

Corporate Disclosure on Safety: - Evidence from Listed Companies in India

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ABSTRACT

The aim of this paper is to measure empirically the extent of corporate safety reporting in annual reports of Indian listed companies and to assess how far different company characteristics can explain the variation, if any, in the extent of such safety reporting. For measuring the extent of corporate safety reporting in annual reports of the companies, we have constructed a weighted disclosure index. Corporate safety disclosure scores are regressed on the determinants of extent of disclosure. This study provides competing arguments on the relative importance of each of the factors in the corporate safety disclosure level determination. Among the company specific factors, two factors, viz., sales and profitability are having significant influence on the extent of safety disclosure.

Keywords: Corporate safety; Corporate safety reporting; Disclosure score; Determinants of safety reporting; India

INTRODUCTION

Corporate initiative to address the safety issues has gathered momentum in the last few decades. But, whether a firm visualizes this issue as a trivial concern or as a challenge (to cure an unsafe environment) or as a business opportunity can be contested. Such initiative undertaken by the firms is sometimes related to the firm business and sometimes are strikingly unrelated.

According to Dekker (2002), Zohar (2002) and Zohar and Polachek (2014), unsafe behavior is the antecedent to industrial accidents, which is partly attributed to the safety systems in organizations. The safety systems are related to various features of people, tools, tasks, and operating environment. From a macro perspective, safety climate is considered as employees' shared perceptions of the overall importance of accorded safety and it is a derivative of the organizational climate concept. Good safety climate organizations are characterized by strong support and commitment to safety by employees as well as employers themselves.

Conzola and Wogalter (2001) put emphasis on occupational-related warnings, where it is readily admitted that warnings are not the best method of controlling hazards and promoting safety. The best method of hazard control is to eliminate (or remove) the risk from the workplace. Here comes the concept of safety measures. For example, redesigning a dangerous material handling process by having machines instead of humans transport hazardous materials, reducing workers' exposure to the hazard, making it much less likely that they will be injured. Similarly, it may be possible to remove a dangerous chemical from the workplace by substituting a safer chemical. The substitution eliminates or reduces the hazard (e.g., breathing dangerous vapours) and consequently employees' risk of injury.

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Most would agree that corporations should assume responsibilities towards society beyond merely the production of goods and services at a profit. In other words, corporations should act in a manner that not only takes into consideration shareholder interests, but also considers the interests of a broader group of stakeholders viz., employees, customers, suppliers and the general public. Therefore, SH&E professionals can actually collect objective data throughout their daily routines that not only improve decision making but also motivate the application of improved safety management strategies (Geller, 2004).

Corcoran and Shackman (2007) examined the application of Resource Dependence Theory relative to company involvement in an important voluntary, governmentally sanctioned employee safety program that goes by the acronym Voluntary Protection Program (VPP). According to them, companies consider adoption of beyond compliance safety programs as a strategy to manage the expression of resource control power on the part of powerful stakeholders. Therefore, many businesses have responded to safety issues by more openly reporting on safety measures of their activities. Such disclosures are attracting increasing attention from regulators and stakeholders. A company may make its safety disclosure in the annual report or may employ other media like advertising, focus group, employee councils, booklets etc. Corporate disclosure on safety aspects can typically be thought of as comprising information relating to a corporation's activities, aspirations and public image with regard to safety, employee and consumer issues. In this paper, we have attempted to explain such disclosure by Indian companies by reference to observable company characteristics. It is observed that a good number of researches have been undertaken on safety disclosure practices in the economic and organizational contexts of Europe and the United States of America. But there is a lack of studies on the identification of determinants of corporate disclosure on safety in the context of listed companies in India. The aim of this paper is to report the findings of our study that sought to assess how far different company characteristics can explain the variation, if any, in the extent of such reporting on safety issues.

The paper is structured as follows: Section 2 gives a brief overview of the literature relevant to this paper. Section 3 provides details about data and methodology adopted followed by a discussion of the findings relating to the extent of corporate disclosure on safety issues in section 4. In section 5, the impact of several company characteristics on the extent of corporate disclosure on safety is reported and analyzed. Section 6 sums up and gives concluding remarks.

