Journal of Information Systems Engineering and Management
2025, 10(31s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Corporate Environmental Disclosure and Financial Indicators of Indian Oil Sector: an Empirical Analysis

Mangulu Charan Dash1 ,Dr. Pratap Chandra Sahoo2, Monalisa Panigrahi3 , Dr. Bamadeb Mishra4

[1]Ph.D Scholar, Fakir Mohan University, Odisha, India. Email id – mangulucharandash@gmail.com, ORCID Id: 0000-0002-7613-414X, https://orcid.org/.

[2]Assistant Professor, Bhadrak (Autonomous) College, Bhadrak, Odisha, India. Email id – pratap.c.sahoo@gmail.com.

[3]Lecturer in Commerce, Rayagada Autonomous College, Rayagada, Odisha, India. Email id: Monalisa.panigrahi28@gmail.com.

[4]Lecturer in Commerce, Prananath College (Autonomous), khordha, Odisha, India. Email id: bamadev.cp@gmail.com.

ARTICLE INFO

Received: 29 Dec 2024

Revised: 12 Feb 2025

Accepted: 27 Feb 2025

ABSTRACT

Introduction
Environmental disclosure is the process to disseminate the environmental related information in the company's statutory report. In India the amount of disclosure has significantly increased over the years.
Objectives
The present paper examines the relationship of financial performance indicators i.e. return on assets (ROA), return on equity (ROE) and earning per share (EPS) with environmental disclosure (ED). The data are collected over the period of 5 years from 2019-20 to 2023-24 by using the annual report of top 5 Indian oil sector companies listed by Bombay Stock Exchange as per their market capitalization as on 1.10.2024.
Methods
This study analysis the ED factors by using content analysis. To justify the objectives statistical tools like descriptive statistics, correlation analysis, analysis of variance and regression model are applied in this study.
Results
This study reveals that financial performance i.e. ROA and EPS have significantly impacted by environmental disclosure factors of sample companies whereas ROE is not significantly influenced by environmental disclosure factors.
Conclusion
In India environmental disclosure Practices are found in infant stage. There is no such mandatory provision for all the corporate sectors to maintain a single framework for environmental disclosure. Oil sector companies are required to build the corporate images by strengthening their environmental factors which enhance the corporate performance.
Keywords: Environmental disclosure, financial performance, environmental factors.

INTRODUCTION

Environmental reporting serves as a means of informing stakeholders about environmental performance and businesses' concerns about environmental issues, Shearer, (2002). The quantity and quality of environmental data provided by firms from various industries and countries vary greatly since environmental reporting is still optional globally. The agency theory states that the corporation is responsible for the management's decision to report environmental data in order to protect the interests of the various shareholders, Buniamin et. al., (2011). Emphasis should be placed on the internal context in order to influence business conduct and increase shareholder insight. In order to determine whether there are any correlations between the corporate governance attributes and the degree of environmental reporting, we have concentrated on certain entity-related factors in this study, such as internal characteristics, which primarily consist of the entity's management style. The results show that, with regard to petroleum and petroleum refining enterprises, environmental reporting is significantly influenced by the board's independence and the presence of an environmental committee.

1.2 Review of Literature

Financial performance (FP) and environmental disclosure (ED) are positively correlated, according to many research studies. According to, Murray et al. (2006), the largest businesses with greater returns in the UK are more likely to disclose higher degree of voluntary and comprehensive information on social and environmental components. According to Moneva and Ortas (2010) 230 European businesses, support the idea that businesses with higher environmental

performance scores will also have better financial performance as overall. They used measurements yardstick like operating profit and cash-flow, which are absolute matrix whereas ROE, ROA, EPS, and profit margin are relative matrix. Ullmann (1985) claimed that the relationships between financial and social performance are ambiguous for the following reasons: (1) there is no sufficent theory; (2) important terms are not defined appropriately; and (3) there are gaps in the empirical data. Numerous research data have demonstrated that ED and financial performance are negatively correlated with each other. According to Zauwiyah et al. (2003), a company's financial leverage and its decision to release environmental informations are negatively correlated with each other. Additionally, it was determined that voluntary disclosures in Malaysia might not be fully covered by a positive accounting approach.

1.3 Objectives of the study

Jing Jia, Zhongtian Li (2022) Examine the connection between financial distress and corporate environmental performance. It concludes that there is a significant association between financial distress and corporate environmental performance. Dion van de Burgwal, Rui José Oliveira Vieira (2014) to analysis how Dutch listed companies' financial performance and environmental disclosures are relate to one another. As a result, Environmental high potential firm provide a higher level of environmental disclosure than low potential firm.

