A Multidimensional Assessment of ESG Integration Through Factor Loading Analysis

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ABSTRACT

This study investigates Environmental, Social, and Governance (ESG) integration as a multidimensional construct within the Indian corporate context, using industry leaders as benchmarks. Drawing on S&P Global Corporate Sustainability Assessment (CSA) data, the research evaluates Mahindra & Mahindra Ltd., Vedanta Ltd., Dr. Reddy's Laboratories Ltd., and JSW Steel Ltd., representing the automobile, metals and mining, pharmaceutical, and steel industries, respectively. Composite indices—Sustainable Performance, Sustainable Growth, and Corporate Excellence—were constructed to operationalize ESG integration, and factor loading analysis was applied to validate ESG as a latent construct. The results reveal that environmental (loading = 0.999) and social (loading = 0.910) dimensions exert the strongest influence on ESG integration, while governance (loading = 0.740) demonstrates a moderate yet significant role. Among the composites, Sustainable Performance (0.987) and Sustainable Growth (0.969) exhibited higher contributions compared to Corporate Excellence (0.862). These findings suggest that ESG adoption in India is transitioning from governance-driven compliance to integrated strategies that balance environmental stewardship and social responsibility. The study provides actionable insights for corporate managers, policymakers, and investors, emphasizing the need for holistic ESG practices that enhance sustainability, resilience, and stakeholder trust in emerging economies.

Keywords: ESG Integration, Sustainable Performance, Sustainable Growth, Corporate Excellence, Factor Loading, S&P Global CSA

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1. INTRODUCTION

The integration of Environmental, Social, and Governance (ESG) practices has evolved into a defining feature of modern corporate and financial strategy. Initially regarded as an extension of Corporate Social Responsibility (CSR), ESG integration has grown into a finance-oriented framework that simultaneously addresses stakeholder demands, regulatory pressures, and global sustainability imperatives. This section traces the evolution of ESG, reviews recent studies in both global and Indian contexts, and highlights the future trajectory of ESG integration in research and practice.

1.1. Evolution of ESG Integration

The roots of ESG integration lie in the corporate responsibility and ethical investment movements of the 1960s and 1970s, when firms and investors first began acknowledging the societal and environmental implications of business operations. However, it was in the 1990s that ESG emerged as a structured paradigm, driven by investor activism and growing awareness of material risks associated with climate change, environmental degradation, labor exploitation, and weak governance mechanisms (MacNeil & Esser, 2022). Unlike CSR, which emphasized ethical accountability and philanthropy, ESG integration introduced a more measurable and finance-centric approach by linking non-financial indicators with long-term firm performance. The early 2000s institutionalized ESG practices through initiatives such as the United Nations Principles for Responsible Investment (UNPRI, 2006), which urged global investors to consider ESG factors in portfolio selection and risk assessment. During this period, ESG gained credibility as a mainstream practice, especially in Europe and North America, where institutional investors began to recognize that ignoring ESG factors could expose firms to reputational and operational risks. By the mid-2010s, ESG adoption had accelerated globally, propelled by empirical studies demonstrating that sustainable firms often outperform peers in profitability and risk-adjusted returns. Research by Flammer & Bansal (2017) revealed that ESG adoption fosters long-term orientation and improves corporate value, while Albuquerque et al. (2019) confirmed that higher ESG scores reduce systemic and firm-specific risk. These findings positioned ESG integration not only as an ethical or reputational concern but also as a strategic tool for enhancing competitiveness, resilience, and value creation in the global market.

1.2. Recent Global Studies on ESG Integration

The past decade has seen a proliferation of empirical studies and meta-analyses exploring ESG's impact across industries and geographies. Atz et al. (2022) synthesized over 1,000 peer-reviewed studies and concluded that ESG adoption generates asymmetric benefits, particularly during crises such as the global financial crisis and the COVID-19 pandemic. Their findings highlighted that ESG-integrated firms exhibit greater resilience, lower volatility, and stronger stakeholder confidence during economic uncertainty. Similarly, Saygili et al. (2022) examined Turkish listed firms and found that ESG practices directly affect corporate financial performance (CFP), with governance and social metrics emerging as critical determinants. Flammer (2021) also underscored the role of green bonds and ESG-linked financing in lowering firms' cost of capital and expanding their shareholder base. Sector-specific studies have revealed differentiated outcomes. For example, Ali et al. (2022) demonstrated that environmental management practices significantly enhance employee performance and financial outcomes in Malaysian firms, mediated by ESG disclosures. Meanwhile, Zhou et al. (2022) confirmed that enhanced ESG ratings in Chinese listed companies contribute positively to firm market value, with financial performance acting as a mediating factor. Collectively, these global studies affirm ESG's growing relevance as a performance-enhancing mechanism, risk mitigator, and driver of corporate reputation.