LITERATURE REVIEW

In the evolution of safety research, Mitropoulos, Cupido and Namboodiri (2009) developed a cognitive model of construction safety, which conceptualizes safety as an emergent property of the production system. A wide variety of potential determinants of safety issues have been examined in the literature.

The International Labor Organization (2001, p. 19) defines Occupational Safety and Health Management System OSHMS as 'a set of interrelated or interacting elements to establish OSH policy and objectives, and to achieve those objectives'. Unlike most OSHMS standards, CP79:1999 (Singapore Productivity and Standards Board, 1999) is written specifically for the construction industry in Singapore (Goh and Chua, 2013), where 13 determinants of safety items were focused.

We also provide a review of literature that examines the determinants of disclosure of safety issues in corporate annual reports. According to the SOCSO Annual Report 2007-2011, the manufacturing sector was reported to be the largest and most consistent contributor to workplace accidents in Malaysia (SOCSO 2011).

Conzola and Wogalter (2001) surveyed a set of factors known to influence the effectiveness of workplace warnings. The description of empirical research was organized around a communication-human information processing (C-HIP) model. The cognitive perspective propounded by Mitropoulos, Cupido and Namboodiri (2009) shifts the focus of accident prevention from conformance with rules to the issues of task demands and applied capabilities, and the factors affecting them - such as work design, workload, resource allocation, and

team processes. Sunindijo and Zoushow (2013) revealed that conceptual skill influences the implementation of safety management tasks, which in turn promotes the development of a safety climate. Johari, Yean, Adnan (2017) carried out a survey among employees in manufacturing companies in Klang Valley and reported that safety climate and work environment had a significant impact on unsafe behaviour. Kelloway, Mullen and Francis (2006) and Akselsson et al. (2012) focused that safety climate and safety consciousness are major two variables to predict safety events and injuries. Most studies concluded that top management support (Jannadi, 1996; Jaselskis et al., 1996; Hinze and Rabound, 1988; Sawacha et al., 1999; Cheng et al., 2004; Tam et al., 2004) and safety training (Jannadi, 1996; Jaselskis et al., 1996; Tam and Fung, 1998; Hinze and Gambatese, 2003; Lee and Halpin, 2003; Cheng et al., 2004; Tam et al., 2004) are two of the most important factors affecting construction safety. Some believed that the employment of a safety officer (Hinze and Rabound, 1988; Sawacha et al., 1999) is important, while others used vague terms such as 'organization structure' which is hard to follow (Fang et al., 2004). An interesting factor was the provision of 'a safe environment/working conditions' (Sawacha et al., 1999; Ng et al., 2005) or an 'inadequate safety level' (Cheng et al., 2004), which seem tautological. But Yung (2009) used province-level construction safety records in China from 1994 to 2000 and explored that the major factors affecting construction safety were found to be the implementation of construction safety laws and the rate of subcontracting.

In the Indian context, research on the extent of disclosure of safety issues and identification of its determinants are significantly ignored.

DATA, SAMPLE AND METHODOLOGY

This section describes the research design of the study including sample description and data collection.

Sample

The population of this study was listed companies of the Bombay Stock Exchange (BSE) comprising BSE 500 index, which represents 94% of the market capitalization of all listed companies of BSE1. Considering time and resource constraints, we have restricted the survey among 20% of those 500 units i.e. 100 units. This survey is undertaken by reviewing information disclosed by the 100 numbers of listed companies on their annual reports and these 100 companies out of 500 companies were selected on a random basis. We followed the process of random sampling without replacement. The data were obtained from the annual reports of the 2017-18 financial year (i.e. year ending 31 March 2018), being the latest period for which annual reports were available when the study was undertaken. Out of 100 companies, 4 companies could not be considered due to the non-availability of annual report or firm-level data in the Centre for Monitoring in Indian Economy (CMIE) Prowess database. Thus our final sample consists of 96 listed companies.

