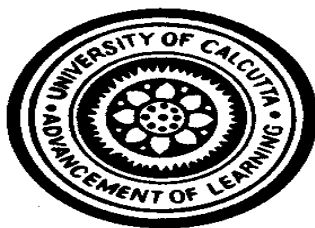


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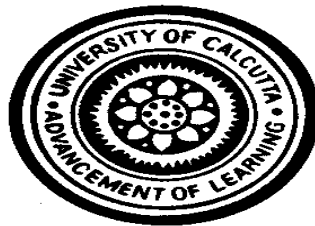


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University College of Business Studies
UNIVERSITY OF CALCUTTA

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Editorial

The 38th volume of refereed journal, 'Business Studies' of the Commerce Department, Calcutta University presents twelve insightful research papers on diverse contemporary issues in the field of accounting, economics, international finance, banking and management, within the realm of commerce and business. The papers involve either descriptive or empirical study, and have been so arranged as to retain the universal appeal of the research volume. The first paper identifies the major factors governing ethical responsibility of statutory auditors based on a primary survey. Through a case analysis of Cipla Ltd., the second paper judges the stock market reaction to disclosure of selected accounting parameters using regression approach. Focusing on a time period during recent global financial turmoil of 2007-2008 and a period prior to and after the crisis, the third paper examines the pattern of inter-linkages, especially the volatility dynamics, between stock returns of Indian multi-national firms and foreign exchange rates. The fourth paper makes an exploratory analysis of prepaid payment instruments being introduced recently in India by RBI in its effort to transform India into a digital economy. Again from a completely different perspective, the fifth paper explores the quality improvement programme relating to a product or process developed by Genichi Taguchi, the Director of Japanese Academy of Quality, and its implications for industry use. The service quality at selected branches of State Bank of India in Burdwan district is empirically examined based on primary data collected from banking customers in the sixth paper. In continuation of discussion on 'quality' and 'banking sector', the seventh paper analyses the burning problem of non-performing assets of public and private sector banks in India by evaluating its trend and its relationship with various economic parameters and corporate debt restructuring. In another exploratory analysis, the eighth paper evaluates the growth and recent trend in Indian micro-finance institutions, especially after the setback following Andhra Pradesh crisis of 2010. In order to judge the ethical and moral responsibility of certain selected Central Public Sector Enterprises in doing their business, the ninth paper makes a content analysis of the whistleblowing policies framed by such enterprises in the light of recommendations of Central Vigilance Commission. With corporate social responsibility (i.e. CSR) gaining added importance following enactment of Indian Companies Act 2013, the tenth paper highlights industry-specific CSR disclosure practices of selected Indian MNCs in pre- and post 2013 Act period. In another study on CSR, the eleventh paper evaluates the impact of such initiatives on consumers' purchase decisions of selected toothpaste brands in Kolkata region. Finally, the twelfth paper empirically examines the causal linkage, if any, between India's service trade and economic growth during post liberalization period. We sincerely hope that all the articles published in this volume of the Departmental journal will impart knowledge and stimulate the intellect of our valued readers and encourage them to contribute their research work to this journal on various contemporary issues in the field of accounting, finance, economics and management.

Tanupa Chakraborty
Associate Editor

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Underlying Factors governing Ethical Responsibility of Statutory Auditors: An Empirical Analysis

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Abstract: Declining ethical responsibility of statutory auditors is reducing the market vitality of audit and sustenance of economy. In this backdrop, the study examines opinions of statutory auditors and other related groups of respondents on select issues that may govern ethical orientation of statutory auditors. Exploratory Factor Analysis is conducted on the data collected and out of 15 variables, 5 underlying factors are identified. Major factors identified are related to practical approaches to ethical education, measures taken to implement ethics in education, punitive action and inner values, public awareness and global regulatory convergence, regulatory framework and recent events. Practical approach to ethical education is the most important factor governing ethical responsibility of statutory auditors.

Key-words: Corporate scandal, ethics, exploratory factor analysis, stakeholders' interest, statutory audit.

1. Introduction

Recent cases of audit failures are reducing the market vitality of audit. Regulators are trying to develop ideas and initiate steps to restore the lost image of the accounting profession. The mission was conceived in the context of the current corporate environment that repeatedly points out the deteriorating ethical commitment of statutory auditors. Statutory financial audit is very vital for

sustenance of our economy (Elliott, 1995). But our recent experiences tell us that statutory auditors over the last few decades are failing in fulfilling their professional responsibilities (Saha & Roy, 2017). Increased competition in the auditing profession, saturation of the market could be some of the reasons why statutory auditors are compromising with their ethical responsibilities towards the stakeholders of their corporate client. They are continuously trying to identify the lacuna in the existing regulation and using it for fulfilling their own personal economic motives (Saha, 2015). This entire system ultimately demeans the usefulness of financial statements. Declining reputation of the auditing profession is ultimately hitting the reputation of the company and economy as a whole (Vittal, 2000). In this backdrop, when the regulatory stricture is failing to ensure quality audit, it would not be superfluous to appoint additional means to ensure ethical commitment of statutory auditors.

This present study is an attempt to identify underlying factors that may govern ethical responsibility of statutory auditors. These factors would help to unearth the assurance services in a wider perspective and help the regulators to refurbish the accounting profession.

2. Review of Literature

A series of conceptual and empirical researches conducted by eminent scholars covers different areas of ethical responsibility of statutory auditors. Some of the significant studies are discussed here. Elliott (1995) in his article proposed some steps to increase the market vitality of audit in light of recommendation given in the American Institute of Certified Public Accountant (AICPA) Special Committee Report. The author discussed the scope and potential of assurance service as a whole. Research had been conducted to find out the potential services by professional accountants based on customer needs. In-depth interviews had been conducted with institutional investors, managers, Board of Directors (BoD), suppliers, creditors, regulators and Government officials to find out the wider scope of attestation services nowadays. Interviews had also been conducted with academicians and students of big Universities to include course work on auditing in the accounting curriculum and to promote academic research in this area. According to the author, this would help audit practitioner to know the current situation. The model was completely customer driven and aimed at increasing auditors' competence. Lovell (1998) in his study pointed out how tension and conflicts prevailed in the management of public sector enterprises and their impact on ethical orientation of statutory auditors'. Vittal (2000) conducted a conceptual study of ethics and code of conduct in the accounting profession. Professional ethics in Chartered Accountancy profession, the impact of globalisation on accounting regulation and professional ethics of accounting profession in other countries were thoroughly studied and comparatively analysed. The study observed that at the advent of globalisation, there had been a paradigm shift in the accounting profession. In order to help accounting professionals especially auditors in providing ethical service, there should be an integration of ethical code in India and other

countries of the world. Earley & Patrick (2004) in their study empirically analysed impact of Enron scam on moral reasoning of accounting students. The moral reasoning was analysed in pre and post-Enron period using certain educational intervention tools, like Accounting Ethical Dilemma Instrument and Defining Issue Test score, etc. It was observed that Enron event did not have a significant influence on moral reasoning of accounting students. Jeffrey (2004) in his edited book covered different areas, such as professional responsibility, professionalism, the ethical dilemma in resolving conflicts of interest among different related groups in terms of incentives and goals and the method of resolving them, and accountability of the accounting professionals. The book also contained guidelines for an auditor that stemmed from the code of conduct, rules, and securities exchange regulations. It also described the interactions between accountants, auditors, client, industries, regulators and standard-setting agencies and the impact of these interactions on guidelines for auditors. Mayper, Pavur, Merino, & Hoops (2005) in their research paper empirically analysed the impact of accounting education on ethical values of accounting students. The theory of Veblen was discussed which stated that autonomous bodies, like academic institutions also ran with an economic motive. A few hypotheses were developed relating to impact of accounting education on ethical values of students. Opinions of accounting students were gathered and empirically analysed. The study observed that more reforms in accounting education were needed to make students aware of ethical dimensions. Hasnas (2007) in this article examined the growing divergence between managers' ethical and legal obligation. After describing traditional business ethics, the author identified the features of federal criminal law and law enforcement obligation and how they were affecting the traditional approach with an illustration of workplace confidentiality. As a measure of solution, the author suggested reforming the traditional approach of organisational justice, privacy, and ethical auditing. In order to prove his conclusion, the author also provided one case study on KPMG abusive tax shelter. Chauhan & Gupta (2007) theoretically analysed the need for ethical audit in modern times business decision making. They proposed ethical audit in every organisation that set the limit of acceptable behaviour in an organisation. They also proposed its implementation internationally taking into consideration local societal differences. Ethics might not provide money but it gave immense mental satisfaction. According to them, implementation of ethical audit in an organisation would reduce internal and external inconsistency in an organisation. Ghaffari, Kyriacou, & Brennan (2008) in their study reviewed incorporation of ethics in accounting curriculum of different Universities in the United Kingdom (UK). A survey was conducted on the course design and curriculum of accounting of different universities in the UK. Ethics had already been incorporated into the accounting curriculum of major Universities. Following recent corporate scandals, it had been given more importance in the studies. However, course designs of different universities were different. Koumbiadis & Okpara (2008) in their study empirically analysed stages of ethical behaviour of accounting students. Stages of ethical behaviour of accounting students were analysed with reference to ethical behaviour theory developed

by Lawrence Kohlberg. Perceptions of 300 students enrolled in 5-year accounting course in different Universities at New York on the role of auditors in recent corporate accounting scandals are gathered and empirically analysed. The findings of the study suggested that students belonging to different stages of ethical behaviour responded differently to the questions. This was exactly in conformity with Kohlberg's theory.

3. Research Gap

Past Studies on ethical responsibility of statutory auditors mainly covers both conceptual and empirical researches conducted in this field. The concept of ethics, professionalism and ethical dilemma are the main theme of studies in existing literature. Application of ethics in business, management, accounting, and auditing are conceptually enumerated there. Professional ethics in the accounting profession is theoretically discussed with special emphasis on the code of conduct. Ethical behaviour of statutory auditors is also empirically analysed subject to recent corporate accounting scandals. Moreover, in recent studies, the impact of ethical education on moral reasoning of statutory auditors is analysed with an analytical approach. Influence of global convergence of regulatory framework on ethical behaviour of an auditor is critically analysed in existing studies.

In this backdrop, it is imperative to pursue a research on ethical responsibility of statutory auditors. More so, some gaps still persist in existing literature. Truly speaking, a number of empirical researches are comparatively less in this field. Determinants of ethical responsibility are not identified in the literature reviewed so far. Finally, opinions of different sections of individuals who are related to the field of auditing are not empirically analysed. Based on the identified gap in existing researches, the objective of the current study is made in the following section.

4. Objectives

The objectives of the current study are the following:

- (i) To identify underlying factors governing ethical responsibility of statutory auditors (*Refer to Section 6.3.2*);
- (ii) To develop the component plot in the rotated space based on extracted factors and their underlying variables (*Refer to Section 6.3.3*);
- (iii) To generate factor models for each extracted factor (*Refer to Section 6.3.4*);
- (iv) To ascertain fitness of the factor model (*Refer to Section 6.3.5*);
- (v) To draw a suitable conclusion of the study (*Refer to Section 7*).

5. Research Methodology

Type of Research	Empirical Research	
Nature of Research Design	Exploratory Research Design (Kothari, 2010)	
Nature of Data	Primary as well as Secondary	
Secondary Data	Books, Journal Articles, Newspaper Articles, Legislations, Reports	
Primary Data	Perceptions of Respondents from field survey	
Method of Sampling	Non-Probability Convenience Sampling Technique (Ho, et. al., 1997)	
Sample Design		
Respondents Category	Number of Respondents Initially Selected	Final Number of Respondents
a) Chartered Accountants (CAs)	150	101
b) Cost and Management Accountants (CMAs)	150	94
c) Academicians	150	111
d) Students	150	118
e) Investors	100	86
f) Corporate Executives	100	91
Total	800	601
Survey Area	Kolkata, West Bengal	
Survey Period	June 2015 to December 2015	
Data Collection Tool	Pre-Tested, Close Ended, Structured Questionnaire	
Number of Statements in the Questionnaire	16 (Table 1)	
Measurement Scale	Likert 5-Point Scale [1: Strongly Disagree (SD); 2: Disagree (D); 3: Neutral (N); 4: Agree (A); and 5: Strongly Agree (SA)] (Kothari, 2010)	
Determination of Likert’s Scale Value from Likert’s Rating Scale	Likert’s scale value for each answer in a independent variable are required to be determined to convert categorical responses into continuous data for performing the empirical analysis. However, the responses on	

	<p>Dependent Variable are kept at categorical level.</p> <p>The formula for calculation of Likert's scale value is: <i>Likert's Scale Value: $[\phi(x_1) - \phi(x_2)] / [\Phi(x_2) - \Phi(x_1)]$</i></p> <p>$[\Phi(x_2) - \Phi(x_1)]$ is the cumulative percentage of respondents against each level of agreement. From these values, the values of $x_1, x_2, \phi(x_1), \phi(x_2)$ for each answer to a statement has been obtained from the statistical table on 'Ordinates and Areas of the Distribution of Standard Normal Variable'. Now, putting the values in the above formula, the Likert's scale value for each answer to a statement has been obtained (Goon, et.al, 2013).</p>
Analysis	<i>Statistical Technique</i>
Identification of underlying factors governing 'ethical responsibility of statutory auditors'	Exploratory Factor Analysis

Table 1: Selection of Variables

Variable Code	Variable Name	Rationale for Selection <i>(Based on Review of Literature and Other Secondary Information)</i>
Dependent Variable (DV)		
V₁	Ethical responsibility of Statutory Auditors in Corporate Accounting Scandals	Duska, et. al. (2011), in their study pointed out that in the last few decades, absence of ethical behaviour of statutory auditors not only impaired their reputation but also impacted stakeholders of the business.
Independent Variables (IVs)		
V₂	Recent accounting scandals as driver of ethical need	Earley & Kelly (2004) in their study, unearthed a few corporate accounting scandals where statutory auditors did not show their ethical responsibility. Because, of these accounting scandals, ethics became a centre of attention of the accounting profession.
V₃	Sufficiency of regulatory framework	Price Waterhouse, statutory auditors at Satyam was associated with a company for quite a long period of time, as the

		applicable Company law at that time did not have any provision on rotation of auditor (Fernando, 2010).
V ₄	Strict enforcement of regulatory pronouncements	If regulatory framework governing statutory auditors is not properly enforced, their independence is not protected. In judiciary case Price Waterhouse & Co. vs. Securities and Exchange Board of India, 2010, it was observed that statutory auditor did not comply with applicable Standards on Auditing (SAs) while performing audit engagements.
V ₅	Punitive actions	Disciplinary actions against statutory auditors are mentioned in the Chartered Accountants Act, 1949. However, in several cases of audit failure, (Council of Institute of Chartered Accountants of India vs. Shri S. N. Sachdeva, 2011) the auditors were only reprimanded. Thus, the existing disciplinary framework actually failed to encourage an auditor to perform ethically.
V ₆	Moral behaviour influenced by cultural orientation	According to Rau & Weber (2004), certain values, like honesty, responsibility, respect which are influenced by the culture and family of the concerned person sometimes influence his moral behaviour.
V ₇	Focus on internal values	Gowthrope & Blake (1998) in their book have given huge importance to core internal values in reinstating ethical compliance by statutory auditors.
V ₈	Measures by professional bodies	Pendergast (2004) in his study opined that professional bodies should take adequate measures to restore ethical orientation of statutory auditors.
V ₉	Ethical education	Swanson & Fisher (2009) in their study pointed out that ethical education in every sphere of life could help a person to understand the true meaning of ethics and its impact on decision making.
V ₁₀	Inclusion of ethics in professional accounting curriculum	Bates and Waldrup (2008) has discussed that inclusion of ethics in professional accounting curriculum could help a statutory auditor to understand the ethical implication of every professional decision.
V ₁₁	Awareness programmes on ethics	Jeffery (2004) in his edited book covered so many aspects of auditing. A few of the researches included in this book was

		about awareness programmes for statutory auditors. Awareness programmes on ethics could facilitate a practical approach to the ethical knowledge. This sometimes may prove to be beneficial in resolving ethical dilemma.
V ₁₂	Collaboration between professional bodies and academia in reinstating ethics	Copeland (2005) in his study talked about a constructive collaboration between professional bodies and academic world. It could facilitate exchange of ideas in a wide spectrum. It would result in improvement in accounting curriculum and ethics would get a special importance in it.
V ₁₃	Practical training and psychological development	According to Mayper, et. al. (2005) practical training on ethics directly addresses ethical problems faced by a statutory auditor.
V ₁₄	Reward for ethical performance	If statutory auditors get rewarded for ethical performance, it might provide other auditors some impetus to be ethical in their future engagements.
V ₁₅	Mass media as a medium of spreading ethical awareness	In this media centric environment, ethical awareness of auditors spread with the help of newspaper, television, social networking sites could improve the current situation.
V ₁₆	Uniformity in regulatory framework across countries	Vittal (2000) in his study said that in cross country audit engagements, auditors faltered in their ethical duty by using the loopholes of regulatory mismatch in two countries. This situation could be avoided if regulatory framework across the globe were uniform.

