CHAPTER 3
RESEARCH METHODOLOGY

For pursuing any research there should be proper research design. To fulfill this task, the present chapter is devoted to prepare a detailed plan of the study. This chapter comprises of following sections:-

1. Need of Study
2. Objectives of the Study
3. Theoretical framework of the study
4. Analytical framework of the study
5. Organization of the Study

3.1 NEED OF THE STUDY

An extensive review of literature has been carried out in preceding chapter. The purpose of this chapter is to shed some light on the research methodology and to understand the various analytical and statistical techniques used for analysis. This review of literature mainly poses upon the practices of disclosures on social (employees, customers, community and investor) and environmental issues. Majority of the research papers have dealt with issues on empirical data base following the descriptive statistics like content analysis on the basis of extent, type of disclosures. Average disclosure was calculated on the basis of themes. Though the theme varied from researcher to researcher and across global boundaries but still a thematic framework can be seen revolving around the human resources, environment performance, community involvement, ethical issues (only scanty work could be seen), consumers.

In the study conducted by Chahoud et al it was shown that 62% of the companies presented ‘business case’ as motivator for corporate social responsibility. The strategic focus on corporate social responsibility can pay the business world a rich dividend. Though the corporate world cannot be presumed to be unaware of the financial side of CSR, the intentions have not been brought to public openly and even not conceptually accepted by financial wizards of the corporate world. "CSR can be a value proposition for companies, profit is the by product of the business, real aim of the business is to serve the society" (Deveshwar1, 2006).

One of the main concerns in CSRD is awfully diverse forms, content, quality, location of the corporate social reporting documents. Secondly, there is total lack of standardization of formats and

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benchmarks for these reporting practices. The plethora of the benchmarks can be found. Somebody judges the reporting based upon the GRI (Global Reporting Initiatives), somebody on the basis of ten principles given by UNGC and academic researchers have developed their own thematic instruments covering range of issues which widely come in the realm of CSR. Different jargon relating to naming of documents like Reporting on Enterprise social responsibility (ESR), Environment reports, COP (Communication on Progress), EHS (Environment, health and social disclosures), sustainability reports adds more confusion to the literature on CSR.

3.2 OBJECTIVES

The objectives of the present study are

1. To compare the content, extent, nature, quality and location of disclosures regarding the corporate social responsibility by Indian companies.

2. To benchmark corporate social disclosures against Global Reporting Initiatives.

3. To find out the association between the social disclosures and corporate characteristics such as size\(^2\), profitability, risk and others etc.

4. To examine the perceptions of investors and the stock brokers with regard to the corporate social disclosures by the Indian companies.

3.3 THEORETICAL FRAMEWORK OF THE STUDY:

The theoretical framework of the study consists of two parts; the operational definitions and structure of research design.

OPERATIONAL DEFINITION OF CSR: For the purposes of this research, the definition given by The World Business Council for Sustainable Development (1999) “The ethical behavior of an organization towards society – management acting responsibly in its relationship with other stakeholders who have legitimate interest in the business” has been considered. This definition has been taken as the base for the reason that it offers scope for the inclusion of new stakeholders in

\(^2\) Company size has been measured by either number of employees, total asset value, sales volume, or an index rank (e.g. Fortune 500). Belkaoui and Karpik (1989) employed the log of net sales in their study, whereas Trotman and Bradley (1981) used both sales and total assets. Roberts (1992) used a four-year average of revenues. Patten (1991) used the log of sales, but also repeated the analysis with Fortune 500 rankings. Employee numbers, sales and total assets have been shown to be highly correlated. Hackston, David, Milne, Markus J. (1996) used three measures of size -market capitalization, sales, and total assets. Trotman and Bradley (1981) used both sales and total assets. Roberts (1992) used a four-year average of revenues. Patten (1991) used the log of sales, but also repeated the analysis with Fortune 500 rankings. Employee numbers, sales and total assets have been shown to be highly correlated. Hackston, David, Milne, Markus J. (1996) used three measures of size -market capitalization, sales, and total assets.
discharge of social obligations. A new stakeholder namely natural environment has been added while measuring CSR performance of the company via addition of a new theme i.e. ‘carbon and other harmful gases emissions’.

**OPERATIONAL DEFINITION OF CSRD:** The definition given by Guthrie and Parker (1989) has CSRD defined as “Reporting on the social impacts of its activities; effectiveness of its social programmes; discharge of its social responsibilities; stewardship of its own social resources”. For consistency purposes, decision rules have been used while indentifying, measuring and analyzing the items of social importance. These rules have been inspired from previous study by Hall, 2005. Any variation in these decision rules have been distinguished by using italics style.

