

# Inter relationship between corporate environmental reporting and company demographics: An empirical analysis

<sup>1</sup>Anumeet & <sup>2</sup>Dr. Sukhdev singh

<sup>1</sup>Research scholar, Dept of management, Punjab technical University, Kapurthala, Punjab (India)

<sup>2</sup>Professor and head of dept of business administration, Guru Nanak Dev Engineering College, Ludhiana, Punjab (India)

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### Corresponding Author

Email: annumeet01[at]gmail.com

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## ABSTRACT

The purpose of this research paper is to examine the intensity of corporate environmental disclosure practices of Indian and Multinational firms during the period of study from 2012 to 2016 and to study the liaison between corporate environmental disclosure and company demographics. This research is based on the annual reports of 100 listed companies in the manufacturing sector and this selection is based on the market capitalisation of the companies. This research has been done by applying multiple regression model, descriptive statistics, Pearson correlation coefficient and Students' T-test as the statistical techniques. The findings found that there exists an important distinction of environmental disclosure level between domestic firms and MNCs'. On the other hand, industry wise linkage between corporate environmental disclosure and company demographics have been performed and it has been found that in different industries has the different results and overall it has been found that firm's size, company age and profitability are more statistically significant with the corporate environmental disclosure level and in case of other explanatory variables some are statistically significant and some are statistically insignificant with the corporate environmental disclosure level.

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## 1. Introduction

Corporate environmental reporting is not a recent aspect and it has been traced as long back as 5000 BC in Egypt (Anderson, 1989). (Jones, 2011), since the early 1990s, environmental reporting within company's annual reports has captivated raise concern and this concern captured extreme strength by the sustainable development deliberation initiated by the Brundtland Report (1987). Environmental disclosures are commonly describes as "those disclosures related to the impact of an organizational activities and production procedure on the natural environment" (Campbell, 2000). Corporate environmental disclosures contain the material about the previous, ongoing and forthcoming financial significance emerging from a company's environmental management outcomes or actions (Berthelot et al, 2003).

Corporate environmental disclosure is the mean of dispersing material on the impact of corporate economic movement on the natural environment for usage by different stakeholders (Gray et al., 1987). As per (Cormier et al., 2004 and Daub, 2007) firms are required to rationalize their operational movement by disseminating the environmental dimensions of company's operations rather than restricting themselves disseminating only the economic dimensions because today stakeholders are progressively demanding environmental matters. Corporate environmental reporting practices are a matter that has engaged a strong accord of consideration in the accounting literature (Gray et al., 1995, 1996; Mathews, 1997; Beck and Laan, 2008). There has been raising public consciousness of the performance of the corporate in society, during the previous years. Many of the companies which have been considered with giving to economic and technological evolution have been condemned for conceiving social issues like pollution, reserve deficiency,

product nature and security, waste, the rights and position of workers are matters which have turned into the target of rising consideration and interest (Gray et al., 1987, p. 1).

## 2. Significance of the Study

In developing countries, there are very finite researches on corporate environmental disclosure practices. This study provides to the literature by handling a comprehensive research of corporate environmental disclosures and its relationship with company demographics. Using a significant approach, this study has elected seven independent variables (company size, profitability, company age, Systematic risk, nature of industry, stock market quotation and nature of ownership) and one dependent variable that is corporate environmental disclosure into the analysis. A detailed study of such a combination of firm components and corporate governance variables offer understanding on corporate voluntary transmission proceedings especially in respect of environmental disclosure of Indian and MNC firms operating in India. Chaudhary (2011) features the relevance of India in the international economy as one of the fastest developing countries and one of the prominent manufacturing industries in the World. Given the shortage of literature spotlighting on environmental disclosure of the manufacturing industry and the relevance of this sector in reducing climate change and improvement of the society, this study addresses the chasm in the voluntary disclosures literature by thoughtfully analyzing the corporate environmental disclosure with an exclusive focus on the manufacturing industries.

## 3. Research Objectives

The following important research objectives are:

- To study the intensity of corporate environmental disclosure practices of Indian and Multinational firms during the period of study from 2012 to 2016.
- To examine the liaison between corporate environmental disclosure and company demographics.

**4. Review of Literature**

In the prior more than two decades, the environmental reporting concern has entered the field but analysis of research work specifies that the environmental reporting material has still at its initial stage. There is paucity of reporting on important environmental matters and most of the deliberate environmental issues like water wastage, reprocessing of wastes, noise creep, efflux etc have been neglected by the companies. Yusoff and Glen (2005) in the analysis of top 50 companies who are listed at both Australian stock exchange and Bursa Malaysia and found that Australian company's disclosures are more comprehensive than Malaysian companies. Shil and Iqbal (2005) studied the annual reports of 121 firms of Bangladesh and has made the conclusion that only 11% companies have revealed the information that is related to environment in a qualitative way (i.e 13 companies out of 121 companies). Bose (2006) in his study of corporate environmental reporting practices of 11 PetroBangla firms stated that qualitative descriptive and positive information was disclosed in the annual reports and negative information has been ignored by the reporting companies. Sumiani et al (2007) reported that the level of amount of environmental information in Malaysian companies is relatively low; the study found that 36 out of 50 firms disclosed some form of environmental information in their annual reports. Papaspyropoulos et al (2010) comprises 270 firms of Greece and stated that there is a comparatively low amount of environmental reporting by Athens Stock Exchange firms, corporate environmental and social reporting imply to be still a developing assignment for them. By applying a content analysis plan, it has been confirmed that there is a low amount of environmental reporting by Greek firms. Gupta (2012) examined the annual reports of top 50 firms of India and found that voluntarily in India very less firms are disclosing environmental matters in their annual reports the reason behind for such poor disclosure is lack of environmental legislation in India. Aktas et al (2013) stated that selective company's sustainability reporting generally meet the least obligations of the GRI standards still there are distinctiveness between company's score, few companies show more information as compared to other one but in the whole voluntarily companies do not expose much information regarding sustainability. Goyal (2014) comprises 50 firms of India and has made the results there is no definite structure for environmental reporting, while maintaining annual reports few items have immense exposure regarding environment and some of the items have been neglected by the firms. Another finding which has been made by the author that the environmental disclosure level is really very high in oil and gas and cement firms but on the other side, it is very low among textile firms. Asaduzzaman Fakir et al (2015) in their study of 50 firms of Bangladesh and concluded that some of the firms in Bangladesh are voluntarily disclosing the environmental matters in the annual reports. Cunha (2017) comprises 34 firms of oil and gas sector and reported oil firms

disclose their sustainability reports and usage the environmental indicators of the GRI. Still, the level of the environmental indicators published is not what is normal, nor is there a proactive access that is useful to the needs of the stakeholders.

