Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069(Print), Impact Factor: 7.650, Volume 11, No. 04, October-December, 2025, pp. 98-104

Risk Exposure and Management Quality in Indian Energy Sector: Evidence from Sustainalytics Risk Ratings

Ms Khusboo Kumari[1*] & Dr. Mukesh Kumar Verma[2]

[1]Research Scholar, Department of ABST, University of Rajasthan, Jaipur, India.
[2]Assistant Professor, Department of ABST, University of Rajasthan, Jaipur, India.

[*]Corresponding Author: khushbumeena1998@gmail.com

Citation: *Kumari, K., & Verma, M. (2025). Risk Exposure and Management Quality in Indian Energy Sector: Evidence from Sustainalytics Risk Ratings. Journal of Commerce, Economics & Computer Science, 11(04), 98–104. https://doi.org/10.62823/jcecs/11.04.8232*

Abstract

Risk related to the environment, society and governance have a growing impact on the operational and strategic choice made by energy companies. Growing concerns include stakeholder expectations, environmental challenges and regulatory pressure. The study examines overall risks related with ESG and their different components of selected companies in the Indian energy sector. It also analyzes the relationship between risk exposure and the effectiveness of the management strategies. The study covers a sample of 20 companies representing oil and gas, thermal power, and renewable energy segments. The study relies primarily on secondary data and data of risk ratings has been collected from Sustainalytics and company sustainability reports. Descriptive statistical tools were used to compare risk levels across companies, while Pearson's correlation was applied to assess the relationship between risk exposure and management practices across firms. The Firms that are operating in renewable and low-emission segments have demonstrated relatively lower exposure than fossil fuel-based companies. Overall, the findings conclude that even though risk management is improving, the existing frameworks are insufficient to address rising sustainability-related risks. This study underscores the necessity for more integrated and proactive risk management approaches to enhance the long-term resilience of energy companies in India.

Keywords: *Exposure Risk, ESG Risk Ratings, Energy Sector, Management Gap.*

Introduction

In recent years, Environmental, Social, and Governance (ESG) criteria have become essential elements of sustainable value generation (Ahmad et al., 2023). As more people recognize the importance of sustainability and global efforts it gain momentum, So ESG factors are no longer just optional- they are becoming essential expectations. They play an important role in shaping corporate strategies, guiding investment behavior and influencing regulatory policy frameworks across various industries and national contexts (Kalyani & Mondal, 2024). ESG risk ratings play a crucial role in this area as they provide a comprehensive assessment of organizational resilience against non-financial risks. These ratings help to assess the extent to which a firm's enterprise value is exposed to ESG related issues (Karwowski & Raulinajtys-Grzybek, 2021). Due to the introduction of new laws, attention of investors has increased

toward sustainability, thereby rendering the disclosure of ESG ratings is becoming mandatory for companies. Indian energy companies, particularly those operating in fossil fuels and high-impact sectors are exposed to different levels of ESG risks and face distinct challenges in managing this risks effectively (Yildiz et al., 2024). Understanding the extent of ESG risk exposure and effectiveness of risk management practices is therefore essential for assessing corporate sustainability and long-term value (Horobet et al., 2024). Against this backdrop the present study focuses on the Indian energy sector and evaluate key components of ESG risk across selected companies. The study further examines the relationship between ESG risk exposure and effectiveness of management in order to provide a comparative assessment of how firms respond to ESG related challenges.

Review of Literature

Dorfleitner et al. (2015)examines the concept of ESG risks by analyzing changes in ESG performance over time across different ratings providers. Data has been collected from 8,561 firms over 2002-2012, the study analyzes score distribution, firm ranking and cross sectional correlation across provider and measures ESG risk through expected losses derived from downward changes in ESG Scores. The result reveals a lack of convergence among ESG ratings and ESG risk measures across the three providers due to methodological differences. While some alignment exists between Bloomberg and KLD. Overall the findings emphasize that ESG assessments and risk evaluations are significantly influenced by the selection of the rating provider.

