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An Empirical Evaluation of Environmental, Social and Corporate Governance (ESG) Disclosures on the Select Public Sector Enterprises in India

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ABSTRACT

Environmental, Social and Corporate Governance (ESG) factors provide the quality management of the company, the culture of the company, the risk management of the company and other characteristics of the company. In the present study, the ESG adaptation of 87 Indian PSEs has been measured by developing the ESG Index. The aims of this study are to select of ESG factors, evaluate the current position of select PSEs on ESG reporting practices, highlight the position of sample PSEs on disclosure practices of ESG and explore the unit-specific determinants (if any) that may explain the variation in proactiveness among the sample units. The score/weightage assigned to ESG factors on the basis of their importance in the ESG disclosure practice of sample PSEs. Battelle Environmental Evaluation System (BEES) has been used for the distribution of total scores among all the indicators and their sub-indicators on the basis of their importance. In this study, each factor has some sub-factors, and the total score was allotted among the sub-factors under each factor on the basis of its anticipated importance according to the Battelle Environmental Evaluation System (BEES). To ascertain the quantitative and relative effect of different variable factors on the overall ESG score of different PSEs', multiple linear (OLS) regression analyses (Linear Enter model) have been made and subsequently tested through the SPSS statistical package. The study period was the financial year 2017-2018. In the present study, the highest score for overall ESG disclosure is 73.70% and the lowest score is 14.4%. In the present study the regression analysis showed that Net sales, Total expenses, Profit after tax, Current liabilities and provisions, Total assets, Amount spent on CSR activities during the year, Profit before taxation and Paid up equity capital (net of forfeited equity capital) have significant positive effect on the extent of percentage of Overall ESG disclosure score. The sample PSEs with higher Total expenses, Profit after tax, Current liabilities and provisions, Total assets, Amount spent on CSR activities during the year, Profit before taxation and paid up equity capital (net of forfeited equity capital) are more ESG proactive. ESG disclosure would not only demonstrate companies' committed approach towards the community and society at large, but also drive a company towards gaining competitive advantage in the long run. ESG disclosure performance of select PSEs' can be improved by Implementation of coherence legal structure has been implemented by Central Government and related By-laws have been framed by State Government for Environment related issues, Social accounting should be introduced in the enterprises and implement sound public governance system.

Keywords: *Environmental performance; Social Issues; Corporate Governance; Index; Indian Enterprises*

Introduction

At present, the number of companies reporting information relating to ESG performance has increased very significantly. Environmental, Social and Corporate Governance (ESG) factors provide the quality management of the company, the culture of the company, the risk management of the company and other characteristics of the company. For increasing the sustainable diligent advantage (i.e., business risk) and decreasing operational or reputational risks (i.e., financial risk). Companies are required to maintain definite relations with key non-financial partners like workers, consumers, society, and the government. ESG performance of a company may be objectively measured based on specific indicators, these are playing as evidence to assess the corporate governance of partners' relations with ESG disclosure (Boffo & Patalano, 2020). ESG factors include the risks and opportunities that businesses face based on ESG issues. It is worth mentioning that powerful governance systems, suitable executive control and top-class of clarity are among the factors likely to differentiate the act of corporate in long run (Maher & Anderson, 2000). Based on literature survey and normally accepted norms. This study focused on three major factors (Environmental, Social and Corporate Governance) and some important sub-factors. In the present research paper, to assess and analyze the degree of ESG execution of various companies the ESG Index has been developed for assigning weightage to various ESG issues.

Literature Review

Very few studies focused on the presentation of Environment, Social and Governance factors. In some studies, unit specific determinants have been purely theory driven, such as, those conducted by Greening of Industry Network, Ashford and Meima (1993); Welford and Gouldson (1993); Fiksel (1994). For framing the social factors, they evaluated three different research providers, which were Deloitte and Touche, KPMG and Pacific Sustainability Index (PSI) Scoring Sheet. They had added 20 social factors. Then General; Employee; Diversity, Opportunity and Human Rights; Customers and Communities; and Integrity and Ethics had been created for the distribution of 20 social factors. Energy, Water, Materials, Pollution and Waste Management and Others are the group's name of 'Environmental' disclosure factors. Chin, Jennifer and Taylor (2007) in their study of CTBL disclosure practice highlighted on the 60 disclosure items following the Global Reporting Initiative (GRI) Reporting Guidelines (2002). The 'social' indicators in the study of Chin, Jennifer and Taylor (2007) were primarily adapted from the 2002 GRI Guidelines. However, a few researches have awarded score to performance indicators on the basis of their merit of overall proactiveness (Rice, 1993; Russo & Fouts, 1997; Gupta & Goldar, 2003; Wu, Chan & Shen, 2004; Zhu & Sarkis, 2004; Zutshi, 2006). Global Environmental Management Initiative (1998) arguing in the same tune, put weightage of each performance level based on priority during the evaluation of environmental performance. In the study of Gupta and Goldar (2003), the scored allotted to different factors were differing significantly among the organiations' on the basis of their intrinsic characteristics. Wier *et al.* (2005) also used calculated environmental impact indices to create one environmental activity score for each family variety and product variety. Sahut and Descomps (2015) had concluded a non linear relationship between news based scores in ESG factors and the month wise returns of stock market in Switzerland, US and UK. Syed

