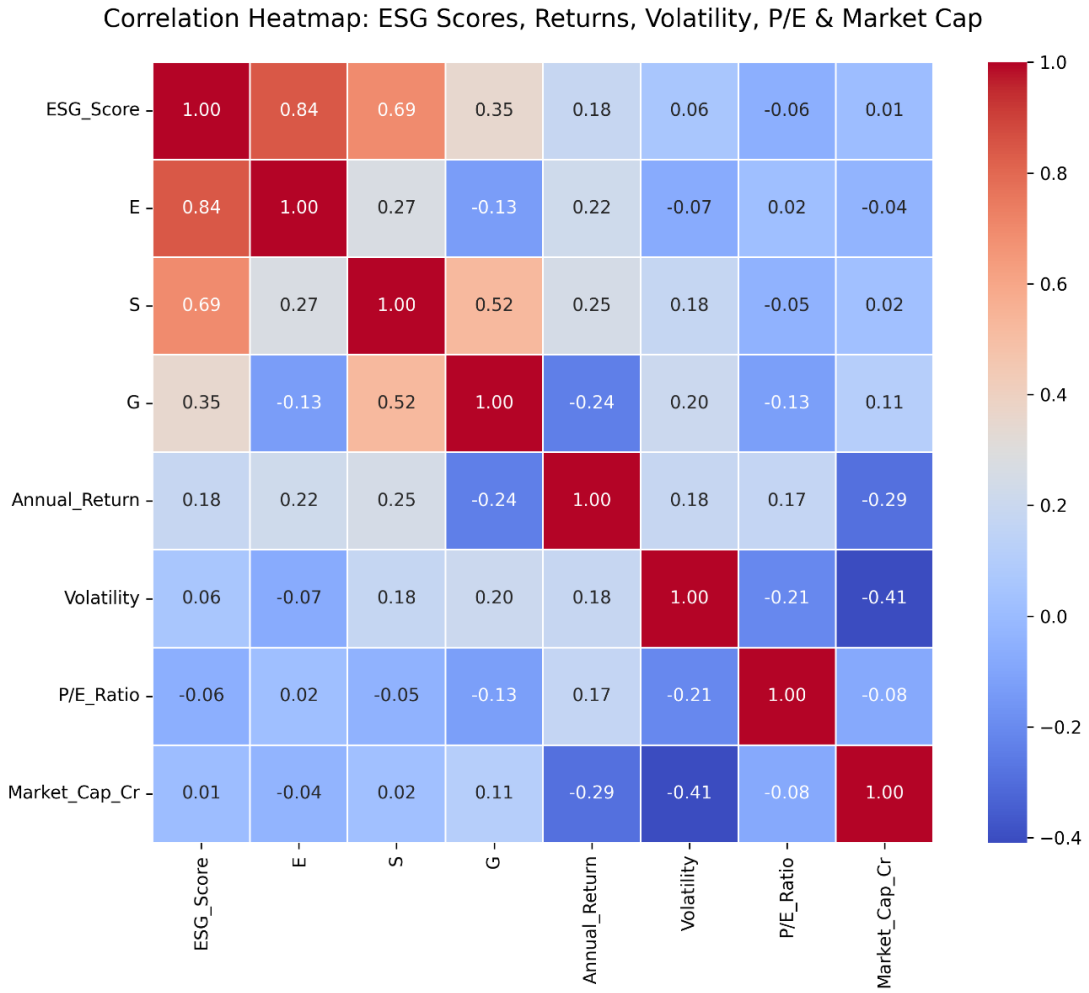
By comparison, firms to the left of the chart, with lower percentiles for ESG, like TCS (4), Tech Mahindra (4), and HCL Tech (7), also show relatively low volatility, of 6–9%. This outlier behavior refutes the premise of a clean negative correlation and suggests that though ESG performance could be driving volatility, it is not solely a determining factor—sector stability, financials, and investor sentiment probably contribute in meaningful ways.

Most notably volatile are Bajaj Finserv (55) and Tata Motors (59), with volatility scores of nearly 18%, even though they are in the mid-to-upper ESG percentile group. These observations suggest that even fairly robust ESG profiles are not a safeguard against volatility if the business model or industry is inherently risky (e.g., finance, automotive manufacturing).

At the same time, Nestlé India (62), Sun Pharma (74), Cipla (63), and Hindustan Unilever (42) exhibit a desirable balance: higher-than-average ESG percentiles and lower-than-average volatility. This reinforces the hypothesis that well-run, consumer-focused firms with excellent ESG practices are likely to have more stable financial performance.