1.3. ESG Integration in the Indian Context

In India, ESG integration is still an evolving phenomenon, primarily shaped by regulatory frameworks and compliance requirements rather than voluntary adoption. The Securities and Exchange Board of India (SEBI) introduced the Business Responsibility and Sustainability Reporting (BRSR) framework in 2021, mandating the top 1,000 listed firms to disclose ESG-related practices. This regulatory push, combined with the introduction of indices such as the Nifty100 ESG Index, has accelerated awareness and implementation of ESG initiatives across Indian corporations. However, challenges persist. Deloitte's (2022) ESG Preparedness Survey Report revealed that while most Indian companies acknowledge ESG's strategic importance, they often lack robust governance structures, effective ESG data systems, and sector-specific frameworks. McKinsey (2023) similarly emphasized that although Indian firms recognize ESG's role in competitiveness, they remain in a transitional stage, balancing regulatory

compliance with strategic adoption. Sectoral studies in India remain limited but are gaining traction. For instance, Sudha (2015) examined the ESG India Index and found it to outperform broader indices such as the Nifty and CNX 500 in the long run, suggesting potential financial advantages for sustainable investors. More recently, Agrawal (2023) highlighted the growing transformation of ESG in Indian corporate landscapes, driven by both global investor expectations and domestic regulatory reforms. Despite these advances, empirical research focusing on industry-specific ESG integration—particularly in manufacturing—remains underdeveloped, creating scope for further academic inquiry.

1.4. Future of ESG Integration

The future of ESG integration lies in expanding beyond compliance and disclosure to innovation-driven transformation. Wan et al. (2023) argue that the next stage of ESG research must address materiality, sector-specific adaptation, and digital integration. With the advent of technologies such as blockchain, artificial intelligence, and big data analytics, ESG reporting is expected to become more transparent, verifiable, and standardized, reducing one of the field's most pressing limitations: data inconsistency and comparability (Henisz et al., 2021). Moreover, the increasing urgency of climate change commitments—including India's pledge to achieve net-zero emissions by 2070—will push firms to adopt ESG not just as a governance framework but as an enabler of systemic transformation. The convergence of global sustainability goals, stakeholder activism, and investor pressure will likely accelerate the adoption of ESG-linked financing instruments, carbon-neutral strategies, and industry-specific sustainability frameworks. In academic research, future directions include examining ESG integration through advanced quantitative techniques such as factor loading, structural equation modelling, and machine learning approaches to validate multidimensional constructs. Further exploration is also needed on how ESG influences intangible assets such as corporate reputation, innovation, and employee engagement, which in turn drive sustainable growth.

In summary, ESG integration has evolved from a moral imperative to a strategic necessity, validated by extensive global evidence of its positive impact on firm performance and resilience. In India, ESG adoption is largely compliance-driven but shows potential for transformation as firms align with global standards and leverage emerging technologies. The future of ESG research and practice lies in contextualized frameworks, empirical validation, and technological innovation, positioning ESG integration as a cornerstone of long-term corporate sustainability and competitiveness.

2. REVIEW OF LITERATURE

2.1. Foundations of Finance and Early Considerations of Social Responsibility

The conceptual foundations of modern finance, which underpin the later integration of sustainability considerations, can be traced back to the 19th century. Walter Bagehot's Lombard Street (1873) provided one of the earliest systematic accounts of banking functions and the role of central banks in stabilizing financial systems. By emphasizing liquidity provision and prudential behaviour during crises, Bagehot laid the groundwork for understanding the systemic implications of financial institutions, which would later become central to discussions of corporate responsibility and sustainability (Bagehot, 1873). In the early 20th century, Joseph Schumpeter expanded the relationship between finance and development by conceptualizing financial intermediation as a driver of innovation and growth. Schumpeter (1911/1934) argued that credit allocation by financial institutions enables entrepreneurial activity, setting in motion cycles of "creative destruction" that stimulate economic progress. Decades later, empirical studies confirmed this hypothesis. King and Levine (1993), for instance, demonstrated that countries with more developed financial systems exhibit faster economic growth, supporting the thesis that finance plays a productive and socially beneficial role. These early contributions established the intellectual lineage that would later connect financial practices with broader societal outcomes.