- Discussion of directors’ activities is not to be included as discussion on employees.
- Every sponsorship oriented activity is to be included, no matter how much it is advertising.
- Performance monitoring systems in operation have not been considered as a favor done towards the employees/work force, so have not been counted as a CSRD.
- All disclosures must be specifically stated; they cannot be implied. All disclosures must specifically relate to the company and its actions, they cannot be general background information about an action.
- If any sentence has more than one possible classification, the sentence has been classified as to the activity most emphasized in the sentence. When a CSD contains monetary and non-monetary quantitative disclosure, classify CSD as the dominant type of evidence (monetary or non-monetary quantitative). When there is an equal amount of monetary and non-monetary quantitative disclosure in a sentence, classify the CSD as monetary quantitative disclosure.
- Tables (monetary and non-monetary) that provide information that is on the checklist should be interpreted as one line equals one sentence and classified accordingly. Headings to tables are also classified.
- Graphs are classified as the heading equaling one sentence, and each bar on a bar graph/point on a line graph/segment of a pie graph, is classified as one sentence.
- Innovations in products or services should not be included unless they are beyond what is necessary to compete in the marketplace or attract business.
- Innovations in products or services should not be included unless they specifically benefit the customer (e.g. through safety) or the community or environment (e.g. through recyclable packaging), while also being beyond what is necessary to compete in the marketplace or attract business for example the research and development which improve the safety or specific benefits to consumers.
- Any disclosure that is repeated shall be recorded as a CSD sentence each time it is discussed.
Discussions relating to the quality of goods and services will not be a CSD unless it contains notice or a verifiable change in quality, e.g. accreditation to the International Standards Organization (ISO 9000) quality series standard.

Only the caption of pictures is classified.

Personal awards to the employees/directors and CEO are not considered as social responsibility towards employees.

Reservations of jobs for Scheduled caste/schedule tribe is considered in community development only if it is more than what is mandatory under law for PSU’s.

Research Technique- Content analysis: The content analysis has been used for measuring the items of social importance. This is a highly used method in CSR and intellectual capital disclosure studies (Agarwal, 1992; Belal, 2001; Carol and Zutshi, 2004; Raghu, 2006; Barut, 2007; Murthy, 2008; Sobhani et al, 2009; Khan and Khan, 2010; Menassa, 2010).

Unit of content analysis: Average number of sentences has been used to measure the extent of disclosures as the sample firms made a meager amount of disclosures making it unsuitable for other measurement units such as, page or paragraph. Choi (1998) also used number of lines to measure the amount of disclosures in a Korean study of environmental disclosures. However, there are problems associated with the measurement by number of lines. For example, in the case of the use of graphs or pie charts, measurement difficulties may arise.

Construction of Corporate social, environment, carbon disclosure index (CSECDI)

Accepting CSR (talking specifically in terms of environment related issues) as a business proposition shall necessitate a deep look inside carbon footprints of the company and a serious attempt at designing a model for conversion of corporate social responsibilities initiatives into financial gains.

To summarize, the items of CSR information included in the CSECDI index have been developed based on the following criteria:

i) The checklist cited in Hall, 2002 (appendix 1A - checklist of categories of corporate social disclosure) has been taken as the base. This list has been claimed to an exhaustive itemization of information with social importance (Hackston and Milne, 1996). Another CSR disclosure index by Mitchell and Carol-Anne, 1999 (Appendix 1B) has been taken into consideration.

3 Content analysis is used to measure corporate social responsibility disclosures. Content analysis is a method of codifying the text (or content) of a piece of writing into various groups (or categories) depending on selected criteria (Weber, 1988). Following coding, quantitative scales are derived to permit further analysis. Krippendorff (1980, p. 21) states that "content analysis is a research technique for making replicable and valid inferences from data according to their context". In one form or another, the method has been widely adopted in previous social responsibility disclosure studies (for example, Abbott and Monsen, 1979; Ernst & Ernst, 1978; Guthrie and Mathews, 1985; Guthrie and Parker, 1990).
(ii) Disclosure items identified in earlier studies examining disclosure in India (Agarwal, 1992; Singh, 2005).

(iii) Many items which could become part of corporate social disclosures on the basis of pilot study have been considered.

(iv) After this, the Cronbach's Alpha has been run to assess the reliability of the disclosure index to be used for the purpose of analysis of the data.

\[
\alpha = \frac{i}{i-1} \left(1 - \frac{\sum_{i=1}^{n} \sigma^2_{y_i}}{\sigma^2_x}\right)
\]

Where the \(\alpha\) = Cronbach's Alpha, \(i\) is the number of components (\(i\) items; 111 items here), \(\sigma^2_x\) the variance of the observed total disclosure score, \(\sigma^2_{y_i}\) the variance of item \(i\) for the current sample of companies i.e. (20 companies selected at random in pilot study) has been run to assess the reliability/internal consistency of the disclosure index.

(v) The disclosure index constructed for this study finally included 96 items.

Exhibit I displays the modus operandi of construction of CSECDI in a lucid manner.

**Methods of measuring CSR performance:** To quantifying the CSR performance two methods has been used: 1. Construction of Corporate social, environmental & carbon disclosure index (CSECDI) based upon an extensive list items complied from earlier disclosure indices\(^4\) and pilot study of 20 Indian companies. The disclosure index covered seven themes namely environment, energy, human resources, product, community development, carbon related disclosures and others. 2. Space incidence method.