Amongst the previous studies on the association between corporate environmental disclosure and company demographics, there was the study of some experts. Hossain (2002) in his study of 150 non-financial firms of Bangladesh and has made the conclusion that only 5% firms expose environmental information in their annual reports on a voluntary basis and the information was qualitative in nature and another conclusion has drawn by author that a positive and significant relationship exist between the company size and the amount of environmental disclosure on the other side there was negatively relationship between the subsidiary of MNC and the amount of environmental disclosure. Pahuja (2009) examined 91 manufacturing firms of India and found that firms with better environmental performance are giving more environmental matters in their annual reports as compared to poor performers and larger and more profitable firms expose more environmental matters as compared to smaller and less profitable firms. Joshi and Suwaidan (2011) results showed that highly environmental sensitive industries disclose more information regarding environment than the less environmental sensitive industries and for Indian firms environmental disclosure are of a spontaneous by nature. Nurhayati et al (2016) comprises 100 textile and apparel companies of India and have made the results that level of the amount of SER is very low, on average companies recorded more comprehensive environmental matters with a mean disclosure of 18.4% on the other side, companies reported social matters with a mean disclosure of 10.7%.

**5. Research methodologies**

**Universe and sample of the study**

The companies that are listed in the Bombay Stock Exchange (BSE-500) Index stocks constitute the Universe of the study. The sample used in this study has been taken from 100 large companies from the manufacturing sector and this selection is based on the market capitalisation of the companies. The period of study is five years ranging from 2012-13 to 2016-17.

**Measurement and construction of environmental disclosure**

In this study, Environmental disclosure index (EDI) has been designed and the main purpose of Environmental Disclosure Index (EDI) is to measure the extent of environmental information which has been mentioned in the firm's annual reports and it applies a Scoring system as below:

**Table 1- Scoring method of the Environmental disclosure index (EDI)**

Detail of Scoring	Score
No mention of any information	0
Companies which have given some information	1
Companies which have disclosed information in paragraph form	2

Companies which have given information in statement form	3
Companies which have given information in money form	4

### Hypotheses

In this study, different hypotheses have been selected on the basis of legitimacy theory. The legitimacy theory is the most extensively applied theory to describe the efforts behind the disclosure of voluntary environmental and societal information (Deegan, 2002; Islam and Deegan, 2008). The following hypotheses have been set in order to test the relationship between the corporate environmental disclosure level and the company variables. Ho means null hypotheses and Ha means alternative hypotheses.

Ho1. There is no liaison between firm's size and the amount of environmental disclosure.

Ha1. There is a liaison between firm's size and the amount of environmental disclosure.

Ho2. There is no association between profitability (measured by return on asset and net profit) and extent of environmental disclosure level.

Ha2. There is an association between profitability (measured by return on asset and net profit) and extent of environmental disclosure level.

Ho3. There is no relationship between firm age and the amount of environmental disclosure.

Ha3. There is a relationship between firm age and the amount of environmental disclosure.

Ho4. There is no linkage between systematic risk and environmental disclosure level.

Ha4. There is a linkage between systematic risk and environmental disclosure level.

Ho5. There is no liaison between financial leverage and environmental disclosure.

Ha5. There is a liaison between financial leverage and environmental disclosure.

Ho6. There is no relationship between quoted firms and environmental disclosure level.

Ha6. There is a relationship between quoted firms and environmental disclosure level.

Ho7. The extent of corporate environmental disclosure in annual reports is negatively related with ownership concentration.

Ha7. The extent of corporate environmental disclosure in annual reports is positively related with ownership concentration.

### Data collection

In order to examine the extent of corporate environmental disclosure in Indian companies and MNCs'; annual reports are the main source of environmental information. Collection of data from the websites and annual reports of sampled companies are examined with the help of the structured data collection instrument and this instrument is formed on the basis of Global Reporting Initiative-3 and 4 Guidelines.

### Regression model

The multiple linear regression models have been applied in order to analyze the effect of company demographics on the

extent or level of environmental disclosure. The model has been detailed as below:

$$ENVDI = B_0 + B_1 \text{SIZE} + B_2 \text{PROFIT} + B_3 \text{AGE} + B_4 \text{BETA} + B_5 \text{INDUST} + B_6 \text{OWNER} + B_7 \text{STOCK} + e$$

Where, ENVDI- environmental disclosure index

B<sub>0</sub>- constant

B<sub>1</sub> to B<sub>8</sub>- Coefficient of slope parameters

B<sub>1</sub> SIZE- Company size (total assets)

B<sub>2</sub> PROFIT- Profitability (return on equity)

B<sub>3</sub> AGE- Company age

B<sub>4</sub> BETA- Systematic risk (beta)

B<sub>5</sub> INDUST- Nature of industry

B<sub>6</sub> OWNER- Nature of ownership

B<sub>7</sub> STOCK- Stock market quotation

e- Error term

## 6. Analysis and discussion of the data

According to (Goswami, 2014), corporate environmental reporting proceedings initiated two decades ago but have not yet obtained the position of consistency, credibility and accuracy. The precise study is as follows:

### Part 1- Environmental disclosure practices of the domestic companies and MNCs'

In this research, the status of environmental disclosure practices of firms has been examined on the basis of category-wise, company-wise and industry-wise as below:

#### Category-wise disclosure

The environmental disclosure index (EDI) consists of 32 items and in order to determine the amount of disclosure the item-wise environmental disclosure index (EDI) has been calculated as follows:

$$\frac{\text{Number of companies disclosing } i\text{th item} * 100}{\text{Total number of companies in the sample (100)}}$$