Gerard (2018) critically analyze the existing literature on ESG and Socially Responsible Investment (SRI), with particular emphasis on fixed income investments and examine how firm's corporate social responsibility and governance performance influence equity valuation, debt valuation, and risk–return characteristics. This study adopts a critical literature review approach and collected findings from a broad range of academic studies examining the relationship between ESG and financial outcomes. The literature shows that stronger ESG performance is generally associated with higher firm value, better profitability, and lower risk, with governance playing a key role in strengthening this relationship. Governance plays a pivotal role in enhancing the positive correlation between ESG performance and financial outcomes. Research shows that the extra returns from ESG factors have decreased over time. This means that ESG features are now more included in stock and bond prices.

Hubel & Scholz (2019) aims to integrate sustainability risks into asset management by using return based ESG exposures and identify and measure ESG risk factors. The study uses a quantitative approach with European stocks from 2003 to 2016. ESG risk exposure for each firm is estimated using an extended Fama–French five-factor model that includes the three ESG factors. The findings reveals that firms with low environmental ratings earned higher returns than firms with high environmental ratings and Companies with strong social performance performed better during economic downturns. Incorporating Environmental, Social, and Governance (ESG) factors enhances the explanatory power of asset pricing models, despite the fact that ESG ratings and ESG exposures exhibit only a weak correlation. So, while ESG exposures might not have a big impact on average stock returns, when these exposures are extreme, they tend to bring about more risk and volatility.

Cornell and UCLA (2020) investigates the conceptual relationship between risk, return and ESG characteristics by emphasizing how investors' growing preferences for firms with strong ESG performance influences expected stocks returns. The study adopts a theoretical and conceptual approach grounded in established financial models and asset-pricing theory. Strong investor demand for companies with high-ESG ratings tends to drive up their stock prices while simultaneously reducing their capital cost. This dynamic overall enhancing firm value but leading to lower expected future returns. Although stocks with higher ESG ratings might perform better when there is growing demand exists, their long-term equilibrium returns are anticipated to be lower. The evidence regarding ESG as a unique risk factor is still not definitive, however, current research suggests that if such a factor does exist, it probably has a negative risk premium. This underscores the critical role of high-ESG stocks as a robust safeguard against sustainability-related risks.

Research Gap

- Most existing studies rely on traditional ESG ratings to evaluate sustainability outcomes, while the use of ESG risk ratings is limited in academic research.

- There are few empirical studies based on Sustainalytics risk ratings and their implications, while the majority of previous research focuses on ESG risk ratings and financial outcomes.
- Empirical research on sustainability risk ratings and their role in assessing risk exposure remains insufficient. To address this gap, the present study collects ESG risk ratings for selected Indian energy companies and empirically analyzes the relationship between ESG risk exposure and ESG risk management effectiveness.

Research Methodology

This study adopts a descriptive analytical research design to evaluate ESG risk components and examine the relationship between ESG risk exposure and management effectiveness among Indian energy companies. The sample comprises 20 companies selected from the Indian energy sector which represent the thermal power, oil and gas, renewable energy, and utility segments based on the availability of ESG data. Secondary data has been collected and ESG risk ratings have been taken from the Morningstar Sustainalytics database and corporate sustainability reports, with ESG scores obtained on December 3, 2025. Since ESG risk ratings are updated both periodically and in response to specific events, slight fluctuations in scores over time are to be expected. The independent variable isthe exposure score, and the dependent variables are ESG risk management effectiveness (managed risk and management gap). Descriptive statistics is used to compare ESG risk components across firms, while Pearson's correlation examines the relationship between ESG risk exposure and ESG risk management effectiveness within the Indian energy sector.

Objectives

- To evaluate and compare the ESG risk components(manageable risk, unmanageable risk, exposure score, managed risk, and management gap) across companies operating in the Indian energy sector.
- To examine the relationship between ESG risk exposure and ESG risk management effectiveness among companies operating in the Indian energy sector.