- To study the relationship between environmental disclosure and financial parameters i.e. ROA, ROE, EPS of the selected Indian oil sector Companies.
- To examine how environmental disclosure factors impact the financial parameter of the selected Indian oil sector companies, such as ROA, ROE, and EPS.

1.4 Hypothesis Development

Candy Lim Chiu et.al. (2020) the firm with better ROA, size of the firm, leverage and environment accreditation certificate can influence to disclose large amount of environmental related data of chinese companies. Ankita Chaturvedi and Aditi Khandelwal (2021) studied that ROA and ROE are strongly impacted by environmental disclosures, whereas EPS and profit margin are not significantly impacted.

H_1: Return on Assets of sample companies are significantly influenced by Environmental Disclosure.

H_2: Return on Equity of sample companies are significantly influenced by Environmental Disclosure.

H_3: Earning Per Share of sample companies are significantly influenced by Environmental Disclosure.

1.5 Methodology

The main focus of this study is to establish the relationship between ED and FP indicators of selected Indian oil sector companies listed by Bombay Stock Exchange. The sample of this study comprises of top 5 oil sector companies as per their market capitalization as on 1.1.2025. The study has analysed the environmental factors by using content analysis. Descriptive research and causal research are considered in this study. Environmental components are selected for this study according to environmental sensitive initiatives of oil industry. Total 23 sub factors of environmental disclosures are grouped in 6 major factors whereas ROA, ROE and EPS are considered as financial factors for this study. Both environmental and financial factors are measured by using 3 rating scale i.e. 1, 0.5 and zero. Those factors whose values are more than average, researcher has assigned 1, for those factors whose values are less than average the researcher has assigned 0.5 and zero is assigned for those factors which has no value.

1.5 Variable Description

Performance Matrix and formula

According to Zhang et al. (2014) ROA is widely acknowledged by more research since it may show how executives are using the resources of their creditors and shareholders. (Feng et al. 2018). As per (Uniamikogbo Emmanuel & Ali Peter Ifeanyichukwu 2021) The share prices, returns on equity, and returns on assets of Nigerian industrial businesses were all greatly impacted by environmental accounting disclosures. According to Dr. Aditi R Khandelwal, Dr. Ankita Chaturvedi (2021) there is a substantial correlation between ROE, ROA, and total environmental disclosure. There is no substantial correlation between total environmental disclosures and the other two variables, EPS and profit margin. ROA, ROE, and EPS are regarded as dependent variables in this study.

For ROA, this study calculates as net profits before tax / total assets and for ROE, net profit before tax / share holders' equity whereas for EPS, net income / number of share outstanding share.

ENVIRONMENTAL DISCLOSURE

Reflections on management and the reporting of environmental practices have been prompted by the adaptation of businesses to the environmental standards demanded by various social groupings (Morioka, Bolis, & Carvalho, 2018). Businesses that engage in environmental and social disclosure do so in an effort to gain legitimacy for their operations, which helps interested parties evaluate the company's worth, potential futures, possibilities, and risks, among other things (Trierweiller et.al. 2013.

For this study the environmental disclosure index is constructed to study the environmental performance. Here 6 major factors are considered in this study i.e. Environmental policy and Initiatives (EPI), Environmental research and development (ERD), Emission and waste management (EWM), Environmental Reporting Elements (ERE), Environmental Compliance and audit (EAC)and Green Environment and sustainability (GES).

1.6 Data Analysis and Interpretation

This research is focused on environmental disclosure performance of Indian Oil sector Industries. This section analyses the data by using different statistical tools like descriptive statistics, correlation analysis, ANOVA and regression techniques.

Econometric Model

- **ROA=** $\beta_{0+}\beta_1$ EPI+ β_2 ERD+ β_3 EWM+ β_4 ERE+ β_5 ECA+ β_6 GES+ Ui
- **ROE=** $\beta_{0+}\beta_1$ EPI+ β_2 ERD+ β_3 EWM+ β_4 ERE+ β_5 ECA+ β_6 GES+ Ui
- **EPS=** $\beta_{0+}\beta_1$ EPI+ β_2 ERD+ β_3 EWM+ β_4 ERE+ β_5 ECA+ β_6 GES+ Ui

Where, $\beta_{0=}$ constant

β_1, $\beta 2$, $\beta 3$, $\beta 4$ $\beta 5$, $\beta 6$ = Slope of Independent Variable

Ui= Error Term.