6. Results and Discussion

6.1 Demographic Profile of Respondents

A brief summary of the demographic profile of respondents is provided in the following table.

Table 2: Demographic Profile of Respondents

Demographic Profile Based on Gender					
Male	%	Female	%		
522	86.9	79	13.1		
Demographic Profile Based on Age					
Young	%	Middle Aged (Age	%	Experienced	%

(Age less than 30 years)				between 30 and 50 years)				(Age more than 50 years)			
194		32.3		279		46.4		128		21.3	
Demographic Profile Based on Occupation											
CA s	%	CMA s	%	Academician s	%	Student s	%	Investor s	%	Corporate Executive s	%
101	16.8	94	15.6	111	18.5	118	19.6	86	14.3	91	15.1

(Source: Compilation of Primary Data using SPSS.20)

Inferences

A very small proportion of respondents in this study are woman. It shows that that most the people in the select occupations are male. Most of the respondents for this current study are middle aged followed by a young population. While the proportion of experienced respondents in the sample is comparatively small, they are not negligible. Hence, our entire data is fairly distributed in terms of age of respondents. Participation of each occupation in the overall data is almost equal. In terms of number of respondents in the total sample, Students top the list followed by Academicians. Participation of Investors in the overall sample is comparatively small than other occupational categories.

6.2 Reliability of Data

Details about reliability of data	Results
Technique to measure internal consistency and reliability of data	Chronbach's alpha (Peterson, 1994)
Chronbach's alpha value	0.7373
Decision	The value of ' α ' is more than the threshold 0.6 (Chronbach, 1951). Hence, the data is considered to be reliable and internally consistent.

6.3 Identifying Primary Factors Governing Ethical Responsibility of Statutory Auditors using Exploratory Factor Analysis

In the study, there are 16 variables out of which, 15 variables (V_2 to V_{15}) are primarily assumed that they have influence on 'Ethical responsibility of Statutory Auditors in Corporate Accounting Scandals' (V_1). However, Exploratory Factor Analysis (EFA) is conducted to reduce the number of variables (15

variables) into some factors governing the stated theme of the study. In this section, an endeavour has been made to study the following:

- (a) 'Fulfilment of assumptions of exploratory factor analysis' (Refer to Section 6.3.1);
- (b) 'Factor analysis results' (Refer to Section 6.3.2);
- (c) 'Development of component plot in the rotated space' (Refer to Section 6.3.3);
- (d) 'Factor model development and interpretation' (Refer to Section 6.3.4); and
- (e) 'Factor model fitness' (Refer to Section 6.3.5).

6.3.1. Fulfilment of Assumptions of Exploratory Factor Analysis

The assumptions for conducting Exploratory Factor Analysis are discussed in the following table (Malhotra, 2004).

Table 3: Fulfilment of Assumptions of Exploratory Factor Analysis

Sl. No.	Assumptions	Statistical Test used	Decision Criteria	Result	Fulfilment of Assumptions
1	Variables should be internally correlated	◆ Bartlett's Test of Sphericity.	P-Value should be less than 0.05	P-Value is less than 0.05	Satisfied
2	Sample must be adequate	◆ Kaiser Meyer Olkin (KMO) measure.	KMO should be greater than 0.5	KMO = 0.732	Satisfied

The above assumptions are satisfied for conducting exploratory factor analysis.

6.3.2. Factor Analysis Results

Subject to fulfilment of the aforesaid assumptions, Exploratory Factor Analysis is conducted. Components with Eigen Value more than 1 are extracted as factors. All the variables are grouped under the extracted factors based on Rotated Component Matrix (Refer to Table 1, Annexure 1) and the factors are named accordingly. Results of Factor Analysis is summarised here:

Table 4: Factor Analysis Result

Variable Code	Variable Name	Rotated Factor Loadings	Extracted Communality	Factor Code	Factors Name	Eigen Value	Percentage (%) of Variance Explained
V ₁₁	Awareness programmes on ethics (F _{1V11})	0.829	0.789	F₁	Practical Approaches of	4.156	27.709

V ₁₂	Collaboration between professional bodies and academia in reinstating ethics (F _{1V12})	0.877	0.835		Education on Ethics to Professionals		
V ₁₃	Practical training and psychological development (F _{1V13})	0.871	0.821				
V ₈	Measures by professional bodies (F _{2V8})	0.703	0.658	F₂	Increasing focus on Ethics in Education	1.742	11.612
V ₉	Ethical education (F _{2V9})	0.826	0.741				
V ₁₀	Inclusion of ethics in professional accounting curriculum (F _{2V10})	0.775	0.693				
V ₅	Punitive actions (F _{3V5})	0.721	0.579	F₃	Punitive Action and Inner Values	1.682	11.212
V ₆	Moral behaviour influenced by cultural orientation (F _{3V6})	0.735	0.628				
V ₇	Focus on internal values (F _{3V7})	0.706	0.642				

V ₁₄	Reward for ethical performance (F _{4V14})	0.700	0.540	F ₄	Public Awareness and Global Regulatory Convergence	1.155	7.702
V ₁₅	Mass media as a medium of spreading ethical awareness (F _{4V15})	0.779	0.646				
V ₁₆	Uniformity in regulatory framework across countries (F _{4V16})	0.698	0.514				
V ₂	Recent accounting scandals as driver of ethical need (F _{5V2})	0.578	0.489	F ₅	Regulatory Framework and Recent Events	1.102	7.345
V ₃	Sufficiency of regulatory framework (F _{5V3})	-0.784	0.712				
V ₄	Strict enforcement of regulatory pronouncements (F _{5V4})	0.681	0.552				
Total Percentage (%) of Variance Explained							65.579

(Source: Compilation of Field Survey Data using SPSS 20.0)

Inferences

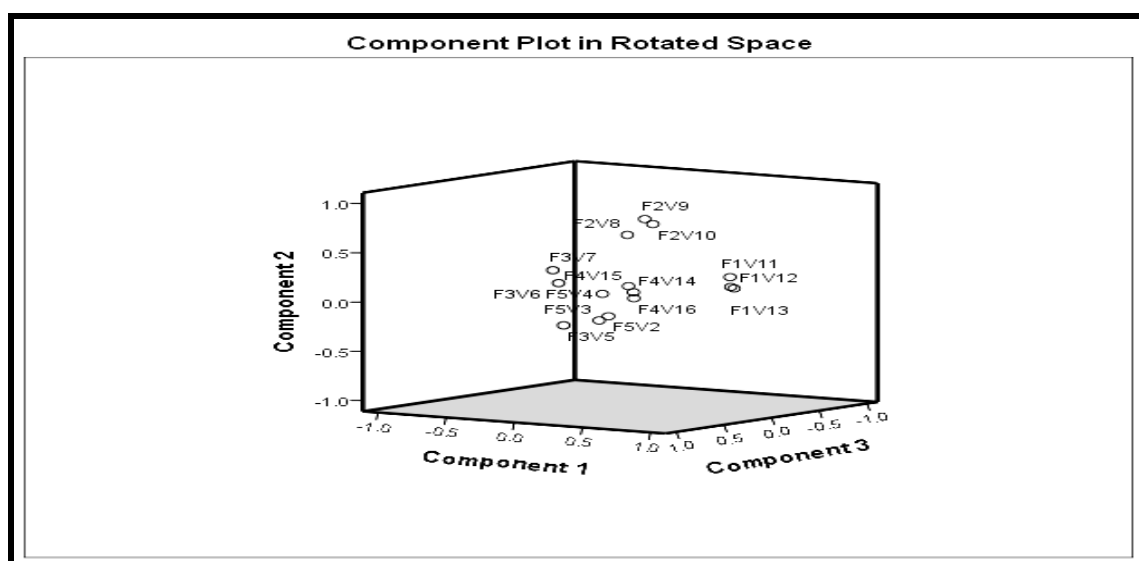
- Out of initially selected 15 variables, 5 factors have been identified based on their Eigen values more than 1.

- Variables, F_{1V11} [Rotated Factor Loading (RFL): 0.829], F_{1V12} [RFL: 0.877] and F_{1V13} [RFL: 0.871] have significant absolute loadings with the first factor. Naturally they come under it. From the underlying nature of these variables, it is observed that certain practical approaches to teaching ethics e.g. awareness, orientation and training programmes on ethics come under this factor. Thus, Factor-1 is named as ‘**Practical Approaches of Education on Ethics to Professionals**’.
- Variables, F_{2V8} [RFL: 0.703], F_{2V9} [RFL: 0.826], and F_{2V10} [RFL: 0.775] are grouped under this factor. These variables mainly deal with measures taken by professional bodies and increased focus on ethics in accounting education. Naturally, the name of the Factor-2 is ‘**Increasing focus on Ethics in Education**’.
- The third factor includes variables, F_{3V5} [RFL: 0.721], F_{3V6} [RFL: 0.735], and F_{3V7} [RFL: 0.706]. By the nature of these variables, it is seen that internal values and moral behaviour is the main focus of the underlying variables. However, in terms of absolute loading, punitive action also comes under this factor which in a way also influences moral behaviour of a person. Keeping all that in mind, Factor-3 is named as ‘**Punitive Action and Inner Values**’.
- The following factor incorporates variables, such as F_{4V14} [RFL: 0.700], F_{4V15} [RFL: 0.779], and F_{4V16} [RFL: 0.698]. Measures that relate to improving public awareness and global regulatory convergence are the main coverage of these variables. Hence, Factor-4 is named as ‘**Public Awareness and Global Regulatory Convergence**’.
- Variables, F_{5V2} [RFL: 0.578], F_{5V3} [RFL: -0.784], and F_{5V22} [RFL: 0.681] which represent regulatory laxity and recent cases of accounting frauds as the major reasons of increasing focus on ethical responsibility are grouped under this factor. Hence, the name ‘**Regulatory Framework and Recent Events**’ for Factor-5 is appropriate.
- In terms of percentage of variance explained, ‘Practical Approaches to Teaching Ethics to Professionals’ (27.709%) is the most imperative factor influencing ‘ethical responsibility of statutory auditors’ followed by ‘Increasing focus on Ethics in Education’ (11.612%), ‘Punitive Action and Inner Values’ (11.212%) and so on. ‘Regulatory Framework and Recent Events’ (7.345%) is the least significant factor governing the stated theme.
- The factor model explains 65.58% of total variance. It is a substantial proportion in social science research.
- It is observed that variables, V_{12} and V_{13} have higher extracted communalities. It indicates that a larger proportion of variance of these variables is explained by the factor model. Hence, they have a considerable influence on the factor model. On the other hand, extracted communality for V_2 is really less. It indicates an insignificant influence of this variable on overall factor model.

6.3.3. Development of Component Plot in Rotated Space

‘Component Loading Plot in Rotated Space’ is a graphical representation of ‘Rotated Component Matrix’ which basically represents rotated factor loadings between underlying variables and extracted factors. Here, 5 factors are extracted. Hence, the plot has 5 dimensions. Relative positioning of different variables on these dimensions is portrayed through this plot. For convenience, variables are coded with respect to their governing factor (*Refer to Table 4*).

Figure 1: Component Plot in Rotated Space



(Source: Compilation of Field Survey Data using SPSS 20.0)

Inferences

Variables, F_{1V11}, F_{1V12}, and F_{1V13} grouped under F₁ have a close proximity among them. They together are close to the axis representing Factor–1. Variables, F_{2V8}, F_{2V9}, and F_{2V10} are found to have closeness among them. They have nearness to the axis representing Factor–2. Variables, F_{3V5}, F_{3V6}, and F_{3V7} are not very near to each other but they are adjacent to the axis representing Factor–3.

Variables, F_{4V14}, F_{4V15}, and F_{4V16} have a very close association among themselves. That is why they are grouped under Factor–4, represented by the adjacent axis. Finally, variables, F_{5V2}, and F_{5V4} are very close, while F_{5V3} is slightly far from them. However, all three are close to the axis that represents Factor–5.

6.3.4 Factor Model Development and Interpretations

Factor Models, are developed based on ‘Component Score Coefficient Matrix’ (*Refer to Table 2, Annexure 1*). Individual factor models for the study are shown below:

Practical Approaches of Education on Ethics to Professionals (Factor-1)

$$\Rightarrow F_1 = 0.031V_2 + 0.065V_3 + 0.002V_4 + 0.073V_5 - 0.072V_6 - 0.120V_7 - 0.046V_8 - 0.098V_9 - 0.072V_{10} + 0.377V_{11} + 0.424V_{12} + 0.421V_{13} - 0.014V_{14} - 0.128V_{15} - 0.021V_{16}$$

Factor score coefficients are estimated from factor loadings. Hence, it is natural that the variable with high loading with a factor have high coefficient with it. Accordingly, variables, V_{11} , V_{12} , and V_{13} have high factor score coefficients which mean that these variables have high influence on this factor. In terms of magnitude of the coefficients, ‘Collaboration between professional bodies and academia in reinstating ethics’ (V_{12}) has highest influence.

Increasing focus on Ethics in Education (Factor-2)

$$\Rightarrow F_2 = -0.176V_2 - 0.119V_3 - 0.029V_4 - 0.228V_5 + 0.041V_6 + 0.142V_7 + 0.326V_8 + 0.443V_9 + 0.401V_{10} - 0.042V_{11} - 0.125V_{12} - 0.113V_{13} - 0.031V_{14} + 0.044V_{15} + -0.060V_{16}$$

Following the same rule as described above, a strong positive influence of variables, V_8 , V_9 , and V_{10} on Factor-2 is seen. ‘Ethical education’ (V_9) has highest impact on this factor.