Data Analysis and Interpretation

The ESG risk rating indicates how much a company's value is threatened by ESG factors. The exposure score shows the extent to which a company is vulnerable to ESG-related risks, while the managed risk reflects how effectively the company is handling and reducing the risk. The selected companies from the Indian energy sector show considerable variations across all ESG risk components. It also reports descriptive statistics to highlight variations in ESG risk components.

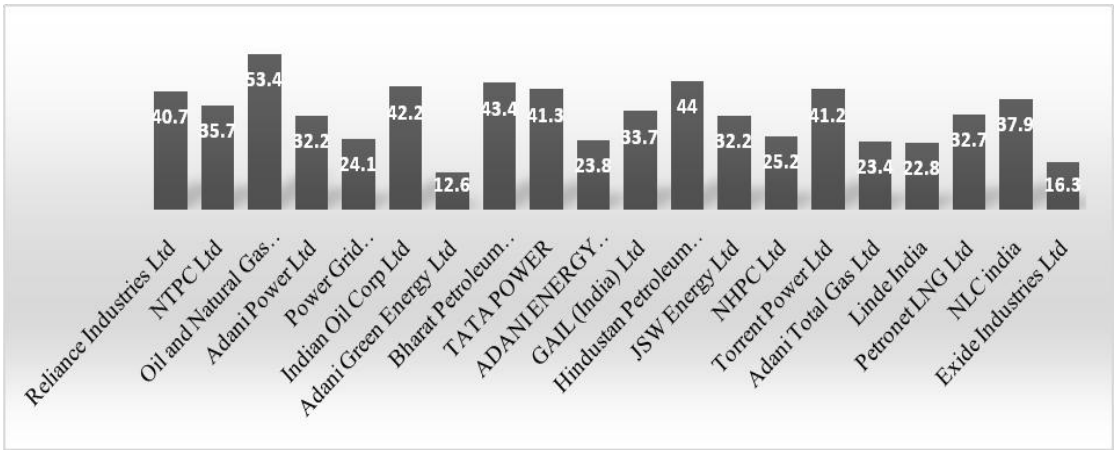
Table 1: ESG Risk Component Scores of Selected Indian Energy Companies

S. No	Company	MR	UR	ES	MGR	MG	ESG
1	Reliance	59.1	11.2	70.4	29.7	29.4	40.7
2	NTPC	68.4	5	73.5	37.8	30.6	35.7
3	ONGC	73	11.9	84.9	31.4	41.5	53.4
4	Adani power	62.1	4.4	66.5	34.3	27.8	32.2
5	Power Grid Corp. of India	39.4	2.6	42	17.8	21.6	24.1
6	IOCL	56.9	10.4	67.4	25.2	31.7	42.2
7	Adani Green Energy	36.4	2.4	38.8	26.2	10.1	12.6
8	Bharat Petroleum Corp	54	10.1	64.1	20.6	33.3	43.4
9	Tata Power	74	6.2	80.2	38.9	35	41.3
10	Adani Energy Solutions	54.2	4.1	58.2	34.4	19.8	23.8
11	GAIL	51.9	3.8	55.7	22	29.9	33.7
12	Hindustan Petroleum Corp	57.7	11	68.7	24.6	33.1	44
13	JSW Energy	67	5.2	72.2	40	27.1	32.2
14	NHPC	38.6	2.5	41.1	15.9	22.7	25.2
15	Torrent Power	59.4	4.4	63.9	22.7	36.7	41.2
16	Adani Total Gas	48.2	3.6	51.8	28.4	19.8	23.4
17	Linde India	35.1	4.3	39.5	16.6	18.5	22.8
18	Petronet LNG	50.3	6.7	56.9	24.2	26.1	32.7