**Measurement/Scoring in CSECDI:** Simple disclosure score and weighted disclosure scores have been computed in the following manner:

**Un-weighted disclosure scores:** Disclosures scores are calculated firstly on the basis of number of items disclosed. Here, the only consideration is whether or not a company discloses an item of CSR information in its CAR. If a company discloses an item of CSR information in its annual report it will be awarded `1' and if not it will be awarded `0'. The disclosure model for the un-weighted CSR disclosure thus measures the CSECD score for a company as an additive of the 96 items selected. So, the formula used is

\[ CSECDIscore_i(NW) = \sum_{j=1}^{j} \sum_{i=1}^{n} d_{ij} \]

Where, \( j \) represents the number of companies (82 companies in the sample);

\( d_{ij} = 0 \); if the item has not been disclosed;
\( d_{ij} = 1 \); if the item has been disclosed;
\( n \) = the maximum number of items a company is expected to disclose (96 items)

**Weighted disclosure score:** Evidence of the disclosures measured on a rating scale ranging from 0-5 using following formula based on 0-5 rating scale

\[ CSECDIscore_i(w) = \sum_{j=1}^{j} \sum_{i=1}^{n} d_{ij} \]

Where, \( j \) represents the number of companies (82 companies in the sample);

\( d_{ij} = 0 ; \) if the item has not been disclosed;
\( d_{ij} = 1 ; \) if only one or less than one sentence has been disclosed;
\( d_{ij} = 2 ; \) if more than one sentence have been disclosed;
\( d_{ij} = 3 ; \) more than one quantitative figure is found;
\( d_{ij} = 4 ; \) if the disclosure is Non-Monetary and comprises more than one figure;
\( d_{ij} = 5 ; \) if the disclosure is expressed in money terms

\( n \) = the maximum number of items a company is expected to disclose (96 items)
CSR endeavors taken specifically in India

A Pilot Study of 30 Randomly Selected Indian Companies, Out of BSE - 500

Earlier Indices in India

Agarwal, 1992
Singh, 2005

Earlier Indices in Developed Countries

Mitchell & Carol - Anne, 1999
Hall, 2002

Number of Themes
One
None
Seven
Five
Six

Number of Items
12
20
36
42
96

Repetitive items = 103; Items considered = 214 - 103 = 111

Number of items Removed in Crosbach's Alpha = 15

Number of items finally selected for representing CSECDI = 111 - 15 = 96
Exhibit II
Content, Extent, Nature, Quality and Location of CSRD in India and Benchmarking it against Global Reporting Initiatives

CSR

CSRD

Benchmarked with GRI in India

No. of GRI reports

Trends of GRI (1999-2011) in India, Asia, & World

Content of CSRD (Non-Weighted 0-1 scale)

Extent of CSRD (Weighted 0-5 scale)

Nature of CSRD (Theme wise analysis)

Quality of CSRD

Location of CSR disclosures

Web Disclosures (Website visits)

Location of Dedicated CSR & Env. Sections in Corporate Annual

1 2 3

4 5 6

7 8

9 10 11

12 13 14

15 16 17

18

19
1. Item wise analysis of CSRD Investigation into significance of variation in items
2. Frequency distribution of overall no. of items disclosed
3. Extent of CSRD across companies
4. Top ten most disclosing companies.
5. Ten least disclosing companies
6. Extent of CSRD across industries
7. Investigation into significance of variations across industries
8. CSRD across forms of ownership.
9. Investigation into significant of variations in CSRD across forms of ownership.
10. No. of item of disclosed in each theme.
11. Investigation into significance of variations in number of items across themes.
12. Extent of CSRD in each theme & Investigation into significance of variations in it.
13. Zero and minimum (5 or less than 5) disclosures in each theme.
14. Top 5 most and least disclosed items in each theme.
15. Longitudinal analysis (2000-01 to 2008-09) of CSRD in each theme.
16. CAGR across themes.
17. Quality of each item disclosed in CSECDI
18. Quality of CSRD across themes.
19. Longitudinal analysis of quality of CSRD (narrative, quantitative and monetary categories).

Space incidence method: Space incidence method has been used to conduct longitudinal analysis by taking ‘sentence’ as a unit of content analysis. CGAR (Compound growth annual rate) has been calculated to understand the growth in theme wise disclosures.

Exhibit II presents a bird’s eye view of the methodology used for discerning the CSR performance measures and CSRD patterns across the themes, industries and ownership.

Theme wise disclosure: In order to measure theme wise disclosures, total disclosure of each theme has been calculated using the rating 0-5. The formula designed and used for this purpose is

\[ \bar{X}_{TH} = \frac{\sum i_{TH}}{N \times K} \]

\( \bar{X}_{TH} = \) Average weighted disclosure score in a theme
Where \( N \) is the number sample companies; \( K \) is the number of items in a theme.