Data and Methodology for the Study

The data for this research is secondary in nature and safety disclosure items are handpicked from the annual reports of the sample units after a thorough examination of the contents of annual reports. Only voluntary disclosure items are considered. A literature survey was used for the selection of corporate safety reporting indicators or disclosure items. For measuring the extent of corporate safety reporting in annual reports of the companies, we have constructed a weighted disclosure index based on the previous empirical studies with some modifications. The measurement for the extent of disclosure is categorized as follows: No score is assigned if a company did not disclose any item; on the other hand, if a company disclosed, the score is assigned based on attributes like comprehensive-ness, clarity, relevance etc. Further, based on its relative importance on total disclosure practice, it was decided to attribute some weightage to each of the indicators or disclosure items. Although attributing weightage is fraught with subjectivity to some extent (Das et al., 2008), it was considered unavoidable given the lack of uniformity in safety disclosure. Later, based on previous studies on corporate safety reporting and our sample survey, normally accepted norms, also the theoretical considerations and availability of data, a number of factors had been selected as potential explanatory variables for explaining the variation in the safety disclosure score among the selected units. Finally, a regression model

is utilized to analyze the results of this study and this is in tandem with the previous studies. The firm-level data relating to explanatory variables corporate characteristics (sales, market capitalization etc.) are taken from the CMIE Prowess database.

Selection of Indicators

To show the trends in safety disclosures and to analyze the extent and type of disclosure in a systematic manner, the selection of some indicators was considered necessary. The study concentrated on 4 primary indicators and some major sub-indicators based on previous studies (Gray et al., 1995; Guthrie and Mathews, 1985; Goh and Chua, 2013). Content analysis was used to place information within four dimensions/indicators: 'Theme', 'Evidence', 'Location' and 'Amount'.

However, we have considered disclosure through two mandatory reports (viz., corporate governance report and management discussion and analysis) to assess the extent of voluntary safety reporting. Corporate safety disclosures through such reports are considered voluntary, there being no structure of such reports. 'Evidence' is related to the manner of reporting of safety disclosure items: monetary, non-monetary, declarative (qualitative) and none. 'Location' indicates the place of disclosure of safety reporting items as management of a company may make a choice between management reviews, a separate safety disclosures section, parts of other sections of the annual report and a separate booklet on safety issues/measures. 'Amount' of safety reporting is measured through the proportion of pages devoted to safety matters following Guthrie and Mathews (1985).

Assignment of Score

It was decided to attribute some score/weightage to the first 3 indicators mentioned above considering their perceived importance towards the safety reporting activity of any unit. We have avoided the assignment of scores in case of the remaining indicator since considerations of the first three indicators are enough for the purpose of evaluation of the extent of disclosure. The details of the maximum achievable score for each indicator are given below:

Primary Indicator	Score/Importance
Theme	2000
Evidence	2000
Location	1000
Total	5000

We have subdivided each of the indicators into some sub-indicators and distributed the maximum achievable score to each of the sub-indicators. Our distribution of total score is based on the perceived relative importance of such items. For the purpose of designing the scorecard, we have taken the help of academicians, auditors and corporate executives working in the field of finance. The distribution of total score is a subjective process but it was considered unavoidable to assess the extent of safety reporting (Wallace et al., 1994).

Table 1 gives a detailed scorecard for 'Theme' and 'Evidence' indicators.

TABLE 1
Corporate Safety Disclosure Scorecard

Sl. No.	Parameter	Score
1	Theme (2000)	
1.1	Safety policy	200
1.2	Safe work practices	200
1.3	Safety training	173
1.4	Group meetings	155
1.5	Incident investigation and analysis	135
1.6	In-house safety rules and regulations	125
1.7	Safety promotion	112
1.8	Evaluation, selection and control of subcontractors	112
1.9	Safety inspections	170
1.10	Maintenance regime for all machinery and equipment	155
1.11	Hazard analysis	173
1.12	The control of movement and use of hazardous substances and chemicals	145
1.13	Emergency preparedness	145
2	Evidence (2000)	
2.1	Monetary quantification	1400
2.2	Non-monetary quantification	600
GRAND TOTAL		4000

Regarding 'Location' scoring pattern is given below. We have given a maximum score for reporting of safety disclosure through a separate booklet.

