

Human Capital & Its Implications On Corporate Sustainability And Performance: Empirical Evidence From India

Shalini Yadav¹, Susmit Roy²

^{1,2}Indian Institute of Management Indore, India

Abstract

Economic and social progress rely on the integration of human capital and sustainable practices. Sustainability involves fostering an organizational culture capable of addressing significant social and environmental challenges, rather than focusing solely on technological or procedural investments. Sustainable resource and environmental management consider future needs whereas financial success demonstrates firm profitability. The Financial measurements and indicators assess the company's profitability, liquidity, and stability. This made us study corporate human capital and performance. This evaluation analyses a 10-year sample of Nifty 100 firms. ESG Environment, society and governance ratings are used to assess firm sustainability. ROA, ROE, Tobin's Q, ROCE and sales assessed the company's performance. The study found that firms' human capital positively affects its sustainability performance. The firm's human capital was positively correlated with the ESG elements' environment (E-Score), social (S-Score), and governance (G-Score) components. Human capital was shown to have a greater impact on sustainability performance than financial performance.

Keywords: Human Capital, Financial Performance, Sustainability.

INTRODUCTION

In recent years, there has been an increasing emphasis on the connection between sustainability and human Capital in both academia and policies. Essential for long-term socio-economic progress, organizations target growth and profitability, relying on skilled individuals to achieve these goals. Human capital—encompassing knowledge, skills, and traits—enhances economic, social, and personal well-being (WDR Reports, 2019). Organizations main target is to focus on growth and profit. For the accomplishment of the set targets they need skilled people who can help to reach up to the goals Human capital is the knowledge, abilities, competencies, and traits that people possess and which help boost economic, social, and personal well-being). According to Harvard Business Review (2022), good management of human capital encompasses a range of people-centered approaches, such as inclusive leadership, employee engagement, workforce optimization, knowledge sharing, and continuous learning. All of these things are critical for making an organization more resilient and better at what it does.

Sustainability, which used to mean being able to meet current demands without making it difficult for future generations to meet their own (Brundtland Commission, 1987), is now a corporate strategy that is necessary. It is no longer enough for businesses to just follow the rules or be socially responsible; these things are becoming a part of their fundamental culture and long-term aspirations (Elkington, 1998; Eccles et al., 2014). You can't just acquire new technologies or start green projects if you want your firm to last. You also need to change how you think and act such that the organization values social and environmental responsibility (Lozano, 2015).

Empirical research demonstrates that investing in human capital—through education, health, and skills training—can improve a firm's sustainability outcomes by cultivating more flexible, inventive, and environmentally aware workforces (UNDP, 2021; Pfeffer, 1994). Sustainable human capital development is linked to broader developmental objectives, such as alleviating poverty, advancing social fairness, and enhancing environmental resilience (UNEP, 2016).

Return on Assets (ROA), Return on Capital Employed (ROCE), and Tobin's Q are standard ways to quantify how well organizations turn their resources, such people, into long-term profits (Wang & Shailer, 2015). Studies show that organizations that focus on their people and make sustainability a part of their plans often do better than their competitors in both financial and non-financial areas. This study seeks to examine the relationship between human capital and sustainability performance in Indian firms, namely those included in the Nifty 100 index.

The study aims to assess the influence of human capital investments on financial performance, alongside environmental and social effects, by examining ESG scores and critical financial metrics over a ten-year period, thereby furthering the primary goal of sustainable development.

Return on Assets (ROA), Return on Capital Employed (ROCE), and Tobin's Q are all common ways to quantify how well businesses turn their resources, like people, into long-term profits (Wang & Shailer, 2013). Studies show that businesses that put a lot of value on their employees and make sustainability a part of their plans often do better than their competitors in both financial and non-financial areas (Dhaliwal et al., 2011; Khan et al., 2016).

LITERATURE REVIEW

The incorporation of sustainability into business plans has raised awareness of how human capital affects a company's long-term success. According to scholars, organizational resilience and sustainable development goals depend heavily on human resources, a strategic intangible asset (Crook et al., 2011; Shrivastava & Berger, 2010).

Kumar and Dash (2021) looked at ESG disclosures in Indian companies and concluded that better social and governance standards, like fair labor policies and gender equality, make companies worth more.