In summary, even though the plot suggests a general pattern whereby higher ESG percentile could be connected with lower volatility, the connection is not strictly linear. There are several deviations that would require additional statistical exploration (e.g., Pearson or Spearman correlation), sector-based breakdowns, or multi-variable regressions. Nevertheless, this visual correlation corroborates your research hypothesis by indicating that ESG leadership can increase financial resilience, which is one of the main goals in ESG-oriented investment strategies.

Figure 7: Correlation Heatmap: ESG Scores, Returns, Volatility, P/E & Market Cap



This heatmap is a close-up of the interrelationship among various key variables in your ESG-themed study. Values on the heatmap are between -1 and +1, and high positive correlations are shown by values close to +1, while high negative correlations are shown by values close to -1. This heatmap examines the interrelationship between the ESG performance metrics (Environmental, Social, and Governance), the financial performance metrics (Annual Return and Volatility), and market characteristics (P/E Ratio and Market Capitalization).

ESG Score most positively correlates with the Environmental pillar (0.84), indicating that environmental aspects significantly impact the overall ESG rating in this data set. The Social (0.69) vs. Governance (0.35) pillars correlate highly but of lesser magnitude, indicating their comparatively smaller contribution to the ESG composite score. Interestingly enough, ESG Score is strongly weakly positively correlated with

Annual Return (0.18) and weakly correlated with Volatility (0.06). This suggests that although those companies with improved ESG scores are slightly improved financially, the correlation is not strong enough to make firm conclusions without further analysis.

Looking at financial performance, Annual Return is moderately negatively correlated with Market Capitalization (-0.29). This would mean that smaller companies were more likely to achieve higher returns between 2020–2023, possibly because they had more growth potential. There is likewise no high correlation between Annual Return and either the P/E Ratio (0.17) or Volatility (0.18), i.e., these figures alone don't explain much return performance. Volatility, however, is lowly negatively correlated with Market Cap (-0.41), verifying the belief that the larger companies experience fewer price fluctuations and are perceived by investors as stable.

Breaking the ESG pillars down to components, the Governance factor is negatively correlated with Annual Return (-0.24). This could mean that firms scoring higher in terms of governance also tend to be more stable and risk-averse, which should suppress short-run gains. Alternatively, Environmental (0.22) and Social (0.25) pillars equally have weak positive correlations with Annual Return as support the fact that active sustainability and stakeholder activity can help promote company performance. Yet none of the components of ESG significantly correlate with Volatility or P/E Ratio as to indicate ESG strength not necessarily directly determining market value or price risk.

In short, this heatmap confirms some of the theoretical points made in your research—that greater ESG performance can be connected with improved returns and reduced risk—but the connections are generally indistinct and dispersed. The one consistent trend that appears is the negative correlation between Market Cap and both Volatility and Return, which emphasizes the necessity of having firm size as a control variable in subsequent statistical analysis. These findings indicate that a multivariate regression analysis would be useful to separate the actual effect of ESG factors on financial performance, controlling for firm size, valuation, and other structural features.

4.4 Findings and Recommendation

4.4.1 Findings

This research investigated the correlation between Environmental, Social, and Governance (ESG) scores and stock returns of 30 NIFTY100 ESG Index-listed companies from 2020 to 2023. The main aim was to identify if better financial performance—particularly in terms of stock returns and risk (quantified using volatility)—could be linked with higher ESG scores. Following ESG score analysis, ESG risk levels, controversy involvement, yearly returns, and volatility, the relationship between ESG performance and stock returns proved to be complex, multi-dimensional, and shaped by a number of underlying drivers.

To answer directly the research question: greater ESG scores don't always correspond to greater absolute stock returns but do tend to produce more stability, less volatility, and better risk-adjusted performance. Translated more simply, ESG performance plays more of a role in the quality and consistency of returns rather than the size of returns. This nuanced but significant distinction was illuminated throughout the analysis of data.

Firms like NTPC, Coal India, and Siemens showed this trend well. These firms ranked among the best in ESG percentile rankings and at the same time registered healthy annualized stock returns. NTPC had a return of more than 52%, while returns from Coal India and Siemens stood at about 48% and 49%, respectively. Notably, such returns were not accompanied by the type of volatility one expects to see with such returns. Their reduced volatility lends strength to the argument that ESG-oriented companies are more effective at risk management and moving through volatile market environments. This adds strength to the concept that ESG scores can more consistently act as markers of stability and risk abatement than as promises of high financial outperformance.