Location	Score
Separate booklet	500
Other section/ Separate section of the annual report devoted to safety Disclosure	300
Management Discussion and Analysis	200

Finally, we evaluated the combined CSf disclosure score of each sample unit based on CSf reporting with respect to the above 3 primary indicators. We used the following formulae to obtain Corporate Safety Disclosure Score (CSfDS):

$$CSfDS = \frac{ScoreObtained}{MaximumAchievableScore} \times 100$$

SAFETY REPORTING PRACTICE OF INDIAN COMPANIES

Extent of Reporting

Table 2 reports our findings relating to types of corporate safety disclosure by sample Indian Companies. It is observed that out of 96 sample companies only 76 (79.17%) companies made some form of safety disclosure and 20 (20.83%) companies avoided such disclosure. The most popular theme was safe work practices related disclosure as 67 (69.79%) companies made such disclosure. Some other things that attracted better disclosure include safety training (60.42%) and emergency preparedness (51.04%). Our findings on themes of safety disclosure are reported in Table 2.

TABLE 2
Types of Corporate Safety Disclosure

Theme of Disclosure	Companies reporting	% of Total
Safety policy	33	34.38
Safe work practices	67	69.79
Safety training	58	60.42
Group meetings	20	20.83
Incident investigation and analysis	33	34.38
In-house safety rules and regulations	10	10.42
Safety promotion	16	16.67
Evaluation, selection and control of subcontractors	21	21.88
Safety inspections	40	41.67
Maintenance regime for all machinery and equipment	33	34.38
Hazard analysis	41	42.71
The control of movement and use of hazardous substances and Chemicals	36	37.50
Emergency preparedness	49	51.04
No disclosure	20	20.83

Note: Some companies reported more than one theme.

Source: Annual Reports (2018) of Select Companies. Results computed.

An analysis of results on the manner of quantification of safety disclosure items given in Table 3 reveals that all the 76 corporate safety reporting companies had made some form of quantification of safety disclosure items. 56 (58.34%) companies made both monetary and non-monetary quantification and 20 (20.83%) companies made only non-monetary quantification. No sample company gave monetary disclosure alone.

TABLE 3
Quantification of Safety Accounting Disclosure

Quantification	No.	%
Both monetary and non-monetary quantification	56	58.34
Monetary quantification	0	0
Non-monetary quantification	20	20.83
No disclosure	20	20.83
Total	96	100.00

Source: Annual Reports (2018) of Select Companies. Results computed.

Table 4 reports our findings on the location of safety disclosure. A separate corporate safety report is not common among sample companies as only one sample company issued a separate booklet on safety-related matters. Safety-related disclosures are made in various places and only a handful of companies created a separate section in the annual report for safety reporting.

TABLE 4
Location of Corporate Safety Disclosure

Theme of Disclosure	Management Discussion and Analysis		A separate section of the annual report devoted to Safety Disclosure		Other sections		Separate booklet	
	No.	%	No.	%	No.	%	No.	%
Safety policy	7	21.21	8	24.24	17	51.52	1	3.03
Safe work practices	17	25.37	11	16.42	38	56.72	1	1.49
Safety training	4	6.90	12	20.69	41	70.69	1	1.72
Group meetings	5	25.00	7	35.00	7	35.00	1	5.00
Incident investigation and analysis	2	6.06	12	36.36	18	54.55	1	3.03
In-house safety rules and regulations	3	30.00	3	30.00	3	30.00	1	10.00
Safety promotion	4	25.00	5	31.25	6	37.50	1	6.25
Evaluation, selection and control of subcontractors	3	14.29	14	66.67	3	14.29	1	4.76
Safety inspections	12	30.00	18	45.00	9	22.50	1	2.50
Maintenance regime for all machinery and equipment	12	36.36	15	45.45	5	15.15	1	3.03
Hazard analysis	6	14.63	18	43.90	16	39.02	1	2.44
The control of movement and use of hazardous substances and chemicals	9	25.00	10	27.78	16	44.44	1	2.78
Emergency preparedness	15	30.61	15	30.61	18	36.73	1	2.04

Note: Many companies made disclosure under more than one theme and disclosure in Director's Report has not been considered.

Source: Annual Reports (2018) of Select Companies. Results computed.

We report our findings on the proportion of pages devoted to safety disclosure in Table 5. Only 16.66% of sample companies devoted more than 10% of the total pages of the annual report for safety reporting. Out of 76 companies having some safety disclosure, 53 companies used less than 6% of total pages for safety reporting. As a whole, our findings do not indicate a satisfactory result regarding corporate safety reporting by Indian companies.