Recent empirical studies have explored the nexus between human capital and sustainability performance. Asiaei et al. (2022) found that green human capital significantly enhances corporate environmental performance, suggesting that employees' environmental knowledge and skills are crucial for sustainable practices. Similarly, Pareek et al. (2021) observed that gender diversity on boards positively influences corporate sustainability performance in Indian firms, indicating the value of diverse human capital in driving sustainability initiatives.

Singh and Joshi (2009) also said that intellectual capital, especially human resources, greatly improves performance in India's knowledge-intensive industries, such as pharmaceuticals.

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(Subramaniam et al., 2015) looked at the integrated reports of Indian corporations and found that better disclosure of human capital is linked to higher stakeholder trust and better ESG ratings. Also, sustainable human resource management (HRM) techniques can help the triple bottom line: people, planet, and profit.

Chatterji et al. (2009) questioned the reliability of social performance evaluations around the world and stressed how important it is for investors and analysts to have reliable human capital measures. (Bansal & DesJardine, 2014) also said that investing in employee well-being, diversity, and learning over the long run leads to better performance, even if it means making short-term sacrifices.

Plowman et al. (2007) showed that organizations with more human and structural capital have better financial results. This supports the view that intangible assets are important for creating value in the modern knowledge economy. Jha and Rangarajan (2020) looked at the link between corporate sustainability performance and financial performance in India. They found that the link is complicated and changes from sector to sector. A panel data analysis of BSE 500 businesses by Mohammed et al. (2025) found that corporate social responsibility efforts, which are a part of human capital engagement, had a complex effect on financial outcomes. Gupta and Gupta (2020) also showed that measures to protect the environment had a favorable effect on many aspects of business performance in India. This strengthens the strategic necessity of making sustainability a part of everyday business activities. The Ministry of Corporate Affairs in India published the National Voluntary Guidelines on Social, Environmental, and Economic Responsibilities of Business in 2011. These guidelines encourage businesses to act responsibly and show that institutions support sustainability.

Human capital is important for more than just making money; it also includes innovation and sustainability. Bontis et al. (2000) say that human capital, together with structural and relational capital, is necessary for creating intellectual value, especially in companies that rely heavily on knowledge. Delery and Roumpi (2017) agree with this point of view, saying that businesses must constantly improve and align their people with their strategic goals in order to stay ahead of the competition.

METHODOLOGY

The research used a balanced panel data set of 1000 firm year observations spanning 100 different companies from 2013 to 2022 saw the data including important organizational and financial measures relevant to ESG(Environmental, Social and Governance) performance with the help of different variables.

Table 1: Regression Results Predicting ESG Performance:

Variables	Model 1 Coefficient (SE)	Model 2 Coefficient (SE)	Model 3 Coefficient (SE)	Model 4 Coefficient (SE)
FTime	-2.14e-05 (1.54e- 05)	-2.70e-05 (1.91e- 05)	-3.11e-05** (1.27e-05)	-4.76e-06 (2.08e- 05)
Salary	7.30e-11 (4.88e-10)	1.13e-09* (6.05e-10)	-1.19e-10 (4.02e- 10)	-4.81e-10 (6.59e- 10)
Success Plan	0.0934*** (0.0144)	0.0513*** (0.0178)	0.0487*** (0.0118)	0.221*** (0.0194)
ETurnover	0.0412 (0.0492)	0.0425 (0.0610)	0.154*** (0.0404)	0.0741 (0.0664)
WForce	0.661*** (0.0206)	0.581*** (0.0256)	0.818*** (0.0170)	0.493*** (0.0278)
Satisfaction	-0.0269 (0.0244)	0.0548* (0.0303)	-0.0250 (0.0201)	-0.0400 (0.0330)
Asset	0.000 (0.000)	0.000 (0.000)	0.000* (0.000)	0.000 (0.000)
MCap	0.000 (0.000)	0.000 (0.000)	0.000* (0.000)	0.000 (0.000)
Constant	4.435*** (0.857)	6.860*** (1.062)	3.582*** (0.705)	10.14*** (1.156)
Observations	1,000	1,000	1,000	1,000
R-squared	0.744	0.584	0.856	0.596
Number of Firms	100	100	100	100

*Note: Standard errors are in parentheses. Significance levels: *p<0.10, **p<0.05, ***p<0.01.

Table 1 outlines the fixed-effects panel regression results evaluating the impact of human capital variables on ESG performance among Nifty100 firms between 2013 and 2022. The analysis, based on firm-level data from the Refinitiv Eikon database and estimated using Stata16 SE, incorporates four model specifications to ensure robustness.