Table No. 1

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
2019-20	130	0.00	1.00	0.4038	0.38928
2020-21	130	0.00	1.00	0.4269	0.36891
2021-22	130	0.00	1.00	0.5385	0.40642
2022-23	130	0.00	2.00	0.6515	0.39966
2023-24	130	0.00	1.00	0.5808	0.40253

Source: self-accumulated

Interpretation: Table No. 1 describes, the performance of environmental and financial factors of selected sample companies. The sample companies' performance is not satisfactory in the year 2019-20 and 2020-21 whereas the company's performance is good in the years 2021-22, 2022-23 and 2023-24. Here the standard deviation value is low in the years 2019-20, 2020-21 and 2022-23 i.e.0.38, 0.36 and 0.39 respectively which indicates that the overall performance of the company is consistent during that period whereas the company is maintaining less consistency in their performance record in the years 2021-22 and 2023-24 due to high variability i.e. 0.406 and 0.402 respectively.

Table No. 2 Correlation Results

		EPI	ERD	EWM	ERE	ECA	GES
EPS	Pearson Correlation	.467*	.678**	.608**	.510**	.361	.611**
	P- value	.018	.000	.001	.009	.076	.001
ROA	Pearson Correlation	.123	-.387	-.076	-.387	.022	.058
	P- value	.559	.056	.719	.056	.918	.785
ROE	Pearson Correlation	.137	-.442*	-.198	-.272	-.090	-.079
	P- value	.514	.027	.343	.188	.669	.707

Source: self-accumulated

** significant at the 0.01 level (2-tailed).

* significant at the 0.05 level (2-tailed).

Interpretation: Table No. 2 describe the relationship between environmental factors and financial factors. It indicates that there is a significant association of all environmental factors with EPS except ECA. However, the ROA is insignificantly associated with all the environmental factors i.e. EPI, ERD, EWM, ERE, ECA and GES whereas, ROE is insignificantly related with all the environmental factors except ERD.

Table No. 3 Regression Results of ROA

R	R^2	Adj. R^2	S.E of the Est.	D.W
0.693[a]	0.480	0.306	0.21233	1.622

Source: self-accumulated

Table No. 3.1

ANOVA					
	Sum of Sqr.	d.f.	Mean	F	p-value
Regression	0.749	6	0.125	2.767	0.044[b]
Residual	0.811	18	0.045		
Total	1.560	24			

Source: self-accumulated

Table No. 3.2

Coefficent				
	B	S.E.	T	p-value
(Constant)	1.074	0.147	7.294	0.000
EPI	0.029	0.041	0.711	0.486
ERD	-0.391	0.256	-1.528	0.144
EWM	-0.077	0.073	-1.052	0.307
ERE	-0.638	0.272	-2.343	0.031
ECA	-0.114	0.123	-0.928	0.366

GES	0.150	0.079	1.905	0.073

Source: self-accumulated

Model-1, ROA= 1.074 + 0.029 EPI - 0.391ERD - 0.077 EWM - 0.638 ERE - 0.114 ECA + 0.150 GES + Ui

Interpretation: Table No. 3, indicates that R square value is 0.48 which means there is 48% influence of environmental disclosure on ROA. Here the D.W value is 1.62 which is within the standard range 0 to 4. which indicates there is no autocorrelation among the variables.

Table no. 3.1, indicates the analysis of variance of sample data. Here the probability value is 0.04 which is below the critical value i.e. 5% level of significance. Hence the alternative is Approved (H1) which means there is a significant influence of environmental disclosure on ROA.

Table no. 3.2 shows beta value of unstandardized coefficient as 1.07 which indicates there is a highly positive influence of environmental disclosure on ROA as the beta value is more than 1. The slope of independent variables i.e. EPI, ERD, EWM, ERE, ECA and GES are 0.02, -0.39, -0.07, 0.63, 0.11 and 0.15 respectively, which indicates 1% change in independent variables results the corresponding percentage change in the dependent variables.