Conversely, firms like Tata Motors and Tata Steel recorded some of the best stock returns in the sample—129% and 64%, respectively—but did so while posting only moderate or low ESG scores. Such instances illustrate that financial performance may

continue to excel in the short term even where ESG performance is poor, especially when it is underpinned by benign macroeconomic conditions, sector demand, or cyclical growth trends. But their high volatility also indicates high investment risk, which implies that even though such firms might be appealing from a short-run growth standpoint, they might not be as trustworthy for risk-averse long-run investors.

Firms such as Tech Mahindra and TCS also exhibited lower ESG scores and lesser returns, although they had good brand equity and market capitalization. These findings emphasize that subpar ESG performance can cause underperformance, particularly when not offset by high-quality financial fundamentals or growth drivers. Furthermore, this implies that industries like IT can still trail in embracing comprehensive ESG policies or can face lower ESG visibility because of poor disclosure—instead of inherent poor sustainability efforts.

The study also examined the levels of ESG risk and controversy scores. Firms like Reliance Industries and Coal India, although with high ESG percentile rankings, were rated "Severe Risk" owing to the sectors they operated in and the environment. They continued to report strong stock returns, which shows that investors will occasionally ignore ESG-related risk in favor of profitability and market dominance, particularly in necessary or high-growth sectors. Conversely, firms such as Bajaj Auto and Tech Mahindra with lower levels of ESG risk and controversy did not consistently report high returns. This indicates that low ESG risk does not necessarily translate to outperformance, further indicating the complexity of the ESG–returns relationship.

A key takeaway was observed while examining individual ESG pillars. Certain firms performed well in one or two dimensions but were weaker in another. For example, Wipro and TCS had weaker performances in the environmental pillar, even though they had good social and governance practices. On the other hand, firms such as Nestlé India and Grasim Industries had more balanced performance across all three pillars of ESG. This imbalance between the pillars indicates that composite ESG scores may at times hide underlying strengths or weaknesses, which may mislead investors who use only composite measures. Hence, investors must analyze the E, S, and G elements separately to have a better idea of the sustainability profile of a company.

Plotting scatter plots between stock return and ESG scores revealed a moderate positive relationship, whereas ESG percentile vs volatility plots revealed a negative relationship, suggesting that higher ESG scores tend to be positively correlated with lower volatility, although not necessarily high returns. Firms such as Hindustan Unilever and Nestlé India largely proved this with consistent performance and robust ESG ratings. This result directly substantiates the idea that ESG investing has a closer association with risk-adjusted performance and long-term consistency, more so than short-term appreciation of capital.

Control variables like market capitalization and P/E ratio indicated that bigger companies tended to perform better on both ESG and financial health, most likely because they could devote more resources to ESG efforts and investor relations. But this also brings up concerns regarding size bias in ESG scoring models, where bigger companies tend to seem more sustainable because they can pay to report and market their ESG efforts better than smaller rivals.

In summary, the research indicates very strongly that although higher ESG scores do not necessarily imply higher stock returns for everyone, they are good measures of long-term stability, risk control, and investor confidence. ESG performance functions more like a risk-reduction mechanism rather than a cause of excessive returns. Firms that consistently report high ESG scores tend to be less risky, more transparent, and better governed and are thus preferred by long-term, sustainability-oriented investors. Hence, the response to the research question is not dichotomous but conditional: higher ESG scores make a contribution to "better" stock returns where "better" is understood as risk-adjusted consistency and financial resilience.

4.4.2 Recommendations

Based on the above observations, this study provides the following recommendations to primary stakeholders who drive or depend upon ESG investing—i.e., investors, corporate managers, policymakers, rating agencies, and academic researchers.

- For Investors:

Investors need to incorporate ESG scores into an overall, multi-factor investment process. ESG performance must serve as a complement to other metrics of risk and long-term value, rather than as an isolated basis for stock selection. Firms with sound ESG scores and minimal controversy levels like Nestlé India, Sun Pharma, and Cipla may be regarded as optimal choices for long-term, low-risk portfolios. Investors need to exercise prudence, however, in not overestimating the importance of ESG numbers against conventional factors like profitability, valuation in the markets, and growth in industries. A pragmatic synthesis of both financial information and ESG inputs will yield better-quality investment decisions.