Data Collection

The data for the present study has been collected from both primary and secondary sources. The primary sources: For collection of primary data two semi-structured questionnaires have been designed for gauging the awareness level as well as perceptions of brokers and investors regarding utility of these reports. For studying the awareness level and perceptions of investors regarding the corporate social activities of their companies, a sample of 100 investors has been taken from Delhi, Chandigarh and Ludhiana each. A sample of 50 brokers has been taken from Delhi and Ludhiana each as two stock exchanges exist at these places.

The secondary sources:
1. Data with regard to corporate characteristics has been taken from PROWESS Database managed by CMIE (Centre for Monitoring Indian Economy). The data for the year 2009-10 has been extracted to establish the relationship of CSRD with various corporate characteristics. Prowess database has been preferred as it provides normalized financial data relating to companies.

2. In addition, for identification of top 100 companies to be selected in the sample, BSE 500 index has been used from BSE website. The annual reports of the companies finally selected in the sample have been collected from the Ludhiana stock exchange, Delhi stock exchange and websites of the respective companies. The e-mails requests to secretaries of some companies were made so as to maximize the number of annual reports for comprehensive study.

3. The list of stock brokers in Ludhiana has been extracted from ‘SILVI’ software maintained by the stock exchanges.

4. The secondary data has been self processed from books, journals, articles and newspapers and magazines for the purpose of present study. The data was collected from the libraries of Panjab University Extension Library, Ludhiana, Punjab Agriculture University, Ludhiana, and Panjab University, Chandigarh.

**Universe of the Study:**

The Indian companies of BSE 500 index constitute the universe of the study. The Financial companies (55 in number) has been excluded from the purview of this study because all the themes of social disclosures like energy, environment, product, carbon disclosures are not directly relevant in these companies.

**Sample Size and Sampling Method:** A sample of 100 companies from BSE- 500 is considered, in order to provide a reasonable level of breadth without sacrificing the depth and richness of the data (Eisenhardt, 1989). Top 100 companies have been selected on the basis of market capitalization from the universe (Appendix 2). Final selection of sample: Out of these 100 companies the final sample was formed in the following manner

<table>
<thead>
<tr>
<th>Sample selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total companies listed in BSE -500 index</td>
</tr>
<tr>
<td>Less Companies in Financial sector</td>
</tr>
<tr>
<td>Companies left in the universe</td>
</tr>
<tr>
<td>Companies selected on the basis of Market capitalization</td>
</tr>
<tr>
<td>Less Companies with annual report available for less than five years</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>Final Sample</td>
</tr>
</tbody>
</table>

**Period of the study:** The study covers a period from the year 2000-01 to 2008-09. This period has been selected against the backdrop that the significant amendments in the Companies Act, 1956 were carried out since 2000 and the requirement of report on corporate governance under the listing agreement by SEBI. This period also coincides with the release of second version of Global Reporting Initiative at the World Summit for Sustainable Development in Johannesburg in the year 2000.

**Determinants of CSR**

In the present study sales, total assets, number of employees, compensation paid to employees, average capital employed have been used as the measures of size. These variables are labeled as SALE, TA, NEMPL, COMEMPL and ACAPE. In addition, log of sales, total assets, number of employees, compensation of employees have also been used as measures of size. These variables are labeled as LOGSALE, LOGTA, LOGNEMPL and LOGCEMPL correspondingly.

The following specific hypotheses have been tested regarding CSRD and Accounting based measures of profitability of companies: In this study, revenue, profit before tax (PBT), profit after tax (PAT) as absolute measures and earning margin ratio, return on net worth, return on capital employed have been used as the relative measures of profitability. These variables are labeled as REV, PBT, PAT, EMR, RONW and ROCE in order. In addition log of PBT, PAT have also been used as measures of economic performance of firms. These variables are labeled as LOGPBT, LOGPAT correspondingly.

**Relationship between CSECD score and corporate characteristics:**

In a regression model, a response variable \( Y \) is expressed as a function of one or more predictor variables \( X \), plus noise. In many (but not all) cases, the functional form is linear in the unknown coefficients, so that the model can be expressed as:

\[
Y_i = \beta_0 + \beta_1X_1, i + \beta_2x_2, i + \beta_3X_3, i + \ldots + \beta_kX_k, i + \epsilon_i
\]

where the \( i \) represents the i-th observation in the data sample, the \( \beta \)'s are unknown model coefficients, and \( \epsilon \) is a random deviation, usually assumed to come from a normal distribution with mean 0 and standard deviation (\( \sigma \)) equal to one.