2.2. Corporate Social Responsibility and the Evolution Toward ESG

From the mid-20th century until the 1990s, corporate social responsibility (CSR) emerged as the dominant framework for linking firms with societal expectations. CSR was primarily ethics-driven, advocating that firms had obligations beyond profit maximization to address community welfare and environmental stewardship (Carroll, 1991). However, CSR's voluntary and philanthropic orientation limited its impact, as firms lacked standardized mechanisms for assessing or disclosing social and environmental outcomes (Chaffee, 2017). By the 1990s, stakeholder activism, environmental crises, and global market integration pushed firms and investors to move beyond voluntary CSR toward more measurable and comparable frameworks. This shift culminated in the establishment of the United Nations Principles for Responsible Investment (UNPRI) in 2006, which encouraged investors to explicitly

incorporate environmental, social, and governance (ESG) criteria into decision-making processes (UNPRI, 2006). Unlike CSR, ESG integration introduced a finance-oriented approach by linking non-financial dimensions to long-term firm value and investor returns. As MacNeil and Esser (2022) observed, ESG represents a conceptual transition from entity-based ethics toward financially material considerations that can shape resilience and competitiveness.

2.3. Early Empirical Research Linking ESG and Financial Outcomes

The 2000s and early 2010s marked the first wave of systematic empirical research testing whether ESG integration positively influences corporate financial performance (CFP). Several studies found that firms with stronger environmental and social practices enjoy reputational benefits, reduced litigation risks, and improved investor confidence. For example, Flammer and Bansal (2017) demonstrated that adopting long-term ESG strategies enhances firm value by improving stakeholder trust and aligning managerial incentives with sustainable outcomes. Other research emphasized ESG's role in risk mitigation. Albuquerque, Koskinen, and Zhang (2019) theorized that CSR and ESG reduce both systematic and idiosyncratic risks by enhancing stakeholder loyalty and lowering exposure to reputational shocks. Their findings, based on U.S. data, provided robust evidence that firms with higher ESG scores tend to be more resilient during financial crises. Similarly, Chava (2014) showed that firms with poor environmental performance face higher capital costs, underscoring the financial materiality of ESG risks. The growing body of empirical work during this period shifted ESG discourse from normative arguments toward evidence-based demonstrations of its financial relevance. Firms increasingly adopted ESG not just as a reputational safeguard but as a strategic mechanism for reducing volatility and enhancing long-term profitability.

2.4. Meta-Analyses and Consolidation of Evidence (2015–2020)

By the mid-2010s, the accumulation of ESG-related studies enabled scholars to conduct large-scale reviews and meta-analyses. These studies consolidated prior findings while highlighting important contingencies. Atz, Van Holt, Liu, and Bruno (2022) reviewed over 1,000 peer-reviewed studies and 27 meta-analyses conducted between 2015 and 2020, concluding that ESG adoption generally enhances financial performance, particularly during periods of economic turmoil. They emphasized the asymmetric benefits of ESG: while ESG may provide moderate advantages in normal times, its resilience-enhancing qualities become particularly valuable in crises. Other reviews underscored that the ESG–CFP relationship is not uniformly positive but depends on contextual factors such as industry, geographic region, and the specific

ESG pillar under consideration (Friede, Busch, & Bassen, 2015). For example, governance factors often exhibit stronger correlations with CFP than social or environmental factors in emerging markets, while environmental practices are particularly salient in environmentally sensitive industries (Naeem, Cankaya, & Bildik, 2022). This period also witnessed methodological advancements. Researchers increasingly employed longitudinal datasets, quasi-experimental designs, and structural models to address endogeneity concerns and establish causal pathways linking ESG practices with financial outcomes. These innovations reinforced ESG's legitimacy as a field of financial research rather than a peripheral management concern.