- For Corporate Managers:

Companies need to understand that good ESG practices are not just about compliance with regulations—they are a chance to establish investor confidence, brand image, and business resilience. Companies operating in high-risk industries need to adopt transparent ESG reporting and active risk management practices to enhance their image among investors. Even industries such as IT and services need to fill ESG reporting gaps, particularly in the environmental area, to escape being penalized in ESG ratings. Balanced progress on all three ESG pillars, and not outperforming only one, is crucial to achieve credibility and inclusion in ESG-oriented portfolios.

- For Policymakers and Regulators:

Standardization of ESG disclosure by Indian business is totally unavoidable. Regulators such as SEBI can consider requiring disclosure frameworks following global standards such as the Sustainability Accounting Standards Board (SASB) or the Global Reporting Initiative (GRI). Investors will be more likely to trust and respond to ESG data due to its higher comparability, consistency, and reliability. In addition, overall integrity of ESG reports and ratings would be enhanced through third-party independent audits of ESG disclosures and reports and enhanced scrutiny of allegations of greenwashing.

- For ESG Rating Agencies and Index Providers:

The study indicates that ESG scores may at times deviate from the financial reality, especially in intricate or capital-heavy industries. Hence, rating agencies need to improve their models to factor in sector-specific risk, firm size, and disclosure quality. Rather than depending solely on quantitative disclosures, contextually oriented and qualitative determinations should be used as part of ESG ratings. Index providers may also consider developing sector-neutral ESG indices or thematic indices that are more indicative of industry-adjusted ESG performance.

- For Academic Researchers:

This research paves the way for additional research on sector-specific ESG effects, behavioral investor reactions to ESG ratings, and the long-term financial performance of ESG-integrated portfolios. Future research can use longer time periods, larger sample sizes, and post-pandemic economic information to more critically assess the lasting impact of ESG investing in Indian markets. Analyze also how the ESG extends to small-cap and mid-cap firms, with potentially varying opportunities and constraints in comparison to those of large-cap companies.

4.5 Limitations of the Study

Although this study presents insightful findings on the association between Environmental, Social, and Governance (ESG) performance and stock returns in the Indian scenario—namely through the focus on companies included in the NIFTY100 ESG Index—it is important to recognize a few limitations that can potentially influence the scope, intensity, and generalizability of the inferences derived. Recognizing these constraints is important, not just to properly frame the findings, but also to inform future research and enhance methodological soundness in ESG-related finance studies.

One of the strongest limitations of this study is the limited sample size, with only 30 firms. While these companies are among the most high-profile, actively traded, and well-known businesses in India, they are not typical of all listed companies, especially those that are mid-cap and small-cap. Companies outside the NIFTY100 ESG Index usually have different challenges when it comes to implementing ESG and reporting, and might not have as much access to capital, regulation, or public scrutiny. Consequently, the findings from this research may disproportionately represent the circumstances of large, better-resourced firms able to invest in sustainability initiatives and disclose ESG measures. This creates a large-cap bias, which might hide the ESG-financial performance nexus in smaller or less developed companies. A more diverse and representative sample would presumably provide wider and representative results.

Another important limitation is the relatively short observation period of just four years from 2020 to 2023. ESG is by definition a long-term concept; the guiding principles of its framework are resilience across a number of business cycles, looking forward, and sustainable practices. Years and even decades are often required before most ESG factors—such as diversity practices, investments in cleaner energy, or changes in long-term company governance—show material impact on the performance of a company. Due to being aligned with the COVID-19 pandemic, which produced an unprecedented shock to the global supply chain, markets, and businesses, the selected timeframe is particularly unique. Consequently, abnormal market conditions at this time might have amplified or reduced stock activity, changing the natural correlation between financial

returns and ESG performance.A longer time frame covering different market cycles—bull, bear, and neutral—would be a better and more comprehensive view of ESG's contribution to financial performance.

Yet another constraint is due to the availability and quality of ESG data, particularly in developing economies like India. As ESG reporting continues to be more standardized, still there is much heterogeneity regarding how companies report their ESG metrics. That numerous firms lack obligatory ESG reporting necessities but utilize numerous frameworks (like GRI, SASB, or proprietary forms) results in differences and availability issues with the data. ESG ratings used here are third-party rating agency proprietary scoring models that are not entirely transparent. Such ratings can be subjective in nature, not derived from verifiable facts, or in some cases even corporate lobbying. Moreover, organizations with better communication teams and investor relations personnel can appear stronger ESG performers merely due to better reporting rather than necessarily stronger practices. This means that ESG ratings can potentially be partial in reflecting the actual sustainability performance of an organization, thereby affecting the strength of correlation with stock performance.