1. **Model I:** Simple linear regression model (Linear and curvilinear) and coefficients
2. **Model II:** Multiple regression model
3. Model III: Hierarchical model i.e. forward and backward model
4. Graphical representation of the linear model fitted

For relating CSECDI score with various corporate characteristics, Simple Regression procedure has been fitted. Both linear and non-linear Models have been fitted. The simplest model relating one dependent variable $Y$ to independent variable $X$ is a straight line of form:

$$ Y = a + b X $$

*Where $b$ equals the slope of the line and $a$ equals the Y-intercept.*

Curvilinear models such as the exponential model have been used to know, whether the relation is non-linear, explaining the larger quantum of variations in CSRD for example:

$$ Y = \exp(a + b X) $$

The various other regression models used in the study are mentioned below. The correlation and R-Squared statistics have been computed using STASGRAPHIC software under all the methods of regression. To avoid cluttering of data wherever a particular curvilinear model could not be fitted, the details have been omitted. If the P-value in the ANOVA table is found to be greater or equal to 0.05, there is not a statistically significant relationship between CSECDI score and corporate characteristics at the 95.0% or higher confidence level.

The simple linear regression model as fitted has been shown with each of the corporate characteristics. The fitted model is plotted with confidence limits and/or prediction limits.

The exhibit III presents the scheme of independent variables considered in the present study in a logical and systematic manner.
Exhibit III
Determinants of CSRD

Model 1 (Simple Linear Regression & Curvilinear)

**Grouping of corporate characteristics**

*Size*
- Income Statement Based
  - Revenue
  - Sales
  - Log sales
- Balance Sheet Based
  - Av. Capital employed
  - Total Assets
  - Log Total Assets
  - No. of Employees
  - Log No. of Employees
  - Compensation to employees
  - Log Compensation to employees

*Profitability*
- Accounting Base
  - Absolute
    - PBT
    - LOGPBT
    - PAT
    - LOGPAT
  - Relative
    - ROI
    - ROCE
    - RONW
    - EMR
- Market Based
  - Av. Stock Price of last 365 days

*Risk*
- Financial Leverage
  - Debt Equity Ratio
- Market risk
  - Beta

**Others**
- Age
  - Era of Origin
- No. of Awards
- Industry
Exhibit III (Cont.)
Determinants of CSRD

Grouping of corporate characteristics

Model II
Multiple Regression Model

Model III
Hierarchical Regression Model

Size
- Average Capital Employed
- Log Sales
- Log Total Assets
- Log Number of Employees

Profitability
- Log PAT
- Log PBT
- Earning Margin Ratio
- Market Prices of Shares

Risk
- Debt Equity Ratio
- Beta

Others
- Age

Data collected from Prowess database of CMIE
Data compiled by author on the basis of weighted CSECDI
**Pilot study and designing of questionnaires**: To design the questionnaire first of all a pilot study of the brokers and investors was conducted. To check the reliability of the questionnaire, alternate questions, odd- even and split half correlation test have been conducted.

Descriptive Statistics- Percentages, Mean, frequency distribution tables, Standard Deviation, Co-efficient of variation, Skewness, Kurtosis, Ranking, five point Likert scale for quantitative measurement of satisfaction responses for analytic purposes.

Analytical Statistics- ANOVA test, Kruskal Wallis test and Mood’s test have been conducted to find out whether average response in one category differs from other categories. Keeping in view the vastness of country, fewer studies, research can be called a combination of empirical and exploratory research. The researcher has added another dimension to the research problem by gauzing the perceptions of the brokers towards the CSR and reporting.

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**Exhibit IV**

<table>
<thead>
<tr>
<th>PERCEPTIONS OF INVESTORS AND BROKERS REGARDING CSR AND CSR&amp;D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issues considered</td>
</tr>
<tr>
<td><strong>Part-I</strong></td>
</tr>
<tr>
<td>Awareness level and importance of CSR</td>
</tr>
<tr>
<td><strong>Part-II</strong></td>
</tr>
<tr>
<td>Relationship between CSR and financial performance</td>
</tr>
<tr>
<td><strong>Part-III</strong></td>
</tr>
<tr>
<td>Disclosure of CSR Activities</td>
</tr>
<tr>
<td><strong>Part-IV</strong></td>
</tr>
<tr>
<td>Level of satisfaction with CSR&amp;D</td>
</tr>
</tbody>
</table>

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**FORMULATATION OF HYPOTHESIS**

The study has formulated and tested the following hypothesis with regard to CSR&D patterns.

Hₐ: Null hypothesis Ho: There is no statistically significant difference among the various items of social performance.

Null hypothesis H₀:  \( \bar{X}_1 = \bar{X}_2 = \bar{X}_3 = \bar{X}_4 = \ldots \bar{X}_n \)
Alternative hypothesis $H_{1a}$: 
\[ \bar{X}_1 \neq \bar{X}_2 \neq \bar{X}_3 \neq \cdots \neq \bar{X}_n \]

Where, $n =$ maximum number of items a company is expected to disclose (96 items)

$H_2$: There is no statistically significant difference among the overall mean CSR Disclosure score across Industries.

$H_3$: Public sector companies are making better overall CSR disclosures than the private sector companies.

$H_4$: There is no statistically significant difference among the mean weighted disclosures scores of the seven themes of CSR.