Table 2 provides the descriptive statistics of environmental disclosure as per item-wise. After examining the table it has been found that under the first category that is company's responsibility regarding environment, the environmental policy and aim has been disclosed by firms with total disclosure level is 71.6% and the second item which has been mostly disclosed by firms is eco-friendly manufacturing facilities and its total disclosure score is 42.4%, it has been followed by another element which has been disclosed by firms is product life cycle with disclosure level is 34%. Under the second category which is environmental management system (EMS) and standards, the item which has been often revealed by firms is EMS including International Standard of Organisation (ISO) and other certifications and its total disclosure score is 66% which has been followed by another two items that are plantation or bio-diversity and compliance of the company and their environmental disclosure scores are 54% and 43% respectively. Under the third category which is Resource management and preservation of the environment, most of the items under this category like water management, air emission, energy conservation and waste management are disclosed by firms and their environmental disclosure scores are 61.4%, 63%, 97% and 63.2% respectively. Under fourth category which is environmental auditing and expenditure on both environment and society, under this category all items are moderately

disclosed by firms like environmental expenditure, societal expenditure, environmental auditing and energy auditing and their environmental disclosure scores are 20.8%, 14.8%, 14.8% and 4% respectively. Under the fifth category which is guidance and consciousness of environment and society, under this category the environmental awareness programmes for employees has been disclosed by firms that is 21.8%.

Under the sixth and last category which is awards it includes both environment related awards as well as corporate social responsibility awards and this has been disclosed by various firms that is 42.4%. Under this study, it has been identified that most of the items regarding environment are disclosed under sustainability reports and Business responsibility reports.

**Table 2- Descriptive statistics of environmental disclosure as per item wise**

Different categories	GRI Indicator	2012 (%)	2013 (%)	2014 (%)	2015 (%)	2016 (%)	Mean (%)	S.D	Min	Max	C.V
<b>1) Company's responsibility regarding environment</b>											
Environmental policy and aim		74	72	70	69	73	71.6	2.07	69	74	4.3
Product life cycle		34	33	35	34	34	34	0.70	33	35	0.5
Research and development for environment		11	11	11	9	11	10.6	0.89	9	11	0.8
Eco-friendly products	EN27	43	41	43	42	43	42.4	0.89	41	43	0.8
Support of environmental organizations		10	10	10	10	10	10	0.00	10	10	0
world environment day		14	13	12	13	13	13	0.70	12	14	0.5
CDM programme		15	15	15	15	15	15	0.00	15	15	0
<b>2) Environmental Management System and benchmarks</b>											
EMS consisting ISO 14000, 14001		66	66	66	66	66	66	0.00	66	66	0
Plantation and bio-diversity	EN11	56	55	55	54	54	54.8	0.83	54	56	0.7
Compliance of the company	EN29	43	43	44	43	43	43.2	0.44	44	43	0.2
<b>3) Resource management and preservation of the environment</b>											
GHG emission	EN18	64	64	61	62	64	63	1.41	61	64	2
Initiative to reduce GHG emission	EN19	61	61	61	60	59	60.4	0.89	59	61	0.8
Scope wise emission	EN15	63	62	63	63	63	62.8	0.44	62	63	0.2
Ozone- depleting substance	EN20	54	53	51	54	52	52.8	1.30	51	52	1.7
Reduction of carbon footprint	EN21	58	57	58	57	58	57.6	0.54	57	58	0.3
Water withdrawal	EN8	62	62	60	62	61	61.4	0.89	60	62	0.8
Recycled water	EN10	62	62	62	62	62	62	0.00	62	62	0
Rain water harvesting	EN11	56	56	55	56	57	56	0.70	55	57	0.5
Energy sourcing	EN3	97	97	97	97	97	97	0.00	97	97	0
Recycle, reduction and reuse of waste	EN23	64	64	61	63	64	63.2	1.30	61	63	1.7
Hazardous and non-hazardous waste	EN24	64	64	62	64	63	63.4	0.89	62	64	0.89
Proper usage of raw material	EN1	40	40	41	40	39	40	0.70	39	41	0.5
Usage of material that is recycled	EN2	39	38	39	39	39	38.8	0.44	38	39	0.2
<b>4) Environmental auditing and expenditure on both environment and society</b>											
Environmental expenditure	EN31	21	21	20	21	21	20.8	0.44	20	21	0.2
Societal expenditure		15	14	15	15	15	14.8	0.44	14	15	0.2
Environmental auditing		15	15	14	15	15	14.8	0.44	14	15	0.2
Energy auditing		4	4	4	4	4	4	0.00	4	4	0
<b>5) Guidance and consciousness for environment and society</b>											
Environmental awareness programmes	EN34	22	21	22	22	22	21.8	0.44	21	22	0.2
Cleanliness programmes		6	6	6	6	6	6	0.00	6	6	0
Society involvement in Sustainable development programme		1	1	1	1	1	1	0.00	1	1	0
<b>6) Awards</b>											
Environment & CSR related awards		43	41	42	43	43	42.4	0.89	41	43	0.8

Source: By the author

### Company wise disclosure

The descriptive statistics of environmental disclosure of each firm has been shown in table 3, it is noticeable from the table that Indian oil corporation ltd is the company with highest environmental disclosure level that is 21.2% and it has been followed by another firms namely, Hindustan Petroleum Corporation ltd with total environmental disclosure score is

18.6%, GAIL (17.6%), ACC ltd (17.6%), Tata Steel Corporation ltd (17.2%), ITC ltd (16.6%), Bosch ltd (16.8%), Oil India ltd (16.4%), Ambuja Cement ltd (16.4%), SAIL (15.6%), Coal India ltd (14.4%), Bharat Petroleum Corporation ltd (14.4%), Jindal steel and power ltd (13.4%), Exide Industries ltd (14.4%), Bharat Electricals ltd (14.2%), Bharat Heavy Electricals ltd (15.2%) and Apollo tyres ltd (15%). The least environmental

information disclosed by firms with their environmental disclosure scores namely Ashok Leyland Ltd (4%), Bajaj auto ltd (5.6%), Cadila healthcare ltd (3%), Ceat ltd (1.8%), Castrol India ltd (6.6%), Eveready Industries ltd (2%), Ferro Alloys Corporation ltd (1%), Force motors ltd (2%), Bharat Forge Ltd (1%), Mafatal Industries Ltd, National Steel and Agro Industries Ltd, Indian Metals and Ferro Alloys Ltd (1%), Raymond ltd (2%), Philips Carbon Black Ltd (2%), Colgate Palmolive India ltd (3%), Honeywell Automation India ltd (2%), Pfizer ltd (3%) and Vardhman Textiles Ltd (1%). The table also reveal about the minimum and maximum environmental items disclosed by firms and the maximum environmental items has been revealed by Indian Oil Corporation ltd that is 22, it has been followed by another firms namely Tata Steel Corporation ltd (18), Hindustan Petroleum Corporation ltd (19), GAIL (18), ACC ltd (18), Ambuja Cement ltd (17), Apollo

