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Financial implications of ESG adoption: A comparative study of ESG (Environmental, Social and Governance) impact in IT and Energy sectors

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Abstract
The purpose of this study is to determine whether and how the financial performance of Indian companies in the IT and energy sectors is impacted by environmental, social, and governance (ESG) integration. The analysis uses correlation and multiple regression techniques to separate the distinct effects of the E, S, and G dimensions on profitability and growth outcomes based on firm-level ESG pillar scores and six performance metrics: return on capital employed, return on equity, return on assets, earnings per share, profit earning growth, and profit growth. Stronger environmental performance is typically linked to higher returns on capital and assets, according to empirical data, while the social pillar is consistently linked to lower short-term profitability and muted earnings and profit growth, indicating costly social commitments that are not immediately offset by financial gains. Tighter governance frameworks seem to limit some accounting-based returns, but they are positively correlated with profit growth and shareholder-oriented metrics, indicating a trend toward more sustainable wealth generation. Overall, the results show that ESG integration in Indian IT and energy companies is marked by significant short-term financial trade-offs along with possible long-term benefits, providing managers, investors, and policymakers with useful information for striking a balance between performance expectations in emerging markets and sustainability goals.

Keywords
Environmental, Social, Governance, ROA, ROE, ROCE, EPS, PEG, PG

1. Introduction
Companies today prioritize comprehensive ESG strategies to drive sustainable growth and stakeholder value, encompassing targeted environmental initiatives such as cutting greenhouse gas emissions through green energy shifts from 2019 baselines, boosting solid waste recycling and reuse rates, adopting recycled paper, tracking business travel emissions, and expanding green cover through afforestation efforts. On the social front, these efforts emphasize elevating employee learning through extended training hours, advancing gender diversity through dedicated hiring, fostering inclusivity across cultures, genders, abilities, and ages, amplifying CSR outreach for community up liftment, and promoting employee volunteering. Governance measures further strengthen this framework by enhancing ESG training and awareness for staff, diversifying supplier bases, embedding ESG principles in supply chains via expanded social audits, training coverage, and emissions tracking, while upholding exemplary corporate governance standards (CRISIL Report 2022). The United Nations Sustainable Development Goals (UN SDGs) provide a global framework for advancing sustainable progress in economic, social, and environmental spheres by 2030. Our organization commits to these objectives through strategic initiatives that deliver long-term value to all stakeholders. Aligned with our

business model, we prioritize seven key SDGs to maximize meaningful contributions (CRISIL Report 2022). An ESG risk management framework addresses key environmental risks like resource use and emissions, embeds innovation to meet measurable targets, and shows effectiveness through improved practices. Social risk management focuses on employee welfare, supply chain standards, and community engagement. Governance evaluates board independence, diversity, leadership, audits, and shareholder rights to ensure strong oversight and risk mitigation. This integrated framework identifies material risks and ensures strategic management for sustainable performance (ESG Assessment & Methodology Report by ESG Risk Assessments & Insights Limited).

2. Literature Review

In their analysis of ESG indices across both developed (the USA, Germany, and Japan) and emerging (India, Brazil, and China) markets, using MSCI data from 2017 to 2022, Gupta and Chaudhary focused on risk and return comparisons. Utilizing sophisticated volatility models (ARCH), risk metrics (Sharpe, Sortino, Treynor, Jensen's Alpha), and daily returns, they found that Brazil's ESG index outperformed its benchmark peers. In contrast, the USA and India's ESG indices demonstrated stronger risk-adjusted returns than their broader markets. Germany's ESG index was noted for its lower volatility, while both Brazil and Germany exhibited resilience in the face of negative news, unlike their counterparts. The research highlighted that market dynamics and the macroeconomic environment have a significant impact on ESG index performance, carrying implications for investment strategies and policy formulation in emerging economies **Gupta & Chaudhary, 2023.** This study employs PLS-SEM modelling and an exploratory, quantitative methodology to analyse primary data from the CFOs of 122 top ESG companies (rated by CRISIL in India). It investigates how the relationship between CSR initiatives and competitive performance is mediated by business reputation and sustainability practices. The findings show that this link is highly mediated by reputation and sustainability practices, indicating that CSR's competitive value is realized through improved sustainability and public perception rather than directly. The report recommends more research on managerial skills, company innovativeness, and comparative work across various economies or industry groups **Dash & Mohanty, 2023.** This study utilizes multivariate regression analysis on S&P BSE 100 companies (drawing from Bloomberg and Prowess data from 2015 to 2019) to examine the correlation between ESG disclosure scores and the individual scores for environmental, social, and governance factors with ROA and ROCE. The results reveal a statistically significant positive association between ESG disclosures and both ROA and ROCE. Eight distinct models reinforce the validity of these conclusions. The importance of this research is further enhanced by its suggestion for future investigations to incorporate market-based metrics (such as stock returns or Tobin's Q) and to pursue similar studies in international contexts for broader applicability **Kumar & Firoz, 2022.**