Null hypothesis $H_0$: 
\[ \bar{X}_{CD} = \bar{X}_{HR} = \bar{X}_{PSI} = \bar{X}_{ENV} = \bar{X}_{ENG} = \bar{X}_{EMN} = \bar{X}_O \]

Alternative hypothesis $H_{1b}$: 
\[ \bar{X}_{CD} \neq \bar{X}_{HR} \neq \bar{X}_{PSI} \neq \bar{X}_{ENV} \neq \bar{X}_{ENG} \neq \bar{X}_{EMN} \neq \bar{X}_O \]

**CSR disclosures and size of companies**

The following specific hypotheses have been tested regarding CSRD and size of companies:

$H_5$: Firms with higher level of sales disclose CSR information to a greater extent than those firms with lower level of sales.

$H_6$: Firms with higher level of total assets disclose CSR information to a greater extent than those firms with lower level of total assets.

$H_7$: Firms with higher level of average capital employed disclose CSR information to a greater extent than those firms with lower level of average capital.

$H_8$: Firms with more number of employees disclose CSR information to a greater extent than firms with less number of employees.

$H_9$: Firms paying more compensation to employees disclose CSR information to a greater extent than firms paying lesser aggregate compensation to employees.

**CSR disclosures and profitability of companies**

$H_{10}$: Firms with higher quantum of revenue disclose CSR information to a greater extent than do those firms with lower quantum of revenue.

$H_{11}$: Firms with higher profit before tax disclose CSR information to a greater extent than do those firms with lower profit before tax.

$H_{12}$: Firms with higher profit after tax disclose CSR information to a greater extent than do those firms with lower profit after tax.
H13: Firms with higher RONW disclose CSR information to a greater extent than do those firms with lower RONW.

H14: Firms with ROCE disclose CSR information to a greater extent than do those firms with lower ROCE.

Market based measures of profitability:

H15: Firms with higher stock market prices disclose CSR information greater extent than do those firms lower market prices.

**CSR disclosures and risk profile of companies**

The following hypotheses have been tested regarding CSRD and risk profile of companies:

H16: Firms with higher financial leverage disclose CSR information greater extent than do those firms with lower financial leverage.

H17: Firms with higher systematic risk (Beta) disclose CSR information greater extent than do those firms with lower Beta.

**CSR disclosures and other characteristics of companies**

The following hypotheses have been tested regarding CSRD and other characteristics:

H18: Long-established companies may disclose more information than newly established companies.

H19: The higher the number of awards/certifications received by the companies, the more likely there will be more voluntary disclosures of information about CSR.

**Hypotheses relating perceptions of investors**

The following hypotheses have been tested regarding perceptions of investors with respect to CSR and CSRD:

H20: There is no difference between average levels of satisfaction of investors making investments in various levels of amount invested.

H21: There is no difference between average levels of satisfaction of investors with various educational profiles.

H22: There is no difference between average levels of satisfaction of investors with various levels of investment experiences.

H23: Level of satisfaction with CSR disclosures does not vary with the gender of the investors.
3.4 ANALYTICAL FRAMEWORK OF THE STUDY:

In addition to descriptive tools like percentages, average, ranks, standard deviation, range, coefficient of variation, skewness and kurtosis, tests of normality namely Kolmogorov-Smirnov (K-S test) and Shapiro-Wilk test, Levene’s test have been used. To find out the association between CSRD and various corporate characteristics analytical tools like Simple linear regression, hierarchical regression model and multiple regression models along with the curvilinear models have been used.

**Student’s t-test and ANOVA:** T-test analyses the variation in two variables and ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio is a ratio of the between-group estimate to the within-group estimate. In case, the P-value of the F-test is less than 0.05, there is a statistically significant difference between the means of the variables at the 95.0% confidence level.

**Multiple Range Tests:** These tests apply a multiple comparison procedure to determine which means are significantly different from which others. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. The level of significance used for this is 5 per cent. The bottom section of the output shows each pair of means. The *Difference* column displays the Sample mean of the first group minus that of the second. The (+/-) *limit* column shows an uncertainty interval for the difference. Any pair for which the absolute value of the difference exceeds the limit is statistically significant and is indicated by an * in the *Sig.* column. The top section of the display arranges the samples into homogeneous groups, shown as columns of X’s. A homogeneous group is a group within which there are no significant differences.

**Kruskal Wallis test:** Kruskal-Wallis test compares the sample medians rather than the means. It works with the Null hypothesis: The medians are all equal. This test is appropriate when each column contains a random sample from its population. In such a case, the rows have no intrinsic meaning.

**Mood’s median test** tests the hypothesis that the medians of all samples are equal. The test has been used in the present study where the data was found to be skewed or lack of normality could be noticed. It does so by counting the number of observations in each sample on either side of the grand median. If the P-value for the chi-squared test is found to be less than 0.05, the medians of the samples are interpreted to be significantly different at the 95.0% confidence level.