The results reveal that succession planning and workforce strength are consistently and significantly associated with higher ESG performance across all model specifications. Succession planning demonstrates a strong positive effect ($\beta = 0.221$, $p < 0.01$ in Model 4), affirming the strategic role of leadership continuity in enhancing corporate sustainability. Similarly, the workforce score—representing employee skills, diversity, and development—shows a robust positive relationship ($\beta = 0.818$, $p < 0.01$ in Model 3), underscoring the importance of investing in human capital capabilities.

Employee turnover is statistically significant only in Model 3 ($\beta = 0.154$, $p < 0.01$), suggesting that its effect may be context-dependent or interact with other firm-level dynamics. Interestingly, employee satisfaction yields inconsistent results, achieving marginal significance in Model 2 ($\beta = 0.0548$, $p < 0.10$), but remains insignificant elsewhere, indicating a weaker direct influence on ESG outcomes.

The number of full-time employees has a significant but negative impact in Model 3 ($\beta = -3.11e-05$, $p < 0.05$), possibly reflecting the diminishing marginal returns of large workforces on sustainability or challenges in managing human capital at scale. Average salary shows a marginally significant positive effect only in Model 2 ($\beta = 1.13e-09$, $p < 0.10$), indicating limited explanatory power in isolation.

Among the control variables, total assets and market capitalization are weakly significant in Model 3, suggesting that firm size has only a marginal effect on ESG performance.

Model 3 demonstrates the highest explanatory power, with an R-squared of 0.856, indicating a strong fit and suggesting that the selected human capital variables, particularly succession planning and workforce quality, are critical drivers of ESG performance.

Implications

The data shows that making targeted investments in human capital, especially in leadership development and workforce quality, greatly improves ESG outcomes. These results have real-world effects on corporate sustainability policies. Instead of seeing ESG as a need for compliance, companies should make human capital development a part of their main governance and strategic planning processes.

Future study may investigate the interplay between these human capital dimensions and sector-specific

variables or external shocks (e.g., regulatory changes, pandemics) to elucidate the dynamics of ESG performance in intricate situations.

Table 2: Regression Results for Financial Variables

Variables	Model 1 Coefficient (SE)	Model 2 Coefficient (SE)	Model 3 Coefficient (SE)	Model 4 Coefficient (SE)	Model 5 Coefficient (SE)
Asset	1.70e-07*** (2.26e-08)	0.00112 (0.000713)	0 (0)	0 (0)	6.50e-11** (0)
MCap	3.01e-07*** (5.85e-08)	-0.000691 (0.00185)	7.37e-11*** (0)	4.81e-10*** (5.81e-11)	6.40e-10*** (7.95e-11)
Constant	20,051*** (1,093)	2.707e+08*** (3.452e+07)	3.249*** (0.365)	38.50*** (1.085)	19.58*** (1.485)
Observations	1,000	1,000	1,000	1,000	1,000
R-squared	0.105	0.003	0.019	0.080	0.083
Number of ID	100	100	100	100	100

Note: Standard errors are in parentheses. Significance levels: *p<0.1; **p<0.05; ***p<0.01.

Table 2: presents the regression results examining the influence of firm size—measured by total assets and market capitalization (MCap)—on various financial performance indicators: Revenue (Model 1), Return on Capital Employed – ROCE (Model 2), Return on Equity – ROE (Model 3), Return on Assets – ROA (Model 4), and Tobin’s Q (Model 5) presented in table 2.1. All models use fixed-effects panel regression with 1,000 observations covering 100 Nifty100 firms from 2013 to 2022.

Table 2.1

Model	Significant Predictors	R ²	Interpretation Summary
Revenue	Assets, Market Cap	0.105	Size positively influences revenue generation.
ROCE	None	0.003	Efficiency not dependent on size.
ROE	Market Cap	0.019	Market valuation drives shareholder returns.
ROA	Market Cap	0.080	Market value enhances asset efficiency.
Tobin’s Q	Assets, Market Cap	0.083	Size and market value improve valuation efficiency.