TABLE 5
Proportion of Page Devoted to Safety Disclosure

Ratio of Pages (%)	No. of Companies	%
0	20	20.83
0-2	10	10.42
2-4	22	22.92
4-6	21	21.88
6-10	7	7.29
10-14	5	5.21
14-16	5	5.20
>16	6	6.25
Total	96	100.00

Source: Annual Reports (2018) of Select Companies. Results computed.

Corporate Safety Disclosure Score of Sample Companies

Based on performance with respect to three primary indicators – theme, evidence and location, the study evaluated the combined CSfDS value of the sample companies. Analysis of the CSfDS value reported in Table 6 reveals that out of 96 sample companies, 20 companies don't attain any score, as they have not made any form of safety disclosure. Our analysis of the overall disclosure score reveals that no sample company has attained a 100% corporate safety disclosure score. The range of overall score is very wide maximum being 89.74% and the minimum being 26.78%. The mean score is moderate (59.33%) and the standard deviation is 15.57% respectively. Only 5 (5.21%) companies have attained more than 80% score and 11 (15.63%) companies have attained less than 40% score. Most of the sample companies (56) have attained scores in the range of 40-80%.

TABLE 6
Overall Corporate Safety Disclosure Score

Score (%)	No. of Sample Companies	% of Sample Companies
0	20	20.83
<40	11	15.63
40-60	33	34.38
60-80	23	23.96
>80	5	5.21
Total	96	100.00

Source: Annual Reports (2008) of Select Companies. Results computed.

IMPACT OF COMPANY CHARACTERISTICS ON THE EXTENT OF CORPORATE SAFETY DISCLOSURE

We measure corporate safety through Corporate Safety Disclosure Score (CSfDS). Disclosure score is measured through analysis of the content of annual reports of sample units and by applying weightage on different disclosure. We seek to determine whether a relationship exists between CSfDS and a set of firm-specific factors. Taking a cue from previous studies on corporate safety reporting disclosure and based on our sample survey, normally accepted norms, also the theoretical considerations and availability of data, some firm-specific factors had been selected as potential explanatory variables for explaining the variation in the corporate safety disclosure score among the selected units.

Explanatory Variables & Hypotheses Formulation

Non-Promoters' Holding

It is argued that ownership structure i.e. concentration of ownership in the hands of few large investors has a negative influence on safety disclosure (Brammer and Pavelin, 2008; Reverte, 2009; Roberts, 1992; Ullmann, 1985). Empirical studies suggest that corporations with dispersed ownership contribute to increased voluntary disclosure (Chau and Gray, 2002; Ghazali and Weetman, 2006; Marwata, 2001; Ullmann, 1985). We use the percentage of non-promoters holding as a proxy of dispersion of ownership (promoters being a controlling group of investors in the Indian context). Accordingly, we hypothesize that:

Hypothesis 1: There is a significant relationship between the company's public ownership or ratio of share held by non-promoters and corporate safety disclosure scores.

Size

Considerable empirical evidence supports a positive relationship between size and safety disclosure (Adams et al., 1995 and 1998; Belkaoui and Karpik, 1989; Hossain et al., 1995; Neu et al., 1998; Patten, 1991; Reverte, 2009). Agency theory (Hossain et al., 1995) and political costs (Cooke, 1989; Gray et al., 1995; Hackston and Milne, 1996; Watts and Zimmerman, 1986) are used to explain the association between firm size and disclosure. A few empirical studies, however, support some exceptions (Lau, 1992; Singh and Ahuja, 1983).

Several variables like turnover, capital investment, market capitalization, manpower strength, etc. may serve as a proxy for the size. The size of the company is measured here using market capitalization and sales. Accordingly, we used these two variables as a proxy of the size of the units and to address multicollinearity, we have modified the models as considered necessary. In order to avoid the problems caused by heteroscedasticity, natural logarithms of these variables were used to estimate its potential effect on the extent of corporate safety disclosure.

The discussion above leads us to the following pair of hypothesis:

Hypothesis 2a: There is a significant relationship between the company's sales and corporate safety disclosure scores.

Hypothesis 2b: There is a significant relationship between the company's market capitalization and corporate safety disclosure score.

Profitability

The association between profitability and safety disclosure has been examined by a number of studies. It is argued that extensive disclosure is provided by the managers of profitable companies to signal better performance to investors and to help support management's continuation and compensation (Giner, 1997).

Some authors argue that the availability of economic means (organizational slack) in profitable firms may be the most obvious and explicit explanation of such a positive relationship (Cowen et al., 1987; Hackston and Milne, 1996; Pirsch et al., 2007). In general, the empirical findings are inconclusive. Studies have found positive relationship (Bowman, 1978; Cowen et al., 1987; Roberts, 1992), no relationship (Belkaoui and Karpik, 1989; Hackston and Milne, 1996; Lau, 1992; Mishiel et al., 2004) and a negative relationship (Brammer and Pavelin, 2008; Freedman and Jaggi, 1988; Freedman and Ullmann, 1986). Thus, any prior assumption about the sign of association between safety disclosure and profitability is fraught with difficulties.

Several variables like return on net worth (RONW), return on capital employed (ROCE), net profit margin (NPM), etc. may serve as a proxy for profitability. We used among these, RONW and ROCE as a proxy of profitability of the units and to address multicollinearity, we have modified the models as considered necessary.

The discussion above leads us to the formulation of the following pair of hypothesis for testing:

Hypothesis 3a: There is a significant relationship between the company's return on net worth and corporate safety disclosure score.

Hypothesis 3b: There is a significant relationship between the company's return of capital employed (ROCE) and corporate safety disclosure score.

Industry Type

Prior research suggests that industry environmental sensitivity has a role in explaining the content and extent of safety disclosure (Adams et al., 1998; Cowen et al., 1987; Freedman and Jaggi, 1988; Gray et al., 1995). Such empirical studies have done in the context of specific industries like mining, oil, chemical, etc. (Clarke and Gibson-Sweet, 1999; Jenkins and Yakovleva, 2006; Ness and Mirza, 1991) by bifurcating industries in sectors like high-profile and low profile (Hackston and Milne, 1996; Roberts, 1992). Roberts (1992, p. 605) defines high-profile industries as those with consumer visibility, a high level of political risk, or concentrated intense competition. Following Hackston and Milne (1996) we classify petroleum, chemical, paper, extractive industry, automobile, airline, agriculture, liquor and tobacco, media and communication as high profile industries. Also, considering the impact of the industry on the environment we have identified power generation, construction and real estate companies as high profile industries. While low profile consists of other industries and services. To test this hypothesis, a dummy variable was used, which took the value one, if industry type was high profile, and 0 otherwise.

On the basis of the above discussion, we hypothesize that:

Hypothesis 4: There is a positive significant relationship between industry type and corporate safety disclosure score.

Leverage

The role of leverage in explaining safety disclosure is supported through agency theory. It is argued that more highly leveraged firms disclose voluntary information in order to reduce their agency costs and as a result, their costs of capital (Jensen and Meckling, 1976; Myers, 1977). However, there is another view that firms with high leverage may have a closer relationship with their lenders and use other means to disclose safety-related information and consequently, leverage may have a negative influence on safety disclosure.

Empirical evidence regarding the relationship between leverage and safety disclosure is conflicting. A positive relationship is supported by the studies of Hossain et al. (1994) and Lau (1992). On the other hand, studies of Chow and Wong-Boren (1987) and Raffournier (1995) find no relationship between leverage and corporate safety disclosure.

Thus, it is difficult to make any assumption about the nature of relationship between these two variables. We have measured leverage as long term debt/book value of equity (i.e. Debt/Equity ratio) following Cornier et al. (2005) and Roberts (1992). Based on the above arguments, the following hypothesis is tested:

Hypothesis 5: There is a significant relationship between the debt-equity ratio and corporate safety disclosure score.

Another common variable studied as the determinant is listing status. As our sample consists of only listed companies, we have not included listing status as a potential determinant of the safety disclosure.

Formulation of Model

The model (Model 1) that had been specified for the determination of the relative role of each independent variable is given below:

$$CSfDS_i = \alpha + \beta_1 NPRMHOLD + \beta_2 LOGSALES + \beta_3 LOGMKCAP + \beta_4 RONW + \beta_5 ROCE + \beta_6 HPINDTYP + \beta_7 DER + e_i$$

where,

i = Index of unit (1, 2, ..., 96)

CSfDS = Corporate Safety Disclosure Score

NPRMHOLD = Ratio of Non-promoters' holding

LOGSALES = Natural log of book values of sales

LOGMKCAP = Natural log of book values of market capitalization

RONW = Ratio of return on net worth

ROCE = Ratio of return of capital employed

HPINDTYP = 1, if the industry type is high profile, or 0 otherwise

DER = Ratio of debt and equity

α = Constant

β = Parameters

e = Error term

Regression Results

Multiple regression models (Linear Enter model) are used to ascertain which of the variables have a significant influence on corporate safety and which of them do not. To perform multiple regressions, the values of all the independent variables and dependent variables are computed taking the data of all sample units. In Model 1 we analyzed corporate safety disclosure score (CSfDS) and its relationship with seven independent variables such as non-promoters' holding (NPRMHOLD), sales (LOGSALES), market capitalization (LOGMKCAP), return on net worth (RONW), return of capital employed (ROCE), high profile industry type (HPINDTYP) and debt-equity ratio (DER).

Table 7 presents correlation coefficients (Pearson Correlation) between all the variable pairs. It indicates that there was a strong correlation (0.841) between return on net worth and return of capital employed, and strong correlation (0.618) between sales and market capitalization. Because of a high degree of association between each of these two explanatory variables, there may be the problem of multicollinearity and it seems justified not to incorporate both of these two pair together in the same model. The methodology followed for dropping the variables was as suggested by Kaushik (2007). Hence, four separate regression models, omitting one variable of each pair each time, were estimated. Model 2 omitted market capitalization (LOGMKCAP) and return of capital employed (ROCE); Model 3 omitted sales (LOGSALES) and return of capital employed (ROCE); Model 4 omitted market capitalization (LOGMKCAP) and return on net worth (RONW) and Model 5 omitted sales (LOGSALES) and return on net worth (RONW) and incorporated all other explanatory variables.

TABLE 7
Correlation Coefficients between Variables
(Observations = 76)

VARIABLES	CSfDS	NPRMHOLD	LOGSAL ES	LOGMKCAP	RONW	ROCE	HPIND TYP	DER
CSfDS	1.000							
NPRMHOLD	-0.081	1.000						
LOGSALES	**0.355	-0.288	1.000					
LOGMKCAP	0.189	-0.486	**0.618	1.000				
RONW	0.038	-0.189	*0.196	0.128	1.000			
ROCE	0.021	-0.091	-0.033	0.010	**0.841	1.000		
HPINDTYP	-0.111	-0.180	0.114	*0.208	0.137	0.109	1.000	
DER	0.083	-0.009	-0.061	-0.083	0.099	0.121	-0.145	1.000

* Significant at 0.05 level (one-tailed)

** Significant at 0.01 level (one-tailed)

Source: SPSS Output (Model 1)

The results of the regression analysis for each of the models are obtained by using SPSS (version 16.0) statistical package. Comparing the overall explanatory power as indicated by adjusted R² amongst Models 2, 3, 4 and 5, Model 4 shows the most improved value, which was 0.798 (R² is 0.858). The observed F statistics for Model 4 is also significant at 1% level. Model 4 incorporates a total of five explanatory variables viz., non-promoters' holding (NPRMHOLD), sales (LOGSALES), return on capital employed (ROCE), high profile industry type (HPINDTYP) and debt-equity ratio (DER). The summarized results of the final regression for Model 4 are reported in Table 8.

TABLE 8
Estimates from the OLS Regression Analysis of Corporate Safety Disclosure Score on Factors

Model 4 (Excluding LOGMKCAP and RONW):						
Sources	Sum of Squares	df	Mean Square	F	Sig.	
Regression	2879.037	5	575.807	2.633	.001	
Residual	15310.302	70	218.719			
Total	18189.338	75				

Number of observations: 76
 $F(5, 70) = 2.633$
 $R^2 = 0.858$
Adjusted $R^2 = 0.798$
Durbin-Watson statistics = 1.632
Standard error of the estimate = 14.7891