3. Research Objectives

- To evaluate the ESG integration and financial performance across the IT and Energy sectors of Indian companies.
- To investigate the relationship between ESG integration and financial performance for the IT and Energy sectors of Indian companies.

4. Hypothesis

H1 There is a relationship between ESG scores and different financial metrics across the IT and Energy sectors of Indian companies.

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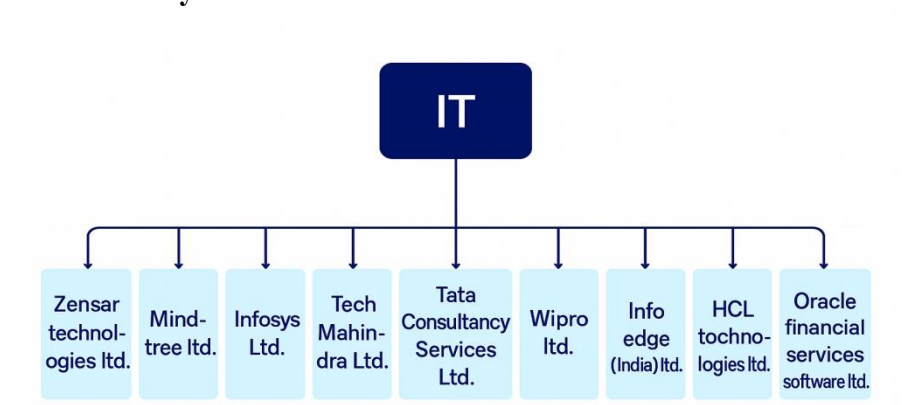
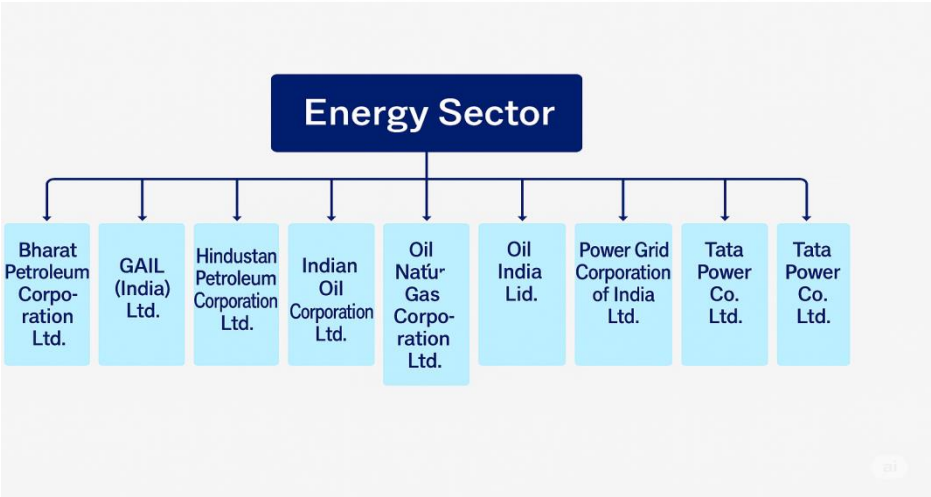
5. Data Collection

The study uses secondary data obtained from S&P Global Co. and Money Control, which provides standardized information on ESG scores and financial indicators for listed Indian Companies. The final sample consists of 20 listed companies, comprising 10 firms from the IT sector and 10 firms from the Energy sector, selected based on data availability and continuous listing during the study period. The analysis covers the period from 2019-20 to 2024-25, resulting in a balanced panel of 20 firm-year observations. The ESG score is used as the key explanatory variable to capture the firm's sustainability performance, while ROCE, ROE, ROA, EPS, PEG and Profit Growth serve as measures of financial performance.

5.1 Sample Of The Study





5.2 Tools And Techniques

5.2.1 Accounting tools:

ROCE, ROE, ROA, EPS, Profit Earnings Growth (PEG), Profit Growth as key financial performance indicators.