Punitive Action and Inner Values (Factor-3)

$$\Rightarrow F_3 = 0.098V_2 + 0.238V_3 + 0.083V_4 + 0.439V_5 + 0.405V_6 + 0.374V_7 + 0.073V_8 - 0.084V_9 - 0.094V_{10} - 0.049V_{11} - 0.021V_{12} - 0.008V_{13} + 0.062V_{14} - 0.077V_{15} + 0.018V_{16}$$

Variables, V_5 , V_6 , and V_7 have considerable influence on this factor with ‘Punitive actions’ (V_5) depicting highest impact.

Public Awareness and Global Regulatory Convergence (Factor-4)

$$\Rightarrow F_4 = 0.095V_2 + 0.065V_3 - 0.128V_4 - 0.040V_5 + 0.070V_6 - 0.016V_7 - 0.055V_8 - 0.024V_9 + 0.027V_{10} - 0.051V_{11} - 0.021V_{12} + -0.057V_{13} + 0.434V_{14} + 0.484V_{15} + 0.425V_{16}$$

Variables, V_{14} , V_{15} , and V_{16} which are grouped under this factor eventually have substantial influence on this factor. In terms of magnitude of coefficients, ‘Mass media as a medium of spreading ethical awareness’ (V_{15}) is most influential.

Regulatory Framework and Recent Events (Factor-5)

$$\Rightarrow F_5 = 0.374V_2 - 0.587V_3 + 0.481V_4 + 0.044V_5 - 0.070V_6 - 0.068V_7 - 0.012V_8 - 0.012V_9 - 0.019V_{10} - 0.007V_{11} - 0.011V_{12} - 0.005V_{13} - 0.131V_{14} - 0.005V_{15} - 0.037V_{16}$$

Variables, V_2 , V_3 and V_4 are major influencing variables of this factor. The magnitude of coefficients shows that ‘Sufficiency of regulatory framework’ (V_3) influences this factor most.

If Likert’s scale value of each IV of a respondent is incorporated in the above equations, factor scores of that respondent with respect to that factor can be generated (Gaur, 1997). In the same way, factor

scores of all 601 respondents can be generated for the 5 extracted factors. The purpose of data reduction through Factor Analysis is met.

6.3.5. Factor Model Fitness

The fitness of the factor model is estimated from Residual Correlation Matrix (*Refer to Table 3, Annexure 1*). A decision on model fitness is taken on the basis of the number of non-redundant residuals with absolute values greater than 0.05 (Sarkar, et. al., 2011). If the number is very large, the model cannot be considered to be fit. The total number of residuals is calculated from the formula $[n \times (n-1) \div 2]$. In this study, there are 15 variables. Hence, the total number of residuals are, $(15 \times 14 \div 2) = 105$. Here, only 34 residuals out of 105 residuals have absolute value more than 0.05. It is only 32% of the total number of residuals. The proportion is insignificant in social science research. So, it can be concluded that the factor model perfectly fits the data.

7. Conclusions

Regulatory reforms are not sufficient enough to completely resolve the problem of audit failure, while enhancement of ethical orientation is very much essential as well. In this study, professional accountants, investors, corporate personnel, and people from academic fraternity have expressed their concern and pointed out some issues that eroded ethical behaviour of statutory auditor. In order to identify the primary factors governing ethical responsibility of statutory auditors the study identifies a few important issues that positively or negatively influence ethical behaviour of statutory auditors. Opinions of statutory auditors and other related groups are collected on those issues. Exploratory Factor Analysis is conducted on the data collected. Five factors covering five distinct dimensions have been identified. 'Practical Approaches of Education on Ethics to Professionals', 'Increasing focus on Ethics in Education', 'Punitive Action and Inner Values', 'Public Awareness and Global Regulatory Convergence', and 'Regulatory Framework and Recent Events' are the factors that may govern statutory auditors' ethical responsibility.

The factors identified suggest that the Institute of Chartered Accountants of India (ICAI) should give maximum emphasis on practical training programmes for auditors. They should also organise awareness programmes, sometimes in collaboration with academic institutions. Aspiring statutory auditors should be taught the ethical implication of each of their professional decisions. Instituting a strict disciplinary mechanism may provide some solution to ethical failure of statutory auditors. Regulatory bodies, such as Peer Review Board, Quality Review Board (QRB), the Securities and Exchange Board of India (SEBI) should increase their effectiveness in enforcing existing regulations. A collaboration of all the aforesaid efforts may ultimately improve ethical responsibility of statutory auditors.

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Annexure 1

Table 1: Rotated Component Matrix

Variables	Component				
	1	2	3	4	5
V ₂	.072	-.152	.226	.274	.578
V ₃	-.002	-.204	.218	-.090	-.784
V ₄	.063	.081	.276	-.037	.681
V ₅	.089	-.172	.721	-.040	.143
V ₆	.062	.257	.735	.127	.048
V ₇	.000	.378	.706	-.015	.025
V ₈	.262	.703	.299	.013	.071
V ₉	.221	.826	.058	.061	.052
V ₁₀	.262	.775	.032	.145	.054
V ₁₁	.829	.294	.034	.106	.045
V ₁₂	.877	.187	.059	.155	.047
V ₁₃	.871	.206	.086	.101	.050
V ₁₄	.175	.085	.111	.700	-.018
V ₁₅	-.013	.097	-.105	.779	.133
V ₁₆	.127	.009	.037	.698	.093

(Source: Compilation of Field Survey Data using SPSS 20.0)

Table 2: Component Score Coefficient Matrix

Variables	Component				
	1	2	3	4	5
V ₂	.031	-.176	.098	.095	.374
V ₃	.065	-.119	.238	.065	-.587
V ₄	.002	-.029	.083	-.128	.481
V ₅	.073	-.228	.439	-.040	.044
V ₆	-.072	.041	.405	.070	-.070
V ₇	-.120	.142	.374	-.016	-.068
V ₈	-.046	.326	.073	-.055	-.012
V ₉	-.098	.443	-.084	-.024	-.012

V₁₀	-.072	.401	-.094	.027	-.019
V₁₁	.377	-.042	-.049	-.051	-.007
V₁₂	.424	-.125	-.021	-.021	-.011
V₁₃	.421	-.113	-.008	-.057	-.005
V₁₄	-.014	-.031	.062	.434	-.131
V₁₅	-.128	.044	-.077	.484	-.005
V₁₆	-.021	-.060	.018	.425	-.037

(Source: Compilation of Field Survey Data using SPSS 20.0)

Table 3: Residual Correlation Matrix

	V₂	V₃	V₄	V₅	V₆	V₇	V₈	V₉	V₁₀	V₁₁	V₁₂	V₁₃	V₁₄	V₁₅	V₁₆
V₂		.145	-.232	-.096	.002	-.026	.002	.079	.092	.015	-.034	-.022	-.049	-.071	-.089
V₃	.145		.208	-.031	-.085	-.095	.017	.072	.072	-.006	-.023	-.023	-.043	.039	-.010
V₄	-.232	.208		-.054	-.061	-.052	-.004	-.006	.000	-.023	.008	-.007	.087	.038	.022
V₅	-.096	-.031	-.054		-.193	-.165	.015	.135	.073	-.007	-.034	-.032	-.037	.078	.023
V₆	.002	-.085	-.061	-.193		-.100	-.101	-.049	.010	-.024	.035	.034	-.026	-.038	-.032
V₇	-.026	-.095	-.052	-.165	-.100		-.035	-.121	-.076	.060	.022	.017	-.013	.026	.007
V₈	.002	.017	-.004	.015	-.101	-.035		-.076	-.167	.000	-.012	-.017	-.017	.040	.032
V₉	.079	.072	-.006	.135	-.049	-.121	-.076		-.046	-.048	.001	-.004	.005	-.024	.009
V₁₀	.092	.072	.000	.073	.010	-.076	-.167	-.046		-.003	-.026	-.013	-.023	-.048	.002
V₁₁	.015	-.006	-.023	-.007	-.024	.060	.000	-.048	-.003		-.082	-.096	-.036	.029	.006
V₁₂	-.034	-.023	.008	-.034	.035	.022	-.012	.001	-.026	-.082		-.070	.001	.018	-.026
V₁₃	-.022	-.023	-.007	-.032	.034	.017	-.017	-.004	-.013	-.096	-.070		-.012	.026	-.011
V₁₄	-.049	-.043	.087	-.037	-.026	-.013	-.017	.005	-.023	-.036	.001	-.012		-.170	-.239
V₁₅	-.071	.039	.038	.078	-.038	.026	.040	-.024	-.048	.029	.018	.026	-.170		-.179
V₁₆	-.089	-.010	.022	.023	-.032	.007	.032	.009	.002	.006	-.026	-.011	-.239	-.179	

(Source: Compilation of Field Survey Data using SPSS 20.0)

Market Reaction to Financial Disclosure: A Study on Cipla Ltd.

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Abstract: This research article attempts to empirically examine the relative significance of selected accounting parameters on the stock market performance of the Indian pharmaceutical industry. The selected parameters include total income, operating profit, earnings per share, cash flow and book value per share. The effect of changes of these selected parameters is measured on the proxy company – Cipla Ltd. It is a study conducted over a ten year period from 2007-16. The period has been carefully chosen to encompass significant changes taking place all over the world and also in the world of Indian accounting and reporting system.

The study considers the result day declaration price only as the dependent variable for most cases as the period around the result declaration day hold much more significance for the movements in share price than the customary financial year-end price. The study is mainly based on a set of progressive regression equations with checks for goodness of fit, autocorrelation, and multi-collinearity. The final outcome suggests that for Cipla specifically and for the pharmaceutical industry in general, cash flow and book value surprisingly seem to be best determinants of its share price rather than the usual income related parameters.

Key-words: Accounting parameters, market price, multiple regression, correlation analysis.

1. Introduction

The Indian pharmaceutical industry is a star sector in the Indian industrial landscape. It is one of the sectors that has successfully harnessed the intellectual capital of India and has become one of the top export earners of modern India. As per EquityMaster, it accounts for 20 per cent in volume terms and

1.4 per cent in value terms of the Global Pharmaceutical Industry. India is currently the largest provider of generic drugs globally accounting for 20 per cent of global export volume.

Indian pharmaceutical sector is expected to grow to US\$ 55 billion by 2020, and further to US\$100 billion by 2025. The sector has been forecasted to generate 58,000 additional job opportunities by the year 2025. India's pharmaceutical exports stood at US\$ 16.8 billion in 2016-17 and are expected to grow by 30 per cent over the next three years to reach US\$ 20 billion by 2020, according to the Pharmaceuticals Export Promotion Council of India (PHARMEXCIL).

The key reasons behind the superlative performance of the sector are as follows:

- India's cost of production is nearly 33 per cent lower than that of the US.
- The labour cost is 50–55 per cent cheaper than in most Western countries.
- The cost of setting up a production plant with modern hygiene standards in India is 40 per cent lower than in Western countries.
- India has a skilled workforce, and managerial and technical competence in comparison to its peers in Asia.
- India has the 2nd largest number of USFDA-approved manufacturing plants outside the US. It has 2,633 FDA-approved drug products and has over 546 USFDA-approved company sites, the highest number outside the US.

Cipla Ltd. is one such leading global pharmaceutical company from India, dedicated to high-quality, branded and generic medicines. It is present in over 80 countries.

The Company was incorporated in 1935 by Dr. K.A. Hamied. Its Registered Office is in Mumbai. The company is part of both BSE Sensex 50 and the NSE Nifty and has a large number of investors in its shares with a market capitalisation of over Rs. 410.44 billion (as on March 31st, 2016).

The company currently has a turnover over USD 2.2 Billion and an employee base of about 23,000. Cipla has over 43 state-of-the-art manufacturing facilities for API and formulations providing 1500 products across various therapeutic categories, with more than fifty dosage forms.

Cipla's state-of-the-art manufacturing facilities are approved by major international regulatory agencies including the US FDA, MHRA (UK), TGA (Australia), Federal Ministry of Health-Germany, MCC (South Africa), the Department of Health (Canada), ANVISA (Brazil), WHO and Ministry of Health of various countries.

2. Research Problem

Capital market investment by the general public is always fraught with risk. While short-term investors mainly depend on technical charts to make some quick profit, fundamental and long-term investors are very much interested in pre-determining the share price of a company in order to harvest a good profit from their investments. This is what exactly this paper attempts to find out by analysing the effect of actual accounting results on the share price of Cipla Limited.

3. Literature Review

There have been many studies on the effect of company specific factors on its own share price both from Indian sources and foreign sources as stated below.

Bagherzadeh, *et. al.* (2013), Dawar (2012), and Sharma (2014) have found evidence of the effect of accounting parameters on share prices with greater precision.

Bhatt *et. al.* (2012) has highlighted the impact of earnings per share (EPS) while Gee-Jung (2009) has empirically indicated that book value and cash flows are more value relevant than earnings.

Udhaya (2014) in his paper has shown that in Bombay Stock Exchange the companies representing industries have reflected semi-strong form of market efficiency.

Halonon, *et. al.* (2013) have found that value relevance as measured by Book Value per share (BV) has increased over time. Sharma (2011) observed that earnings, dividend and book value per share have significant impact on the market price of share.

So, after going through the above studies in both Indian and foreign context, the five well researched accounting variables have been selected as the independent variables – total income (TI), operating profit (OP), earnings per share (EPS), Cash Flow (CF), and Book Value per share (BV), for the study.

4. Objectives of the Study

The literature studied have shown that the effects of the selected accounting parameters on the share price of a company representing the Indian pharmaceutical industry have not been noticed. So the present paper attempts to fill in the gap.

The selected two objectives are as follows –

- a) To study the role of accounting parameters in determining the share price of Cipla.
- b) To determine the exact parameters having the most statistically significant effect on the share price of the selected company.

5. Research Methodology

The data for the present study was collected from the company's Annual Reports, websites of BSE, NSE and magazines over a ten year period from financial year ending 2007 to 2016.

The twin objectives are tested by two simple statistical techniques –

a) Bivariate correlation analysis among YEP (year-end price) or RDDP (result declaration day price) with the accounting parameters. YEP or RDDP is selected depending on better statistical correlation.

b) Progressive multiple regressions are then computed with share price taken as the dependent variable and the number of independent variables are steadily increased depending on the acceptability of the model as indicated with the help of Adjusted R^2 , Durbin-Watson d-statistic, F-ratio and average VIF figures.

The formula used for Pearson's correlation is given below:

$$r = \frac{\text{Cov}(x,y)}{\sigma_x \cdot \sigma_y}$$

where, $\text{Cov}(x,y) = (1/n) \sum (X - \bar{X})(Y - \bar{Y})$

A strong linkage between stock prices and selected parameters implies a high degree of positive or negative correlation (close to 1) between YEP and RDDP with the figures of TI, OP, EPS, CF, and BV. Then multiple linear regressions are framed to study the dependency of share price (RDDP or YEP) on five explanatory variables (TI, OP, EPS, CF, BV) in a progressive manner. **Eleven** such equations are framed. The **final** equation that considers all the variables is as follows:

$$\text{YEP or RDDP} = a + b.TI + c.OP + d.EPS + e.CF + f.BV + z$$

where, **a** is the constant term;

b, c, d, e, and **f** are the regression coefficients;

z is the error term.

In order to test the efficacy of the models, the equations are further examined for goodness-of-fit (through *adjusted* coefficient of determination (R^2) and F-ratio), autocorrelation (through Durbin-Watson 'd' statistic), and multicollinearity (through Variance Inflation factor *i.e.*, VIF). A histogram is also drawn based on residual statistics to exhibit normality of data.