19	NLC India	56.9	4.3	61.2	23.3	33.7	37.9
20	Exide Industries	39.4	1.6	41	24.7	14.6	16.3
Mean		54.1	5.79	59.9	26.9	27.1	32.9
Std. Dev		11.9	3.29	13.9	7.26	7.96	10.4
Min		35.1	1.60	38.8	15.9	10.1	12.6
Max		74	11.9	84.9	40	41.5	53.4

Source: Author's compilation from Sustainalytics and the company's sustainability report

Figure 1: ESG Risk Ratings of Selected Indian Energy Companies



Source: Author's work

Comparative Analysis of ESG Risk Components Across Companies

Manageable Risk (MR)

Manageable risk Score reflects notable fluctuation across the sector

- The Highest MR value are recorded by Tata Power (74) ONGC (73), NTPC (68.4) and JSW Energy (67), indicating that these companies encounter Considerable ESG challenges, which might be alleviated by implementing more robust internal controls.
- In contrast, Adani Green Energy (36.4), Linde India (35.1) and Power Grid reflect lower manageable risk which means that these companies face less exposure to ESG issues that managers can influence. Overall renewable companies have lower risk that can be managed, while companies in thermal power, oil and gas remain more exposed.

Overall, a large proportion of ESG risk is theoretically controllable, with wide firm level variation with high std. dev. (11.9). The wide range between the minimum (35.1) and maximum (74) values further confirms heterogeneity in manageable ESG exposure within the Indian energy sector.

Unmanageable Risk (UR)

It indicates the level of ESG risk that companies cannot control internally because it is inherent to their core products and industry operations. The highest UR is observed in ONGC (11.9) HPCL, and Reliance industries (11.2) implying greater dependency on external environmental and regulatory factors. Conversely Adani Green, NHPC and Exide showed very lower UR, reflecting that renewable and hydro based operations carry minimal inherent ESG risk. Overall, the average unmanageable risk remains comparatively low (5.79), suggesting that inherent ESG risk are limited for most firms, though variability exist due to core operations.

Exposure Score (ES)

Exposure score shows how strongly a company's main operations are exposed to ESG risks.

- The companies such as ONGC (84.9), Tata Power (80.2), and NTPC (73.5) are primarily involved in fossil fuel or high-emission operations.

- The lowest value appears in NHPC and Linde India, which indicates limited risk mitigation despite their moderate exposure levels.

The mean exposure score of 59.9 with a high Std. Dev (13.9) highlights that companies operate under varying levels of ESG exposures, reflecting heterogeneous operational risk profiles within the sector.

Managed Risk (MGR)

It reflects the extent to which companies are successfully mitigating their ESG exposures through internal policies, controls, and governance mechanisms. The comparison reveals that JSW Energy, Tata Power, and NTPC achieved the highest managed risk scores, reflecting their relatively robust ESG risk management systems, and it shows their enhanced capacity to mitigate operational and environmental vulnerabilities through the implementation of well-structured management practices. On the other hand, companies such as NHPC and Linde India display lower managed risk values. Overall, the managed risk score (26.9) with a Std. Dev of 7.26 reflects moderate but uneven effectiveness of ESG risk mitigation practices. It indicates that large integrated energy companies tend to manage ESG risks more effectively than smaller or specialized firms.

Management Gap (MG)

Management gap represent the portion of the manageable risk that the company has not been able to mitigate. It reflect how much of the internally controllable risk still remains unaddressed after management interventions.

- The highest gap are observed for ONGC, Torrent Power, BPCL, and HPCL. This means that they have high risks that are not fully managed and this implies weaker alignment between exposure and mitigation efforts in fossil fuels and thermal power companies.
- In contrast, Adani Green, Exide industries, and Adani total gas demonstrated relatively small management gaps. This indicate that these companies are able to manage large portion of their manageable risk.

The management Gap shows a mean value of (27.1) and a standard deviation of (7.96), implying that a significant portion of manageable ESG risk remains unaddressed in several firms.