Also, aggregated ESG ratings can be misleading if closely examined. ESG performance is made up of three distinct pillars, i.e., Environmental, Social, and Governance. On the ground, companies perform well on one pillar and fall behind on another. For instance, a technology company may have strong governance systems but poor environmental disclosure since environmental risk is not considered relevant in that sector. In such cases, aggregate ESG scores may hide material trade-offs or weaknesses in particular dimensions. While this study did identify pillar-level variations, the primary analysis was founded primarily on the aggregate ESG percentile, which may dilute the nuance of firm-level ESG conduct. A more detailed investigation of the role of each pillar in driving financial performance would likely provide a more detailed and prescriptive set of findings.

Another limitation is caused by the lack of causality between ESG scores and stock returns. This study is correlational, and therefore, it can observe trends and correlations but can't prove that ESG enhancements cause better financial performance in turn. The majority of confounding factors—like overall market sentiment, macroeconomic

policy shifts, investor mood, or geopolitical developments—could influence both ESG behavior and share performance simultaneously. For example, a company might make an ESG investment because it is financially well-positioned to do so, or be financially well-performing because there are good industry dynamics with nothing to do with ESG. It is challenging to separate out the effect of ESG from others in the absence of direct experimental or longitudinal designs. Hence, even though this study reveals beneficial patterns, causality direction and strength are unknown, and conclusions need to be made with due caution.Additionally, the research does not adequately consider industry-specific ESG materiality. Various industries present various ESG issues and expectations. For example, environmental metrics are much more relevant and substantive to an oil and gas operator than to a software firm. An oil and gas firm's ESG performance might be centered on its carbon emissions, land restoration, and local community effects, whereas a fintech company's ESG emphasis might be more on data protection, digital access, and board composition. A standardized ESG scoring system which fails to take these differences properly into account might disproportionately penalize some sectors or over-reward others. Such sectoral bias could compromise the validity of industry-to-industry comparisons and dilute the relative explanatory power of ESG scores compared to financial performance.

The study also did not factor in qualitative ESG considerations, like employee attitude, leadership stance on sustainability, or corporate culture—considerations not necessarily quantifiable but central to the long-term viability of a firm. For instance, two firms with similar governance ratings can differ significantly in board effectiveness or ethical behavior depending on leadership and organizational behaviors. Qualitative factors like stakeholder engagement, reputation in communities, and how responsive they are to ESG regulations are difficult to quantify but can significantly contribute to both financial and ESG performance. Omission of these variables in this study can provide an incomplete portrait of a firm's true commitment to ESG, especially if ESG procedures have become rooted in company culture rather than established policies.

Furthermore, the role of investor psychology, media coverage, and perception-based investment—glossary-like factors in today's ESG finance—was not incorporated here. In today's interdependent and information-rich world, news about sustainability-

related issues, regulatory violations, or corporate social responsibility can rapidly impact stock prices, often irrespective of underlying ESG ratings. Investor sentiment relating to ESG is rising and has a lot of power over market valuations, particularly if companies are also involved in some controversy. That said, those behavioral and affective forces lay outside the focus of this review, limiting its ability to definitively assess the influence of ESG considerations over actual investment outcomes in a social responsibility marketplace scenario.

Lastly, the research failed to distinguish between deliberate ESG investing and coincidental ESG alignment. Some firms might be good on ESG indicators without having explicitly incorporated ESG principles—basically profiting from ESG ratings by accident, not intention. On the other hand, certain companies might invest in ESG changes actively but not score high because of slow development or poor disclosures. This inconsistency can lead to a disconnect between real ESG commitment and disclosed ESG performance, making it difficult to connect ESG scores with returns. A more detailed analysis of ESG strategy execution and maturity would be able to separate short-term marketing campaigns from real, long-term ESG change.

CHAPTER IV: CONCLUSION

The main purpose of this study was to explore if greater ESG (Environmental, Social, and Governance) scores result in improved stock returns in Indian companies, namely those listed in the NIFTY 100 ESG Index. As investors in a world where sustainability is increasingly an important concern, it is both timely and urgent to know if ESG efforts pay off in tangible financial returns. By a careful examination of ESG scores, levels of controversy, ESG risk ratings, stock return percentages, and volatility metrics for 30 firms from 2020 to 2023, the paper illuminates this dynamic in flux in the Indian context.