6. Research Findings

In the accompanying Table 1, the Pearson's correlation coefficients of share price of Cipla with that of its five accounting parameters are analysed. It can be observed from the table that total income (**TI**), operating profit (**OP**) and book value (**BV**) are all significantly correlated with both Year-end Price (**YEP**) and Result Declaration Day Price (**RDDP**). Furthermore, earnings per share (**EPS**) is also correlated at the 5% level with RDDP. However, the correlation of RDDP looks to be stronger than YEP in all the cases. So RDDP is taken as the chosen dependent variable for the following set of regression equations.

Table 1: Correlation coefficients (r) with RDDP and YEP

	T.I.	O.P.	EPS	C.F.	B.V.
YEP [Sig. level]	0.815** [0.004]	0.672* [0.033]	0.597 [0.068]	-0.112 [0.757]	0.854** [0.002]
RDDP [Sig. level]	0.831** [0.003]	0.718** [0.019]	0.647* [0.043]	-0.105 [0.772]	0.874** [0.001]
* = Correlation is significant at the 0.05 level (2-tailed)					
** = Correlation is significant at the 0.01 level (2-tailed)					

[Source: Author's own calculations]

Among the five independent variables, BV has the strongest correlation with RDDP. Hence in the first regression equation, BV is taken as the sole independent variable. The output is given in Table 2.

Table 2: Results of First Regression

Sl. No.	Variables taken	Adj. R ²	d-statistic	F-ratio [sig.]	Avg. VIF
R1	RDDP (dependent) and BV	0.735	2.716	25.976 (0.001)	1.00

[Source: Author's own calculations]

The output from the table shows that BV is having good explanatory power regarding the share price of the Cipla in respect of the adjusted R² and F-ratio values. In Table 3, the remaining variables like total income (TI), operating profit (OP), earnings per share (EPS), and cash flow (CF) are progressively considered along with BV.

Table 3: Key aspects of Second to Fifth Regressions

Sl. No.	Variables taken	Adj. R ²	d-statistic	F-ratio [sig.]	Avg. VIF
R2	RDDP (dependent) and BV, TI	0.733	2.005	13.384 (0.004)	32.515
R3	RDDP (dependent) and BV, OP	0.776	3.213	16.565 (0.002)	7.096
R4	RDDP (dependent) and BV, EPS	0.762	3.192	15.371 (0.003)	4.036
R5	RDDP (dependent) and BV, CF	0.779	2.266	16.880 (0.002)	1.176

[Source: Author's own calculations]

Table 3 shows that out of four equations, the fifth one has the best fit. The two independent variables BV and CF can explain about 78% (adjusted R² being 0.779) of the change in share price of Cipla. The second regression has a serious problem of multi-collinearity. The third and fourth are marginally inferior to the fifth one. Hence the fifth regression is finally chosen for the next set of tests with the remaining variables.

Table 4 given below now incorporates additional variables like TI, OP and EPS to the fifth regression.

Table 4: Results of Sixth to Eighth Regressions

Sl. No.	Variables taken	Adj. R ²	d-statistic	F-ratio [sig.]	Avg. VIF
R6	RDDP (dependent) and BV, CF, TI	0.766	1.643	10.824 (0.008)	22.532
R7	RDDP (dependent) and BV, CF, OP	0.821	2.636	14.719 (0.004)	5.157
R8	<i>RDDP (dependent) and BV, CF, EPS</i>	0.828	2.752	15.490 (0.003)	3.182

[Source: Author's own calculations]

Among the three equations in Table 4, the eighth regression has a better fit in terms of adjusted R². However, the regression has marginal problems of auto-correlation and multi-collinearity. Hence for the next set of equations, the eighth regression is taken as the base and TI and OP are added progressively.

Table 5: Results of Ninth and Tenth Regressions

Sl. No.	Variables taken	Adj. R ²	d-statistic	F-ratio [sig.]	Avg. VIF
R9	RDDP (dependent) and BV, CF, EPS, TI	0.832	2.344	12.125 (0.009)	19.193
R10	RDDP (dependent) and BV, CF, EPS, OP	0.794	2.773	9.694 (0.014)	44.527

[Source: Author's own calculations]

The output from the above table indicates that both the equations face the problem of multi-collinearity.

In the final regression, all the independent variables are considered corresponding to RDDP.

Table 6: Results of Eleventh Regression

Sl. No.	Variables taken	Adj. R ²	d-statistic	F-ratio [sig.]	Avg. VIF
R11	RDDP (dependent) and ALL other variables	0.792	2.232	7.871 (0.034)	56.044

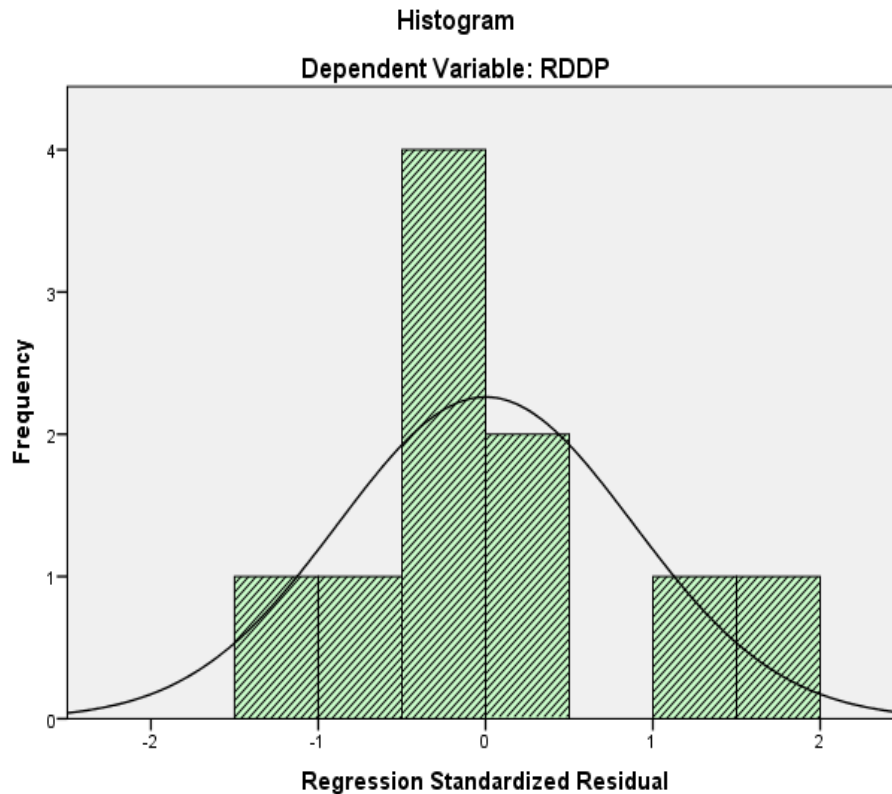
[Source: Author's own calculations]

Table 6 gives the final regression output. The eleventh regression has a moderately good fit without marginal autocorrelation problem. But the equation has an acute problem of multi-collinearity.

Summarising from the eleven regression equations of Cipla, it can be concluded that the fifth and eighth regression equations have the best output. But to choose the final one, the fifth equation is the best because of negligible autocorrelation and multi-collinearity problems. The associated histogram has almost a normal bell-shaped curve indicating normality of data.

Hence it can be said that Book value and Cash flow of Cipla are the best determinants of its share price.

Figure 1:



The final selected regression output stands as follows:

$$\text{RDDP} = -66.19 + 0.00000013 \text{ CF} + 3.17 \text{ BV} + 61.37$$

The values of the coefficient indicate that share price has negligible association with cash flow (CF), while book value (BV) impacts share price almost three times.

7. Conclusion

The present study focuses on the effect of accounting results on the share price of an Indian pharmaceutical company – Cipla. The outcome of the regression equations presents a surprising result. It indicates that rather than the current accounting figures of total income or earnings per share, the historical value of book value and amount of cash generated by the business are very important factors in determining the share price.

If the results are extrapolated over the entire pharmaceutical industry, similar conclusions can be drawn. However, a few more studies on other Indian pharma companies must be conducted in a similar fashion before coming to a definitive conclusion.

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Foreign Currency Exposure of Indian Multinational Companies around the Financial Crisis Period of 2008-2009

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Abstract: In the modern era of globalization, Multi-National Corporations (MNCs) play a key role in the economic growth of a country. They contribute to the economy through Foreign Direct Investments and Foreign Portfolio Investments. India being an emerging economy has also been impacted by the presence of MNCs. The performance of MNCs is influenced by myriad of factors, both domestic and global. One of these factors is inevitably the foreign exchange rate. The performance of MNCs, in terms of economic as well as transaction exposure, depends to a great extent on exchange rate fluctuation. Thus the performance, explicitly replicated by the stock return of MNCs, should not be viewed in isolation. The association between the two markets, with its changing nature is particularly relevant in the present era of strong global financial market integration. The presence of dynamic linkages between the stock market and foreign exchange market has been abundantly evidenced in the literature. However the Sensex is a representation of the Indian Stock Market and includes many companies which operate solely within the National Territory. In order to have a more defined view, the MNC index constituted by global players, has been considered in the present study. Focusing on the recent global financial turmoil of 2007-2008, this paper tries to find the pattern of inter-linkages, specifically the volatility dynamics between the stock return of multi-national firms and foreign exchange rates viz. INR/USD and INR/Euro with respect to India before starting of the global turmoil, during the period of it, and aftermath. Volatility spillover between financial markets has direct implications not only for financial hedging, portfolio management and asset allocation, but also to policy makers and regulators of a country. Based on the volatility dynamics, this study helps the MNCs to manage its currency exposures.

Key-words: Translation exposure, economic exposure, transaction exposure, operating exposure.

1. Introduction

Theoretical background of exchange rate exposure of a firm is enormous. Following a textbook treatment, the foreign exchange exposures of the firm are of two types' viz., Accounting or Translation Exposure, and Economic Exposure. The basic difference between the two is that the accounting exposure is derived from the consolidated financial statement of the parent company and it does not

influence the cash flow. Economic exposure, on the contrary, is the result of the altered cash flow of a company. The economic exposure is further divided into Transaction Exposure and Real Operating Exposure.

Transaction Exposure deals with the changes in cash flows that result from existing contractual obligations denominated in foreign currency. It refers to the risk associated with the change in the exchange rate between the time an enterprise initiates a transaction and settles it.

Operating exposure relates to the effect of unexpected exchange rates on the future operating cash flows of the company. In financial management, a firm is valued by the net present value of the future cash flows. A change in the exchange rate may bring about changes in the cash flows of the company directly by affecting its revenues and costs and indirectly by affecting its competitiveness by the action of its consumers and competitors. As a result, the net present value may differ from the one anticipated.

Finally, Translation Exposure (or Accounting Exposure) arises when the enterprises has subsidiaries abroad. In many countries, multinational companies are required to consolidate the assets and liabilities of the subsidiaries with those of the parent company and present consolidated financial statements. The functional currency used is important because it determines the translation process. If the local currency is used, all assets and liabilities are translated at the current rate of exchange. Moreover, translation gain or losses are not reflected in the income statement but rather are recognized in owner's equity as a translation adjustment. The fact that such adjustments do not affect accounting income is appealing to many companies. Translation exposure should have no effect on the price of a firm's stock with a notion that investors price stocks according to expected future cash flow.

Even a domestic firm with no foreign activities may be exposed to exchange-rate risk for two reasons. Firstly, depreciation or appreciation in the domestic currency has an impact on the earnings of the domestic firms leading to increase or decrease in the value of the firms having foreign competitors. Secondly, the volatility of exchange rate also affects the firms having no foreign competitors, due to the fact that change in exchange rate may affect the input price. For example, depreciation of domestic currency resulting in higher demand for inputs by the export oriented companies leading to increase in the input prices. The firms belong to protected industry also share the same source of input. Thus the rise in input price negatively impact the profitability of those firms. In other words, the depreciation of the exchange rate has a negative impact on the cash flows of the firm. So, it can be said that performance of multinational or domestic firms alike are affected to a large extent by exchange rate fluctuations.

2. Review of Literature

Former studies in the empirical exposure literature have predominantly focused on the amount of exposure and its consistency with the theoretical determinants of exposure. Jorion (1990) in his study finds that only 5% of sample of 287 large U.S. multinational firms have significant exchange rate exposure. However, Amihud (1993), Bartov and Bodnar (1994) and Choi and Prasad (1995) find no such evidence of contemporaneous exposure for U.S. multinationals, although Bartov and Bodnar do find that U.S. firms respond to past quarterly exchange rate movements. Related global studies that explore numerous countries, such as Bodnar and Gentry (1993), Dominguez and Tesar (2001) and Doidge, Griffin and Williamson (2002), also find an astonishingly low number of firms that exhibit significant sensitivity to exchange-rate movements. Bodnar and Gentry (1993) examine exchange-rate exposure at industry level for Canada, Japan and the US over 1979-1988. For the US and Canada they find that respectively 11 out of 39 industries (28%) and 4 out of 19 (21%) have significant exchange-rate exposures. In contrast, the results for Japan indicate that 7 out of 20 industries (35%) are significantly exposed at the 10%-level. Bodnar and Gentry (1993) also test the hypothesis that small and open economies are more sensitive to exchange-rate exposure by investigating the inter-industry variance of the exposure coefficients. They find that the variance of the exposure coefficients is smaller for the US than for Canada and Japan. As the US is the largest and least open economy of the three countries, the results suggest that industries in smaller and more open economies are likely to be more exposed to exchange-rate fluctuations.

Studies on Japanese firms by Bodnar and Gentry (1993) at the industry portfolio level, by He and Ng (1998) at the firm level for several industries and Williamson (2001) at the firm level for the automotive industry, do report significant exchange rate exposure. However, Griffin and Stulz (2001) in their study on the economic magnitude of exchange rate exposure suggest that the extremely high exposure exhibited by the Japanese industries, particularly the automotive industry, is not the norm. Two studies with a large set of international firms are Dominguez and Tesar (2001) and Doidge, Griffin and Williamson (2002). The latter study is the most comprehensive international study on exchange-rate exposure. Using individual firm data from over 27,000 stocks in 21 developed and 29 emerging markets, they still find surprisingly low exchange-rate sensitivity levels. Moreover, they detect quite some cross-sectional variation that cannot be explained fully by exchange-rate determinants. Interestingly, they find that exchange rates affect firm value mainly in periods of large exchange-rate changes. Dominguez and Tesar (2001) study over 2000 firms in 8 countries. The authors use a trade-weighted exchange-rate index, the US dollar and the currency of the largest trading partner. The results show that the trade weighted exchange-rate index understates the exposure. Recent studies, however, show that derivatives usage reduces foreign-exchange exposure. Despite these efforts, the low exposures remain a puzzling phenomenon. The aforementioned studies typically use a trade-

weighted exchange-rate index as a proxy for a firm's exposure to individual exchange rates. Ideally, we would like to have information on the relevant exchange rates for each firm. While some studies (Dominguez and Tesar, 2001) use individual exchange rates, the selection is not based on firm-specific information. Ihrig (2001) constructs a company-specific exchange-rate index using the number and location of each multinational's subsidiaries. Using this company specific exchange-rate index, she finds 16% of the firms to be significantly exposed to exchange-rate risk versus 10% when using a trade-weighted exchange-rate index. More importantly, as we discuss below, our approach differs substantially from prior studies.