**Chi square test:** The $\chi^2$ test first calculates a $\chi^2$ statistic using the formula:

$$\chi^2 = \sum_{i=1}^{n} \frac{(X_i - E)^2}{E}$$

Where: $X_i =$ actual frequency of the i-th item; $E_i =$ expected frequency of the i-th item
**Box whisker plot:** This procedure creates a plot designed to illustrate important features of a numeric data. It was first described by John Tukey (1977) in his box Exploratory Data Analysis. The box-and-whisker plot summarizes a data sample through 5 statistics: minimum, lower quartile, median, upper quartile, maximum.

**Durbin-Watson (DW) statistic** tests the residuals to determine if there is any significant correlation based on the order in which they occur in data file. If the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals at the 95.0% confidence level.

Exhibit V provides a substance of the analytical framework used in the study.

### Exhibit V
**Analytical Framework of the study**

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Analytical and statistical tools used</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTENT OF CSRD</td>
<td></td>
</tr>
</tbody>
</table>
| Item wise CSR Disclosure | A review based, India specific and statistically tested CSECDI constructed  
Cronbach’s Alpha checked to ensure the consistency of CSECDI (See exhibit I)  
Number & percentages of Reporting Companies using the following formula  
\[ R_p = \frac{\text{Number of companies disclosing } i^{\text{th}} \text{ item}}{\text{Total number of companies in the sample (N) i.e. 82}} \times 100 \]  
Average disclosure of each item calculated and significance of variations investigated  
Formula used for item wise disclosures  
\[ CSECDI_{score}(NW) = \sum_{i=1}^{n} \sum_{j=1}^{d_{ij}} \]  
\[ H_1 \text{ has been formulated and tested} \]  
Normality of Data checked using K-S Test, Shapiro-Wilk Test, Skewness, Kurtosis, Log transformation of Data, Chi-square test.  
Frequency distribution, Scatter Plot, Fitting of Line. |
<p>| Item wise variations | | |
| Overall No. of items disclosed | | |
| EXTENT OF CSRD | | |</p>
<table>
<thead>
<tr>
<th>Extent across companies</th>
<th>Weighted average disclosure calculated for each company (0-5 scale)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top 10 most and least CSR disclosing companies</td>
<td>Average weighted CSRD calculated for each industry and significance of variations across industries investigated using ANOVA and Multiple range tests.</td>
</tr>
<tr>
<td>Industry wise extent of CSR</td>
<td></td>
</tr>
<tr>
<td>Ownership wise extent of CSR disclosure</td>
<td>Weighted average CSRD calculated for public and private sector companies.</td>
</tr>
<tr>
<td></td>
<td><strong>H₃ has been formulated and tested</strong></td>
</tr>
<tr>
<td><strong>NATURE OF CSRD</strong></td>
<td></td>
</tr>
<tr>
<td>Number of items disclosed in each theme</td>
<td>Average number of items calculated in each theme</td>
</tr>
<tr>
<td>Extent of CSRD in each Theme</td>
<td>Significance of variation in number of items in each theme using ANOVA, Kruskal-Wallis and Mood median test</td>
</tr>
<tr>
<td>Zero and minimal disclosure in each theme</td>
<td>Weighted average disclosure score calculated for each theme using six point rating scale, using the following formula</td>
</tr>
<tr>
<td>Top five most and least disclosed items in each theme</td>
<td>[ \bar{X}<em>{TH} = \frac{\sum</em>{i=1}^{K} i_{TH}}{N \times K} ]</td>
</tr>
<tr>
<td>Longitudinal analysis across themes</td>
<td>Significance of variation in theme wise extent of CSRD calculated using Kruskal-Wallis, Mood Median, Box Whisker Plot</td>
</tr>
<tr>
<td></td>
<td><strong>H₄ has been formulated and tested</strong></td>
</tr>
<tr>
<td></td>
<td>No. of companies with aggregated 0 or less than 5 score counted in each category.</td>
</tr>
<tr>
<td></td>
<td>Ranking has been done</td>
</tr>
<tr>
<td></td>
<td>No. of sentences from the year 2000-01 to 2008-09 has been calculated and graphically presented in each theme. Space incidence method has been used taking sentence as a base. Trends have been formulated</td>
</tr>
<tr>
<td></td>
<td>Compound annual growth rate (CAGR) calculated for each theme over a period of 9 years.</td>
</tr>
<tr>
<td>QUALITY OF CSRD</td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td></td>
</tr>
<tr>
<td>Quality of each item of CSECDI</td>
<td>Quality of each item measured on five point scale classified into three categories.</td>
</tr>
<tr>
<td>Quality of CSRD over themes</td>
<td>Quality of each item calculated with number of companies showing quality of each item</td>
</tr>
<tr>
<td>Longitudinal Analysis Quality of Disclosures</td>
<td>Quality of weighted average disclosure score aggregated at theme level</td>
</tr>
<tr>
<td></td>
<td>CSRD aggregated over themes have been classified into three categories- Narrative, quantitative, and monetary on five point scale and % of weighted disclosures of CSR in each theme</td>
</tr>
<tr>
<td></td>
<td>Number of sentences disclosed classified into Narrative, Quantitative and monetary categories</td>
</tr>
<tr>
<td></td>
<td>Trends formulation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LOCATION of CSRD and BENCHMARKING AGAINST GRI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location of CSRD</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>GRI reporting benchmarked against CSRD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DETERMINANTS OF CSRD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Find out the determinants of CSRD</td>
</tr>
<tr>
<td>CSRD taken as dependent variable and Corporate characteristics as independent variables</td>
</tr>
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<tr>
<td><strong>PERCEPTIONS OF INVESTORS &amp; BROKERS</strong></td>
</tr>
<tr>
<td>----------------------------------------</td>
</tr>
<tr>
<td><strong>Designing of Questionnaires</strong></td>
</tr>
<tr>
<td>Collection of Data</td>
</tr>
<tr>
<td>Split half, Odd even correlation, Alternate question method have been used, options identified on the basis of review of earlier studies</td>
</tr>
<tr>
<td>Visits to Ludhiana and Delhi Stock Exchanges were made to collect data from investors and brokers. Investor awareness workshops have been organized and attended to collect data from investors.</td>
</tr>
<tr>
<td>‘SILVI’ Software has been used to get a list of brokers in Ludhiana Stock Exchange. In Delhi Stock Exchange personal interview method has been used to collect data from brokers</td>
</tr>
<tr>
<td><strong>Response collection</strong></td>
</tr>
<tr>
<td>Multiple choice question, Five point-Likert scale for measuring satisfaction with current level of CSRD</td>
</tr>
<tr>
<td>Responses collected on four point scale (1-4, Strongly Disagree to Strongly Agree)</td>
</tr>
<tr>
<td>Ranking of options have been used to get responses from investors and brokers.</td>
</tr>
<tr>
<td>Mean, standard deviation, coefficient of variation, Skewness, Median, and ranking has been calculated.</td>
</tr>
<tr>
<td><strong>Analysis &amp; Interpretation</strong></td>
</tr>
<tr>
<td><strong>H_{20}-H_{23} have been formulated and tested</strong></td>
</tr>
<tr>
<td>ANOVA, t-test have been used to investigate the significance of variances in satisfaction of brokers and investors in different categories on the basis of size and duration of investment, gender and educational profile of the respondents</td>
</tr>
</tbody>
</table>