5.2.2 Statistical tools and tests:

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Descriptive statistics (mean, standard deviation, range, skewness, kurtosis), Pearson correlation analysis, multiple linear regression, ordinary least squares (OLS) regression and OLS regression with fixed effects.

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
ENV SCORE	20	74.00	19.00	93.00	57.30	23.090	533.16	-.201	.512	-.952	.992
SOCIAL SCORE	20	63.00	22.00	85.00	52.80	18.297	334.80	-.042	.512	-.490	.992
GOV SCORE	20	79.00	10.00	89.00	46.30	20.274	411.06	.171	.512	-.232	.992
ESG COMBINE	20	69.00	19.00	88.00	51.80	19.011	361.43	.051	.512	-.497	.992
RETURN ON CAPITAL EMPLOYED	20	60.65	3.65	64.30	22.68	14.723	216.78	1.326	.512	1.935	.992
RETURN ON EQUITY 5 Y	20	72.60	-17.00	55.60	5.410	13.962	194.94	2.452	.512	9.089	.992
RETURN ON EQUITY	20	49.06	2.44	51.50	21.96	12.654	160.12	.804	.512	.112	.992

RETURN ON ASSTES 5 Y	20	26.90	2.10	29.00	10.12	7.2535	52.614	1.184	.512	.939	.992
RETURN ON ASSETS	20	30.41	2.09	32.50	11.50	8.0257	64.413	1.166	.512	.979	.992
EARNING PER SHARE	20	262.3	2.70	265.00	54.21	61.542	3787.5	2.419	.512	6.832	.992
PROFIT EARNING GROWTH	20	9.00	-3.00	6.00	1.750	1.8317	3.355	-.218	.512	2.198	.992
PROFIT GROWTH	20	282.0	-79.00	203.00	7.800	55.469	3076.9	2.118	.512	8.303	.992
Valid N (listwise)	20										

6. Data Analysis

6.1 OBJ.1 - To evaluate the ESG integration and financial performance across the IT and Energy sectors of Indian companies.

Table 1: Descriptive Statistics of ESG following the IT and Energy sectors of Indian Companies

6.2 OBJ.2 - To investigate the relationship between ESG integration and financial performance for the IT and Energy sectors of Indian companies.

EQUATIONS LIST

1. **Return On Capital Employed (ROCE):** Earnings before interest & tax (EBIT) / Capital employed
2. **Return On Assets (ROA):** $Net\ income + ((Intrest\ Expense\ on\ Debt - Interest\ expense\ capitalized) \times (1 - Tax\ Rate)) / Average\ of\ Last\ Year's and\ Current\ Year's\ Total\ Assets \times 100$
3. **Return On Equity (ROE):** Net income / Shareholders' funds
4. **Earnings Per Share (EPS):** (Net Income - Preferred Dividends) / Weighted Average Common Shares Outstanding
5. **Profit Earning Growth (PEG):** (P/E Ratio) / Expected EPS Growth Rate
6. **Profit Growth (PG):** ((Current Profit - Previous Profit) / Previous Profit) * 100

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2.1 ESG IMPACT ON ROCE
2.2 ESG IMPACT ON ROE

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	25.401	8.876		2.862	.011	6.585	44.217					
	ENV SCORE	.826	.281	1.295	2.940	.010	.230	1.421	.256	.592	.582	.202	4.957
	SOCIAL SCORE	-.912	.349	-1.133	-2.616	.019	-1.651	-.173	-.041	-.547	-.517	.208	4.802
	GOV SCORE	-.040	.249	-.055	-.162	.874	-.569	.488	.081	-.040	-.032	.332	3.015

Dependent Variable: RETURN ON CAPITAL EMPLOYED

2.3 ESG IMPACT ON ROA

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	14.555	4.807		3.028	.008	4.364	24.746					
	ENV SCORE	.435	.152	1.252	2.861	.011	.113	.757	.195	.582	.562	.202	4.957
	SOCIAL SCORE	-.541	.189	-1.234	-2.866	.011	-.942	-.141	-.110	-.582	-.563	.208	4.802

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GOV SCORE	.013	.135	.033	.096	.925	-.273	.299	.056	.024	.019	.332	3.015