One problem in modeling the relation between exchange rates and firm value is that perhaps it is too simplistic to assume that exchange rate changes have a linear and constant impact on firm value. Only in simplified situations does the theoretical literature predict a linear relation and these methodological issues may mask exposure {Dewenter, Higgins, and Simin (2002)}. Even if the exposure-return relation is linear, but varies through time (Allayannis, 1997), an exposure regression will be misspecified if an imperfect proxy is used to capture the time-variation in exposure. To address these concerns, in addition to tabulating results based on standard regression approaches, we propose a different method to examine exposure.

3. Data and Methodology

Daily closing data of stock price and exchange rates from January 2, 2006 to December 31, 2013 has been considered for this study. The sample is divided into three sub-periods based on the price movements in S & P CNX Nifty:

- i) Period 1 (Pre-crisis period): January 2, 2006 to January 17, 2008
- ii) Period 2 (In-crisis period) : January 18, 2008 to July 20, 2009
- iii) Period 3 (Post-crisis period) : July 21, 2009 to December 31, 2013

At micro level, we further consider the individual stock return of 11 different MNCs, constituents of the CNX MNC indices and two different exchange rates namely, INR/USD and INR/Euro Exchange Rate for this study, based on the assumption that firms within an industry need not be homogeneous. It may be that industry-wide exposure is actually high but that individual firms within the industry are exposed in opposite ways. An aggregation of their returns will therefore average out the individual exposure effects.

To segregate the time period into three sub-periods, the Modified Identification of multiple structural breaks in variance (Modified ICSS Test) proposed by Sans et al. (2003) has been used.

To test the stationarity, Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) has been used. The study of volatility spillover provides useful insights into how information is transmitted from foreign exchange market to individual stock return. Multivariate Asymmetric GARCH (Diagonal VEC) model is used to capture the contagion and asymmetric effect of different foreign exchange on stock return of different selected companies. To explore the presence and nature of the volatility spill-over between the two markets, the study makes use of multivariate GARCH model. We are, in this paper, following the same methodology on Multivariate Asymmetric GARCH (Diagonal VEC) model, used by us, i.e., Saha and Chakrabarti (2011) in one of our paper. Earlier studies have made extensive use of Autoregressive Conditional Heteroskedasticity (ARCH) and Generalized ARCH (GARCH) type models that take into account the time-varying variances. Suitable surveys of ARCH modeling in general and its widespread use in finance applications may be found in Higgins and Bera (1993) and Bollerslev et al. (1988) respectively. Discussion on recent developments in this expanding literature could be found in Pagan (1996). More recently, the univariate GARCH model has been extended to the multivariate GARCH (MGARCH) case, with the recognition that MGARCH models are potentially useful developments regarding the parameterization of conditional cross-moments. Bollerslev (1986, 1990) used a MGARCH approach to examine the coherence in short-run nominal exchange rates, while Karolyi (1995) employed a similar model to examine the international transmission of stock returns between the United States and Canada. Dunne (1999) also employed a MGARCH model, though in the context of accommodating time variation in the systematic market-risk of the traditional capital asset pricing model. Kearney and Patton (2000) used a series of 3-, 4- and 5- variable MGARCH models to study the transmission of exchange rate volatility across European Monetary System (EMS) currencies prior to the introduction of the single currency. However, while the popularity of models such as these has increased in recent years, “...the number of reported studies of multivariate GARCH models remains small relative to the number of univariate studies” (Kearney and Patton, 2000).

The daily returns for the individual series are calculated based on the logged difference as below:

$$R_{it} = [\ln(P_{it}) - \ln(P_{it-1})] \quad \text{Equation.....(1)}$$

The diagonal VEC model chosen in this study is of particular interest as it allows the conditional variance covariance matrix of stock market returns to vary over time and is more flexible compared to BEKK model if there are more than two variables in the conditional variance covariance matrix (Scherrer and Ribarits, 2007). Empirical implementation of the VEC model is, however, limited due to the difficulty of guaranteeing a positive semi-definite conditional variance covariance matrix (Engle and Kroner (1993), Kroner and Ng (1998), Brooks and Henry (2000)). This study uses the

unconditional residual variance as the pre-sample conditional variance to overcome this problem thus guaranteeing the positive semi-definite of conditional variance covariance matrix of the diagonal VEC model. The conditional variance-covariance matrix (H_t) has four dimensions with the diagonal and non-diagonal elements representing the variance and the covariance terms, respectively. In matrix notation, H_t can be written as:

$$H_t = \begin{bmatrix} h_{11t} & \cdots & h_{1nt} \\ \vdots & \ddots & \vdots \\ h_{n1t} & \cdots & h_{nnt} \end{bmatrix} \quad (2)$$

Where h_{iit} is a conditional variance at time t of the stock return of country i and h_{ijt} denotes the conditional covariance between the stock returns of country i and country j (where $i \neq j$) at time t .

Although there are different ways of specifying the MGARCH model, this study uses the diagonal VEC model of Bollerslev et al. (1988) as the model is more flexible when H_t contains more than two variables (Scherrer and Ribarits, 2007). The diagonal VEC representation is based on the assumption that the conditional variance depends on squared lagged residuals and the conditional covariance depends on the cross-lagged residuals and lagged covariances of other series (Harris and Sollis, 2003). The diagonal VEC model can be written as follows:

$$\text{Vech}(H_t) = C + A\text{vech}(\varepsilon_{t-1}\varepsilon_{t-1}^T) + B\text{vech}(H_{t-1}) \quad (3)$$

Where, A and B are $\frac{N(N+1)}{2} \times \frac{N(N+1)}{2}$ parameter matrices and C is a $\frac{N(N+1)}{2} \times 1$ vector of constants. The diagonal elements of matrix A (a_{11} , a_{22} , a_{33} and a_{44}) measures the influences from past squared innovations on the current volatility (i.e. own-volatility shocks) while non-diagonal elements (a_{ij} where, $i \neq j$) determine the cross product effects of the lagged innovations on the current volatility (i.e. cross-volatility shocks). Similarly, the diagonal elements of matrix B (b_{11} , b_{22} , b_{33} and b_{44}) determine the influences from past squared volatilities on the current volatility (i.e. own-volatility spillovers) and non-diagonal elements (b_{ij} where, $i \neq j$) measure the cross product effects of the lagged co-volatilities on the current co-volatility (i.e. cross-volatility spillovers).

The study has incorporated a threshold term in the variance-covariance equation to capture asymmetric volatility spill-over. Volatility responses are said to be asymmetric when volatility changes dissimilarly with good and bad news in any market. In presence of asymmetric volatility spill over, volatility responses of any market towards good or bad news in any other markets will be different. The model used in this study could be represented as:

$$\begin{aligned} \text{VECH}(H_t) &= C + A.\text{VECH}(\epsilon_1(t-1) \epsilon_1(t-1)') + B.\text{VECH}(H_{t-1}) + \\ &D.\text{VECH}((\epsilon_1(t-1) \epsilon_1(t-1)') < 0] * ((\epsilon_1(t-1) \epsilon_1(t-1)') < 0]) \\ &+ D*\text{VECH}((\epsilon_1(t-1) \epsilon_1(t-1)') < 0] * ((\epsilon_1(t-1) \epsilon_1(t-1)') < 0]) \end{aligned}$$

(4)

A, D and B are $\frac{N(N+1)}{2} \times \frac{N(N+1)}{2}$ parameter matrices. C is $\frac{N(N+1)}{2}$ vector of constant. a_{ii} in matrix A, that is the diagonal elements show the own innovation impact and the cross diagonal terms (a_{ij} , $i \neq j$) show the cross innovation impact. Similarly, b_{ii} in matrix B shows the own volatility impact and b_{ij} shows the cross volatility impact. d_{ii} shows the volatility spillover with asymmetry from the i 'th market to itself. d_{ij} shows the volatility spill over with asymmetric response from the i 'th market to the j 'th market.

Karunanayake et al.(2008) emphasize that in estimation of a diagonal VECH model the number of parameters to be estimated are crucial. Bollerslev et al. (1988) and Goeij and Marquering (2004) suggested use of a diagonal form of A and B. Moreover, in the estimation process, one has to ensure the positive semi-definiteness of the variance covariance matrix. The condition is satisfied if all of the parameters are positive with a positive initial conditional variance covariance matrix (Bauwens et al., (2006)). Bollerslev et al. (1988) suggested some restrictions to be used in the estimation process that were duly followed by Karunanayake et al. (2008). They used maximum likelihood function to generate these parameter estimates by imposing some restriction on the initial value.

Prior to implement the Asymmetric MGARCH model on the selected data series, the descriptive statistics of the raw return, particularly measures of skewness, kurtosis and Jarque-Bera Statistics are calculated to explore the nature of the selected return series.

4. Results

4.1. Stationarity Test and Descriptive Statistics

The descriptive statistics and unit root test results for eleven different multinational firms, two foreign exchange rates and NSE as a proxy for market index for the pre-crisis period has been shown in Table 1 to Table 4. For bilateral exchange rates, USD has negative means (-0.00023), indicating that the rupee was appreciating on average against those two currencies during the sample period. However, it is positive for euro (0.000174), suggesting that rupee was depreciating against euro during the sample period. All the return series for pre-crisis period showed in Table 1 to Table 4 of the selected companies under different industries, two foreign exchange rates and NSE NIFTY under ADF and PP

test found stationary at level. All the series were non normal, skewed and had kurtosis values greater than three.

Table 1: Descriptive Statistics for pre-crisis period

SL NO.	Name of the Company	Mean	Median	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability
	ABB	-0.00066	0.00162	0.072036	-19.1239	405.589	3393471	0
	CUMMINSIND	0.00159	-0.00059	0.026948	0.381328	4.614036	66.1252	0
	GLAXO	-0.00028	-0.0012	0.02138	0.01136	5.58222	138.3688	0
	GUJAMBCEM	0.000831	0.000683	0.021955	-0.0717	6.127067	203.3315	0
	HINDLEVER	3.23E-05	-0.00112	0.021826	0.345812	4.932389	87.40873	0
	IFLEX	0.000342	-0.00052	0.02657	0.186795	8.548747	641.7594	0
	MARUTI	0.000369	-0.00043	0.024075	-0.00505	5.996438	186.3089	0
	MICO	0.001083	-0.00045	0.022557	1.547826	11.02499	1535.158	0
	SESAGOA	0.002125	-1.17E-05	0.031856	0.124724	5.852552	170.135	0
	SIMENS	-0.00125	0.000487	0.079643	-18.2927	382.8572	3021822	0
	STER	-0.00043	0.001555	0.079219	-15.7509	313.2101	2017370	0

Table 2: Stationarity Test for pre-crisis period

SL NO.	Name of the Company	ADF	PP	Bandwidth
	ABB	-22.787*	-22.7914*	2
	CUMMINSIND	-23.9879*	-24.0738*	6
	GLAXO	-18.7657*	-23.885*	5
	GUJAMBCEM	-18.2545*	-22.8198*	1
	HINDLEVER	-21.8079*	-21.8077*	3
	IFLEX	-22.4695*	-22.4789*	7
	MARUTI	-23.0846*	-23.1955*	9
	MICO	-24.5356*	-24.6125*	5
	SESAGOA	-20.8099*	-20.7829*	9
	SIMENS	-21.5158*	-21.5024*	2
	STER	-21.8802*	-21.8765*	6

* Implies that significance at 1% level of significance

Table 3: Descriptive Statistics for pre-crisis period of Exchange Rates and NSE

SL no.	Name	Mean	Median	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability
1	USD	-0.00023	-7.45E-05	0.003403	-0.06127	8.034441	526.2326	0
2	EURO	0.000174	0.000408	0.004915	0.038077	3.831755	14.47553	0.000719
3	NSE	0.001417	0.001668	0.016132	-0.3781	5.040258	98.24037	0

Table 4: Stationarity Test for pre-crisis period of Exchange Rates and NSE

SL no.	Name of the Company	ADF	Lag	PP	Bandwidth
1	USD	-24.45335	0*	-24.43563	6*
2	EURO	-24.40661	0*	-24.40598	1*
3	NSE	-21.59442	0*	-21.59529	1*

* Implies that significance at 1% level of significance

Table 5 to 8 showed the descriptive statistics and unit root test results for eleven different multinational firms, two foreign exchange rates and NSE as a proxy for market index for crisis period. Most of the multinational companies had negative mean return with a high standard deviation as compared to the pre-crisis period. For bilateral exchange rates, all currencies, USD and euro have positive means (0.00075 and 0.000754 respectively), indicating that the rupee was depreciating on average against those currencies during the sample period. All the series were stationary under ADF and PP test, non-normal, skewed and had kurtosis values greater than three.

Table 5: Descriptive Statistics for crisis period

SL NO.	Name of the Company	Mean	Median	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability
	ABB	-0.00185	-0.00089	0.033277	-0.494	5.334846	95.61099	0
	CUMMINSIND	-0.00142	-0.00074	0.030171	-0.31627	6.504375	188.6261	0
	GLAXO	0.000729	0.001364	0.018606	-0.49857	6.320682	178.8159	0
	GUJAMBCEM	-0.00085	-0.00123	0.033988	0.025107	4.191447	21.15324	0.000026
	HINDLEVER	0.000529	-0.00077	0.024178	-0.13138	4.134307	20.166	0.000042
	IFLEX	0.000108	-0.00204	0.044301	-0.06024	4.900309	53.93212	0
	MARUTI	0.000919	0.001295	0.029623	-0.2702	3.507751	8.178883	0.016749
	MICO	-0.0008	-0.00082	0.022309	0.791334	20.88632	4796.076	0
	SESAGOA	-0.00721	-4.50E-05	0.161944	-16.6096	300.8125	1335713	0
	SIMENS	-0.00427	-0.00364	0.056336	-6.2662	83.01385	97569.26	0
	STER	-0.0013	0.001359	0.047968	-0.00646	3.760322	8.601563	0.013558

Table 6: Stationarity Test for crisis period

SL NO.	Name of the Company	ADF	PP	Bandwidth
	ABB	-17.6695*	-17.6325*	12
	CUMMINSIND	-19.4168*	-19.4168*	0
	GLAXO	-16.3932*	-16.368*	2
	GUJAMBCEM	-19.6163*	-19.6166*	1
	HINDLEVER	-20.8471*	-22.2189*	18
	IFLEX	-17.9074*	-18.0064*	7
	MARUTI	-16.8799*	-16.8336*	10
	MICO	-17.1084*	-17.1656*	14
	SESAGOA	-18.8872*	-18.8873*	1

	SIMENS	-17.3138*	-17.3127*	3
	STER	-14.7923*	-17.536*	10

* Implies that significance at 1% level of significance

Table 7: Descriptive Statistics for crisis period of Exchange Rates and NSE

SL no.	Name	Mean	Median	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability
1	USD	0.00075	0.000598	0.007081	-0.02057	7.692697	327.5935	0
2	EURO	0.000754	0.000691	0.0096	-0.01703	4.142552	19.43547	0.00006
3	NSE	-0.000931	0.000491	0.026595	-0.33051	4.433139	37.05118	0

Table 8: Stationarity Test for crisis period of Exchange Rates and NSE

SL no.	Name of the Company	ADF	Lag	PP	Bandwidth
1	USD	-19.04446	0*	-19.05061	4*
2	EURO	-21.04170	0*	-21.04170	0*
3	NSE	-17.93144	0*	-17.92843	15*

* Implies that significance at 1% level of significance

Table 9 to 12 showed the descriptive statistics and unit root test results for eleven different multinational firms, two foreign exchange rates and NSE as a proxy for market index for post-crisis period. Most of the multinational companies had positive mean return and less standard deviation as compared to the crisis period. For bilateral exchange rates, all currencies, USD and euro have positive means (0.000125 and 3.83E-05 respectively), indicating that the rupee was depreciating on average against those currencies during the sample period. All the series were stationary under ADF and PP test, non-normal, skewed and had kurtosis values greater than three. These justified the use of GARCH family models in the selected data set.