	Regression Coefficients	Std. Error	t	P > t	95% Confidence Interval for B	
					Lower Bound	Upper Bound
(Constant)		10.731	3.315	0.001	14.173	56.978
NPRMHOLD	0.006	9.917	0.054	0.957	-19.243	20.313
LOGSALES	0.380	2.461	3.300	**0.002	3.213	13.028
ROCE	0.041	2.272	0.363	**0.001	-3.707	5.354
HPINDTYP	-0.146	3.580	-1.283	0.204	-11.733	2.545
DER	0.080	0.874	0.717	0.476	-1.117	2.369

** At 1% level of significance

Source: SPSS Output (Model 4)

The following observations may be made on the basis of regression results obtained for Model 4:

The multiple regression model with CSfDS as dependent variable has a coefficient of determination of 0.858 with a standard error of the estimate of 14.7891 (Model 4). Observed F statistics of the model is 2.633 and it is significant at a 1% level. This indicates that all the independent variables together have a significant influence on the corporate safety disclosure, the CSfDS at a 1% level. Among the explanatory variables, coefficient of two variables viz sales (LOGSALES) and profitability (ROCE) are significant. Hence, only two hypotheses may be accepted. This is:

Hypothesis 2a: Company's sales (LOGSALES) are associated with corporate safety disclosure scores.

Hypothesis 3b: There is a significant relationship between the company's return of capital employed (ROCE) and corporate safety disclosure score.

It is observed that the coefficient of LOGSALES and ROCE are positive. Thus, big size and highly profitable companies are reporting extensively in safety front. On the other hand, among other variables, HPINDTYP has negative but non-significant coefficients. It implies that the high profile industry type negatively impacts its safety score. Leverage and non-promoters' holding have a positive but insignificant coefficient. Thus none of them seem to explain variations in the safety disclosure score of Indian listed companies. The findings on the significance of firm size and profitability as a significant variable is consistent with those reported by Adams et al., 1995 and 1998; Belkaoui and Karpik, 1989; Hossain et al., 1995; Neu et al., 1998; Patten, 1991; Reverte, 2009; Cowen et al., 1987; Hackston and Milne, 1996; Pirsch et al., 2007 in the context of other countries.

SUMMARY AND CONCLUSION

On an overall basis, corporate safety reporting practices of Indian companies are not at all encouraging. There is a lack of objective and informative reporting as revealed by this study.

Further, this paper has tried to trace the history of the determinants of the corporate safety disclosure and the competing arguments on the relative importance of each of the factors in the corporate safety disclosure score determination.

Among the company-specific factors, two factors, viz., sales and profitability are having a significant influence on safety disclosure. In respect of HPINDTYP, the relationship is negative but having non-significant coefficients, i.e. companies having high profile may be less proactive in reporting safety performance.

As with all empirical work in this area, our results are subject to certain limitations. First, our sample period is only one year and the results we document may not adequately capture the historical trend of safety reporting. Second, we have assigned weights to a different theme to arrive at the corporate disclosure score. To the extent, subjectivity involved in such a scoring process, our inferences may be used with caution. However, subjectivity is unavoidable in measuring qualitative disclosure. Third, we do not take other forms of corporate reporting like reporting through the internet or advertisement into consideration. Despite these potential shortcomings, we believe that our findings contribute evidence on the recent trend of corporate safety reporting in India and its determinants.

There is a need for continuing more exploratory and empirical research on different aspects of corporate safety. Apart from the explanatory variables considered in the present study, future research may analyze the brand value, investor pressure, litigation, regulation/legislation, innovation and quality control, productivity and cost savings, research and development, expenditure on social overheads, quality assurance and consumer protection, employees participation in management, corporate governance parameters, etc. on safety reporting practice. Even, future research may be conducted to identify the extent and direction of corporate safety reporting in the Indian context in a more detailed way. A comparative study may also be undertaken on safety reporting practices in developing countries. It is generally assumed that better corporate safety reporting would promote socially responsible behaviour. A study on the relationship between safety disclosure score and safety performance may help to answer the question of whether increased safety reporting is simply rhetoric or whether they represent moral stance, with safety reporting truly reflecting ethical behaviour.

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FOOTNOTES

1. As per the website of the Bombay Stock Exchange (BSEindia.org), BSE 500 index represents nearly 93% of the total market capitalization of BSE. BSE 500 covers all 20 major industries of the economy, available at <http://www.bseindia.com/about/abindices/bse500.asp> (accessed on 10 February 2018).