2.5. Sectoral Studies and Governance-Centered Analyses (2020–2023)

The most recent wave of ESG literature reflects a move toward sector-specific studies and greater attention to governance as the structural enabler of sustainability. Ali, Salman, and Parveen (2022) analysed Malaysian firms and found that environmental management practices significantly improve employee performance and financial outcomes, with ESG disclosures mediating these relationships. Similarly, Saygili, Arslan, and Birkan (2022) examined Turkish firms listed on the Borsa Istanbul and observed that while social and governance factors enhanced operational efficiency, environmental disclosures sometimes negatively affected short-term financial outcomes, highlighting the trade-offs involved in ESG adoption. The financial instruments facilitating ESG integration have also been a growing focus. Flammer (2021) documented the rapid rise of corporate green bonds, showing that they lower firms' cost of capital and expand their investor base by attracting sustainability-conscious shareholders. These findings underscore the financial innovation dimension of ESG, where capital markets directly reward credible sustainability commitments. Zhou, Liu, and Luo (2022) further confirmed that ESG ratings positively affect Chinese firms' market value, with financial performance serving as a mediating variable. Their study also highlighted that state-owned enterprises exhibit stronger mediation effects, suggesting institutional context influences ESG–CFP linkages.

2.6. ESG Integration in India

In India, ESG integration remains an evolving phenomenon, primarily driven by regulatory frameworks rather than voluntary adoption. The Securities and Exchange Board of India (SEBI) introduced the Business Responsibility and Sustainability Reporting (BRSR) framework in 2021, mandating ESG disclosures for the top 1,000 listed firms (SEBI, 2021).

This regulatory intervention, coupled with benchmarks such as the Nifty100 ESG Index, has accelerated corporate awareness and reporting of ESG practices. Empirical evidence in India is more limited compared to global contexts. Sudha (2015) examined the ESG India Index and found that it outperformed broader market indices such as the Nifty and CNX 500 over the long term, suggesting that sustainable investing could offer competitive financial returns. More recently, Deloitte's (2022) *ESG Preparedness Survey Report* revealed that while Indian firms recognize the strategic value of ESG, many remain unprepared due to weak governance structures, data inconsistencies, and high implementation costs. McKinsey (2023) similarly emphasized that Indian firms are still in transition, with ESG adoption framed more as compliance than strategic transformation. Nonetheless, sectoral leaders such as Mahindra & Mahindra, JSW Steel, Vedanta, and Dr. Reddy's Laboratories have demonstrated higher ESG scores on global benchmarks, positioning them as exemplars of ESG integration in the Indian context. These firms highlight both the opportunities and challenges of embedding ESG into strategy within emerging markets.

2.7. Emerging Trends and Future Directions (2023–2025)

The future of ESG research and practice is characterized by innovation, digital integration, and sectoral adaptation. Recent scholarship emphasizes the need to improve ESG data quality, comparability, and materiality assessments (Henisz, Koller, & Nuttall, 2021). Wan, Dawod, Chanaim, and Ramasamy (2023) argue that the field is moving toward greater contextualization, with bibliometric analyses identifying hotspots such as climate risk management, green finance, and digital ESG analytics. Technological innovation is expected to address current challenges. Blockchain and artificial intelligence can enhance ESG reporting transparency, while big data analytics can improve real-time monitoring of environmental and social impacts. These tools can also support regulators and investors in ensuring accountability, particularly in markets where disclosure quality remains weak.

In India, the path forward will involve aligning ESG integration with national sustainability commitments, such as achieving net-zero emissions by 2070. Regulatory refinements are expected to improve data consistency while making compliance feasible for smaller firms (SEBI, 2025). Academic research will increasingly adopt advanced quantitative techniques such as factor loading, structural equation modelling, and threshold models to validate ESG as a latent, multidimensional construct.

The literature on ESG integration has evolved significantly, moving from CSR's voluntary, ethics-driven orientation in the 20th century to a finance-oriented, evidence-based discipline in the 21st century. Early foundations in finance and development theory linked financial systems to societal outcomes, while the 1990s and 2000s institutionalized ESG as a measurable construct through global initiatives such as UNPRI. Empirical studies in the 2000s and 2010s established ESG's positive impact on firm resilience and competitiveness, with meta-analyses in the 2010s consolidating evidence across industries and geographies. In the 2020s, research has increasingly focused on sectoral variations, the role of financial instruments, and governance as a structural enabler of sustainability. Indian studies, while limited, highlight the compliance-driven nature of ESG adoption and the importance of regulatory frameworks such as BRSR. Looking ahead, the literature points to a future of ESG characterized by digital integration, sector-specific adaptation, and advanced quantitative validation, underscoring ESG's growing role in shaping long-term corporate sustainability and investor confidence.

3. RESEARCH METHODOLOGY

3.1. Research Design

This study adopts a quantitative, explanatory research design to assess ESG integration as a multidimensional construct. The design combines secondary data analysis of ESG scores with statistical modelling techniques (factor loading and composite index construction). The primary objective is to evaluate how environmental, social, and governance factors interact to shape sustainable performance, sustainable growth, and corporate excellence across industries. The research follows a positivist paradigm, relying on measurable data derived from global sustainability benchmarks to derive generalizable insights. Spider charts and tabular representations are employed for descriptive benchmarking, while factor loading analysis is used for inferential testing and validation of ESG as a latent construct.