Table 9: Descriptive Statistics for post-crisis period

SL NO.	Name of the Company	Mean	Median	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability
	ABB	-0.00016	0.000176	0.019604	2.042043	26.39164	12616.11	0
	CUMMINSIND	0.000818	0.000295	0.02326	-6.2393	101.6484	221226.7	0
	GLAXO	0.000881	0.000574	0.0131	0.181704	5.337967	125.2587	0
	GUJAMBCEM	0.000791	0.000833	0.020544	0.28	4.338307	47.09194	0
	HINDLEVER	0.000509	0	0.016392	-0.13052	4.574724	57.00913	0
	IFLEX	0.000452	-0.00063	0.017798	0.815104	6.704956	366.5982	0
	MARUTI	-0.0002	-0.00074	0.019437	-0.25453	7.186423	397.9454	0
	MICO	0.001209	-0.00036	0.012896	1.278164	8.263218	766.0367	0
	SESAGOA	-0.00044	-0.00046	0.027525	-0.01478	5.639755	155.9354	0
	SIMENS	0.00097	0.000342	0.018288	1.143846	14.05078	2849.53	0
	STER	-0.0032	-0.00023	0.06141	-18.0144	384.2271	3280895	0

Table 10: Stationarity Test for post-crisis period

SL NO.	Name of the Company	ADF	PP	Bandwidth
	ABB	-22.9094*	-22.9533*	7
	CUMMINSIND	-24.471*	-24.4449*	5
	GLAXO	-22.5674*	-22.5931*	5
	GUJAMBCEM	-25.0564*	-25.0133*	6
	HINDLEVER	-22.2097*	-22.2369*	9
	IFLEX	-21.0048*	-20.999*	2
	MARUTI	-21.3588*	-21.3518*	11
	MICO	-18.1207*	-22.6219*	3
	SESAGOA	-22.9667*	-22.9656*	2
	SIMENS	-25.1781*	-25.2495*	0
	STER	-22.1968*	-22.1833*	5

* Implies that significance at 1% level of significance

Table 11: Descriptive Statistics for post-crisis period of Exchange Rates and NSE

SL no.	Name	Mean	Median	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability
1	USD	0.000125	-0.00016	0.004723	0.419366	4.245121	50.42867	0
2	EURO	3.83E-05	0.00013	0.006289	0.248659	3.549042	12.27878	0.002156
3	NSE	0.000118	0.000244	0.011811	-0.08955	3.56048	7.746514	0.020791

Table 12: Stationarity Test for post-crisis period of Exchange Rates and NSE

SL no.	Name of the Company	ADF	Lag	PP	Bandwidth
1	USD	-22.50621	0*	-22.52505	6*
2	EURO	-23.33534	0*	-23.37333	7*
3	NSE	-21.56168	0*	-21.51955	6*

* Implies that significance at 1% level of significance

4.2 Results of applying MGARCH

4.2.1 Pre-Crisis Period

The results of contagion effect are shown in Table: 13. In the pre-crisis period, the effect of own lagged innovation (a_{ij} , where $i=j$) were significant at five percent level of significance for 8 out of the 11 selected MNCs, indicating the presence of ARCH effect. Amongst eleven MNCs, the own lagged innovation impact was highest for Sesa Goa. Siemens India and Hindustan Unilever Ltd. are less impacted by own lagged innovation as compared to all other selected multinational companies in this segment. Based on the magnitude of the estimated cross innovation coefficients (a_{ij} : where $i \neq j$), it was observed that cross innovation impact emanating from two foreign exchange rates was not statistically significant for any of these selected companies in this segment. The cross innovation impact originating from NSE NIFTY was positive and significant at five percent level for 5/11 MNCs and the impact was highest for Cummins India ltd.

Table 13: Results for applying MGARCH (Diagonal VEC)

Pre-Crisis Period

	aij	company	usd	euro	nse
1	ABB	-0.00312	0.005095	0.010768	0.036209*
2	CUMMINSIND	0.138313*	0.019669	-0.00625	0.103854*
3	GLAXO	0.1245*	-0.00127	-0.0425	0.072719*
4	GUJAMBCEM	0.035351	0.027589	0.000846	0.00749
5	HINDLEVER	0.066821*	0.023411	0.020331	0.020331
6	IFLEX	0.117111*	-0.00252	-0.01743	0.039164
7	MARUTI	0.067867*	0.017309	0.042227	0.045026*
8	MICO	0.093278*	0.021005	-0.03845	0.064135
9	SESAGOA	0.148554*	0.014881	0.036733	0.051999
10	SIMENS	1.75E-01*	8.46E-02	-0.07589	-0.10736*
11	STER	-3.07E-03	1.39E-02	0.005017	0.062119

	dij	company	usd	euro	nse
1	ABB	8.28E-08	2.85E-07	2.87E-07	2.90E-07
2	CUMMINSIND	2.01E-06	2.61E-06	2.07E-07	3.15E-06
3	GLAXO	0.001709	0.000792	-0.00042	0.001813
4	GUJAMBCEM	0.092077*	-0.02811	-0.02457	0.058088*
5	HINDLEVER	0.180989*	-0.02845	0.007438	0.103974*
6	IFLEX	0.006969	-0.00039	-0.00068	0.01931
7	MARUTI	0.007166	0.006968	0.003128	0.017966
8	MICO	5.56E-05	3.30E-06	1.95E-06	7.48E-05
9	SESAGOA	0.099923	-0.02458	-0.0079	0.142945*
10	SIMENS	2.579103*	0.174004	-0.0171	1.122692*
11	STER	1.16E-06	1.08E-06	1.05E-06	1.12E-06

	bij	company	usd	euro	nse
1	ABB	1.00507*	0.927428*	0.943108*	0.918562*
2	CUMMINSIND	0.718451*	0.744747	0.745792	0.76387*
3	GLAXO	0.740504*	0.803746	0.76757*	0.846735*
4	GUJAMBCEM	0.828222*	0.587623	0.803793*	0.932297*
5	HINDLEVER	0.637664*	0.916942*	0.593386	0.840002*
6	IFLEX	0.858667*	0.989228*	1.013245*	0.91836*
7	MARUTI	0.866925*	0.86051*	-0.28589	0.895503*
8	MICO	0.815132*	0.833112*	0.859932*	0.793572*
9	SESAGOA	0.706779*	0.736745*	0.814619	0.7408*
10	SIMENS	0.586192	0.045044	0.572651	0.377285
11	STER	0.592379	0.716607	0.728521	0.705147

*indicates significance at 5% level

No asymmetric volatility spillover effect, however, was significant during the pre-crisis period amongst two foreign exchange rates and the selected multinational companies.

The values of b_{ij} (where $i=j$) coefficients were positive and significant at 5% level of significance, indicating the presence of GARCH effect, for 9/11 multinational companies. Own past volatility impact was highest for ABB ltd. (1.00507) amongst the selected multinational companies. Moreover, the cross volatility impact emanating from two foreign exchange rates was positively significant at 5% level for 3/11 selected multinational companies while 9/11 multinational companies had positive and significant impact from NSE NIFTY. Only 6/11 multinational companies were exposed to USD, 10/15 multinational companies were exposed to yen, 8/15 multinational companies were exposed to euro and only 9/11 were exposed to NSE. The average cross volatility impact was more as compared to the own past volatility impact. ARCH-LM test suggested no remaining ARCH effect in the residuals.

4.2.2. Crisis Period

Results for crisis period were presented in Table 14. In the crisis period, the effect of own lagged innovation (a_{ij} , where $i=j$) were significant at five percent level of significance for 5/11 selected multinational companies indicating the presence of ARCH effect. Amongst eleven multinational companies, the own lagged innovation impact was highest for GlaxoSmithKline Pharmaceuticals Limited (0.177393) while ABB ltd. was less impacted by own lagged innovation. Based on the magnitudes of the estimated cross innovation coefficients (a_{ij} : where $i \neq j$), it was observed that no companies effected by cross innovation impact emanating from two foreign exchange rates. Cross innovation impact was positive and significant between USD and ABB ltd. while the exposure was negative and significant between USD and GlaxoSmithKline Pharmaceuticals Limited. HUL was the only MNC which exposed to euro and impact was negative and statistically significant. Moreover, only 1/11 multinational companies effected from the positive and significant cross volatility impact emanating from NSE NIFTY while the same was negative for MICO.

Table 14: Results for applying MGARCH (Diagonal VEC)

Crisis Period

	a_{ij}	company	usd	euro	nse
1	ABB	0.099938*	0.077107*	-0.0302	0.022732
2	CUMMINSIND	0.149984*	0.087932	0.018244	0.009314
3	GLAXO	0.177393*	-0.0376*	-0.01534	0.05166
4	GUJAMBCEM	0.108404*	0.002263	-0.00494	0.085277*
5	HINDLEVER	0.167476*	0.028045	-0.02674*	0.038897
6	IFLEX	-0.0122	-0.00281	-0.03625	-0.01882
7	MARUTI	0.022035	0.023392	-0.00889	-0.00538
8	MICO	0.066317	-0.02874	-0.01072	-0.14487*
9	SESAGOA	-0.00397	0.010168	0.015078	0.022422
10	SIMENS	-0.00192	0.010513	-0.00766	0.056178
11	STER	0.050509	0.004575	0.001424	0.01328

	d_{ij}	company	usd	euro	nse
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1	ABB	0.031015	-0.00832	-0.00392	0.051648
2	CUMMINSIND	2.62E-05	1.90E-05	5.24E-05	0.00012
3	GLAXO	4.45E-04	1.16E-04	1.83E-04	0.001304
4	GUJAMBCEM	4.41E-03	8.67E-04	3.85E-04	-0.01452
5	HINDLEVER	1.03E-01	5.07E-03	3.06E-03	0.093571*
6	IFLEX	6.50E-02	-1.19E-02	-6.77E-03	0.078015*
7	MARUTI	4.81E-02	3.71E-03	7.60E-03	0.073491*
8	MICO	5.68E-01*	-4.10E-02	-3.66E-02	0.276665*
9	SESAGOA	9.64E-07	9.68E-07	9.80E-07	9.85E-07
10	SIMENS	1.33E-06	6.22E-07	1.09E-06	1.47E-06
11	STER	0.047337	0.004058	0.015863	0.066028*

	b _{ij}	company	usd	euro	nse
1	ABB	0.827672*	-0.83622*	0.8726*	0.874706*
2	CUMMINSIND	0.358196*	0.310164	0.532267	0.892903*
3	GLAXO	0.750562*	1.012146*	0.765651	0.844428*
4	GUJAMBCEM	0.852824*	0.929265*	0.832315	0.86702*
5	HINDLEVER	0.643634*	0.890606*	1.015599*	0.774025*
6	IFLEX	0.841182*	0.911146*	0.909388*	0.868634*
7	MARUTI	0.904629*	0.907493*	0.990132*	0.854101*
8	MICO	0.617541*	0.807375*	0.782292	0.838416*
9	SESAGOA	0.591557	0.760066	0.745754	0.706222
10	SIMENS	0.845581*	0.910959*	0.887424	0.812131*
11	STER	0.864778*	0.926185*	0.86731*	0.891421*

*indicates significance at 5% level

No asymmetric volatility spillover effect, however, was significant during the crisis period amongst two foreign exchange rates and the selected multinational companies.

The values of all b_{ij} (where $i=j$) coefficients were positive and significant at 5% level of significance, indicating the presence of GARCH effect, for 10/11 multinational companies. Own past volatility impact was highest for Maruti Suzuki India Ltd. (0.904629) amongst the selected multinational companies. Moreover, the cross volatility impact was positively significant at 5% level for 5/11 selected multinational companies while all 10/11 multinational companies had positive and significant impact from NSE NIFTY. The average cross volatility impact emanating from foreign exchange rates and NSE NIFTY was more as compare to the own past volatility impact for all selected companies. 9/11 multinational companies were exposed to USD, 5/11 multinational companies were exposed to euro. ARCH-LM test suggested no remaining ARCH effect in the residuals.

4.2.3. Post-Crisis Period

Results for post-crisis period are presented in Table 15. In the post-crisis period, the effect of own lagged innovation (a_{ij} , where $i=j$) were positive and significant at five percent level of significance for 7/11 selected multinational companies indicating the presence of ARCH effect. Amongst eleven

multinational companies, the own lagged innovation impact was highest for HUL (0.269435). Maruti and Sesa Goa were less impacted by own lagged innovation as compared to the other multinational companies in this segment. Based on the magnitudes of the estimated cross innovation coefficients (a_{ij} : where $i \neq j$), it was observed that only one multinational company got impacted by US dollar and 3 MNC impacted by euro. Moreover, only 3/11 was affected from the positive and significant cross volatility impact emanating from NSE NIFTY.

Table 15: Results for applying MGARCH (Diagonal VEC)

Post-Crisis Period

	a_{ij}	company	usd	euro	nse
1	ABB	0.163944*	0.023533	-0.07569*	-0.05917*
2	CUMMINSIND	0.921444	0.019343	0.074647	0.11991*
3	GLAXO	0.025736	-0.00981	-0.00302	-0.01498
4	GUJAMBCEM	0.038493	0.014826	0.081142*	-0.03063
5	HINDLEVER	0.269435*	0.088045*	0.008228	0.117671*
6	IFLEX	0.046127*	0.013068	-0.00826	0.023877
7	MARUTI	-0.01471*	0.019401	0.039798*	-0.00067
8	MICO	0.171696*	-0.02873	0.043778	-0.01786
9	SESAGOA	0.069736*	0.009508	-0.05102	0.010614
10	SIMENS	0.320596*	-0.02207	0.070789	0.050072
11	STER	-0.00216	0.005381	0.003209	0.021715

	d_{ij}	company	usd	euro	Nse
1	ABB	0.23844*	-0.05752	0.074417*	0.195118*
2	CUMMINSIND	0.000687	-0.00415	0.003147	0.012452
3	GLAXO	0.004035	-0.0145	-0.00547	0.030938
4	GUJAMBCEM	0.074879	-	-0.04044*	0.135917*
5	HINDLEVER	0.026396	-0.01447	0.021315	0.067942
6	IFLEX	0.048416	-0.0387	0.033014*	0.093122*
7	MARUTI	0.003705	-0.0012	0.007666	0.01763
8	MICO	0.026821	-0.02662	0.02286	0.080916*
9	SESAGOA	0.02082	-0.00909	0.020025	0.057014
10	SIMENS	3.29E-05	1.60E-05	-0.00038	-0.00063
11	STER	9.62E-07	9.56E-07	9.90E-07	9.97E-07

	b_{ij}	company	usd	yen	euro
1	ABB	0.577292*	0.818461*	0.8426*	0.740092*
2	CUMMINSIND	0.040707	0.238489	0.076668	0.274708
3	GLAXO	0.818417	0.947735	0.988038	0.867418
4	GUJAMBCEM	0.108242	0.052183	0.142087	-0.13354
5	HINDLEVER	0.108242	0.052183	0.142087	-0.13354
6	IFLEX	0.88457*	0.767625*	0.469984	0.552846*
7	MARUTI	0.979649*	0.891619*	0.785178*	0.950329*
8	MICO	0.431965*	0.355669	0.43579	0.856592*

9	SESAGOA	0.772781*	0.910827*	0.837293*	0.760571*
10	SIMENS	-0.01786	0.085039	0.307426	0.772059*
11	STER	0.590568	0.730244	0.763964	0.705725

*indicates significance at 5% level

There exists asymmetric volatility spillover effect during the post-crisis period. HUL was significant, but had negative impact from USD where as GUJAMBCEM and IFLEX have positive impact from euro, while the same was negative for company ABB.