Dependent Variable: RETURN ON ASSETS

2.4 ESG IMPACT ON EPS

2.5 ESG IMPACT ON PEG

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1 (Constant)	99.341	37.077		2.679	.016	20.741	177.942					
ENV SCORE	.020	.042	.254	.477	.640	-.069	.110	.001	.118	.114	.202	4.957
SOCIAL SCORE	1.052	1.173	.395	.897	.383	-1.435	3.538	-.050	.219	.177	.202	4.957
GOV SCORE	-.059	.052	-.588	-1.123	.278	-.170	.052	-.105	-.270	-.268	.208	4.802
	-4.000	1.457	-1.189	-2.746	.014	-7.088	-.912	-.250	-.566	-.543	.208	4.80
	.030	.038	.330	.796	.438	-.050	.109	.069	.195	.190	.3322	3.015
	2.285	1.042	.753	2.194	.043	.077	4.494	.130	.481	.434	.332	3.015

Dependent Variable: PROFIT EARNING GROWTH

Dependent Variable: EARNING PER SHARE

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2.6 ESG IMPACT ON PG

7. FINDINGS (Interpretation of Data Analysis)

3.1 Overall findings of IT sector companies

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1 (Constant)	44.071	32.608		1.352	.195	-25.055	113.197					
ENV SCORE	-1.021	1.032	-.425	-.990	.337	-3.208	1.166	-.199	-.240	-.191	.202	4.957
SOCIAL SCORE	-2.037	1.281	-.672	-1.590	.131	-4.753	.678	-.237	-.369	-.307	.208	4.802
GOV SCORE	2.803	.916	1.025	3.060	.007	.861	4.746	.157	.608	.590	.332	3.015

Dependent Variable: PROFIT GROWTH

	ROCE	ROE	ROA	EPS	PEG	PG
E SCORE	.067	.117	-.017	-.428	-.078	-.654
S SCORE	-.261	-.235	-.316	-.559	-.171	-.463

G SCORE	-.402	-.383	-.473	-.462	-.261	-.313
ESG COMBINE	-.209	-.173	-.285	-.511	-.158	-.506

With tiny positive values for ROCE and ROE and small to moderate negative values for ROA, EPS, PEG, and profit growth, the environmental score has extremely weak associations with the financial indicators. This implies that environmental performance may include trade-offs between short-term profitability and longer-term capital and equity returns and is not substantially correlated with any one financial statistic.

With moderately negative values for ROCE, ROE, ROA, and EPS and lesser negative values for PEG and profit growth, the social score is consistently negative across all six metrics. This pattern suggests that companies with higher social ratings in the sample typically exhibit lower growth and profitability, suggesting that social initiatives may come with costs that are not immediately offset by financial gains.

With values that are typically bigger than those for environmental or social scores, the governance score shows the highest and most consistent negative connections with ROCE, ROE, ROA, EPS, PEG, and profit growth. This implies that companies with higher governance scores are not the ones with the highest contemporaneous profitability or growth. This could be due to more conservative practices, more stringent compliance, or less risk-taking, all of which can limit short-term financial results.

With moderate correlations for ROCE, ROA, EPS, and profit growth and lesser negative correlations for ROE and PEG, the aggregate ESG score is likewise negative across all six metrics. Overall, this suggests that greater overall ESG integration is linked to lower current profitability and growth in this dataset, supporting the evidence from the individual pillars that ESG practices, as currently implemented by these firms, may involve short-term financial sacrifice even though they may yield strategic or reputational benefits over a longer horizon

3.2 Overall findings of Energy sector companies

	ROCE	**ROE**	**ROA**	**EPS**	**PEG**	**PG**
E SCORE	.194	.197	.009	-.374	-.480	-.199
S SCORE	.103	.243	-.146	-.467	-.356	-.319
G SCORE	-.130	.018	-.388	-.581	-.210	-.199
ESG COMBINE	.055	.138	-.179	-.496	-.380	-.219

Stronger environmental performance is associated with marginally higher returns on capital and equity but does not significantly affect returns on assets in the sample, according to environmental scores, which show only a minor positive correlation with ROCE and ROE and are nearly unrelated to ROA. Simultaneously, the environmental score exhibits a somewhat negative correlation with EPS, PEG, and profit growth. This suggests that companies that prioritize environmental initiatives tend to report lower current earnings per share and slower earnings and profit growth, which reflects the short-term cost burden of such investments on immediate financial outcomes.