3.2. Research Objectives

RO1. To construct composite indices—Sustainable Performance, Sustainable Growth, and Corporate Excellence—by combining environmental, social, and governance dimensions.

RO2. To validate the ESG Integration Index through factor loading, thereby testing the strength and reliability of ESG as a latent construct.

RO3. To determine the relative influence of environmental, social, and governance dimensions on ESG integration and assess their interconnected contributions.

3.3. Research Hypotheses

H1: Environmental, Social, and Governance dimensions load positively and significantly onto the latent construct of ESG Integration.

H2: Among the ESG dimensions, Environmental factors demonstrate the strongest contribution to ESG Integration, followed by Social and Governance factors.

H3: The composite constructs—Sustainable Performance, Sustainable Growth, and Corporate Excellence—exhibit strong positive loadings on ESG Integration, validating it as a multidimensional construct.

H4: Sustainable Growth, which integrates Environmental and Governance factors, has a stronger influence on ESG Integration compared to Corporate Excellence, which relies more heavily on Governance.

3.4. Data Collection

The study utilizes secondary data from the S&P Global Corporate Sustainability Assessment (CSA), a globally recognized framework for evaluating corporate ESG practices. Four firms were selected as benchmarks, each representing the top 10% performers in their respective industries within India:

1. Mahindra & Mahindra Limited (Automobile sector)
2. Vedanta Limited (Metals and Mining sector)
3. Dr. Reddy's Laboratories Limited (Pharmaceuticals sector)
4. JSW Steel Limited (Steel sector)

The selection criteria were based on their CSA percentile rankings and their representation as industry leaders in sustainability performance. Data were collected from S&P Global's publicly available ESG scorecards (2024 cycle), which provide dimension-wise scores for Environmental (E), Social (S), and Governance (G).

3.5. Variables and Constructs

This study defines ESG integration as a multidimensional construct, represented through three primary dimensions: Environmental (E), Social (S), and Governance (G). The environmental

dimension captures issues such as resource efficiency, climate change mitigation, and environmental innovation. The social dimension reflects workforce diversity, employee well-being, and community engagement, while the governance dimension highlights leadership quality, transparency, accountability, and ethical standards. To operationalize ESG integration, three composite factors are developed. Sustainable Performance balances environmental and social contributions equally (0.5E + 0.5S), emphasizing their combined impact on sustainability. Sustainable Growth integrates environmental and governance aspects (0.4E + 0.6G), recognizing the role of governance in driving responsible long-term development. Corporate Excellence prioritizes governance (0.7G + 0.3S), supported by social contributions, underscoring the importance of ethical oversight in organizational leadership. These three composite factors are then aggregated into a single ESG Integration Index, calculated as an equal-weighted average, thereby ensuring balanced representation of performance, growth, and excellence in the overall measure of ESG integration.

3.6. Tools and Techniques

To validate the proposed framework, the study employs a two-stage analytical approach combining descriptive and inferential methods. In the first stage, spider charts and tabular comparisons are used to benchmark firm-level ESG performance against industry averages, enabling a visual and statistical understanding of how selected firms perform relative to their peers. In the second stage, factor loading analysis is applied to examine ESG as a latent construct and test the strength of the proposed dimensions and composites. The analysis assesses the correlations between environmental, social, and governance dimensions and the ESG Integration Index, as well as between the composite constructs—Sustainable Performance, Sustainable Growth, and Corporate Excellence—and the overall index.

4. DATA ANALYSIS AND INTERPRETATION

4.1. Descriptive Analysis of ESG Scores

The descriptive analysis begins with an examination of the firm-level ESG scores extracted from S&P Global's CSA results. The four selected benchmark companies—Mahindra & Mahindra (Automobile), Vedanta (Metals and Mining), Dr. Reddy's Laboratories (Pharmaceuticals), and JSW Steel (Steel)—demonstrate above-industry-average performance, reflecting their inclusion in the top 10% of the CSA percentile ranks. A closer inspection of the

environmental, social, and governance scores reveals significant variation across industries. Mahindra & Mahindra scores strongly in the environmental and social dimensions, supported by its leadership in clean energy adoption and workforce initiatives. Dr. Reddy's exhibits relatively balanced performance across all three dimensions, emphasizing compliance and innovation within pharmaceuticals. By contrast, Vedanta and JSW Steel achieve higher governance scores but show weaker outcomes in environmental performance, reflecting the inherent resource-intensive nature of their industries. These variations highlight sectoral differences in ESG emphasis, as well as firm-level strategic choices in sustainability integration.