The values of b_{ij} (where $i=j$) coefficients were positive and significant at 5% level of significance for 5/11 multinational companies, indicating the presence of GARCH effect. Own past volatility impact was highest for Maruti amongst the selected multinational companies. Moreover, the cross volatility impact emanating from two foreign exchange rates was positively significant at 5% level for 3/11 selected multinational companies while 6/11 multinational companies had positive and significant impact from NSE NIFTY. The cross volatility impact emanating from foreign exchange rates and NSE NIFTY was more as compared to the own past volatility for most of the selected multinational companies. ARCH-LM test suggested no remaining ARCH effect in the residuals.

5. Discussions and Conclusion

The current study seeks to explore the asymmetric exchange rate exposure on MNC's stock return, if any and its varying nature, in the context of India around the financial crisis of 2008-2009. Such exploration might be significant to global fund managers, in their hedging decision, as well as to the policy makers. The studies related to the foreign exchange exposure at firm level, in the context of India, especially related to multinational companies, predominantly before and after the latest financial crisis of 2008-2009 have been restricted in quantity. Furthermore, the existing studies have hardly used the Multivariate GARCH model. The outcome of the present study reveals the significant impact of the recent financial crisis of 2008-2009 on the foreign exchange exposure at firm level under different selected multinational companies. It principally contributes to the literature in the sense that unlike the former studies it has considered the effect of current financial crisis on the association.

USD and Euro were most insignificant past innovation exposure coefficient during pre-crisis period while the same was little significant during the crisis period as compared to the post-crisis period. Past volatility impact arose from different currencies were always less than that arose from market. All four currencies had significant impact on the multinational companies during all sub periods. However, the impact was more in the crisis period. In this sector too, US dollar had the most significant exposure as compared to euro. During the crisis period, currency exposure arising out of past volatility was highest as compared to the other periods. Past volatility impact was always more from both market and currencies, as compared to past innovation impact upon companies.

Across time the MNCs were impacted more by past volatility of market than that of past news of market. Similar results are also attained in terms of currency exposure. However, US dollar was the predominant currency amongst all, which had higher exposure towards multinational companies across eleven different selected multinational companies. USD on an average had less impact on companies due to past innovation. Thus, while cross innovation impacts tend to disappear as the market enters into a new phase of recovery, news about past volatility or any type of announcement in foreign exchange market is less likely to affect the future volatility of the stock price of multinational companies. However, one should be cautious about the past volatility impact on present volatility arising out of foreign currencies upon selected multinational companies. This is particularly true for Indian market, as the study reveals, most of the multinational companies get impacted due to cross market volatility spillover. No asymmetric exposure was found during pre-crisis and crisis period but it was significant for few companies during the post-crisis period. The study reveals enough evidence about the volatility transmission mechanism from foreign exchange markets and also from stock market towards different multinational companies. The nature and extent of such spillover usually depends on the financial market. Thus, not only the hedger and speculators may find the results useful for decision making, but also the managers can use the findings before hedging the foreign currency risk, as pointed out by the study.

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Prepaid Payment Instruments in India-A Journey towards a Digital Economy

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Abstract: Ever since the introduction of Payment and Settlement System Act 2007, RBI is relentlessly working towards creating a digital (i.e. electronic) payment system environment to achieve a less cash efficient economy. Though traditional bank products like debit card, credit cards and net banking have not been overlooked in this process, a lot of effort, on the part of RBI, has been made to promote a relatively newer kind of payment instruments known as prepaid payment instruments which was already widely accepted in many developed countries like USA and European countries. This article attempts to capture India's journey or rather experiment with this innovative payment instrument popularly termed as PPI.

Key-words: Prepaid Payment Instruments, m-wallets, prepaid cards, open system instruments.

1. Introduction

Ever since the introduction of Payment and Settlement System Act 2007, RBI is relentlessly working towards creating a digital (i.e. electronic) payment system environment to achieve a less cash efficient economy. Though traditional bank products like debit card, credit cards and net banking have not been overlooked in this process, a lot of effort, on the part of RBI, has been made to promote a relatively newer kind of payment instruments known as prepaid payment instruments which was already widely accepted in many developed countries like USA and European countries. This article attempts to capture India's journey or rather experiment with this innovative payment instrument popularly termed as PPI.

2. Concept of PPI

Prepaid Payment Instruments (PPIs), also known as prepaid cards or stored value cards in many countries, refer to certain instruments that facilitate purchase of goods and services against the value stored in them. The value stored in such instruments represents the money paid for it by its holder either by cash, by a debit against the holder's bank account (through debit card or net banking) or by any credit card.

There can be different variants of prepaid instruments ranging from smart cards, magnetic strip cards, mobile wallets or even a simple paper voucher. However, each has its own features and terms of use attached to it.

3. Origin of PPI

Prepaid payment instruments (or prepaid cards or stored value cards) came into existence in USA in 1970s as paper gift cards/certificates. Then in 1980s single purpose (or closed loop/system) prepaid cards, acceptable only at specific merchant location, were adopted by US telecom industry. They were followed by big retail chains in early 1990s. Similar trends were visible in Europe also. Till then, however, there was no sign of any multi-purpose prepaid cards.

In 1996, a federal welfare reform in US mandated that food stamp coupon (which were generally issued by employers and were redeemable at designated merchant locations) to be replaced by EBT (Electronic Benefit Transfer) cards. Soon this EBT cards got wide acceptance and gave rise to multi-purpose (or open loop/system) prepaid cards.

In late 1990s, payroll cards emerged as a convenient mean to US employers to pay the unbanked employees (i.e. employees without any formal bank account). During this period open loop prepaid gift cards made its appearance in Europe. The same was however adopted by USA in 1999. Soon many variants of prepaid cards including travel cards and mass transit cards were introduced in many parts of these two continents. Other developed countries of Asia and Australia also adopted the same in due course thanks to the operations of multinational card companies like visa and master cards.

Table 1: Top prepaid cards and prepaid card providers in Europe and USA

USA		Europe	
Prepaid Cards	Issued By	Prepaid Cards	Issued By
ATPA cards	American Public Transit Association	Worldcore Prepaid Card	Worldcore
American Express Prepaid Cards	American Express Bank	Mnecorp's Multi-currency Mastercard	Mnecorp
Benefits Direct Prepaid Card.	Blackhawk Network	Kaiku Visa Prepaid Card	Kaiku
Bluebird Prepaid Card	American Express and Walmart	Payoneer Prepaid MasterCard	Payoneer
Discover Prepaid Card	Discover Network	Even Card	IDT Financial Services Ltd
Green Dot Prepaid Card	Green Dot	Travel Money Card Plus	Clydesdale Bank PLC
Chase liquid prepaid cards	J.P Morgan Chase	Thomas Cook Multi-currency Cash Passport	Thomas Cook

4. Types of PPI

Based on their nature or extent of acceptability PPIs can broadly be classified into four types viz. (i) Closed-system payment instruments (ii) Semi-Closed system payment instruments (iii) Semi-Open system payment instruments and (iv) Open system payment instruments.

(i) Closed System Payment Instruments: These are payment instruments, generally issued by any business organisation for use at that organisation only or for availing some services from a single service provider having a service contract with the organisation. These instruments are generally not reloadable and never permit cash withdrawal. Examples of such instruments include gift vouchers issued by a merchant establishment, telephone calling cards issued by a telecom service provider etc. Even mobile pre-paid value or talk time may also be considered as closed-system prepaid payment instrument though, in some cases, they can be used for availing additional value added services offered by the same service provider.

(ii) Semi-Closed System Payment Instruments: These are payment instruments which are redeemable at a group of specifically identified merchant establishments who have entered into a contract with the issuer to accept such instruments. These are generally issued by third party service providers and can be in reloadable or non-reloadable format but do not permit cash withdrawal.

(iii) Semi-Open System Payment Instruments: These are payment instruments which can be used at any card accepting merchant location (known as Point of Sale or POS). They can be reloadable or non-reloadable but do not allow cash withdrawal. For example, banks often issue gift cards that are operated and settled through recognised card companies.

(iv) Open System Payment Instruments: These are payment instruments which can be used at any card accepting merchant location and can also be used to withdraw cash at ATMs. Examples of such cards include travel cards issued by banks which can be operated and settled through recognised card companies.

Mechanism of PPI:

There are different forms of prepaid payment instruments like paper vouchers, prepaid cards, e-wallets, virtual cards etc. Each has its own mechanism.

Table 2: Mechanism of different prepaid payment instruments

Particulars	Paper Vouchers	Physical Cards	E-wallets	Virtual Cards
Type	Closed or semi closed system payment instruments	Any	Closed or Semi closed	Semi closed
Issued by	An organisation itself or by any third party	Licensed issuers including banks	Licensed issuers	Licensed issuers

	with whom the organisation has service contract	and card companies		
Issued to	Employees or customers	Anyone (sometimes KYC is necessary)	Own customers (Amazon Pay) or anyone (Paytm/ Mobikwik wallets)	Anyone (sometimes KYC is necessary)
Re-loadable	No	May be or may not be	Yes	May be or may not be
Technology used	Numeric/alpha-numeric identification code	Magnetic strips, micro-chips to store the information of the holder and the value.	User id and password. OTPs are also used in some cases.	Card number, CVV number, OTP authentication
Redeemable at	Own establishment (closed system), designated merchant establishments (semi-closed system)	Depends on the nature i.e. closed/semi-closed etc.	Own establishments if close system instrument (e.g Amazon Pay) or any designated merchant (e.g. Paytm)	Designated POS terminals
Example	Metro Railway Smart Cards, Bigbazar Gift Vouchers (Closed), Sodexo coupons (semi-closed)	Gift Cards issued by banks, travel cards.	Amazon Pay (closed), Mobikwik, Paytm, Freecharge (Semi-closed)	Virtual gift cards

5. Advantages of PPI

- a. **Minimum Formalities:** In most of the cases, prepaid payment instruments are issued with minimum formalities. Closed system payment instruments are not at all issued against any specific user. Semi-closed system payment instruments also require only a valid user id or email id and a mobile number to subscribe. Similar is true for semi open system instruments. However for high denominated fund transfer or transaction above a minimum limit there may be additional KYC (know your customer) requirement. Open system instruments also have the similar requirement.
- b. **Convenient:** These instruments come either in form of physical coupons or plastic cards (like a debit/credit card) which can be conveniently used in merchant locations. Alternatively, they can be in the form of wallets or virtual cards which can be easily used by logging into the system and making transactions via PIN/OTP authentication.
- c. **Saves Time:** Prepaid cards issued by mass transit system operators (e.g. Metro Railway Smart Cards) helps to avoid standing in long queues to collect fare tickets.
- d. **No Possibility to Get into Debt:** Since these are prepaid instruments the holder can enjoy benefits equivalent to the value stored in it. So the holder can never get into a debt.
- e. **Control Spending Habits:** Unlike debit or credit cards, prepaid payment instruments help the user to control his spending habits. The holder may load only that much money which is actually essential.
- f. **No Need to Carry Cash:** These instruments are substitutes of physical cash. Hence the user can easily load money into the instruments via cash payment, debit to bank account etc. and use the same instead of cash at acceptable locations.
- g. **Foreign Travel:** Prepaid travel cards which are basically some open system payment instruments are immensely helpful in case of cross border travels as these are generally issued by international card companies in association with banks.
- h. **Promotional Offers:** In many cases, issuers offer promotional benefits to the users which make these instruments further attractive. For example, a semi closed system instrument MOBIKWIK offers cash back (called Supercash) on transaction through their wallet.

6. Disadvantages of PPI

- a. **Not Linked to any Bank Account:** A prepaid payment instrument is not a debit card and hence not linked to any bank account. As a result the balance stored in it does not attract any interest.

- b. It is Not a Credit Card:** A prepaid payment instrument is not a credit card and hence does not allow the user to purchase goods and services beyond the value stored in it.
- c. Security Threat:** In many cases these instruments are issued without adequate security measures. As a result there are occasional instances of hacking of user data from the issuers' server. This poses a security threat to the identity of the user as well as the monetary value stored in the card.
- d. Fees:** In case of semi open and open system instruments (like travel cards or gift cards) the issuer may charge fees for issuing the instruments, administering the operations and even making transactions through them. This may, at times, be frustrating.

7. Prepaid Payment Instruments in India

I. The Journey So Far:

- a. Introduction of formal guideline:** In India, prepaid payment instruments pre-existed the introduction of Payment and Settlement Systems Act 2007. Establishments used to offer simple paper vouchers (say food coupons) to their employees or gift certificates to customers which were redeemable only at the same establishment or with their associated partners. In other words, such instruments were primarily closed system payment instruments. Moreover banks and a few non-bank entities were also experimenting with the semi closed system instruments in form of pre loaded cards. Both the forms of instruments were slowly gaining acceptance among the users. Though closed system payment instruments were not of much concern, semi closed system instruments issued by non bank entities soon came under RBI's lenses as they were alternative payment systems and thus need to be regulated.

Therefore with a view to ensure an orderly development and operation of this product, Reserve Bank prepared and placed an 'Approach Paper' on **issuance and operation of 'prepaid payment instruments in India'** on its website for public comments on November 07, 2008. Consequently, based on the comments received from banks, existing issuers of pre-paid payment instruments, general public and other stake holders, it prepared the draft guidelines which was also placed on the website for public comments. After taking into account further comments/suggestions received, Reserve Bank finalised the 'guidelines for prepaid payment instruments in India' and made it effective from 27.04.2009 in exercise of the powers conferred by section 18 of the Payment and Settlement Systems Act, 2007.

Accordingly, only banks were permitted to issue all kinds of PPIs including mobile wallets & mobile accounts and NBFCs and other persons were permitted to issue only semi-closed system payment instruments. However, persons authorized under Foreign Exchange Management Act (FEMA) to issue foreign exchange pre-paid payment instruments were exempt from the purview of these guidelines, subject to their being the participants of payment systems authorised by RBI. Additionally non bank-

non NBFC issuers were mandated to have a minimum paid up capital of Rs. 100 lakh and positive net owned fund (NOF). The categories of instruments permitted were –

Categories of instruments	Conditions
Semi-Closed System Payment Instruments up to Rs 1000.	To be issued against any identity document furnished by the customer
Pre-paid payment instruments up to Rs 5000.	To be issued against 'officially valid documents' furnished by the customer
Semi-closed system payment instruments which permit only payment of utility bills/ essential services up to a limit of Rs. 10,000.	To be issued without any KYC
Semi-closed system payment instruments issued to institutions/companies for further issuance by these institutions/companies to their employees or other beneficiaries.	The institutions/companies must maintain the full details of the employees or beneficiaries to whom these are issued and the value must not exceed Rs. 5000.