(2017) in his study on Environment, Social and Governance (ESG) criteria and performance managers had conducted a questionnaire survey among 1400 managers who are involved in the investment process. To examine the association between several unit specific determinants (independent variables) and the extent of organisational proactiveness (dependent variable), diverse statistical analyses have been made by various researchers (Gates & Germain, 2010; Chin, Jennifer and Taylor, 2007.Kumar *et al.,* (2016) in their study on ESG indicators and risk –adjusted activities: a new numerical model had introduced ESG risk premium model which was a quantitative model for establishing the correlation between performance and volatility of stock return. Torre, Mango and Leo (2020) in their study showed that the performance of Eurostoxx 50 companies does not affected by their ESG commitments. In some studies the matched-pair statistical procedures have been used to test the difference between ESG performance scores of two country locations or two /more groups of sample firms. Some have relied on ANOVA, Z-testing and chi-square testing, while student's t-test has been used by some others. Bivariate statistical analyses have also been used by some researchers.

Gap Analysis

- Very few studies have been found which have attempted to assess the existing status of the corporate entities on incorporation of the ESG issues;
- No study in Indian perspective has been found where ESG issues have been evaluated quantitatively and ESG indicators have been identified;
- Though there are very few studies in global perspective, where proactiveness of corporate entities in disclosing ESG issues have been empirically assessed, whereas hardly any such study is found in case of Indian corporate sector;
- Even, not a single study is found where unit specific determinants have been attempted to explore that may explain the variation in proactiveness among the units.

Objectives of the Study

The important objectives of the present study are:

- To evaluate the proactiveness among the select PSEs about ESG factors.
- To select ESG factors and to examine the performance of select PSEs on ESG disclosure practices.
- To analyze empirically to which extent the select PSEs are proactive in disclosing ESG factors.
- To explore the unit-specific determinants (if any) that may explain the variation in proactiveness among the sample units.

Methodology

Sample Design

The present research work has surveyed 87 selected Central Public Sector Enterprises (CPSEs) i.e. selected 5 Maharatna CPSEs of India, comprising 5.7% of total 87 CPSEs; selected 14 Navratna CPSEs of India, comprising 16.1% of total 87 CPSEs; selected 50

Miniratna Category I CPSEs (of India, comprising 57.5% of total 87 CPSEs; and selected 18 Miniratna Category II CPSEs (as of India, comprising 20.7% of total 87 CPSEs.

Selection of indicators

ESG indicators include risks and opportunities that businesses face based on ESG issues. In the long run, powerful governance, proper executive domination and top clas of transparency are the factors that can comprehend corporate performance. Based on the literature survey and normally accepted norms, the study concentrated on three major factors which are Environmental, Social, Corporate Governance and some major sub-factors which are presented in the subsequent section.

Assignment of Score

This study considered ESG disclosure of the sample PSEs. The score/weightage had been allotted to all three indicators on the basis of their inherent significance in ESG disclosure performance for all the sample PSEs. The highest attainable allotted score/weight for every factor has been mentioned in Table 1.

Table 1: The System Relating to Indicator Wise assignment of Scoring/ Weight

Primary Indicator	Score/Importance
Environment	400
Social	300
Corporate Governance	300
Total	**1000**

In this study, every factor has some sub-factors. On the basis of inherent importance as per the Battelle Environmental Evaluation System (BEES), the maximum score was administered to every sub-factor of each major factor. As it was personalised, but it was not unavoidable (Wallace *et al.*, 1994). It can be stated here that some editing was made, as per the interaction with the educator, auditing personnel as well as corporate officials working in the field of finance, after creating the scorecard. On the basis of past empirical studies, it has been framed a weighted disclosure index with some alterations to measure the level of corporate ESG disclosure. The quantification for the level of disclosure was rated as follows:

- If a company did not disclose any item, then no score was assigned,
- The score was assigned based attributes like comprehensiveness, clarity, relevance, etc.; if a company disclosed any item then the score was assigned.

The weight is assigned to each of the factors or disclosure items on the basis of their relative importance in total disclosure practice. The present study has subdivided the maximum achievable score under each category (including sub-categories). The ESG disclosure score value for each of the indicators and sub-indicators has been shown in detail in Table 2.

Table 2: Scoring of ESG Disclosure Factors

ESG Indicators		**Score**
1	**Environmental Indicators**	**400**
1a	**Materials:**	**40**
1a(i)	The weight or volume of Materials used	20
1a(ii)	Percentage of recycled materials used as input	20
1b	**Energy:**	**30**
1b(i)	Consumption of Direct energy as the primary source	6
1b(ii)	Consumption of Indirect energy as the primary source	6
1b(iii)	Developments of Conservancy and efficiency improvements to save energy	6
1b(iv)	Proactiveness to provide energy-saving or renewable energy-based products and services, and decreases in energy requirements as a result of these proactiveness	6
1b(v)	Actions to decrease indirect energy use and reductions achieved	6
1c	**Water:**	**30**
1c(i)	Use of water through source	8
1c(ii)	Withdrawal of water significantly affects the Water sources	7
1c(iii)	Water recycled and reused in Percentage and total volume	15
1d	**Biodiversity:**	**20**
1d(i)	Area and volume of land occupied, leased, managed in, or surrounded to, reserved areas and areas of high biodiversity value outside reserved areas	4
1d(ii)	Details of important effects of activities, products, and services on biodiversity in secured areas and areas of increasing biodiversity value outside secured areas	4
1d(iii)	Protection or restoration of habitats	4
1d(iv)	Controlling effects on biodiversity by the policies, recent actions, and plans for future	4
1d(v)	Number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk	4
1e	**Emissions, Effluents, and Waste:**	**50**
1e(i)	The volume of direct and indirect greenhouse gas discharge	5
1e(ii)	Volume of discharge of Other relevant indirect greenhouse gas	5
1e(iii)	Initiatives to reduce and reductions achieved in greenhouse gas emissions	5
1e(iv)	Weight of ozone-depleting substances emissions	5
1e(v)	Important air discharge by type and weight of NOx, SOx, and other	5
1e(vi)	Quality and destination-wise total water discharge	5
1e(vii)	Different types and disposal methods wise weight of waste	5
1e(viiI)	Significant spills in total number and volume of	5
1e(ix)	The volume of transported, imported, exported, or treated waste deemed hazardous and the percentage of transported waste internationally shipped, on the basis of Basel Convention Annex I, II, III, and VIII	5
1e(x)	biodiversity value of water bodies and Related habitats are significantly affected by the reporting organization's discharges of water and runoff and the identity, size, protected status	5

1f	**Services and Products**	**50**
1f(i)	The extent of impact mitigation and Initiatives to reduce environmental effects of products and services	30
1f(ii)	Reclaimed by category of Percentage of products sold and the materials use for packaging	20
1g	**Compliance:**	**60**
1g(i)	For disobedience with environmental laws and regulations the noteable fines in monetary value and the total number of non-monetary sanctions	**60**
1h	**Transport**	**40**
1h(i)	Transporting products and other goods and materials and transporting members of the workforce used for the organization's operations have Significant environmental impacts	40
1i	**Overall:**	**30**
1i(i)	Types of total expenditures and investments for protecting the environment	30
1j	**Environmental Assessment by the Supplier**	**25**
1k	**Grievance Mechanisms of Environment**	25
2	**Social Indicators**	**300**
2a	**Labour Practices and Decent Work:**	**100**
2a(i)	Employment	15
2a(ii)	Relations between Labour and Management	15
2a(iii)	Health and Safety are related to the occupation	15
2a(iv)	Training and Education for Employees	15
2a(v)	Diversity and Equal Opportunity for women employees	10
2a(vi)	Women and Men employees are paid equal remuneration	10
2a(vii)	Labour Practices have been assessed by the Supplier	10
2a(viii)	Grievance Mechanisms for Labour Practices	10
2b	**Human Rights:**	**100**
2b(i)	Investment in protecting human rights	10
2b(ii)	Non-discrimination between different types of employees	10
2b(iii)	Collective Bargaining and Freedom of Association of labours'	10
2b(iv)	Appointment of Child Labour	10
2b(v)	Forced or Compulsory Labour to workers	10
2b(vi)	Security Practices are adopted for employees	10
2b(vii)	Indigenous Rights for workers	10
2b(viii)	Assessment of Human Rights	10
2b(ix)	Human Rights are Assessed by the Supplier	10
2b(x)	Grievance Mechanisms of Human Rights	10
2c	**Society:**	**60**
2c(i)	Local Communities	9
2c(ii)	Anti-corruption	9
2c(iii)	Public Policy	10
2c(iv)	Anti-competitive Behaviour	8
2c(v)	Compliance	8
2c(vi)	Assessment by the Supplier for Impacts on Society	8

2c(vii)	Impacts of Grievance Mechanisms on Society	8
2d	**Product Responsibility:**	**40**
2d(i)	Health and Safety of Customer	8
2d(ii)	Labeling on Product and Service	8
2d(iii)	Marketing Communications	8
2d(iv)	Customer Privacy	8
2d(v)	Compliance	8
3	**Corporate Governance Indicators:**	**300**
3a	**Board of Directors:**	**100**
3a(i)	Board size	10
3a(ii)	Percentage of outside directors	10
3a(iii)	Percentage of independent directors	10
3a(iv)	Presence of nominee directors	10
3a(v)	Presence of non-executive or promoter chairman	10
3a(vi)	Presence of promoter on board	10
3a(vii)	Total number of directorships held by independent directors	10
3a(viii)	Number of board meetings held	10
3a(ix)	Percentage of board meetings attended by independent directors	10
3a(x)	Percentage of independent directors who attended AGM	10
3b	**Ownership Structure and Investor Relations:**	**70**
3b(i)	Percentage of promoter ownership	19
3b(ii)	Percentage of foreign institutional ownership	19
3b(iii)	Percentage of domestic financial institution ownership	16
3b(iv)	Percentage of dispersed ownership	16
3c	**Audit Committee:**	**70**
3c(i)	Size of audit committee	19
3c(ii)	Percentage of independent directors	16
3c(iii)	Presence of executive directors in audit committee	15
3c(iv)	Number of meetings held	20
3d	**Auditor:**	**60**
3d(i)	Percentage of non-audit fees to total payment to auditors	15
3d(ii)	Top auditor in terms of audit fees	15
3d(iii)	Top auditor in terms of audit clients	15
3d(iv)	Change in auditor from last year	15
Grand Total		**1000**

The present study assessed the sum total of the ESG disclosure score of the sample units on the basis of ESG reporting in terms of the three primary indicators. The score has been assigned on the basis of attributes like extensiveness, clarity, relevance, etc. The following formula was applied to obtain ESG Disclosure Score (ESGDS).

$$ESGDS = \frac{ScoreObtained}{MaximumAchievableScore} x100$$

Data Analysis and Findings Relating to ESG Disclosure Score of Sample PSEs

The data from 87 samples were examined regarding reliability. Chronbach's Alpha is the instrument for measuring the reliability, had used in this study. Table 3 reveals that Cronbach's Alpha value is 0.924 (more than 0.700 is good). Therefore it can be concluded that in this study the data and results computed from these samples were reliable from the statistical point of view.

Table 3: Reliability of the Sample

Cronbach's Alpha	N of Items
0.924	4

Reveals of Environmental Factors by the Sample PSEs

The assessed score relating to the environmental disclosure of sample PSEs has mentioned in Table 4. The highest environmental disclosure score is 67%. From this study, it can be seen that not a single PSEs has scored more than 80%. The study also shows that the score of 91.95% of companies (i.e. 80 companies) is less than 40%.

Table 4: Disclosure Score of Environmental Factor of Sample PSEs

Score (%)	Sample PSEs	Sample PSEs (in %)
<40	80	91.95
40-60	05	5.75
60-80	02	2.30
>80	0	0
Total	**87**	**100.00**

Source: Annual Reports/Corporate Social Responsibility Reports/Sustainability Reports (2017-18) of Select PSEs. The results are calculated by the author.

Null Hypothesis (H_0): The Environmental Disclosure Score of PSEs do not vary among the different types of PSEs.

Alternative Hypothesis (H_1): The Environmental Disclosure Score of PSE varies among the different types of PSEs.

Null Hypothesis is not accepted when the P value less than 0.05.

Table 5 has sown the chi-square value. Here the Null hypothesis is not accepted (as P< 0.05). in the contrary the alternative hypothesis is accepted. The computed result of Chi-Square Test in the table 5 is shown that the relationship between disparity of the environmental disclosure score among the various types of PSEs.

Table 5: Assessment of Chi-Square of the Environmental Disclosure Score of Sample PSEs

	Value	df	Asymp.Sig. (2 sided)
Pearson Chi-Square	33.425	3	0.000

Source: Annual Reports/Corporate Social Responsibility Reports/Sustainability Reports (2017-18) of Select PSEs. The result is computed by SPSS software.

Reveals of Social Factors by the Sample PSEs

The assessed score relating to the social disclosure of sample PSEs has mentioned in Table 6. In this study the highest score of social disclosure factor is 85.67%. More than

80% Social Disclosure Score had attained by only one PSE. It can also state that less than 60% Social Disclosure Score has attained by the 91.95% of companies (i.e. 80 PSEs).

Table 6: Disclosure Score of Social Factor of Sample PSEs

Score (%)	Sample PSEs	Sample PSEs (in %)
<40	61	70.11
40-60	19	21.84
60-80	06	6.90
>80	01	1.15
Total	**87**	**100**

Source: Annual Reports, CSR Report, Sustainability Reports (2017-18) of Select PSEs. The results are calculated by the author.

Null Hypothesis (H_0): The Social Disclosure Score of PSEs do not vary among the different types of PSEs.

Alternative Hypothesis (H_1): The Social Disclosure Score of PSEs vary among the different types of PSEs.

Null Hypothesis is not accepted when the P value less than 0.05.

Table 7 has sown the chi-square value. Here the Null hypothesis is not accepted (as $P<$ 0.05). In the contrary the alternative hypothesis is accepted. The computed result of Chi-Square Test in the table 7 is shown that the relationship between disparity of the social disclosure score among the various types of PSEs.

Table 7: Assessment of Chi-Square of the Social Disclosure Score of Sample PSEs

	Value	df	Asymp.Sig. (2 sided)
Pearson Chi-Square	46.210	3	0.000

Source: Annual Reports/Corporate Social Responsibility Reports/Sustainability Reports (2017-18) of Select PSEs. The result is computed by SPSS software.

Reveals of Corporate Governance Factors by the Sample PSEs

The assessed score relating to the corporate governance disclosure of sample PSEs has mentioned in Table 8. The maximum score of corporate governance disclosure is high enough i.e. 82.33%. The study also reveals that 3.45% PSEs (i.e. 3 PSEs) have scored more than 80%. On the other hand, less than 60% have been scored by 59.77% of companies (i.e. 52 PSEs).

Table 8: Disclosure score of Corporate Governance Factor of Sample PSEs

Score (%)	Sample PSEs	Sample PSEs (in %)
<40	09	10.34
40-60	43	49.43
60-80	32	36.78
>80	03	3.45
Total	**87**	**100**

Source: Annual Reports, CSR Report, Sustainability Reports (2017-18) of Select PSEs. The Results are calculated by the author.

Null Hypothesis (H_0): The Corporate Governance Disclosure Score of PSEs do not vary among the different types of PSEs.

Alternative Hypothesis (H_1): The Corporate Governance Disclosure Score of PSE vary among the different types of PSEs.

Null Hypothesis is not accepted when the P value less than 0.05.

Table 9 has sown the chi-square value. Here the Null hypothesis is not accepted (as *P*< 0.05). In the contrary the alternative hypothesis is accepted. The computed result of Chi-Square Test in the table 9 is shown that the relationship between disparity of the corporate governance disclosure score among the various types of PSEs.

Table 9: Assessment of Chi-Square of the Corporate Governance Disclosure Score of Sample PSEs

	Value	df	Asymp.Sig. (2 sided)
Pearson Chi-Square	42.291	3	0.000

Source: Annual Reports/Corporate Social Responsibility Reports/Sustainability Reports (2017-18) of Select PSEs. The result is computed by SPSS software.

Reveals of Overall ESG Factors by the Sample PSEs

The calculate value of the overall disclosure score of the sample PSEs has mentioned in Table 10. 74% is the maximum score of overall ESG disclosure and the lowest value of overall ESG disclosure score is 11%. Not a single PSE of the 87 sample PSEs has attained more than 80% ESG disclosure score. From the following table 10 It can be concluded that the Less than 40% overall ESG disclosure score has scored by 80.46% PSEs (70 PSEs).

Table 10: Disclosure Score of Overall ESG Factor

Score (%)	Sample PSEs	Sample PSEs (in %)
<40	70	80.46
40-60	11	12.64
60-80	06	6.90
>80	0	0
Total	**87**	**100**

Source: Annual Reports, CSR Reports, Sustainability Reports (2017-18) of Select PSEs. The results are calculated by the author.

Null Hypothesis (H_0): The Overall Disclosure Score of PSEs do not vary among the different types of PSEs.

Alternative Hypothesis (H_1): The Overall Disclosure Score of PSE vary among the different types of PSEs.

Null Hypothesis is not accepted when the P value less than 0.05.

Table 11 has sown the chi-square value. Here the Null hypothesis is not accepted (as *P*< 0.05). In the contrary the alternative hypothesis is accepted. The computed result of Chi-Square Test in the table 11 is shown that the relationship between disparity of the overall disclosure score among the various types of PSEs.

Table 11: Assessment of Chi-Square of the Overall Disclosure Score of Sample PSEs

	Value	df	Asymp.Sig.(2 sided)
Pearson Chi-Square	49.236	3	0.000

Source: Annual Reports/Corporate Social Responsibility Reports/Sustainability Reports (2017-18) of Select PSEs. The result is computed by SPSS software

Data Analysis and Findings Relating to the Impact of Determinants of Overall ESG Performance Score Proactiveness on Sample PSEs Characteristics

This section made an attempt to identify some (16) determinants explaining the variations in the overall ESG performance score. Accordingly, firstly this section dealt with the selection of firm-specific determinants along with the formulation of hypothesis.

i) Total income

ii) Total sales

iii) Total capital

iv) Current assets

v) Last three years' Average net profit.

vi) Expenditure to be incurred for Corporate Social Responsibility

vii) No. of employees

viii) Size of the business

ix) Net sales

x) Total expenses

xi) Profit after tax

xii) Current liabilities and provisions

xiii) Total assets

xiv) Investment for CSR activities during the financial year

xv) Profit before taxation and

xvi) Paid-up equity capital (net of forfeited equity capital)

The correlation was undertaken among the 16 independent variables and the dependent variable. The data of 87 samples were tested in terms of reliability. Table 12 shows that the data and results found from this sample were statistically reliable because the value of Cronbach's Alpha is 0.838 (more than 0.700 is good).

Table 12: The reliability Test result of the Above-mentioned Sixteen Independent Variables of the Sample PSEs

Cronbach's Alpha	N of Items
0.838	16

Source: Annual Reports, CSR Reports, Sustainability Reports (2017-18) of Select PSEs. The Result is calculated by the SPSS software.

Formulation of Model

To ascertain the quantitative and relative effect of these factors, multiple linear (OLS) regression analyses (Linear Enter model) have been made and subsequently tested through SPSS statistical package. Accordingly, with the overall ESG performance score as the dependent variable and a linear relationship is assumed, the model for determination of relative role of each independent variable is framed as follows:

$$OESGPS_t = \alpha + \beta_1 TINCOME + \beta_2 SALES + \beta_3 NSALES + \beta_4 TEXPENSE + \beta_5 PAT + \beta_6 TCAPITAL + + \beta_7 CLPROV + \beta_8 TASSET + \beta_9 CASSET + \beta_{10} AVRNP + \beta_{11} CSR + \beta_{12} CSRINCUR + \beta_{13} EMP + \beta_{14} PBT + \beta_{15} SIZE + \beta_{16} PCAPITAL + u_t$$

where,

t = Index of unit (1, 2, ….., 87)

OESGPS = Overall ESG Performance Score

TINCOME = Total Income

SALES = Total Sales

NSALES = Net Sales

TEXPENSE = Total Expenses

PAT = Profit After Tax

TCAPITAL = Total Capital

CLPROV = Current Liabilities and Provisions

TASSET = Total Assets

CASSET = Current Assets

AVRNP = Average Net Profit (last three years)

CSR= Amount Spent on Corporate Social Responsibility Activities During the year

CSRINCUR= as per Companies Act 2013 the CSR Expenditure to be incurred

EMP= No. of Employees

PBT= Profit before Taxation

SIZE= Size of the enterprise

PCAPITAL= Paid up Equity Capital

α = Constant

β = Parameters

u = Error term

However, during running the model because of facing the problem of multicollinearity due to a high degree of VIF of total income (TINCOME), total sales (SALES), total capital (TCAPITAL), current assets (CASSETS), average net profit for the last three years (AVRNP), CSR expenditure to be incurred (CSRINCUR), no of employees (EMP) and size of the business (SIZE), it has been decided to avoid those eight variables in the final Model.

Accordingly, the final Model incorporated total eight explanatory variables viz

The modified equation for final Model is:

$$OESGPS_t = \alpha + \beta_3 NSALES + \beta_4 TEXPENSE + \beta_5 PAT + + \beta_7 CLPROV + \beta_8 TASSET +$$

$$\beta_{12}\,\text{CSRINCUR} + \beta_{14}\,\text{PBT} + \beta_{16}\,\text{PCAPITAL} + u_t$$

The results of the regression for final Model, obtained by using SPSS statistical package are reported in Table 13, Table 13A and Table 13B.

Table 13: Estimates from the OLS Regression Analysis of Overall Disclosure Performance Score on Sample PSEs Characteristics

Final Model

(Excluding total income, total sales, total capital, current assets, last three years' average net profit, expenditure for CSR to be incurred, no. of employees and size of the business):

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.728[a]	0.530	0.482	9.2501800064544450	1.505

Source: Annual Reports, CSR Reports, Sustainability Reports (2017-18) of Select PSEs. The Results are calculated by the SPSS software.

a. Predictors: (Constant), Paid up equity capital (net of forfeited equity capital), Profit before taxation, Sales, Amount spent on CSR activities during the year, Current liabilities & amp; provisions, Profit after tax, Total assets, Net sales, Total expenses

b. Dependent Variable: %of total

Table 13A: Calculation of One Way ANOVA[a] of Overall Performance Score on Sample PSEs Characteristics

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7538.259	8	942.282	11.012	.000[b]
	Residual	6674.135	78	85.566		
	Total	14212.394	86			

Source: Annual Reports, CSR Reports, Sustainability Reports (2017-18) of Select PSEs. The Results are calculated by the SPSS software

a. Dependent Variable: %of total

b. Predictors: (Constant), Paid up equity capital (net of forfeited equity capital), Profit before taxation, Sales, Amount spent on CSR activities during the year, Current liabilities & provisions, Profit after tax, Total assets, Net sales, Total expenses.

Table 13B: Coefficients[a] of Overall Performance Score on Sample PSEs Characteristics

Model		Coefficients in the form of Unstandardized		Coefficients in Standardized form	*t*	Sig.	Confidence Interval for B at 95.0%		Collinearity Statistics	
							Lower Bound	Upper Bound		
		B	Std. Error	Beta					Tolerance	VIF
1	(Constant)	26.702	1.272		20.986	0.000	24.169	29.235		
	SALES	0.000	0.000	-2.479	-3.423	0.001	0.000	0.000	0.011	87.111
	NSALES	0.000	0.000	1.230	2.978	0.004	0.000	0.000	0.035	28.324
	TEXPENSE	0.000	0.000	1.699	2.963	0.004	0.000	0.000	0.018	54.581

	PAT	0.000	0.000	0.641	5.096	0.000	0.000	0.001	0.381	2.626
	CLPROV	0.000	0.000	0.993	3.737	0.000	0.000	0.000	0.085	11.723
	TASSET	-0.0000344	0.000	-1.551	-5.405	0.000	0.000	0.000	0.073	13.676
	CSR	0.000	0.000	-0.087	-0.839	0.404	-0.001	0.001	0.566	1.768
	PCAPITAL	0.000	0.000	0.216	1.643	0.104	0.000	0.000	0.349	2.868

a. Dependent Variable: %of total

Source: Annual Reports, CSR Reports, Sustainability Reports (2017-18) of Select PSEs. The Results are calculated by the SPSS software.

Findings from the Linear Regression Test Results

From Table 13,13A and 13B the present study has constructed the following regression equation.

$OESGPS_t$ = 26.60767 + 0.00013 NSALES + 0.00016 TEXPENSE + 0.00024 PAT + 0.00011 CLPROV + 0.00003 TASSET + 0.00050 CSRINCUR + 00000001 PBT + 0.00018 PCAPITAL + 9.193967129214280

The overall significance of the regression models are indicated by their respective F-values. Since the values of F (9, 77) are not directly available from the Table 13B, values of F (9, 120) have been used instead of F (9, 77). Now, at the 0.01 significance level with 9 and 120 degrees of freedom, table value $F_{0.99}$ = 2.56. Since, observed value of F for final Model i.e. 10.126 > 2.56, therefore the values for final Model are found significant at 1% level.

Regression coefficients shown in the Table 13B revealed the relative contribution of the 8 independent variables to the explanatory power of the equation. The multiple correlation coefficient between the explanatory variables (NSALES, TEXPENSE, PAT, CLPROV, TASSET, CSRINCUR, PBT, PCAPITAL) and the dependent variable (OESGPS) taken together was 0.763. The overall explanatory power as indicated by adjusted R^2 of final Model is 0.489. Thus, the model explains about 48.9% of the variation in the extent of the ESG performance score by the selected company characteristics.

The Detail Measurements of Independent Variables are as Follows:

Table 14: Acceptance or Rejection of Different Hypotheses for the Regression Model

Sl. No.	Null Hypotheses	Alternative Hypotheses	Observed Value of |t|	Tabulated Value of |t| *	Decision
1	$H_0 3:\beta_3 = 0$	$H_1 3:\beta_3 \neq 0$	3.22274	2.38^{**}	Reject $H_0$3 and accept $H_1$3 at 1% level
2	$H_0 4:\beta_4 = 0$	$H_1 4:\beta_4 \neq 0$	2.85131	1.66^{***}	Accept $H_0$4 and reject $H_1$4 at 5% level
3	$H_0 5:\beta_5 = 0$	$H_1 5:\beta_5 \neq 0$	1.96202	1.66^{***}	Accept $H_0$4 and reject $H_1$4 at 5% level
4	$H_0 7:\beta_7 = 0$	$H_1 7:\beta_7 \neq 0$	3.32600	1.66^{***}	Accept $H_0$4 and reject $H_1$4 at 5% level

5	$H_O8:\beta_8 = 0$	$H_1 8:\beta_8 > 0$	5.02528	1.66***	Accept $H_0 4$ and reject $H_1 4$ at 5% level
6	$H_0 12:\beta_{12} = 0$	$H_1 12:\beta_{12} > 0$	1.10864	1.66***	Accept $H_0 4$ and reject $H_1 4$ at 5% level
7	$H_0 14:\beta_{14} = 0$	$H_1 14:\beta_{14} \neq 0$	1.39883	1.66***	Accept $H_0 4$ and reject $H_1 4$ at 5% level
8	$H_0 16:\beta_{16} = 0$	$H_1 16:\beta_{16} > 0$	1.91102	1.66***	Accept $H_0 4$ and reject $H_1 4$ at 5% level

Note: Since the values of* $|t|_{.01, 77}$ *and* $|t|_{.05, 77}$ *are not directly available from the Table 14, values of* $|t|_{.01, 80}$ *and* $|t|_{.05, 80}$ *have been used instead of* $|t|_{.01, 49}$ *and* $|t|_{.05, 49}$ *respectively.*

In this study the regression analysis showed that Net sales, Total expenses, Profit after tax, Current liabilities and provisions, Total assets, Amount spent on CSR activities during the year, Profit before taxation and Paid up equity capital (net of forfeited equity capital) have significant positive effect on the extent of percentage of Overall ESG disclosure score. The results of regression analysis also revealed that the remaining variables namely total income, total sales, total capital, current assets, the last three years' average net profit, CSR expenditure to be incurred, number of employees and size of the business have a statistically insignificant effect suggesting that these variables cannot significantly explain the variation in the extent of overall ESG performance score in of the sample. This may be due to the sampling error, or multicollinearity problem or due to the non-homogeneity of the nature of observations. If there would be larger sample size, such error could be minimized.

Discussion

The overall explanatory power as indicated by adjusted R^2 of final Model is 0.489. Thus, the model explains about 48.9% of the variation in the extent of the ESG performance score by the selected company characteristics. Of the eight significant explanatory variables, seven variables viz., Total expenses, Profit after tax, Current liabilities and provisions, Total assets, Amount spent on CSR activities during the year, Profit before taxation and Paid up equity capital (net of forfeited equity capital) have been found to be positive at 1% level of significance. This indicated that units with higher Total expenses, Profit after tax, Current liabilities and provisions, Total assets, Amount spent on CSR activities during the year, Profit before taxation and paid up equity capital (net of forfeited equity capital) are more ESG proactive. The other variable namely, Net Sales has also found to be significant at 5% level and have positive coefficient in all the models. This suggested that Net Sales has shown relatively better effect on overall ESG performance score. Whelan *et al.* (2020) have mentioned in their study that in case of 26% of studies disclosure alone found a positive correlation with financial performance compared to 53% for performance based ESG measures (e.g. assessing a firm's performance on issues such as greenhouse gas emission reductions). Aydogmus *et al.* (2022) have shown in their analysis by using correlation technique that, there is no correlation between ESG scores & Tobin's Q and ESG scores & ROA; however, ESG scores are highly correlated among themselves. There is also slight correlation between all ESG scores (particularly ENV) and Size indicating the bigger the company, the higher their ESG scores.

Conclusion

The present study has revealed the ESG disclosure performance of only 87 selected PSEs' in India. Large number of sample size may reveal better results. The present study has been restricted to performance of overall ESG disclosure proactiveness in the business practices. In the financial disclosure part of the sample PSEs' there were several other variables, which could have explained the disparity in the levels of overall ESG disclosure score. The study revealed that a few leading PSEs have developed innovative practices for Effective disclosures. ESG disclosures are not structured. But there is enough scope of improvement of corporate performance through ESG disclosure. ESG disclosure performance of select PSEs' can be improved by Implementation of coherence legal structure has been implemented by Central Government and related By- laws have been framed by State Government for Environment related issues, Social accounting should be introduced in the enterprises and implement sound public governance system which has a vital role in sustainable and all around development of society.

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