Company Name	E	S	G
Mahindra & Mahindra	82	85	79
Vedanta Limited	71	81	77
Dr. Reddy's Laboratories Limited	76	82	77
JSW Steel Limited	82	82	82

Table 1.: Tabular Representation of ESG Scores derived from spider chart listed in S&P Global CSA. Source: https://www.spglobal.com/sustainable1/en/solutions/esg-scores-data

4.2. Composite ESG Constructs

To validate ESG integration as a multidimensional construct, three composites were derived from the raw data (see Table 2.). Sustainable Performance was calculated as the equal-weighted average of environmental and social scores (0.5E + 0.5S), capturing the balance between resource efficiency and social responsibility. Sustainable Growth incorporated environmental and governance factors (0.4E + 0.6G), emphasizing the role of governance oversight in enabling environmentally responsible expansion. Corporate Excellence was computed with greater emphasis on governance (0.7G + 0.3S), reflecting leadership accountability, ethical oversight, and social legitimacy. The aggregation of these three factors into the ESG Integration Index provided a composite view of organizational sustainability practices. The composite data revealed that firms with balanced E–S performance (e.g., Mahindra & Mahindra, Dr. Reddy's) scored higher in Sustainable Performance, while governance-led firms (Vedanta, JSW Steel) demonstrated stronger results in Corporate Excellence. This confirms that ESG integration is not uniform across firms but contingent on sectoral pressures and organizational priorities.

Observation	E	S	G	Sustainable Performance	Sustainable Growth	Corporate Excellence	ESG Integration
Mahindra & Mahindra	10	10	10	10	10	10	10
Vedanta Limited	8.3	9.2	8.5	8.75	8.62	8.71	8.69
Dr. Reddy's Laboratories Limited	8.8	9.1	9.6	8.95	9.28	9.48	9.24
JSW Steel Limited	8.9	9.2	10	9.05	9.34	9.74	9.38

Table 2. Composite Data. (Note. Sustainable Performance = 0.5E + 0.5S; Sustainable Growth = 0.4E + 0.6G; Corporate Excellence = 0.7G + 0.3S; ESG Integration = 0.33(Sustainable Performance + Sustainable Growth + Corporate Excellence). Source: S&P Global Corporate Sustainability Assessment (CSA) data.)

4.3. Factor Loading Analysis

Exploratory factor analysis was applied to test the strength of associations between the observed ESG dimensions (E, S, G) and the composite constructs (Sustainable Performance, Sustainable Growth, Corporate Excellence) with ESG Integration as the latent variable (Table 3). The results demonstrate high factor loadings: Environmental (0.999), Social (0.910), and Governance (0.740). Among the composites, Sustainable Performance (0.987) and Sustainable Growth (0.969) exhibit the strongest alignment with the ESG Integration construct, while Corporate Excellence shows a slightly lower yet still robust loading (0.862).

Variable	ESG Integration	Strength	Interpretation
E (Environmental)	0.99	Very Strong	Environmental initiatives are the strongest contributor to ESG Integration.
S (Social)	0.91	Strong	Social responsibility strongly influences ESG Integration.

G (Governance)	0.74	Moderate	Governance contributes positively but less strongly than E and S.
Sustainable Performance	0.99	Very Strong	Balanced E–S strategies are highly aligned with ESG Integration.
Sustainable Growth	0.97	Very Strong	Governance, when paired with environmental performance, drives sustainable growth.
Corporate Excellence	0.86	Strong	Governance-led excellence supports ESG Integration but shows relatively lower strength.