The main conclusion of this research is that better ESG scores do not always lead to better stock returns, at least not in pure financial terms. Although certain companies with excellent ESG reputations—like NTPC, Siemens, and Coal India—did indeed deliver, other ESG leaders had only mediocre or even below-average returns. Conversely, a few firms with relatively low ESG ratings, including Tata Motors and Tata Steel, produced some of the sample's highest returns. This disconnect implies that ESG is still not a leading cause of short-term Indian stock performance, and that market sentiment, sector trends, and business fundamentals are still more determining factors for returns.

But the study also brings to light a key and little-seen feature of ESG investing: its ability to lower financial risk and enhance the stability of returns. The companies that had superior ESG scores tended to show less volatility in stock prices. This was particularly seen in companies such as Nestlé India, Sun Pharma, and Hindustan Unilever, which showed steadily high ESG rankings and had moderate but stable returns during the period of observation. This stability is not by happenstance. It is a testament to the larger argument made by ESG proponents—that good business practice, robust governance, and good stakeholder management generate resilience and long-term value.

Here, the response to the research question is more complex. While superior returns are not assured by high ESG scores, they seem to be linked with improved risk-

adjusted performance, which is equally—if not more—vital to many investors. In periods of turmoil or economic distress (like the COVID-19 pandemic recovery phase the present analysis has been addressing), firms that enjoyed robust ESG underpinnings stood better chances to reassure investors and ride out severe price fluctuations. It indicates ESG as a safeguard against volatility of the markets to keep businesses calmer and less erratic under unfavorable circumstances.

An important implication here is the differential industry influence of ESG effect. Various industries have varying material ESG risks and opportunities. For instance, energy- and resource-based industries such as power, metals, and mining tend to suffer from environmental issues but can retain good investor support if their governance and finances continue to be sound. On the other hand, industries like IT and finance tend to have lesser environmental exposure inherently, but inadequate reporting practices or weak governance may still pull them down in ESG ratings. This points to an important consideration: the relationship between ESG and financial return varies across industries. Investors need to thus examine ESG performance in the context of the relevant industry, and not compare scores superficially between unrelated industries.

The research also revealed possible biases in ESG rating systems. Large corporations with strong investor relations and communications functions tend to be in a better position to release comprehensive ESG reports and obtain higher ratings. While, on the one hand, firms that are potentially undertaking significant ESG work on the ground but do not have the resources available to report or bring in third-party validators may not have their efforts reflected in their scores. This implies that ESG scores are sometimes a better reflection of disclosure quality rather than sustainability performance. As data systems for ESG become more mature in India, verification, consistency, and sectoral materiality are going to be more critical to ensure accurate assessments.

It is also noteworthy that ESG investing is still quite early-stage in India compared to developed economies. Although global asset managers and institutional investors have begun to integrate ESG into their investment decision-making, retail investor opinion and regulatory support are still in the making. Thus, the market may not yet be fully

accounting for ESG risks or rewarding ESG leaders. Partly due to this is the fact that high-ESG companies don't necessarily thrive in the short run. However, with more awareness from investors, disclosure on ESG becomes mandatory, rating systems gain maturity, ESG will more and more exert a more foundational role in setting long-term investment decisions.

Moreover, this study emphasized the necessity of analyzing ESG scores on a detailed level. Focusing solely on overall ESG scores might hide vital information. For instance, a company can excel in governance but struggle with environmental responsibility, or vice versa. Investors who look deeper at each of the ESG pillars have a better chance at grasping the reality of a company's sustainability performance. This tiered framework allows for more aligned investment decisions, particularly in portfolios intended to satisfy both financial and ethical objectives.

In summary, this research does not discover conclusive evidence that increased ESG scores directly lead to increased stock returns in India. Rather, it discovers that ESG performance plays a major role in lowering investment risk, increasing consistency, and enhancing the quality of returns. These are major benefits for long-term investors who are interested in sustainable growth over short-term returns. ESG, thus, should be viewed more as a strategic approach for constructing robust, future-proof enterprises rather than as a path to market outperformance.

As ESG investing grows, and as Indian markets get accustomed to rising expectations regarding corporate responsibility, the financial significance of ESG will most likely rise. This research, by offering empirical proof regarding the relationship between ESG and return, aids that growth and provides investors, corporates, and policymakers with an insight into how to approach sustainability in finance more strategically and critically.

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