tyres ltd (17), Oil India ltd (17), Bosch ltd (17), ITC ltd (17), Maruti Suzuki India ltd (16), SAIL (16), Coal India ltd (15), National Mineral Development Corporation ltd (16), Exide Industries ltd (15), BHEL (16) and Bharat Electronics ltd (15). The least or minimum environmental items disclosed by firms namely, Aurobindo pharmaceuticals ltd (5), Bajaj Auto ltd (3), Ashok Leyland ltd (4), Berger paints ltd (5), Cadila healthcare ltd (3), Ceat ltd (1), Eveready Industries ltd (1), Eicher motors ltd (1), Forbes and company ltd (1), Force motors ltd (2), GP Petroleum Ltd (3), Mafatal Industries ltd (1), Pidilite Industries Ltd (1), Torrent pharmaceuticals ltd (1), TVS Motor Company Ltd (1) and Glenmark pharmaceuticals ltd (2). Under this study, it is noticeable many firms have disclosed only general and positive material; a few firms disclosed corporate environmental material also.

**Table 3- Descriptive statistics of environmental disclosure as per company wise**

Domestic Firms	2012	2013	2014	2015	2016	Mean	S.D	Min	Max	MNC's in India	2012	2013	2014	2015	2016	Mean	S.D	Min	Max
Ambuja cement Ltd	15	16	17	17	17	16.4	0.89	15	17	Abbott India Ltd	10	10	11	11	11	10.6	0.55	10	11
Ashok Leyland Ltd	4	4	4	4	4	4	0	4	4	Bharat Forge Ltd	1	1	1	1	1	1	0	1	1
Apollo tyers Ltd	13	13	15	17	17	15	2	13	17	Bharat petro Corp Ltd	14	14	14	15	15	14.4	0.55	14	15
ACC ltd	17	17	18	18	18	17.6	0.55	17	18	Bosch Ltd	16	17	17	17	17	16.8	0.45	16	17
Aurobindo Pharmaceuticals Ltd	5	8	9	10	10	8.4	2.07	5	10	Clariant Chemical India Ltd	1	4	4	8	8	5	3	1	8
Asian Paints Ltd	11	11	12	12	12	11.6	0.55	11	12	Colgate Palmolive India Ltd	3	3	3	3	3	3	0	3	3
Bajaj Electricals Ltd	13	13	13	13	13	13	0	13	13	Coal India Ltd	13	14	15	15	15	14.4	0.89	13	15
BHEL	14	15	15	16	16	15.2	0.84	14	16	Vedanta India Ltd	12	12	12	12	12	12	0	12	12
Bajaj Auto Ltd	3	4	7	7	7	5.6	1.95	3	7	Glaxosmithkline pharma Ltd	9	9	9	9	9	9	0	9	9
Britannia Industries Ltd	6	7	7	7	7	6.8	0.45	6	7	Cipla Ltd	4	4	8	10	10	7.2	3.03	4	10
Bharat Electro Ltd	13	13	15	15	15	14.2	1.09	13	15	Dr. Reddy's Lab Ltd	12	12	12	12	12	12	0	12	12
Berger Paints India Ltd	5	5	5	6	6	5.4	0.55	5	6	GlaxoSmithKlin Consumer Healthcare Ltd	9	9	10	11	11	10	1	9	11
Biocon Ltd	8	8	8	8	9	8.2	0.45	8	9	Glenmark Pharmaceuticals Ltd	2	2	9	9	9	6.2	3.83	2	9
Cadila Healthcare Ltd	3	3	3	3	3	3	0	3	3	Honeywell Automation India Ltd (HALL)	2	2	2	2	2	2	0	2	2
Ceat Ltd	1	2	2	2	2	1.8	0.45	1	2	Indian Oil Corp Ltd	20	20	22	22	22	21.2	1.09	20	22
Castrol India Ltd	6	6	7	7	7	6.6	0.55	6	7	ITC Ltd	16	16	17	17	17	16.6	0.55	16	17
Chennai Petroleum Corporation Ltd	8	8	8	9	9	8.4	0.55	8	9	Pfizer Ltd	3	3	3	3	3	3	0	3	3
Dabur India Ltd	6	6	6	6	6	6	0	6	6	Larsen & Toubro Ltd	11	11	11	11	14	11.6	1.34	11	14
Eveready Indus Ltd	1	1	2	3	3	2	1	1	3	Lupin Ltd	1	5	6	6	6	4.8	2.17	1	6





Table 4- Descriptive statistics of Environmental disclosure as per industry wise

Industry's name/ Total environmental information disclosed by different industries (%)	Sample firms	2012	2013	2014	2015	2016	Mean	S.D	Min	Max
Oil and gas	10	13.53	13.53	13.64	13.64	13.64	13.59	0.06	13.53	13.64
Pharmaceuticals	13	10.22	10.5	10.5	10.98	10.92	10.62	0.31	10.22	10.98
Automobiles	12	7.93	7.93	8.19	7.28	7.28	7.72	0.41	7.28	8.19
Steel	5	2.82	2.82	2.82	2.82	2.82	2.82	0	2.82	2.82
Cement	6	2.85	2.95	2.95	2.95	3	2.94	0.05	2.85	3
Mining and metal	7	4.2	4.26	4.26	4.26	4.32	4.26	0.04	4.2	4.32
Electrical equipment	11	8.01	8.19	8.19	8.01	8.01	8.08	0.09	8.01	8.19
FMCG	8	5.52	6.32	6.32	6.32	6.32	6.16	0.35	5.52	6.32
Tyres and tubes	3	0.75	0.78	0.78	0.78	0.78	0.77	0.01	0.75	0.78
Textile	6	1.92	1.92	1.92	1.92	1.92	1.92	0	1.92	1.92
Home appliance	2	0.4	0.4	0.4	0.4	0.4	0.4	0	0.4	0.4
Chemicals	12	8.76	9.24	9.24	9.24	9.24	9.14	0.21	8.76	9.24
Conglomerate	5	2.15	2.25	2.25	2.25	2.25	2.23	0.04	2.15	2.25