### 3.5 ORGANIZATION OF THE STUDY

The study has been organized into seven chapters. The first chapter deals with introduction including the focus on the regulatory regime in India.

The second chapter brings to the forefront the theoretical context of the study at global as well as Indian level.

The third chapter presents the research design of the study. It deals with the theoretical and analytical framework of the study, and methodology of sample selection, data collection followed by a brief discussion on statistical tools used for analysis and interpretation.

The fourth chapter is devoted to study the comprehensive patterns of CSRD, presenting evidence and theme based, cross sectional and longitudinal study of CSR disclosures in India. It benchmarks information regarding CSR against Global Reporting Initiatives.

The chapter five is devoted towards investigation into the determinants of corporate social disclosures taking size, profitability, risk and some other organizational characteristics as independent variables.
Simple regression model has been carried out on the sample companies to find out which is the most effective measure among the available variables. This model has been repeated 19 times to check the association of CSR disclosures with independent variables. The R squared (coefficient of determination) has been calculated with all feasible curvilinear models. The correlation matrix has been formulated to test the degree to which each of the independent variable is related to the dependent variable. The analysis has been repeated with another regression model namely multiple regression model. Finally, the hierarchical regression models i.e. backward and forward linear regression models have been applied to further strengthen the results.

The sixth chapter deals with analysis of perceptions of investors and stock brokers with regard to CSR and its disclosure. The level of satisfaction of investors has been statistically tested for differences on the basis of age, gender, amount invested, investment experience and educational background of the investors.

Chapter seven summarizes and concludes the study. Suggestions and scope for further research have also been given in seventh chapter.

CHAPTER 4

Content, Extent, Nature, Quality and Location of CSRD in India and Benchmarking it against Global Reporting Initiatives

Majority of the past empirical research work has dealt with the measurement of CSR reporting using content analysis on the basis of extent, type of disclosures and descriptive statistics. In most cases, average disclosure has been calculated on the basis of themes. Moreover, striking differences can be found across the researches in terms of sample size. On one side there is longitudinal study covering 100 years of Corporate social disclosure in a single company like Shell oil company by Guthrie & Parker (1989), Carol and Zutshi (2004), Cement Corporation of India (Gray et al., 1996), Steel Authority of India Limited (Hegde and Bloom 1997) at the other end Richardson et al (2002) studied social and environmental performance disclosure patterns more than 1000 companies across the world. In light of scarce literature available in India (as discussed in chapter 2), this chapter attempts to revisit the state of corporate social environmental and carbon disclosure in India through content analysis.

The chapter is organized into following parts: