ENVIRONMENTAL REPORTING AND COMPANY CHARACTERISTICS - *A STUDY OF INDIAN COMPANIES*

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Abstract

The present study is an attempt to understand the environmental accounting and reporting practices of manufacturing companies in India also analyses whether environmental disclosure practices are more strongly influenced by corporate characteristics. A sample of 50 Indian Manufacturing companies selected for the study from Cement, Pharmaceuticals, Paper & Pulp, Steel and Petroleum, Oil & Refineries sectors. Data for the study collected from secondary sources. Annual reports for the year 1-4-2017 to 31-3-2018 have been analysed. Content analysis is employed to analyse the annual reports. Index of Environmental Disclosure (IED) is developed with 25 items and divided into five categories, which is capable of measuring the range, quantity and quality of environmental disclosures. The relationship of environmental disclosures and corporate size, age and financial performance has been empirically tested by using statistical tool discriminant function analysis. Result shows that size of the company and net profit are the good predictor variables and there is a relationship between environmental disclosure level of companies and corporate characteristics. On the basis of discriminant function, age of the firm has less ability in processing the cases in to groups. Indian manufacturing companies have started the practice of reporting about environmental information in their annual report. Environmental accounting has significant role in handling environmental transactions. The study found the concept and practice of environmental disclosure is increasing in broader perspective in India it should be supported by reporting standards and guidelines from the accountancy profession.

Key Words: Environmental Reporting, Content Analysis, Index of Environmental Disclosures and quantity and quality of disclosures.

Introduction

Business organizations are forced to perform socially and environmentally responsible manner due to extreme climatic changes occurred worldwide. Manufacturing Industries should find out new method of operation or technology for their production process and products. Environmental concern and protection become correspondingly important to earning profit or revenue in the business. Success and sustainability in business can be achieved by adopting social, ethical and environmental commitment. As environmental conservation activities raised up in entities, lead to social accountability and voluntary reporting.

In the evolving scenario, the need for accounting and reporting on the environment has been largely felt. There should be regulations to prevent pollution created by business organizations and to keep their own carbon emissions low. Sometimes, "polluting companies have not surrendered to social, political, and governmental pressures. Several companies have denied responsibility for pollution even when faced with strong evidence to the contrary. Other companies, after admitting responsibility, promise strong action, but deliver nothing. Still other companies have performed admirably when it comes to being environmental friendly. Industry has not always performed admirably with respect to its responsibility for the pollution it expels into the ecosystem" (Atkins & Koth, 2019).

Environmental accounting and reporting

Environmental Accounting may be defined as "the process of identification, measurement and allocation of environmental costs, the interaction of these costs into business, identifying environmental liabilities, if any, and finally communicating this information to stakeholder as a part of general purpose financial statement" (Pramanik, Shil and Das, 2007, P.18). Environmental Accounting is a sub branch of accounting. Environmental accounting otherwise referred to as "green accounting", "resource accounting" or "integrated economic and environmental accounting" - refers to adjustment of the national accounts to incorporate the use or depletion of natural resources.

The role played by business enterprises in the economy towards the environmental safety and welfare can be explained through the concept of accounting to the society at large. Corporate accounting plays an important role in valuation of environmental issues and its disclosure system. Environmental accounting measures the costs and benefits enjoyed by an organization in terms of both money and physical units. Organizations promote their communication to fulfil their accountability and provide useful information through environmental reporting. Environmental reporting presents information about Eco - friendly policies, programmes, management system, conservation activities and the consequences of an organization. For long term environmental protection and equitable consumption of natural resources companies should create ecological awareness, training and participative decision making.The concern and commitment of industries would hold the key to sustained prevention of environmental pollution and degradation. Environmental reporting, thus by generating confidence among people towards the company, plays the significant role in achieving enterprise's goal. Financial reporting with environmental information can help in building confidence for investing by public and facilitate corporate democracy.

Literature Review

Environmental accounting and reporting literature consists prior studies mainly focused on conceptual fame work, legal framework and the influence of corporate characteristics on environmental reporting. **Chauhan(2005)** studied the environmental concepts and he concluded that in India, "environmental accounting is in preliminary stage". **Pramanik et.al(2007)** also presented the similar view that environmental disclosure by companies in India was not an encouraging level.

Malarvizhi and Yadhav (2008) discussed about diverse reporting practice of Indian companies. She stated that companies have provided environmental matters in annual reports and in their official websites. **Connelly and Limpaphayom (2004)** examined the relation between corporate environmental reporting (CER) and profitability with a sample of 200 public companies of Thailand representing the largest market capitalisation. Empirical results show that no relation was found between environmental activity and profitability.

Goswami (2014) conducted a study on the development of corporate level environmental accounting and the problems associated with that. He collected a sample of top 12 companies from National Stock Exchange list, consisting cement industry, pharmaceutical and energy industries for the year 2012-2013.It was observed reporting was mere descriptive and nothing was disclosed about its financial implications and accounting policy of environmental cost. Also it was found that companies have provided non-quantitative information in annual report, few sample companies expressed quantitative disclosures.

Bora and Das (2013) investigated the reasons for variance in environmental laws across the countries. The study discussed the regulatory framework of some selected countries like Denmark, France, Norway, Australia, Germany, Sweden etc. It was observed only a few international accounting standards exist on environmental issues. The conclusion was that, companies in India are trying to be environmentally friendly to avoid penalty and other costs associated with environment and to derive greater benefits on the basis of information provided by accountants on environmental issues

Kohli (2012) tried to address two research issues to determine current level of compliance with selected disclosure requirements of Indian Accounting Standards and key corporate characteristics that affect their level of compliance. The findings of this study indicated there was no single company has done the full compliance of record. Positive association found between level of disclosure and the size, profitability and timeliness of reporting of the sample companies.

Makori and Jagongo (2013) attempted to find the relationship between environmental accounting and profitability of companies in India. Annual reports and accounts of 14 randomly selected listed companies in India were analysed for this study. Multiple regression technique was applied to analyse the data. The result indicates the negative relationship found between environmental accounting and Return on Capital Employed (ROCE) and Earnings Per Share (EPS). There was a positive association was observed between environmental reporting with Dividend Per Share and Net Profit.

Liu and V. Anbumozhi (2009) tried to identify the determinant factors affecting the disclosure level of corporate environmental information on the basis of stakeholder theory, and gave an empirical observation on Chinese listed companies. He concluded that "The corporate environmental disclosure effort is significantly related to its environmental sensitivity and its size. The better economic performance of a company would provide more information on environmental investment and pollution control.

Pahuja (2009) tested the relationship between environmental disclosure and industry related variables. Both secondary and primary data were used in this study. An index was constructed consisting of 23 items and Environmental Disclosure Score (EDS) was calculated for 91 companies for all the three years. The result shows the environmental disclosure practices influenced by the variables size, profitability, sector and environmental performance.

Gupta (2011*)* examined annual reports of NSE listed top50 companies in India for 3 consecutive years to analyse their environmental disclosure practices. An 'Index of Environment Disclosure' listing 23 items was used. The study reported positive association between nature of industry, size of the company, debt equity ratios and environment performance of the company.

Joshi et.al (2011) investigated the association between environmental disclosure practices and the corporate characteristics. Positive relationship was found between company size environmental disclosures. There was no influence found on environmental disclosure by other variables like accounting firm, profitability, age of the company, foreign operations and leverage.

Akbas (2014) investigated the sample of 62 listed non-financial firms to find the influence of corporate characteristics on the extent of environmental disclosure. Results of the regression analysis indicated that company size and industry membership were positively related to the extent of environmental disclosure and negative association was found between profitability and environmental disclosure. Age of a company was found statistically insignificant relationship with the extent of disclosure.

Baxi.C.V and Ray (2009) analysed a case study and he found companies reported qualitative environmental information in their annual report. It was suggested that standards are necessary to achieve transparency in reporting.

Objectives

1. To study the extent of environmental reporting practices of manufacturing companies in India.
2. To examine the relationship between environmental disclosure practices and the Company characteristics.

Methodology

A sample of 50 manufacturing companies has been selected from Economics Times-2018 rank list for this study. Annual reports of the sample companies collected for the financial year 2017 - 2018 from secondary sources. Content analysis is used with the help of index of environmental disclosure. On the basis of survey taken on previous studies, an Environmental Disclosure Index (EDI) is prepared with five major categories namely Environmental Policies and Initiatives, Material consumption, Energy Consumption, Total water withdrawal and Emission. Numerical value of "1" (one) is given if the statement is disclosed in the annual report, and the value of "0"(zero) for items not disclosed in annual report. All scores were summed up, and percentage analysis is applied to find the extent of environmental disclosure made by companies. The relationship between environmental disclosure and company characteristics is examined by discrimination function analysis using SPSS software.

Variables

The sum of total number of items disclosed by companies is a total score obtained by individual companies and it is considered as a dependent variable. Total assets value taken to measure size of the company, age of firm, profitability measured by net profit and return on assets are used as independent variables in this study. Prior researches in environmental accounting studied the impact or influence of these variables on environmental disclosure. Size of the firm determines the disclosure practice , large size firms have to maintain their image and reputation, their business process and social activities are easily reach public. Large size entities would have enough sources to collect and manage environmental documents and other information. Company runs in a particular locality for many years habitually bonded with that society and it should preserve environment by safe production process. Age is the length of time or the number of years completed since the company was started. Liu and Anbumozhi (2009), Adam et.al (1996), Prasad et.al (2016) examined the relationship between environmental disclosure and age. They found that there was an association between environmental disclosure and age of the firm. It is expected that older companies are more responsible and they report environmental matters to the stakeholders. Financial performance of a company linked with reporting practices. When the earnings of a company is more it could spend for environmental conservation technologies, pollution control, energy saving and improved products and production methods. These initiatives motivate the company to disclose about both the economic and environmental achievements. Makori et.al (2013), Hartikayanti et.al (2016), Smith et.al (2007) has identified mixed influence of profitability on environmental disclosure.

Hypothesis

$H_{1.0}$: Corporate size and age do not have discriminant ability in regard to environmental disclosure made by two groups of companies.

$H_{2.0}$: Economic performance of a company does not have discriminant ability in regard to environmental disclosure made by two groups of companies.

Environmental disclosures score is calculated for all the sample companies by counting the total items reported in the annual reports of the company. There are 25 items included in the Environmental Disclosure Index. Table no: 1 shows the scores of individual companies obtained for the total score of 25. Minimum number of 10 items reported by Orient paper and Industries Ltd, maximum score of 23 items disclosed by Reliance Industries Ltd. It is visible from the table that there are 13 companies have provided environmental disclosure above 20 items included in disclosure index. Only 6 companies have disclosed less than 15 statements. Since sample companies are belongs to environmentally sensitive sectors their reporting on environmental matters found above average level.

Table: 1 Environmental Disclosure Score

S.NO	COMPANY NAME	Total Score		S.NO	COMPANY NAME	Total Score
1	ABC TECHNO LABS LTD	18		26	JK PAPER LTD	20
2	ACC LTD	18		27	J K LAKSHMI CEMENT LTD	22
3	ADANI GAS LTD	19		28	JINDAL STAINLESSL LTD	17
4	AMBUJ CEMENT	19		29	JINDAL STEEL & POWER LTD	18
5	APL APOLLOTUBES LTD	16		30	KAJARIA CERAMICS LTD	12
6	ASTRA ZENECA PHARMA LTD	17		31	KAMADHENU LTD	18
7	AUROBINDO PHARMA LTD	20		32	KHUSHAL LTD	13
8	BICON LTD	21		33	MAHARASTRA NATURAL GAS LTD	17
9	BIRLA CEMENT WORKS LTD	20		34	MANGAL CEMENT LTD	17
10	BRAHMPUTRA PETROCHEMICALS PVT LTD	17		35	MUKUND LTD	16
11	CIPLA LTD	16		36	N R AGARWAL INDUSTRIES LTD	17
12	CHENNAI PETROLEUM CORPORATION LTD	15		37	ORIENT PAPER & INDUSTRIES LTD	10
13	CRUX	17		38	OIL AND NATURAL GAS CORPORATION LTD	21
14	DABUR INDIA LTD	18		39	PRAKASH INDUSTRIES LTD	17
15	DCM SHRIRAM LTD	16		40	RELIANCE INDUSTRIES LTD	23
16	DIVIS LABORATORIES LTD	19		41	STEEL AUTHORITY OF INDIA LTD	22
17	ESSEL PROPACK LTD	12		42	SHREE CEMENT LTD	18
18	EMAMI PAPER MILLS LTD	18		43	STAR CEMENT LTD	15
19	GLAXOSMITHKLINE PHARMACEUTICALS LTD	21		44	STRIDES PHARMA SCIENCE LTD	21
20	GUJARAT STATE ENERGY GENERATION LTD	16		45	TATA STEEL LTD	21
21	GOODLUCK INDIA LTD	16		46	TIME TECHNOPLAST LTD	16
22	HINDUSTAN PETROLEUM CORP LTD	19		47	TAMILNADU NEWSPRINT &PAPERS LTD	20
23	IND - SWIFT LABORATARIES LTD	20		48	UFLEX LTD	19
24	INDIAN OIL CORPORATION LTD	21		49	ULTRATECH CEMENT LTD	18
25	INDIA STEEL WORKS LTD	15		50	THE WESTCOAST PAPER MILLS LTD	15

Table no -2 displays the percentage values of disclosure made by companies. Also it shows the number of firms and percentage of companies reported. Minimum number of disclosure 10 statements reported by only one company out of 50 sample companies. In other terms it is 40% of disclosure made by one firm. That is 2% of sample companies. It is observed that 37 companies have provided 60% - 80% of environmental matters in the annual reports.2% of companies or one company has disclosed 23 statements which are highest disclosure score of sample companies taken for the study.

Table: 2 Environmental Disclosure Score - Aggregate

S.NO	Disclosure Score	Disclosure%	No. of Companies	% of Companies
1	10	40	1	2
2	12	48	2	4
3	13	52	1	2
4	15	60	4	8
5	16	64	7	14
6	17	68	8	16
7	18	72	8	16
8	19	76	5	10
9	20	80	5	10
10	21	84	6	12
11	22	88	2	4
12	23	92	1	2
Total			50	

Figure:1 Shows the graphical representation of environmental disclosure of companies. Minimum disclosure level is 40% provided by one company and Maximum disclosure level is 92%obtained by only one company. Majority of companies, 23 companies' disclosure level lies between 64 % - 72%.

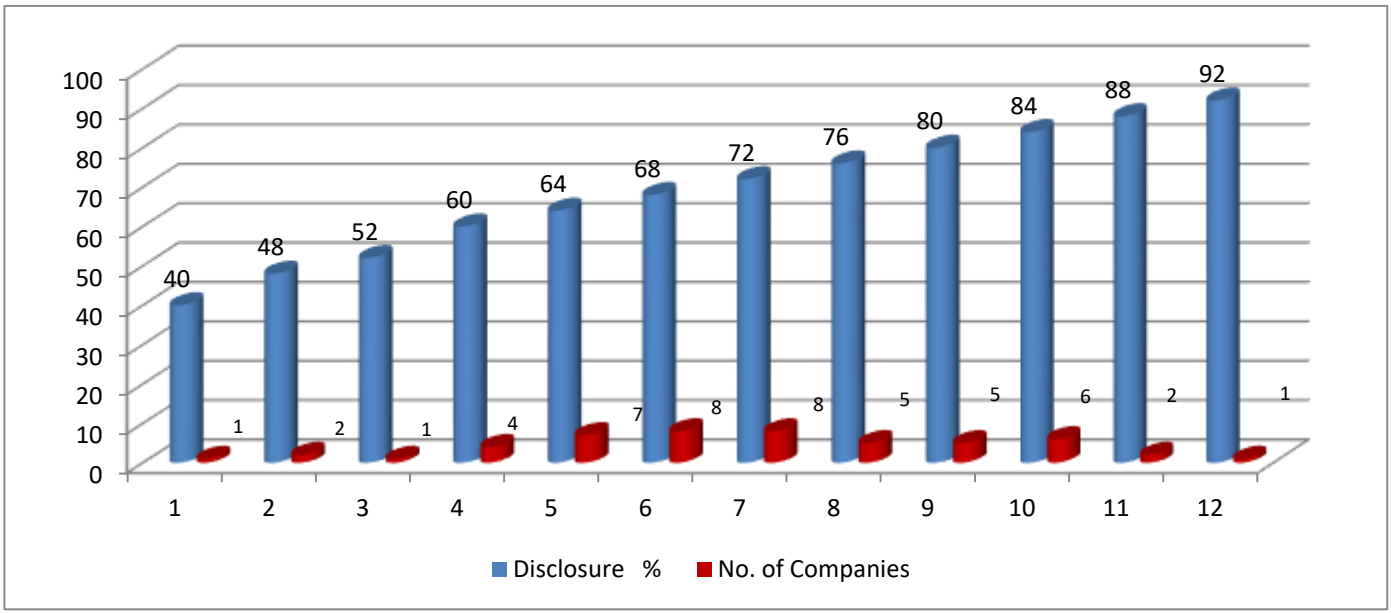

Figure 1

Figure: 2 show the disclosure score obtained by number of companies.Minimum Disclosure 10 statements made by 2% of companies. Maximum Disclosure 23 statements made by 2% of companies and 38% of companies have disclosed more than 18 statements and 62% of companies have reported less than 18 statements.

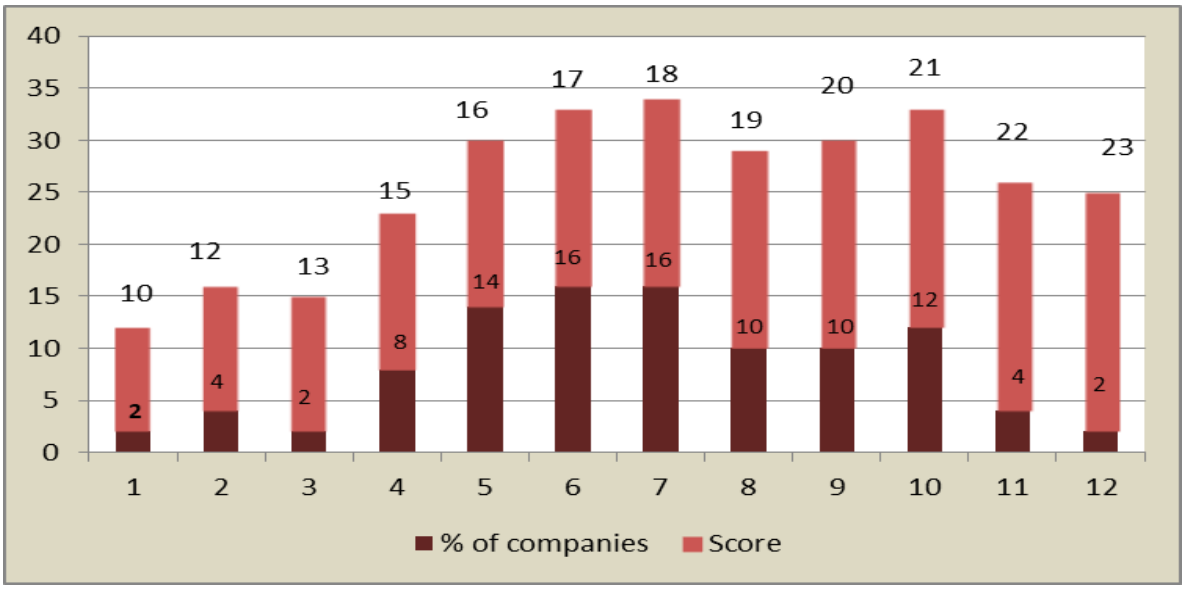

Figure: 2

Discriminant Analysis: Social and environmental disclosure is generally stimulated by the corporate attributes. There are evidences of many empirical researches supporting association of corporate characteristics with reporting practices. The following section presents the results of empirical analysis of association between select corporate characteristics and environmental disclosure in the context of select sample of Indian companies. The study used Discriminant Analysis technique to find out corporate characteristics that differentiate between companies with different levels of environmental disclosure. The objective of a discriminant analysis is to classify objects, by a set of independent variables, into one of two or more mutually exclusive and exhaustive categories. Discriminant analysis is used primarily to predict membership in two or more mutually exclusive groups. Discriminant Analysis is a statistical technique that is used by the researcher to analyze the research data when **the *dependent variable is categorical and the predictor variable is interval in nature.*** It is quite similar to regression analysis. It can be used to determine predictor variables are related to the dependent variable and to predict the value of dependent variable. In the present study, index contains 25 items of disclosure and Table No: 3 displays the median level of disclosure is 18 items, minimum disclosure is 10 and maximum disclosure by the sample companies is 23 statements.

Table: 3 Descriptive Statistics Environmental Disclosure Score

N Valid	50
Median	18
Minimum	10
Maximum	23

Note: Median score is used to form the groups for the dependent variable used in this study.

Table: 4 Group Statistics

Table No - 4 presents the distribution of observation of the independent variables across two groups of companies differing in terms of level of disclosure on Environmental Disclosure Score. The two groups of companies formed on the basis of median value disclosures with those making less than or equal to 18 environmental disclosures (median value) and more than 18 environmental disclosures. There are 31 companies in Group 1 and 19 companies in Group 2. Table also shows the mean value and standard deviation of independent variables.

Table : 4

Group Statistics

Envdisclosure Score		Mean	Std. Deviation	Valid N (listwise) Unweighted
1.00	LogAssets	7.8039	1.62578	31
	Logage	3.4227	.61999	31
	logROA	.6573	.56428	31
	LogNetprofit	4.8064	1.84196	31
2.00	LogAssets	9.4489	1.77639	19
	Logage	3.6830	.66686	19
	logROA	.6034	.44453	19
	LogNetprofit	5.9524	2.10283	19
Total	LogAssets	8.4290	1.85149	50
	Logage	3.5216	.64420	50
	logROA	.6368	.51791	50
	LogNetprofit	5.2419	2.00432	50

Note:<=18 disclosure – Group 1. > 18 disclosure – Group 2.

Table No: 5 displays the significant difference in mean value of Independent variables enables to discriminate the companies according to the level of environmental disclosure effectively between two groups. In this discriminant function model, variables like total value of assets and net profit are the major contributors in predicting the relationship between environmental disclosure and corporate characteristics. Total assets and net profit have statistically significant values (P<0.05) and classified the group membership on the basis of companies reported less or equal to median level environmental disclosure and companies reported more than the median level disclosure.

Table: 5 – Tests of Equality of Group Means

Variables	Wilks' Lambda	F	Sig
Log Assets	.810	11.243	.002
Log Age	.961	1.961	.168
Log ROA	.997	.125	.725
Log Net Profit	.921	4.094	.049

Table 6 expressed the result for homogeneity of variance test of population, the null hypothesis of equal population covariance matrices should be retained because the Box's M result shows insignificant value (P = .385, P > 0.05) which is desirable for the discriminant functional analysis.

Table: 6 – Homogeneity of Variance Test.

Test Results	
Box's M	11.822
F	1.065
Df1	10
Df2	6759.690
Sig	.385
Tests null hypothesis of equal population covariance matrices.	

Summary of Canonical Discriminant Function: The canonical correlation is the measure of association between the independent variables and the groups of dependent variable. Table No: 7 presents value of canonical correlation .473 indicates the discriminant function at medium level. The square value (22.3%) of canonical correlation coefficient gives the percentage of variance explained in the dependent variable. Eigenvalues are related to the canonical correlations and describe how much discriminating ability a function possesses. The magnitudes of the eigenvalues are indicative of the functions' discriminating abilities (Statistical Consulting Group,(n.d). Eigen values .289 explain the proportion of variance in dependent variable by the discriminant function. The larger the eigenvalue, the more of the variance in the dependent variable is explained by that function. Dependent variables have two groups and there is only one discriminant function.

Table: 7

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.289[a]	100.0	100.0	.473

a. First 1 canonical discriminant functions were used in the analysis.

Chi-square statistic tests the null hypothesis that predictor variables do not have discriminant ability. The result shows in the Table No: 8, that there is a statistically significant discriminating power in the variables included in the model. Chi – square value shows 11.666 at degree of freedom level is 4 and the significant P value .020 is less than .05, and null hypothesis is rejected and concluded that predictor variables included in the discriminant function have the ability to classify the cases in to groups of company on the basis of environmental disclosure level.

Table: 8

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	.776	11.666	4	.020

Standardized canonical discriminant function coefficients are similar to the beta values in regression function. Table: 9 shows that company characteristics – size, age and profitability have positive beta values and they have influenced significantly in discriminating the companies on the basis of their environmental disclosure practices. In

canonical discriminant function, the larger beta value implies greater contribution by the respective variable to the model. The independent variables included in the discriminant analysis are having ability to classify the companies.

Table: 9 Standardized Canonical Discriminant Coefficients

Variables	Coefficients
Log Assets	1.576
Log Age	.134
Log Return on Assets	.210
Log Net profit	-.828

Structure matrix is similar to factor loadings in factor analysis explained in the Table No: 10.Structure matrix values provides information and ranking the predictor variables on the basis of their involvement in the model. First, Assets of the firm has larger value (.901) which implies it has ability to predict the group than other variables followed by net profit of the company (.544) it is the profitability indicator and age of the company (.376) positioned in third place in the model as the contribution is minimum in this function.

Table: 10 Structure Matrixes

Variables	Structure Matrix
Log Assets	.901
Log Net profit	.544
Log Age	.376
Log Return on Assets	-.095

Table No-11 indicates the 72 % of cases have been correctly classified between two groups.In group 1, there are 31 companies and 27 companies have been correctly predicted in to group 1 and 4 companies incorrectly falls in to group1. In group 2, there are 19 companies in total and 9 companies were predicted correctly by the discriminant function.

Table: 11 – Classification Results

Classification Results[a]

		EnvdisclosureScore	Predicted Group Membership 1.00	2.00	Total
Original	Count	1.00	27	4	31
		2.00	10	9	19
	%	1.00	87.1	12.9	100.0
		2.00	52.6	47.4	100.0

a. 72.0% of original grouped cases correctly classified.

Conclusion

The basic idea underlying discriminant function analysis is to determine whether groups differ with regard to the mean of a variable, and then to use that variable to predict group membership . The mean value of assets is more for companies disclosed above median level than the other group of companies. It is found that size of the company and net profit are the good predictor variables and there is a relationship between environmental disclosure level of companies and corporate characteristics. On the basis of discriminant function, age of the firm has less ability in processing the cases in to groups. While environmental issues are the dominant theme, today companies are also including social and economic information in their reports. It was perceived from the percentage analysis, environmental reporting has grown and extensively in response to the large size business organizations and the development of technology and legal requirements. The present study contributes to the environmental accounting and reporting literature and it provides an insight into the relationship of corporate characteristics that affect firm's environmental reporting trend in the digital era. The present study used one year data only for evaluating environmental reporting practices of manufacturing companies in India. Non – manufacturing companies have been excluded in this study. Small sample size was used in this study.

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