Table No. 4 Regression Results of ROE

R	R^2	Adj. R^2	S.E of the Est.	D.W
0.607[a]	0.368	0.158	0.22944	1.954

Source: self-accumulated

Table No. 4.1

ANOVA					
	Sum of Sqr.	d.f.	Mean	F	p-value
Regression	0.552	6	0.092	1.749	0.167[b]
Residual	0.948	18	0.053		
Total	1.500	24			

Source: self-accumulated

Table No. 4.2

Coefficent				
	B	S.E.	t	p-value
(Constant)	0.960	0.159	6.031	0.000
EPI	0.060	0.044	1.350	0.194
ERD	-0.483	0.277	-1.744	0.098
EWM	-0.077	0.079	-0.972	0.344
ERE	-0.231	0.294	-0.786	0.442
ECA	-0.083	0.133	-0.622	0.542
GES	0.066	0.085	0.774	0.449

Source: self-accumulated

Model-2, ROE= 0.960 + 0.060 EPI - 0.483 ERD - 0.077 EWM - 0.231 ERE - 0.083 ECA - 0.066 GES + Ui

Interpretation: Table No. 4, indicates that R square value is 0.368 which means there is 37% influence of environmental disclosure on ROE. Here the D.W value is 1.954 which is within the standard range i.e. 0 to 4. which indicates there is no autocorrelation among the variables.

Table no. 4.1, indicates the analysis of variance of sample data. Here the probability value is 0.167 which is more than the critical value i.e. 5% level of significance. Hence the alternative is disapproved (H2) which means there is no significant influence of environmental disclosure on ROE.

Table no. 4.2 shows beta value of unstandardized coefficient as 0.96 which indicates there is a less positive influence of environmental disclosure on ROE as the beta value is less than 1. The slope of independent variables i.e. EPI, ERD, EWM, ERE, ECA and GES are 0.060, -0.483, -0.077, -0.231, -0.053 and 0.06 respectively, which indicates 1% change in independent variables results the corresponding percentage change in the dependent variables.

Table No. 5 Regression Results of EPS

R	R^2	Adj. R^2	S.E of the Est.	D.W
0.827[a]	0.684	0.578	0.16450	1.398

Source: self-accumulated

Table No. 5.1

ANOVA					
	Sum of Sqr.	d.f.	Mean	F	p-value
Regression	1.053	6	0.175	6.485	0.001[b]
Residual	.487	18	0.027		
Total	1.540	24			

Source: self-accumulated

Table No. 5.2

Coefficent				
	B	S.E.	t	p-value
(Constant)	0.249	0.114	2.179	0.043
EPI	0.000	0.032	-0.010	0.992
ERD	0.388	0.198	1.957	0.066
EWM	0.084	0.057	1.478	0.157
ERE	-0.012	0.211	-0.057	0.955
ECA	-0.229	0.095	-2.406	0.027
GES	.123	0.061	2.008	0.060

Source: self-accumulated

Model-3, EPS= 0.249 + 0.000 EPI + 0.388 ERD + 0.084 EWM - 0.012 ERE - 0.229 ECA + 0.123 GES + Ui

Interpretation: Table No. 5, indicates that R square value is 0.684 which means there is 68% influence of environmental disclosure on EPS. Here the D.W value is 1.39 which is within the standard range i.e. 0 to 4. which indicates there is no autocorrelation among the variables.

Table no. 5.1, indicates the analysis of variance of sample data. Here the probability value is 0.001 which is less than the critical value i.e. 5% level of significance. Hence the alternative is approved (H3) which means there is a significant influence of environmental disclosure on EPS.

Table no. 5.2 shows beta value of unstandardized coefficient as 0.249 which indicates there is a low positive influence of environmental disclosure on EPS as the beta value is less than 1. The slope of independent variables i.e EPI, ERD, EWM, ERE, ECA and GES are 0.000, 0.388, 0.084, -0.012, -0.229 and 0.123 respectively, which indicates 1% change in independent variables results the corresponding percentage change in the dependent variables.

1.7 Conclusion and Scope for further research

In India environmental disclosure Practices are found in infant stage. There is no such mandatory provision for all the corporate sectors to maintain a single framework for environmental disclosure. Indian oil sector industries are the most sensible sector for environmental concern. In this study, financial performance i.e. ROE is not significantly impact on environmental factors whereas, environmental factors are most responsible for influencing the financial performance indicators i.e. ROA and EPS which can alert the organization to strengthen their environmental performance. ROA and EPS are the two major factors for the investor to analyse the organizations performance. So, the organizations try to build the corporate images by strengthening their environmental factors.

This study leaves a room for further research i.e. the data are collected only for Indian oil sector industries. This study period is limited to only 5 years. For this study, few dependent as well as independent factors are considered.

The authors contribution to this Nobel work

MD, MP, MB and PS are responsible for study design, conduct the research and analysis manuscript.

Conflict of interest

The author declares that there is no conflict of interest.