Source: By the author

### Hypothesis development

H0: There is no significant difference between Domestic firms and MNC's regarding environmental disclosure level

H1: There is a significant difference between Domestic firms and MNC's regarding environmental disclosure level

The above mentioned hypothesis has been proved in table 5 as below:

Table 5- Two- tail t- test results

	Domestic firms	MNC's in India
Mean	7.993	10.434
Variance	26.914	21.655
Observations	65	35
Hypothesized mean difference	0	-
Df	98	-
T Stat	-2.40	-
P(T<=t) one-tail	0.009	-
T critical one-tail	1.664	-
P(T<=t) two- tail	0.018*	-
T critical two-tail	1.991	-

Note- \*Level of significant at 0.05

As shown in table 5 that there is a significant level as ( $p < 0.05$ ) and null hypothesis has been rejected. It has been proved with the help of above results that there exists a significant difference of environmental disclosure level between domestic firms and MNC's.

### Part 2- Association between corporate environmental disclosure and company demographics

In this research, comprises the second part of the factual work aimed at examining the relationship between environmental disclosure practices and the company variables,

in this part we perform the industry wise association between corporate environmental disclosure and company demographics. It initiate by applying correlation analysis and then the multiple regression analysis. The aim of the correlation analysis is to determine the correlation between the attributes and estimating whether there is multicollinearity complication in the research model or not that's why the Pearson's correlation coefficient has been applied. The outcomes of multicollinearity issue are mentioned in the below table:

Table 6- Multicollinearity among the exogenous (independent) variables

Independent Variables	Co size	ROA	NP	age	Beta	Ownership structure	Stock mkt quotation	FL
Company size	1							
Return on asset	-0.07	1						
Net profit	-0.05	0.78*	1					

Company age	-0.03	-0.02	-0.07	1				
Beta	-0.02	-0.08	-0.06	0.01	1			
Ownership structure	0.04	0.08	0.08	0.13	0.07	1		
Stock mkt quotation	0.03	0.09	0.04	0.03	0.04	0.07	1	
Financial leverage (FL)	-0.05	-0.35*	0.38*	0.03	0.09	0.07	-0.14	1

Note: \*Significant at 5%

In this study, we have applied the leading technique of multiple regression analysis models, as some of the elected independent variables have been found to be correspondent with each other.

**Industry wise association between corporate environmental disclosure and company demographic**

The association between corporate environmental disclosure and company demographic industry wise has been depicted in the below table:

**Table 7: Association between corporate environmental disclosure and company demographics**

Industries	Demographics	P values	Hypothesis acceptance or rejection	Other studies
Oil and gas	Company's size	0.04**	Null hypothesis rejected (Ho1)	Setyorini and Ishak (2012), Echave and Bhati (2010) and Stanwick and Stanwick (1998), found an association between the corporate environmental disclosure level and profitability. The other results in respect of association between financial leverage and corporate environmental disclosure found the mixed outcomes Naser et al (2006), Cornell and Shapiro (1987) have found an association whereas, Jaffer et al (2002) and Chow and Wong-Boren (1987) did not find any association between corporate environmental disclosure and financial leverage.
	Profitability			
	ROA	0.15	Null hypothesis accepted (Ho2)	
	NP	0.28	Null hypothesis accepted (Ho2)	
	Beta	0.29	Null hypothesis accepted (Ho4)	
	Ownership structure	0.33	Null hypothesis accepted (Ho7)	
	Financial leverage	0.58	Null hypothesis accepted (Ho5)	
	Stock market quotation	0.74	Null hypothesis accepted (Ho6)	
Company age	0.06***	Null hypothesis rejected (Ho3)		
Steel	Company's size	0.01**	Null hypothesis rejected (Ho1)	Brammer and Pavelin (2006), found an association between corporate environmental disclosure level and financial leverage, Cormier and Magnan (2003), demonstrated an association between corporate environmental disclosure level and company size and Zhang et al (2008), indicate an association between profitability and corporate environmental disclosure level.
	Profitability			
	ROA	0.00*	Null hypothesis rejected (Ho2)	
	NP	0.00*	Null hypothesis rejected (Ho2)	
	Beta	0.07***	Null hypothesis rejected (Ho4)	
	Ownership structure	0.70	Null hypothesis accepted (Ho7)	
	Financial leverage	0.75	Null hypothesis accepted (Ho5)	
	Stock market quotation	0.37	Null hypothesis accepted (Ho6)	
Company age	0.06***	Null hypothesis rejected (Ho3)		
Pharmaceutical	Company's size	0.00*	Null hypothesis rejected (Ho1)	Gracia- Ayuso and Larrinaga (2003) studied 112 Spanish industrial firms and found that company size, company profitability are associated with the disclosure of corporate environmental information where as Galani et al (2011), studied 100 biggest Greek firms and found that profitability was not associated with corporate environmental disclosure level.
	Profitability			
	ROA	0.12	Null hypothesis accepted (Ho2)	
	NP	0.00*	Null hypothesis rejected (Ho2)	
	Beta	0.40	Null hypothesis accepted (Ho4)	
	Ownership structure	0.68	Null hypothesis accepted (Ho7)	
	Financial leverage	0.31	Null hypothesis accepted (Ho5)	
	Stock market quotation	0.19	Null hypothesis accepted (Ho6)	
Company age	0.75	Null hypothesis accepted (Ho3)		
Automobile	Company's size	0.30	Null hypothesis accepted (Ho1)	Makori and Jagongo (2013), found an association between the level of corporate environmental disclosure and company profitability, Uwuigbe (2012), indicate an association between
	Profitability			
	ROA	0.68	Null hypothesis accepted (Ho2)	
	NP	0.62	Null hypothesis accepted (Ho2)	
	Beta	0.90	Null hypothesis accepted (Ho4)	
Ownership structure	0.70	Null hypothesis accepted (Ho7)		