The social score shows small positive correlations with ROCE and ROE but a negative association with ROA, suggesting that higher social engagement is not consistently reflected in improved profitability across all return measures in the sample. At the same time, its moderately negative correlations with EPS, PEG and profit growth indicate that firms with

stronger social performance tend to report lower earnings per share and slower earnings and profit growth in the short run, highlighting a possible trade-off between social spending and immediate financial gains for these companies.
Stronger governance does not result in higher contemporaneous profitability, as the governance score is nearly zero for ROE and somewhat negative for ROCE and ROA. Instead, it may represent more cautious, compliance-oriented behaviour that tempers returns. Simultaneously, governance is marginally negative for PEG and profit growth and significantly negative for EPS, indicating that more closely regulated companies typically produce slower growth and lower current earnings, which is associated with a conservative risk profile rather than aggressive profit-seeking. The short-term financial impact of ESG adoption in this sample appears mixed and frequently unfavourable for growth-oriented metrics, as the combined score is weakly positive for ROCE and ROE but negative for ROA, EPS, PEG, and profit growth. This suggests that overall ESG integration is associated with marginally better returns on capital and equity but generally weaker earnings and growth indicators.

8. Results And Discussion

The descriptive statistics show that the sampled enterprises' ESG performance and financial results varied significantly. While the wide ranges and relatively high standard deviations show that some businesses are heavily involved in ESG practices while others continue to operate at a very low level, the average environmental, social, governance, and combined ESG ratings fall in the mid-range. Financial metrics like return on assets, return on equity, and return on capital employed also show significant variation, with some businesses reporting moderate or even negative values and others producing extremely high profitability. The profit and profit-growth variables, as well as the long-term performance metrics, are positively skewed and exhibit significant kurtosis, indicating that a small number of companies dominate in terms of long-term profitability and growth. Overall, the descriptive profile demonstrates that the sample is diverse in terms of both financial performance and ESG integration, offering a good foundation for additional investigation into the connection between ESG scores and firm-level financial parameters.

8.1 Return-based indicators (ROCE, ROE, ROA)

For return on capital employed, the environmental score has a positive and statistically significant effect, indicating that firms with stronger environmental practices earn higher returns on the capital deployed, while the social score is significantly negative and governance is insignificant.
For return on equity, none of the ESG dimensions is statistically significant at the 5 percent level; the environmental score is positive but only marginally close to significance, suggesting that ESG effects on shareholder returns are weaker than on other profitability measures.
For return on assets, the environmental score again shows a positive and significant coefficient, whereas the social score is significantly negative and governance remains insignificant, implying that environmental initiatives enhance asset efficiency, while intensive social activities may depress short-term accounting returns.

8.2 Earnings and growth indicators (EPS, PEG, Profit Growth)

In the earnings per share model, the social score is negatively and significantly related to EPS, while the governance score is positively and significantly associated with EPS and the environmental score is not significant, indicating that strong governance supports higher earnings, whereas social initiatives may dilute earnings per share.

For profit-earning growth (PEG), none of the ESG variables reach statistical significance, implying that ESG integration does not show a clear measurable impact on this growth metric in the current sample.
For profit growth, governance has a positive and significant coefficient, whereas the environmental and social scores are not significant, suggesting that better governance frameworks are linked with stronger overall profit expansion, but environmental and social scores do not have a direct, detectable influence on profit growth in this analysis.

4.1 Table of relationships

DEPENDENT VARIABLES	INDEPENDENT VARIABLES		
	E	**S**	**G**
ROCE	Positive	Negative	Negative
ROA	Positive	Negative	Negative
ROE	Positive	Negative	Positive
EPS	Positive	Negative	Positive
PEG	Positive	Negative	Positive
PG	Negative	Negative	Positive

9. Conclusion

Overall, the study concludes that there is a complex and inconsistent relationship between ESG integration and the financial performance of the Indian IT and energy companies that were sampled. Although the impact on shareholder returns is small, environmental performance generally exhibits a positive correlation with key profitability metrics, such as ROCE, ROA, and ROE, suggesting that environmentally conscious businesses can deliver superior returns on capital and assets. In contrast, social performance is primarily negatively correlated with all six financial metrics, suggesting that increased social engagement is frequently accompanied by lower profitability and slower growth in the short term. This indicates that social initiatives may have a cost burden that is not immediately offset by financial gains. Stronger governance is positively correlated with ROE, EPS, PEG, and profit growth, but it is negatively correlated with ROCE and ROA. This suggests that stronger governance structures may limit some accounting returns but promote shareholder-oriented outcomes and more sustainable profit growth over time. The combined ESG score highlights that while ESG adoption in these sectors currently involves short-term financial trade-offs, it also strengthens long-term value creation potential and aligns firms with emerging sustainability expectations in the Indian market. Higher overall ESG integration is associated with better capital and equity returns but tends to coincide with softer earnings and growth metrics.

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