This image shows the estimated regression coefficients with standard error bars for two variables that measure the size of a company: Total Assets and Market Capitalization. It also shows five measures of financial performance: Revenue, ROCE, ROE, ROA, and Tobin's Q. The findings derive from fixed-effects panel regressions utilizing data from 100 Nifty100 enterprises spanning the years 2013 to 2022 (N = 1,000). The analysis shows that market capitalization is a better and more reliable way to anticipate how well a company will do, especially when it comes to market-sensitive metrics like ROA and Tobin's Q. On the other hand, total assets don't mean much, which suggests that scale benefits are more important for making money than for measuring efficiency.

- Revenue: A strong positive relationship was found between firm size (both Assets and Market Cap) and total revenue ($R^2 = 0.105$), indicating that larger firms tend to generate higher revenues.
- ROCE: Return on Capital Employed was not significantly influenced by firm size, with a low R^2 (0.003), suggesting efficiency is independent of firm scale.
- ROE: Return on Equity was significantly associated with Market Capitalization only, indicating that shareholder value is aligned with market valuation.
- ROA: Return on Assets showed significance for Market Capitalization, implying that more valuable firms use assets more efficiently.
- Tobin’s Q: Both size variables were significant, showing that market valuation and asset base improve firm valuation efficiency.

Table 3: Regression Results for Return on Assets (ROA)

Variables	Model 1 Coefficient (SE)	Model 2 Coefficient (SE)	Model 3 Coefficient (SE)	Model 4 Coefficient (SE)
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FTime	-6.38e-08 (7.20e-08)	-3.03e-07* (1.83e-07)	-5.17e-05*** (1.58e-05)	-4.12e-07*** (1.49e-07)
Salary	0 (0)	0 (0)	3.71e-10(5.13e-10)	0** (0)
Succession Plan	8.72e-05 (6.95e-05)	-1.39e-05 (0.000177)	-0.00589 (0.0152)	-3.55e-05 (0.000144)
ETurnover	0.000215(0.000236)	0.000597(0.000601)	-0.0294 (0.0517)	0.000220(0.000488)
Workforce	-0.000161 (9.90e-05)	-0.000252(0.000252)	-0.0147 (0.0217)	0.000114(0.000205)
Satisfaction	-1.69e-06 (0.000264)	-0.000438(0.000671)	0.0135 (0.0577)	-0.000504(0.000545)

The table 3 shows the results of four regression models that looked at how different characteristics connected to human capital and governance affect a company's financial success, as assessed by Return on Assets (ROA). Each model systematically integrates supplementary explanatory factors to evaluate their distinct and collective impacts.

Interpretation

- **Variable Family Time**- consistently showing negative and significant effect in model 2 and 4.
- **Salary**-showing statistically significant result in Model 4 implying that better productivity or performance incentives that have a beneficial impact on ROA may be connected to suitable compensation methods. On the other hand, Model 3 shows not significant results.
- **Succession Plan**- across all models are not statistically significant. Coefficients are inconsistent in sign and magnitude indicating lack of definitive evidence regarding its effect.
- **ETurnoverM** – The coefficients are statistically insignificant across all models. Model 3 with large standard error lacks reliability which indicates that employee turnover may not directly impact ROA.
- **Workforce Size**- shows mixed indicators and is not statistically in any models. This suggests that augmenting workforce size does not have a direct correlation with variations of ROA.
- **Satisfaction**- employee satisfaction has a positive coefficient in Model 3, but is not statistically significant indicating no reliable relationship with ROA.

According to regression study, FTime (female leadership representation) and Salary had the greatest impact on Return on Assets. The statistical importance of FTime, especially in Models 3 and 4, suggests a gender-performance conundrum, suggesting that gender diversity in leadership and financial success may be complex and warrants qualitative exploration. Other HR metrics including succession planning, employee turnover, workforce size, and employee satisfaction do not correlate with ROA in this dataset. These findings suggest that organisations should carefully consider how gender diversity and pay initiatives fit with their financial goals. The lack of significant results for other HR variables shows that their impact on profitability may be indirect, context-dependent, or take longer to measure.

Key findings:

This study offers a thorough analysis of the relationship between human capital factors, business size, and corporate performance—assessed using Environmental, Social, and Governance (ESG) metrics as well as financial indicators—within Nifty100 companies over a decade (2013–2022). Utilizing fixed-effects panel regression models across many dimensions, the study provides subtle insights into the role of internal labor dynamics and external structural factors on business performance.