	Financial leverage Stock market quotation Company age	0.33 0.61 0.82	Null hypothesis accepted (Ho5) Null hypothesis accepted (Ho6) Null hypothesis accepted (Ho3)	financial performance of the Nigerian companies and corporate environmental disclosure on the other hand, Cowen et al (1987), found none of the relationship between the explanatory variables
Cement	Company's size Profitability ROA NP Beta Ownership structure Financial leverage Stock market quotation Company age	0.97  0.72 0.92 0.14 0.01** 0.23 0.44 0.24	Null hypothesis accepted (Ho1)  Null hypothesis accepted (Ho2) Null hypothesis accepted (Ho2) Null hypothesis accepted (Ho4) Null hypothesis rejected (Ho7) Null hypothesis accepted (Ho5) Null hypothesis accepted (Ho6) Null hypothesis accepted (Ho3)	Joshi and Suwaidan (2011) studied 45 Indian companies from the industrial sector and found that there is a relationship between company size and corporate environmental disclosure on the other hand leverage and profitability had no association with environmental disclosure level.
Minings and metals	Company's size Profitability ROA NP Beta Ownership structure Financial leverage Stock market quotation Company age	0.65  0.33 0.45 0.41 0.41 0.00* 0.04** 0.32	Null hypothesis accepted (Ho1)  Null hypothesis accepted (Ho2) Null hypothesis accepted (Ho2) Null hypothesis accepted (Ho4) Null hypothesis accepted (Ho7) Null hypothesis rejected (Ho5) Null hypothesis rejected (Ho6) Null hypothesis accepted (Ho3)	Kilic and Uyar (2013), studied 138 manufacturing firms of Turkey and found that no association exists between profitability, leverage, ownership structure and company age with the corporate environmental disclosure level where as, there is an association between company size and corporate environmental reporting (CER).
Electrical equipment	Company's size Profitability ROA NP Beta Ownership structure Financial leverage Stock market quotation Company age	0.34  0.43 0.28 0.54 0.08*** 0.19 0.44 0.58	Null hypothesis accepted (Ho1)  Null hypothesis accepted (Ho2) Null hypothesis accepted (Ho2) Null hypothesis accepted (Ho4) Null hypothesis rejected (Ho7) Null hypothesis accepted (Ho5) Null hypothesis accepted (Ho6) Null hypothesis accepted (Ho3)	-
Tyres and Tubes	Company's size Profitability ROA NP Beta Ownership structure Financial leverage Stock market quotation Company age	0.43  0.85 0.79 0.34 0.34 0.17 0.03** 0.68	Null hypothesis accepted (Ho1)  Null hypothesis accepted (Ho2) Null hypothesis accepted (Ho2) Null hypothesis accepted (Ho4) Null hypothesis accepted (Ho7) Null hypothesis accepted (Ho5) Null hypothesis rejected (Ho6) Null hypothesis accepted (Ho3)	-
Textile	Company's size Profitability ROA NP Beta Ownership structure Financial leverage Stock market quotation Company age	0.28  0.99 0.53 0.02** 0.12 0.79 0.56 0.38	Null hypothesis accepted (Ho1)  Null hypothesis accepted (Ho2) Null hypothesis accepted (Ho2) Null hypothesis rejected (Ho4) Null hypothesis accepted (Ho7) Null hypothesis accepted (Ho5) Null hypothesis accepted (Ho6) Null hypothesis accepted (Ho3)	Akbas (2014), found by the author that firm size are associated with the amount of environmental disclosure level on the other hand, profitability is not associated with environmental disclosure level. Still, neither leverage nor firm age has an important association with the amount of environmental disclosure level.
Chemical	Company's size Profitability ROA NP Beta Ownership structure Financial leverage Stock market quotation Company age	0.23  0.58 0.58 0.88 0.65 0.82 0.33 0.49	Null hypothesis accepted (Ho1)  Null hypothesis accepted (Ho2) Null hypothesis accepted (Ho2) Null hypothesis accepted (Ho4) Null hypothesis accepted (Ho7) Null hypothesis accepted (Ho5) Null hypothesis accepted (Ho6) Null hypothesis accepted (Ho3)	Freedman and Jaggi (1988) found that there is no connection exists between the firm's extensiveness of environmental disclosures and its economic performance. Stanny and Ely (2008) found that there is an association exists between company size and environmental disclosure on the hand,

				company's ownership; profitability; company's age and leverage are not associated with environmental disclosure.
Conglomerate	Company's size	0.81	Null hypothesis accepted (Ho1)	-
	Profitability			
	ROA	0.37	Null hypothesis accepted (Ho2)	
	NP	0.02**	Null hypothesis rejected (Ho2)	
	Beta	0.17	Null hypothesis accepted (Ho4)	
	Ownership structure	0.14	Null hypothesis accepted (Ho7)	
	Financial leverage	0.35	Null hypothesis accepted (Ho5)	
	Stock market quotation	0.12	Null hypothesis accepted (Ho6)	
Company age	0.82	Null hypothesis accepted (Ho3)		
FMCG	Company's size	0.30	Null hypothesis accepted (Ho1)	-
	Profitability			
	ROA	0.35	Null hypothesis accepted (Ho2)	
	NP	0.30	Null hypothesis accepted (Ho2)	
	Beta	0.55	Null hypothesis accepted (Ho4)	
	Ownership structure	0.97	Null hypothesis accepted (Ho7)	
	Financial leverage	0.68	Null hypothesis accepted (Ho5)	
	Stock market quotation	0.54	Null hypothesis accepted (Ho6)	
Company age	0.39	Null hypothesis accepted (Ho3)		

Note: Significant at 1%\*, 5%\*\* and 10%\*\*\*, Source: By the author

### 7. Findings and Conclusion

Based on the examining of annual reports of top 100 large companies from the manufacturing sector and listed on the Bombay Stock Exchange, it has been found that in the absence of important guidelines, the position of environmental disclosure was not the same in all the firms. It has been examined that few companies have arranged the environmental related information solely in a precise section labelled as 'sustainability reporting' or 'environmental reporting' or 'business responsibility reporting'. On the other hand, regarding the other firms the environmental information was concealed in sub folders and it had to be found out. So there is a requirement to issue instructions and guidelines in respect of the section where the environmental information should be accessible. In this study, the status of environmental disclosure practices of firms has been examined on the basis of category wise, company wise and industry wise. The overall analysis of category wise the top items disclosed by the Indian and MNC's firms regarding environment are- ISO 14001 and other certification, Energy conservation, Water management, Waste management, Air emission, Plantation and biodiversity and bottom items disclosed regarding environment are- R & D for protection of environment, Material management, Energy and environmental audit, Cleanliness programme, Environmental awareness programmes and Environmental expenditure. Whereas, as per company wise disclosure of environmental information it has been examined that there exists a significant difference of environmental disclosure level between domestic firms and MNC's operating in India, from the entire it has been revealed that the top 5 firms who have made the most environmental disclosure in their annual reports. It shows that Indian Oil Corporation Ltd has held the top position over all the periods and it has been followed by Hindustan Petroleum Corporation Ltd (HPCL). Out of this most of the firms getting top 5 ranks are from energy sector namely- GAIL, HPCL, SAIL, BHEL, Oil India Ltd and Indian Oil Corporation Ltd. As per industry wise, it has been found that oil and gas Industry has the highest disclosure of environmental information that is

(13.59) and it has been followed by Pharmaceuticals industry (10.62), Chemical Industry (9.14), Electrical equipment Industry (8.08) and the least disclosure of environmental information by Industries namely Steel (2.82), Cement (2.94)), Tyres and tubes (0.77), Home appliance (0.4) and Textile (1.92).

The Environmental disclosure levels or score made by the sample firms and it has been found that 37% firms have disclosed environment related information in statement form it means companies have only disclosed conservation of energy information in their annual reports. It has been followed by 36% firms have disclosed environmental information in paragraph form that is companies have disclosed more and detailed information in their Sustainability report. Thirdly 25% firms have disclosed some information related to environment it means companies have disclosed information in their annual reports and Business responsibility report. Fourthly 2% firms have disclosed environment related information in money form that is companies have disclosed information regarding environmental protection expenditure, cost incurred due to environment education and training and maintenance cost of equipment used in pollution control. Moreover, association between corporate environmental disclosure and company demographics have been performed as per industry wise and it has been found that in different industries have the different results. Overall, it has been found that company's size, company age and profitability are more statistically significant with the corporate environmental disclosure level and in case of other explanatory variables some are statistically significant and some are statistically insignificant with the corporate environmental disclosure level. Although, in comparison to other studies we have found different results as some are similar and some are contrary to the findings- Setyorini and Ishak (2012), Echave and Bhati (2010), Stanwick and Stanwick (1998), Gracia- Ayuso and Larrinaga (2003), Naser et al (2006), Cornell and Shapiro (1987), Galani et al (2011) and Kilic and Uyar (2013).

## References

1. Akbas, H.E. (2014), Company characteristics and environmental disclosure: An empirical investigation on companies listed on Borsa Istanbul 100 Index. *Journal of Accounting and Finance*, 145-163.
2. Aktas, R; Kayalidere, K and Kargin, M. (2013), CSR and analysis of sustainability reports in Turkey. *International Journal of Economics and Finance*, 5(3): 113-125
3. Anderson, J, W, Jr. (1989), corporate social responsibility: Guidelines for top management. New York, NY: Quorum Books.
4. Asaduzzaman Fakir, A.N.M; Miah, S and Islam, S. (2015), Environmental accounting and reporting practices in the corporate sector of Bangladesh. *Journal of International Business Studies*, 1-14.
5. Berthelot, S; Cormier, D; Magnan, M. (2003), Environmental disclosure research: Review and synthesis. *Journal of accounting literature*, 22: 1-44.
6. Beck, C and Van der Laan, S. (2008), Editorial: Social and environmental accounting research (SEA) - A special issue? *Australasian Accounting, Business and Finance Journal*, 2(1): 1-3.
7. Bose, S. (2006), Environmental accounting and reporting in fossil fuel sector- A study on Bangladesh oil, gas and mineral corporation (PetroBangla). *The Cost and Management*, 34(2): 53-67.
8. Brammer, S.J. and Pavelin, S. (2006), corporate reputation and social performance: the importance of fit. *Journal of Management Studies*, 43(3): 435-455.
9. Campbell, D. (2000), Legitimacy theory or managerial reality construction? Corporate Social disclosure in Marks and Spencer Plc corporate reports, 1969-1997. *Accounting Forum*, 24(1): 80-100.
10. Chaudhary, A. (2011), Changing structure of Indian textiles industry after MFA (MultiFibre Agreement) phase out: A global perspective. *Far East Journal of Psychology and Business*, 2(2): 1-23.
11. Chow, C.W. and Wong-Boren, A. (1987), Voluntary disclosures by Mexican corporations. *The Accounting Review*, 62(3): 533-541.
12. Cornell, B. and Shapiro, A.C. (1987), corporate stakeholders and corporate finance. *Financial Management, Financial Management Association, USA*, 5-14.
13. Cormier, D and Magnan, M. (2003), Environmental reporting management: A continental European Perspective. *Journal of Accounting and Public policy*, 22: 43-62.
14. Cormier, D., Gordon, I., M. and Magnan, M. (2004), corporate environmental disclosure: contrasting management's perceptions with reality. *Journal of Business Ethics*, 49(2): 143-165.
15. Cowen, S.S., Ferreri, L.B. and Parker, L.D. (1987), the impact of corporate characteristics on social responsibility: disclosure a typology and frequency-based analysis. *Accounting, Organizations and Society*, 12(2): 111-122.
16. Craven, B. and C. Marston (1999), Financial reporting on the Internet by leading UK companies. *The European Accounting Review*, 8(2): 321-333.
17. Cunha, D.R. (2017), Environmental indicators of oil companies. *European Journal of Scientific Research*, 146(4): 386-394.
18. Daub, C.H. (2007), Assessing the quality of sustainability reporting: an alternative methodological approach. *Journal of Cleaner Production*, 15: 75-85.
19. Deegan, C. (2002), Introduction: The Legitimizing Effect of Social and Environmental Disclosures - A Theoretical Foundation. *Accounting, Auditing and Accountability Journal*, 15(3): 282-311.
20. Echave, J. and Bhati, S.S. (2010), Determinants of social and environmental disclosures by Spanish companies. *GSMI Third Annual International Business Conference, Global Strategic Management, Michigan*, 55-68.
21. Freedman, M and Jaggi, B. (1988), an analysis of the association between pollution disclosure and economic performance. *Accounting, Auditing and Accountability Journal*, 1(2): 43-58.
22. Galani, D; Gravas, E and Stravropoulos, A. (2011), the relation between firm size and environmental disclosure. *International conference on applied economics ICOAE 2011*, 179-185.
23. Gray, R; Kouhy, R and Lavers, S (1995), Corporate social & environmental reporting- a review of the literature & a longitudinal study of UK disclosure. *Journal of Accounting, Auditing and Accountability*, 8(2): 47-77.
24. Gracia-Ayuso and Larrinaga. (2003), Environmental disclosure in Spain: Corporate characteristics and media exposure. *Spanish Journal of Finance and Accounting*, 115: 184-214.
25. Goyal, N (2014), Corporate Sustainability report practices among Indian Companies: Myth or reality. *International Journal of Management and Social Sciences Research*, 3(1): 54-60.
26. Gupta, V.K. (2012), Environmental Accounting and Reporting- An analysis of Indian corporate sector. *Indian Institute of Management, Indore, India*.
27. Goswami, M. (2014), corporate environmental accounting: the issue, its practices and challenges: a study on Indian corporate accounting practices, *IOSR Journal of Business and Management*, 16(5): 36-42.
28. Hossain, M. (2002), Corporate Environmental Disclosure in Developing Countries: Evidence from Bangladesh. *Bangladesh Environment*, 1 (12): 1077-1089.
29. Hossain, M, Tan, M.L and Adams, M. (1994), Voluntary disclosure in an emerging capital market: Some empirical evidence from companies listed on Kuala Lumpur Stock exchange. *International journal of Accounting*, 29(4): 334-351.
30. Islam, M.A. and Deegan, C. (2008), Motivations for an organisation within a developing country to report social responsibility information: evidence from Bangladesh. *Accounting, Auditing & Accountability Journal*, 21(6): 850-874.
31. Jaffer, R., Iskandar, T.M. and Muhamad, N. (2002), an investigation of environmental disclosures: evidence from selected industries in Malaysia. *International Journal of Business and Society*, 3: 55-68.
32. Jones, A and Jonas, G.A. (2011), corporate social responsibility reporting: The growing need for input from the accounting profession. *CPA Journal*, 81 (2): 65-71.
33. Joshi, P.L and Suwaidan, M. (2011), Determinants of environmental disclosures by Indian industrial listed companies: empirical study. *International Journal of Accounting and Finance*, 3 (2): 109-130.
34. Kilic, M and Uyar, A. (2013), association between firm characteristics and corporate voluntary disclosure: Evidence from Turkish listed companies. *Intangible capital*, 9(4): 1080-1112.
35. Mathews, M.R. (1997), Twenty-Five Years of Social and Environmental Accounting Research. *Accounting, Auditing and Accountability*, 10(4): 481-531.
36. Makori, D.M. and Jagonga, A.O. (2013), Environmental accounting and firm profitability: an empirical analysis of selected firms listed in Bombay Stock Exchange.

- International Journal of Humanities and Social Sciences, 3(18): 248-256.
39. Naser, K., Al-Hussaini, A., Al-Kwari, D. and Nuseibeh, R. (2006), Determinants of corporate social disclosures in developing countries: the case of Qatar. *Advances in International Accounting*, 19: 1-23.
  40. Nurhayati, R., Taylor, G., Rusmin, R., Tower, G., and Chatterjee, B. (2016), Factors determining social and environmental reporting by Indian textile and apparel firms: A test of legitimacy theory. *Social Responsibility Journal*, 12(1): 167-189.
  41. Nicholls, D. (1994), the impact of non-financial company characteristics on mandatory disclosure compliance in developing countries: The case of Bangladesh. *The International Journal of Accounting*, 29: 62-77.
  42. Papaspyropoulos, K.G.; Blioumis, V and Christodoulou, A.S. (2010), Environmental reporting in Greece: The Athens stock exchange. *African Journal of Business Management*, 4(13): 2693-2704.
  43. Pahuja S. (2007), Corporate Environmental Reporting expectation gap: Evidence from India. *The ICAI Journal of Accounting Research*, 4(2): 21-42.
  44. Pahuja, S., (2009), Relationship between environmental disclosures and corporate characteristics: a study of large manufacturing companies in India. *Social Responsibility Journal*, 5(2): 227-244.
  45. Setyorini, C.T. and Ishak, Z. (2012), corporate social and environmental disclosure: a positive accounting theory view point. *International Journal of Business and Social Science*, 3(9): 152-164.
  46. Shil, N.C and Iqbal, M. (2005), Environmental disclosure- A Bangladesh perspective. *The Cost and Management*, 33(4): 85-93.
  47. Stanwick, P.A. and Stanwick, S.D. (1998), the relationship between corporate social performance, and organizational size, financial performance, and environmental performance: an empirical examination. *Journal of Business Ethics*, 17: 195-204.
  48. Stanny. E and Ely. K (2008), corporate environmental disclosure about the effects of climate change. *Corporate Social Responsibility and environmental management*, 15(6): 338-348.
  49. Sumaiani, Y; Haslinda, Y and Lehman, G. (2007), Environmental reporting in a developing country: A case study on status and implementation in Malaysia. *Journal of Cleaner Production*, 15: 895-901.
  50. Yusoff, H and Lehman, G. (2005), International differences on corporate environmental disclosure practices: A comparison between Malaysia and Australia. Paper presented at 4th International Conference on Accounting and Finance in Transition proceedings, 10th -12th April, 2006, University of South Australia, Adelaide.
  51. Uwugbe, U. (2012), corporate environmental disclosure in the Nigerian manufacturing industry: A study of selected firms. *African Research Review*, 6(3): 71-83.
  52. Van Marrewijk, M., & Werre, M. (2003), Multiple levels of corporate sustainability. *Journal of Business Ethics*, 44(2-3): 107-119.
  53. Vogt, M., Degenhart, L., Rosa, F. S., & Hein, N. (2016), Responsabilidade social e ambiental: análise dos impactos ambientais de transporte dos relatórios anuais e de sustentabilidade das empresas brasileiras. *Revista em Agronegócios e Meio Ambiente*, 9 (4): 889-915.
  54. Zeng, S.X., Hu, X.D., Yin, H.T. and Tam, C.M. (2012), Factors that drive Chinese listed companies in voluntary disclosure of environmental information. *Journal of Business Ethics*, 109 (3): 309-321.
  55. Zhang, J.R; Guo, H.T; Li, B and Wang, W. (2008), the influence of financial factors on Environmental Information Disclosure in China Chemical Industry. *Social Science Research Network*.