Funding

The researcher has not received any funding for this research work.

REFERENCE

[1] Ahmad, Z., Hassan, S., & Mohammad, J. (2003). Determinants of Environmental Reporting in Malaysia. *International Journal of Business Studies*, *11*(1).

[2] Arowoshegbe, A. O., Emmanuel, U., & Gina, A. (2016). Sustainability and triple bottom line: An overview of two interrelated concepts. *Igbinedion University Journal of Accounting*, *2*(16), 88-126.

[3] Barth ME, McNicholls MF, Wilson GP (1997) Factors influencing firms' disclosures about environmental liabilities. Rev Acc Stud 3(21):35–65.

[4] Buniamin S., Alrazi B., Johari N., Rahman N., 2011. Corporate Governance Practices and Environmental Reporting of Companies in Malaysia: Finding Possibilities of Double Thumbs Up. Journal Pengurusan 32, p. 55-71.

[5] Burgwal, D. V. D., & Vieira, R. J. O. (2014). Environmental disclosure determinants in Dutch listed companies. *Revista Contabilidade & Finanças*, *25*, 60-78.

[6] Chiu, C. L., Zhang, J., Li, M., Wei, S., Xu, S., & Chai, X. (2020). A study of environmental disclosures practices in Chinese energy industry. *Asian Journal of Sustainability and Social Responsibility*, *5*(1), 9.

[7] Emmanuel, U., & Ifeanyichukwu, A. P. (2021). Environmental accounting disclosure and financial performance of manufacturing firms in Nigeria. *Journal of Economics and International Business Management*, *9*(2), 71-81.

[8] Feng Y, Chen HH, Tang J (2018) The impacts of social responsibility and ownership structure on sustainability financial development of China's energy industry. Sustainability 10301:1–15.

[9] Jia, J., & Li, Z. (2022). Corporate environmental performance and financial distress: evidence from Australia. *Australian Accounting Review*, *32*(2), 188-200.

[10] Khandelwal, A., & Chaturvedi, A. (2021). Environmental accounting disclosures and financial performance in India. *Recent Advances in Fields of Accounting, Finance and Management*.

[11] Khandelwal, A., & Chaturvedi, A. (2021). Environmental accounting disclosures and financial performance in India. *Recent Advances in Fields of Accounting, Finance and Management*.

[12] Kolk, A. (2008). Sustainability, accountability and corporate governance: exploring multinationals' reporting practices. *Business strategy and the environment*, *17*(1), 1-15.

[13] Moneva, J. M., & Ortas, E. (2010). Corporate environmental and financial performance: a multivariate approach. *Industrial Management & Data Systems*, *110*(2), 193-210.

[14] Morioka, S. N., Bolis, I., & De Carvalho, M. M. (2018). From an ideal dream towards reality analysis: Proposing Sustainable Value Exchange Matrix (SVEM) from systematic literature review on sustainable business models and face validation. *Journal of Cleaner Production*, *178*, 76-88.

[15] Murray, A., Sinclair, D., Power, D., & Gray, R. (2006). Do financial markets care about social and environmental disclosure? Further evidence and exploration from the UK. *Accounting, Auditing & Accountability Journal*, *19*(2), 228-255.

[16] Samy, M., Odemilin, G., & Bampton, R. (2010). Corporate social responsibility: a strategy for sustainable business success. An analysis of 20 selected British companies. *Corporate Governance: The international journal of business in society*, *10*(2), 203-217.

[17] Shearer, T., 2002. Ethics and accountability: From for itself to the for-the-other. Accounting, Organizations and Society 27, p. 541-575.

[18] Stanwick, S. D., & Stanwick, P. A. (2000). The relationship between environmental disclosures and financial performance: an empirical study of US firms. *Eco-Management and Auditing: The Journal of Corporate Environmental Management*, *7*(4), 155-164.

[19] Trierweiller, A. C., Peixe, B. C. S., Tezza, R., Bornia, A. C., & Campos, L. M. (2013). Measuring environmental management disclosure in industries in Brazil with item response theory. *Journal of Cleaner Production*, *47*, 298-305.

[20] Ullmann, A. A. (1985). Data in search of a theory: A critical examination of the relationships among social performance, social disclosure, and economic performance of US firms. *Academy of management review*, *10*(3), 540-557.

[21] Zhang HM, Li LS, Zhou DQ, Zhou P (2014) Political connections, government subsidies and firm financial performance: evidence from renewable energy manufacturing in China. Renew Energy 63:330–336.