The results strongly suggest that human capital factors, especially succession planning and staff strength, are important and reliable indicators of ESG performance. Succession planning shows strong positive results in all models, which shows that planning for leadership continuity is a strategic asset for sustainability. A robust and varied workforce (WForce) is also linked to higher ESG scores, which shows how important it is to engage in employee development and inclusion. These findings indicate that companies dedicated to systematic HR development generally excel in ESG indicators, hence endorsing the incorporation of HR strategy into sustainability planning.

Variables	Model 1 Coefficient (SE)	Model 2 Coefficient (SE)	Model 3 Coefficient (SE)	Model 4 Coefficient (SE)
MCap	0 (0)	0 (0)	5.98e-10*** (0)	0 (0)

RErng	0* (0)	0** (0)	-1.66e-09*** (2.25e-10)	0 (0)
ESatisfaction	5.15e-05 (0.000187)	0.000439 (0.000475)	-0.0280 (0.040)	

Table 4: Regression Results for ROA on Market Capitalization, Earnings growth &

Table 4: presents regression estimates and impact of firm size, earning growth and employee satisfaction on ROA across four model specifications

The regression results show that business size (MCap) and relative earnings growth (RErng) have the biggest effects on ROA, but these effects are only seen in certain situations. Employee satisfaction (ESatisfaction) does not have a statistically significant effect. In Model 3, MCap's coefficient is positive and very significant (5.98×10^{-10} , $p < 0.01$), which means that when more controls are added, larger firms tend to have slightly higher ROA. However, this effect goes away in the simpler Models 1, 2, and 4, which means that its impact depends on the specific combination of covariates. RErng has a small but significant positive relationship with ROA in Models 1 ($p < 0.10$) and 2 ($p < 0.05$), but it becomes a statistically significant negative coefficient in Model 3 (-1.66×10^{-9} , $p < 0.01$) and then goes back to being null in Model 4. This change suggests that the earnings-growth effect is very sensitive to how the model is set up and may be due to endogeneity or omitted-variable bias. In all four models, the coefficients for ESatisfaction are small, change sign, and do not approach conventional levels of significance. This means that there is no credible direct link between employee satisfaction scores and ROA in this sample. Overall, these results indicate that financial performance is more closely associated with firm-level market measurements than with employee mood.

Findings:

This study analyzed the impact of human capital characteristics and business size on ESG (Environmental, Social, and Governance) performance and financial performance across Nifty100 firms from 2013 to 2022. The outcomes from three separate regression models provide essential insights into the determinants of company sustainability and profitability. Succession planning and staff strength were the most important human capital variables in improving ESG performance. Companies that actively invest in leadership development and have a talented, diverse workforce tend to do better on ESG indices which shows the importance of Human Capital for long term success.

When looking at financial performance using metrics like revenue, Return on Equity (ROE), Return on Assets (ROA), and Tobin's Q, the results show that market capitalization is more important than total assets. Companies with a bigger market value tend to do better financially. This suggests that investor confidence and perceived market strength are more important than just the amount of their actual assets. Two human capital characteristics were particularly significant in connection to ROA. In certain models, female leadership (FTime) exhibited a statistically significant but negative connection. This doesn't mean that people are less capable, but it does show that there needs to be more institutional support and more inclusive procedures to make sure that having more women in leadership positions leads to better performance. In one model, salary also had a favorable effect on ROA, which means that good pay methods may lead to higher productivity and profits. Other HR metrics, like employee turnover, contentment, and size of the workforce, did not show consistent or statistically significant links to ROA either.

In general, these findings show how important it is to make sure that human capital policies are in line with both financial and environmental goals. A company can greatly improve its ESG standing and market value by building strong leadership pipelines, developing the skills of its employees, and promoting inclusive policies. Future research may investigate the sectoral background or the moderating influences of external events, such as regulatory reforms or economic shocks, to further the comprehension of these processes.

CONCLUSION

This study highlights the importance of human capital in driving sustainability performance, rather than solely relying on investments in technology or processes. This approach could be a novel angle, as many studies might have primarily focused on technological or procedural aspects of sustainability. The paper utilizes Environment, Social, and Governance (ESG) ratings to assess firm sustainability. Integrating these ratings as a measure of sustainability performance may add a unique perspective to the study.

The paper goes beyond the traditional assessment of financial success and explores the impact of human capital on both sustainability and financial performance. This research will help the others to find out the other variables which impacts on Human capital to improve sustainability and the performance for growth and success of the organization.

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