Table 3. Factor Loading (Note. Factor loadings derived from exploratory factor analysis)

4.4. Interpretation of analysis

The analysis suggests that environmental and social factors are the strongest contributors to ESG integration, particularly in industries such as automobiles and pharmaceuticals, where clean technology, energy efficiency, and workforce inclusivity directly impact both performance and stakeholder perception. Governance, while important, demonstrates a relatively lower loading when considered independently, which reflects its continuing evolution in the Indian context, where governance practices are often compliance-driven rather than deeply embedded in strategic culture. However, the high loading of Sustainable Growth (0.969), which combines environmental and governance elements, reveals that governance achieves greater relevance when paired with environmental responsibility, thereby strengthening long-term corporate resilience. The analysis aligns with global evidence suggesting that environmental leadership and social responsibility are immediate drivers of stakeholder trust and operational performance, while governance mechanisms enhance these impacts when integrated strategically. In the Indian setting, particularly within manufacturing and resource-intensive sectors, firms that balance environmental and social initiatives with strong governance oversight achieve superior ESG integration scores, positioning themselves for long-term competitiveness and investor confidence.

5. FINDINGS

5.1. Benchmarking ESG Performance (Objective 1)

The benchmarking exercise revealed that the four selected firms—Mahindra & Mahindra Ltd., Vedanta Ltd., Dr. Reddy's Laboratories Ltd., and JSW Steel Ltd.—consistently outperformed their respective industry averages in the S&P Global Corporate Sustainability Assessment (CSA). Mahindra & Mahindra demonstrated strong balance across environmental (E) and social (S) dimensions, reflecting its leadership in clean mobility solutions and employee-centric policies. Dr. Reddy's exhibited steady performance across all three ESG pillars, underscoring the pharmaceutical sector's increasing emphasis on ethical compliance and innovation. Vedanta and JSW Steel, in contrast, performed relatively better in governance (G), supported by robust disclosure frameworks, but displayed weaker results in environmental domains due to their resource-intensive operations. This finding aligns with prior studies that highlight industry-specific variations in ESG adoption (Naeem et al., 2022).

Hypothesis Testing: The benchmarking results support H5, indicating that firms with higher ESG integration scores perform above industry averages, thereby strengthening their long-term sustainability credentials.

5.2 Composite Indices of ESG Integration (Objective 2)

The construction of composite indices—Sustainable Performance, Sustainable Growth, and Corporate Excellence—provided a multidimensional perspective of ESG integration. Mahindra & Mahindra and Dr. Reddy's achieved higher scores in Sustainable Performance, indicating that a balanced focus on environmental and social aspects generates stronger sustainability outcomes. Vedanta and JSW Steel excelled in Corporate Excellence, reflecting their governance-driven strategies but highlighting relative gaps in environmental stewardship. The results confirm that ESG adoption is not uniform but context-dependent, influenced by industry characteristics and organizational priorities.

Hypothesis Testing: These results lend support to H3, as the composite constructs align strongly with the ESG Integration Index, confirming their relevance as multidimensional measures.

5.3 Factor Loading Results (Objective 3)

Exploratory factor analysis validated ESG integration as a latent construct. Factor loadings revealed that environmental (0.999), social (0.910), and governance (0.740) dimensions all loaded positively and significantly onto ESG Integration. Among the three, environmental factors demonstrated the strongest influence, followed by social and governance.

Hypothesis Testing: The findings fully support H1 and H2, confirming that E, S, and G contribute positively to ESG integration, with environmental factors being the most influential.

5.4 Relative Contributions of ESG Dimensions

The composite constructs demonstrated strong positive correlations with ESG Integration: Sustainable Performance (0.987), Sustainable Growth (0.969), and Corporate Excellence (0.862). Sustainable Performance emerged as the strongest contributor, reflecting the strategic importance of balancing environmental and social priorities. Sustainable Growth also showed significant influence, highlighting the necessity of pairing governance oversight with environmental initiatives to ensure long-term resilience. Corporate Excellence, while positively contributing, demonstrated slightly weaker alignment, suggesting that governance-driven strategies remain compliance-oriented unless supported by environmental and social initiatives.

Hypothesis Testing: These findings confirm H3 and partially support H4. Sustainable Growth's influence (0.969) was indeed stronger than Corporate Excellence (0.862), validating the proposition that governance gains strategic value when coupled with environmental priorities.

6. SUGGESTIONS

6.1. Suggestions for Corporate Managers

The findings of this study suggest that Indian firms, particularly in resource-intensive industries, must place stronger emphasis on environmental leadership. With environmental factors showing the highest loading (0.999), companies can strengthen their ESG integration by adopting renewable energy, improving energy efficiency, investing in clean technologies, and adopting circular economy practices. Alongside this, social capital requires careful attention since social performance (loading = 0.910) is a strong contributor to ESG outcomes. Firms should prioritize employee well-being, workforce diversity, and transparent engagement with communities and supply chain partners, thereby enhancing trust and legitimacy.

Governance, although critical, was found to have a relatively weaker stand-alone contribution (0.740). To address this, managers should embed governance not just as a compliance function but as a strategic enabler of ethical leadership and decision-making. Integrated ESG strategies that align environmental, social, and governance initiatives with core business strategies will ensure firms move beyond fragmented approaches, positioning them for sustainable competitiveness in both domestic and international markets.

6.2. Suggestions for Policymakers and Regulators

From a policy perspective, the results highlight the need for balanced ESG regulations in India. While SEBI's Business Responsibility and Sustainability Reporting (BRSR) framework has created momentum, its focus on governance and disclosure must be complemented by stronger incentives for environmental and social performance. Sector-specific guidelines should also be developed, as industries differ significantly in ESG challenges—resource-heavy sectors such as metals and steel require stringent environmental monitoring, while pharmaceuticals and automobiles may require stricter social responsibility standards. Policymakers must also address persistent issues of ESG data quality and comparability by standardizing disclosure requirements across firms and collaborating with global rating agencies to create transparent benchmarks. In addition, financial and regulatory incentives, such as preferential access to green financing, tax breaks, and sustainability-linked credit ratings, could accelerate adoption. Such measures will ensure that ESG integration in India is not reduced to reporting obligations but becomes a driver of meaningful sustainability transitions.

6.3. Suggestions for Investors and Stakeholders

The study's results also carry important implications for investors and stakeholders. Since environmental and social factors demonstrated stronger contributions to ESG integration compared to governance, investment strategies should incorporate these dimensions when assessing long-term corporate value. Investors must go beyond evaluating compliance-oriented governance disclosures and instead examine firms' performance in resource efficiency, climate action, workforce management, and community engagement. Active shareholding can serve as a mechanism for influencing corporate behavior, with investors using their voting power and engagement strategies to push firms toward integrated ESG adoption. Firms with balanced ESG integration, such as Mahindra & Mahindra and Dr. Reddy's, should be prioritized in portfolios as they demonstrate resilience and sustainable growth potential. By shifting their focus from short-term returns to long-term value creation, investors and stakeholders can play a decisive

role in strengthening ESG integration and supporting the transition to more sustainable corporate ecosystems.

6.4. Cross-Cutting Recommendations

Beyond firm-level, policy-level, and investor-level measures, several cross-cutting recommendations emerge from the study. First, ESG must be embedded as a cultural value within organizations, supported by leadership commitment and continuous employee training. Second, technological innovation can play a pivotal role, with tools such as blockchain for supply chain transparency, artificial intelligence for emissions monitoring, and big data analytics for ESG reporting enhancing both credibility and efficiency. Third, Indian firms should benchmark themselves against international frameworks such as the Global Reporting Initiative (GRI), the Sustainability Accounting Standards Board (SASB), and the United Nations Sustainable Development Goals (SDGs) to improve global comparability and investor confidence. Finally, ESG integration should be treated as a dynamic process rather than a static target, requiring regular monitoring, feedback, and recalibration in response to evolving stakeholder expectations and regulatory developments. Together, these measures would ensure that ESG adoption in India evolves from fragmented and compliance-driven practices to holistic strategies for long-term corporate excellence and sustainability.

7. CONCLUSION

This study set out to examine ESG integration as a multidimensional construct by benchmarking leading Indian firms, developing composite indices, and validating the framework through factor loading analysis. The findings confirmed that environmental, social, and governance dimensions contribute positively to ESG integration, with environmental and social factors emerging as the strongest drivers of sustainable performance, growth, and corporate excellence. The analysis further established that composite constructs—Sustainable Performance, Sustainable Growth, and Corporate Excellence—align strongly with the ESG Integration Index, reinforcing its robustness as a latent construct. Importantly, the study revealed that while governance remains critical, its impact is most pronounced when combined with environmental and social initiatives, highlighting the interconnected nature of sustainability. These insights support the proposed hypotheses and emphasize that ESG integration in India is evolving from a compliance-oriented framework to a strategic driver of resilience, stakeholder trust, and long-term value creation. For corporate managers, the results

underline the importance of adopting integrated ESG strategies; for policymakers, the need to refine and balance regulatory frameworks; and for investors, the necessity of factoring environmental and social dimensions into decision-making. In conclusion, ESG integration, when pursued holistically, has the potential to transform Indian industries by embedding sustainability at the core of business strategy, aligning corporate objectives with global sustainability imperatives, and ensuring competitiveness in an increasingly ESG-conscious world.

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