ESG Risk Rating

The ESG risk rating reflects the total ESG risk which is carried by a company. It captures both the inherent risk that cannot be controlled and the portion of manageable risk that remains unmitigated.

- The comparative result shows that ONGC, BPCL, and HPCL have the highest overall ESG risk ratings and this elevated scores are arise because these firms operates within high impact fossil fuel industries leading to greater inherent risk.
- Conversely, Adani Green and Exide ltd reports the lowest overall ESG risk ratings. Their lower score reflect minimal inherent risk and have only minor management gaps, suggesting that they effectively manage the portion of risk that lies within their control. So the companies operating in renewable or less emission intensive segments tend to experience substantially lower total ESG risk compared to traditional oil and gas firms.

Overall it indicates a moderate level of overall ESG risk (32.9) across the companies and Std.Dev (10.4) reflects substantial variation in ESG risk ratings. The dispersion between min and max score highlights contrasting risk profiles across renewable power and fossil fuel based companies

H_0: There is no significant relationship between ESG risk exposure and risk management effectiveness among companies operating in the Indian Energy sector

Table 3: Correlation between ESG risk exposure and ESG risk management effectiveness

Variable	Pearson's (r)	p-value
Exposure Score -Managed Risk	0.678	0.001
Exposure Score - Management Gap	0.841	< 0.001

Source: Author's Work

Figure 2: Relationship between ESG Exposure and Management Effectiveness

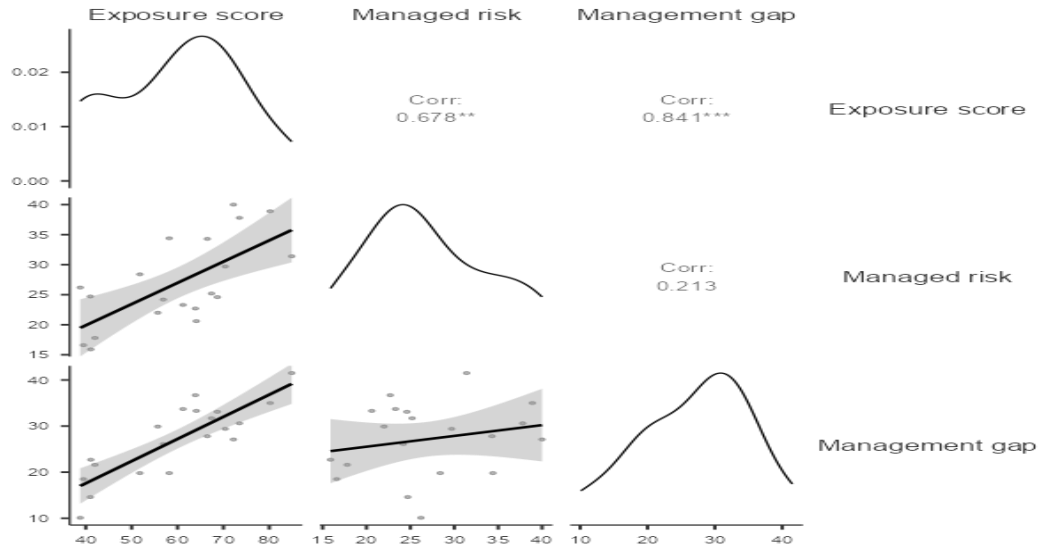


Table 3 reports the result of Pearson's correlation analysis conducted to examine the relationship between ESG risk Exposure and ESG risk management effectiveness among companies operating in the Indian Energy sector. A strong statistical significant positive correlation (r = 0.678) is observed at p value = 0.001, suggesting that firms with higher ESG risk exposure tend to adopt more extensive ESG risk management practices.

At the same time a robust and highly significant positive correlation is evident between the exposure score and the management gap (r = 0.841, p < 0.001). This suggest that despite increased management efforts still companies with higher ESG exposure are leading to a substantial portion of unaddressed controllable risk. These result provides a clear evidence of a statistically significant relationship between ESG risk Exposure and ESG risk management effectiveness, thereby leading to rejection of null hypothesis.

Overall the finding indicates that ESG risk exposure is significantly related to both managed risk and Management gaps. Companies with more ESG risks often takes more steps to manage them. However, they face challenges continuously and it highlights the limitation in existing ESG risk management frameworks. So there is need of more robust, integrated and proactive ESG risk management Strategies.

Conclusion

This research has explored how ESG risk ratings relate to exposure and management quality among selected Indian energy companies. The analysis of manageable risk, unmanageable risk, exposure score, managed risk and management gap highlights that ESG risk is not uniform but strongly influenced by the nature of business operations and the energy mix of each company. Enterprises involved in fossil fuel and thermal power operations encounter higher ESG exposure and unmanageable risk due to the nature of their operations. Although many of these companies have adopted ESG risk management measures, still a considerable management gap exists. Suggesting that current efforts are not entirely effective and in contrast renewable and low emission energy company exhibits lower ESG exposures and smaller management gaps. The correlation result confirms a significant relationship between ESG risk exposure and ESG risk management effectiveness. The companies with greater exposure to ESG factors tend to adopt more robust risk management strategies. However despite these efforts, several significant risk remain insufficiently addressed. As a result, the null hypothesis is rejected. Overall the finding highlights the need for more integrated, proactive and effective ESG risk management strategies particularly for energy companies that are exposed to higher levels of environmental and social risk.

References

1. Ahmad, H., Yaqub, M., & Lee, S. H. (2023). Environmental-, social-, and governance-related factors for business investment and sustainability: a scientometric review of global trends. Environment, Development and Sustainability, 80(4), 2965–2987. https://doi.org/10.1007/s10668-023-02921-x
2. Cornell, B. & UCLA. (2020). ESG Preferences, Risk, and Return. In the UCLA Anderson School of Management. https://ssrn.com/abstract=3683390
3. Dorfleitner, G., Halbritter, G., & Nguyen, M. (2015). Measuring the level and risk of corporate responsibility – An empirical comparison of different ESG rating approaches. Journal of Asset Management, 16(7), 450–466. https://doi.org/10.1057/jam.2015.31
4. Hübel, B., & Scholz, H. (2019). Integrating sustainability risks in asset management: the role of ESG exposures and ESG ratings. Journal of Asset Management, 21(1), 52–69. https://doi.org/10.1057/s41260-019-00139-z
5. Horobet, A., Belascu, L., Dumitrescu, D. G., Radulescu, M., & Bulai, V. (2024). ESG ACTIONS, CORPORATE DISCOURSE, AND MARKET ASSESSMENT NEXUS: EVIDENCE FROM THE OIL AND GAS SECTOR. Journal of Business Economics and Management, 25(1), 153–174. https://doi.org/10.3846/jbem.2024.21070
6. Gerard, B. (2018). ESG and Socially Responsible Investment: A Critical Review. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3309650
7. Kalyani, S., & Mondal, R. (2024). Is ESG disclosure creating value propositions for the firms? An SLR and meta-analysis of how ESG affects the financials of a firm. Corporate Ownership and Control, 21(1), 96–117. https://doi.org/10.22495/cocv21i1art9
8. Karwowski, M., & Raulinajtys-Grzybek, M. (2021). The application of corporate social responsibility actions for the mitigation of environmental, social, corporate governance, and reputational risk in integrated reports. Corporate Social Responsibility and Environmental Management, 28(4), 1270–1284. https://doi.org/10.1002/csr.2137
9. Yildiz, F., Cilesiz, A., Yucel, M., & Dayi, F. (2024). The Impact of ESG Criteria on Firm Value: A Strategic Analysis of the Airline Industry. Sustainability, 16(19), 8300. https://doi.org/10.3390/su16198300.

❑❑❑