- b. Other Persons Allowed to Issue Mobile Phone Based Prepaid Instruments:** After issuing formal policy guidelines on PPIs, RBI, in its next significant move (circular no. DPSS.CO.PD.No.344/02.1 4.06/ 2009-10 dated 14.08.2009), allowed persons other than banks to issue mobile phone based semi closed prepaid payment instruments (m-wallets) subject to full compliance to the safeguards against money laundering (KYC/AML/CFT) provisions. However, fund transfer was not permitted and maximum value of the instruments was restricted to Rs. 5000. Moreover, reloading via airtime or talk time was also not allowed for these instruments.
- c. Issue of Co-Branded Prepaid Cards and Further Widening of Regulatory Ambit:** In its next amendment (circular no. DPSS.CO.No.1041/02.14. 006/ 2010-2011 dated 04.11.2010) RBI adopted a slew of reform measures to widen its regulatory net as well as to introduce new instruments in this field. Accordingly -
- (i) Banks were allowed to issue and reload semi closed prepaid instruments through agents to the extent of their permissible limits.
 - (ii) Additional guidelines were prescribed for Prepaid (non reloadable) Gift instrument issuance by Banks, NBFCs and Other persons, Prepaid Instruments issued by banks to Government Organizations for onward issuance to the beneficiaries of Government sponsored schemes, Prepaid Instruments issued by banks to other Financial Institutions for credit of one-time/periodic payments by these organisations to their customers and Prepaid Instruments issued by banks for credit of cross border inward remittance. The maximum value on each

instrument was kept at Rs. 50000. Fund transfer to bank accounts from the instruments was also allowed in the later three instruments.

(iii) All persons permitted to issue prepaid instruments were also permitted to issue co-branded prepaid instruments with corporate, Government organizations etc. for the purpose of promotion and loyalty programmes.

- d. Semi Closed M-Wallets Made at par with Other Semi Closed PPIs:** Considering the growing acceptance of m-wallets (mobile based semi closed prepaid instruments) issued by banks and other persons, RBI (via circular no. DPSS.CO.No.2501/02.14.06/ 2010-11 dated 04.05.2011) made this product at par with other similar instruments by extending its limits to Rs. 50000 subject to customer due diligence by the issuer.
- e. Banks Allowed Issuance of Prepaid Instruments to Corporate for Onward Issuance to their Employees:** In continuation of its earlier stance RBI permitted (via circular no. DPSS.CO.PD.No. 225/02.14.006/2011-12 dated 04.08.2011) banks to issue prepaid payment instruments to listed corporates for onward issuance to their employees. Fund transfer was also allowed from the instruments to the bank account on request.
- f. Domestic Money Transfer Norms Relaxed for Card to Card Transfer of Funds:** In its next major policy amendment with respect to PPIs, RBI (via circular no. DPSS.PD.CO.No. 62/02.27.019/2011-2012 dated 05.10.2011) relaxed norms for domestic card to card fund transfer for PPIs. Accordingly, transfer of fund (with per transaction cap of Rs. 5000 and a monthly cap of Rs. 25000) from open system PPIs to other open system PPIs, semi closed system PPIs (bank/ non bank), bank account, debit card and credit card (for repayment of dues only) was permitted. However transfer from semi closed system PPIs to debit or credit cards was not allowed.
- g. Extension of Value Limits on Semi Closed PPIs:** In line with its aggressive stance, RBI first extended the value limit on first category semi closed PPI from Rs 1000 to Rs. 2000 on 14.06.2012 and then completely went away with the requirement of official documents of customers to issue semi closed PPI to customers up to Rs. 10000. Monthly re loading was also raised to Rs. 10000. Similarly, non reloadable PPIs with value of Rs. 10001 to Rs. 50000 were allowed with officially valid documents and only loadable PPIs with the same denomination was mandated full KYC.
- h. Open System Prepaid Instruments Were Allowed for Cash Withdrawal at POS:** On 05.09.2013, RBI permitted cash withdrawal from open system PPIs at any POS considering these PPIs a subset of debit cards. The limit was kept similar to debit cards i.e. Rs. 1000 per day.
- i. Issue of Consolidated Policy Guidelines:** On 28.03.2014 RBI issued Consolidated Revised Policy Guidelines bringing in some timely and well deserving changes to further strengthen the product. The changes included raising the capital requirement of issuer, restricting the eligibility to Indian

corporations only, tightening the operational norms, initiating new measures for customer protection etc.

- j. General Permission to Issue Co-branded Prepaid Instruments:** On 13.05.2014 RBI, through an amendment in the Consolidated Revised Policy Guidelines, allowed banks a general permission to issue rupee denominated co-branded prepaid instruments. Earlier a onetime approval was needed in this respect. However, persons other than banks were still to seek approval from RBI before issuing similar instruments.
- k. Urban Co-operative Banks (UCBs) Allowed to Issue Semi Closed System PPIs:** On 27.05.2014, RBI allowed UCBs (which have installed ATMs and issued ATM-cum-Debit cards) to issue 'Semi-Closed Pre-paid Payment Instruments' permitting payment of utility bill/ essential services up to a limit of Rs. 10000.
- l. Further Extension of Value Limit on Specified Semi Closed System PPIs:** With a view of further promoting the semi closed system PPIs to facilitate digitization, RBI, on 03.12.2014, further extended the value limit of reloadable KYC-compliant semi closed PPIs to Rs. 100000 from Rs.50000. The validity period of gift cards was also raised from 1 year to 3 year. Additionally, banks were permitted to issue multiple open system PPIs (in electronic form only) against a single fully KYC-compliant bank account to accommodate dependent/family members. Banks were also permitted issuance of rupee denominated non-reloadable (a) PPIs to NRIs and foreign nationals visiting India & (b) PPIs co-branded with exchange houses/money transmitters (approved by RBI) to NRIs and foreign nationals visiting India subject to the certain conditions.
- m. PPIs for Mass Transit System (PPI-MTS) Introduced:** With the objective of bringing in the micro and small value cash payment transactions in mass transit system (such as metro railways, bus services etc.) under the ambit of digitization, RBI, on 09.07.2015, allowed introduction of PPIs for Mass Transit System (PPI-MTS) to be issued by mass transit authorities as a semi closed system PPI. Apart from mass transit system such instruments can be used only at other merchants whose activities are allied to or are carried on within the premises of the transit system. These will be reloadable with a minimum validity of 6 months and maximum value limit of Rs. 2000. Accordingly, Delhi Metro Rail Corporation (DMRC) has already given a PPI-MTS wallet licence from the Reserve Bank of India in February 2017.
- n. Raising Value Limits Following De-monetization:** In order to facilitate the adoption of digital payments following de-monetization, RBI, on 22.11.2016, extended the existing value limit and monthly reload limit of Rs. 10000 on semi-closed instruments issued without any official document to Rs.20000. It also allowed PPI providers to issue PPIs to small merchants on minimum documentation.
- o. Banks Allowed to Further Extend their Client Base for PPIs:** On 27.12.2016, RBI allowed banks to include other entities / 'employers' such as unlisted corporates / partnership firms / sole

proprietorship / public organizations like municipal corporations, urban local bodies, etc. (employers) for onward issuance of PPIs to their staff / employees / contract workers, etc.

- p. All Co-operative Banks Allowed to Introduce Semi Closed PPIs:** Revising its earlier stance, RBI, on 27.05.2017, allowed all co-operative banks (having their own ATM network) to introduce semi closed PPIs for payment of utility bills / essential services upto a limit of Rs.10000.

II. The growth statistics:

Under the able regulatory supervision of RBI, prepaid payment instruments have emerged as a significant alternative to cash transactions in a number of fields. Such transformation is clearly visible from its immense growth over the last few years, especially from 2011-12, when a number of telecom companies and other persons first started providing m-wallets. *(Note: All data in this section have been compiled from ‘Payment System Indicators’ available in Database on Indian Economy; RBI’s Data Warehouse. For compiled dataset see Annexure)*

- a. Prior to the De-monetization Drive:** PPIs registered a steady growth in both the number and value of transactions on a yearly basis from 2011-12 to 2015-16. The average monthly transactions also grew substantially up to October 2016.

(i) Total No. and Value of PPI Transactions: In India, PPI transactions grew enormously over the years. From a mere 30.60 million total annual transactions in 2011-12 it reached to a whopping 748.02 million total transactions in 2015-16, registering a compounded annual growth rate of 122%. In terms of value, the transactions grew from Rs. 62.01 billion in 2011-12 to Rs.487.58 billion with a CAGR of 67.45%. The year-on-year growth in value was the most in 2014-15 while that in number was the best in 2015-16. The same trend was visible in the first seven months (i.e. prior to de-monetization announcement) of 2016-17. Transaction during these seven months reached around 80% of the previous full year (2015-16) figures.

Figure 1: Total no. of PPI transactions

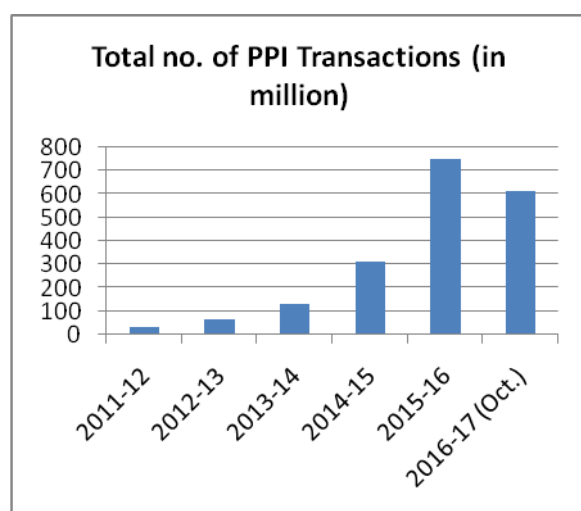


Figure 2: Total value of PPI transactions

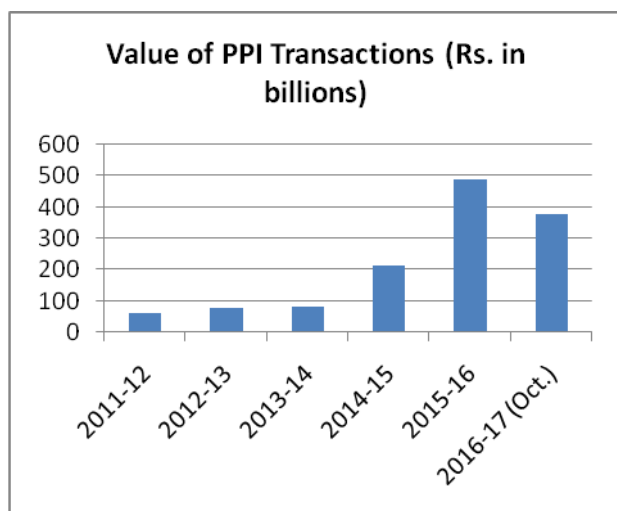
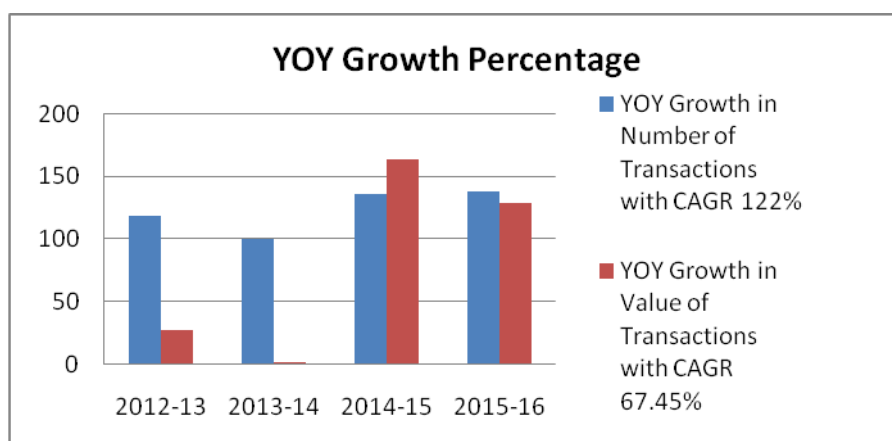
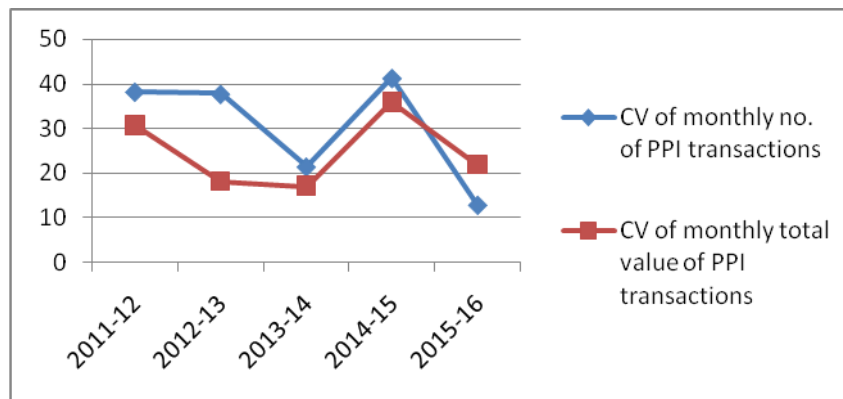


Figure 3: Year on year growth in PPI transactions (total no. and value)



Further, as evident from the monthly average statistics, it can be seen that the growth was quite consistent on intra year basis. The coefficient of variation (i.e. Standard deviation as a percentage of mean) of both the actual monthly number and value of all PPI transaction has come down considerably up to 2015-16. Consistency is, however, found to be more in case of number of transactions than the value.

Figure 4: Coefficient of variation of monthly PPI transactions



(ii) Category-wise performance:

Category-wise performance of PPI instruments is also found to be quite interesting. However, category-wise data is available separately for m-wallet, prepaid cards and paper vouchers only. Accordingly, it is not possible to identify how close system, semi-closed system and open system PPIs performed over the years as the prepaid cards may comprise all the three types.

The data shows that out of the total number and value of transactions, m-wallets constitute the most in all the five years from 2011-12 to 2015-16 and also in the seven months prior to de-monetization announcement. Additionally, m-wallet is found to have an increasing contribution in the total number of transactions meaning that the growth rate in the number of transactions of this type of instrument is the highest among all the three. In terms of value, however, the same is observed for PPI cards. The share of paper voucher is found to be relatively stagnant in both the number and value of transactions. (Figure 5 and 6).

Figure 5: Category wise performance (No.)

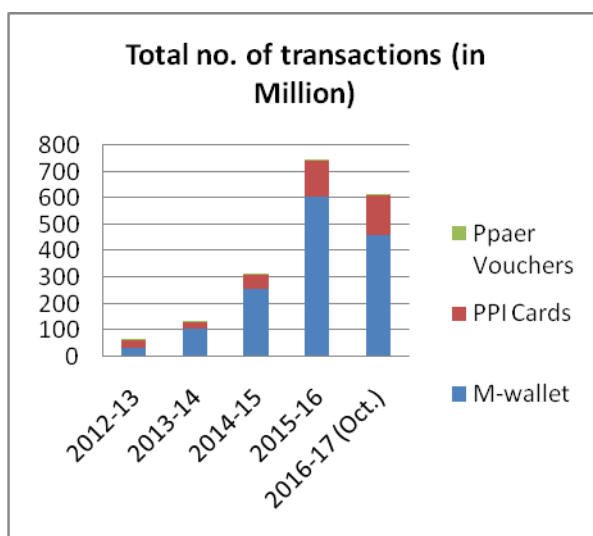
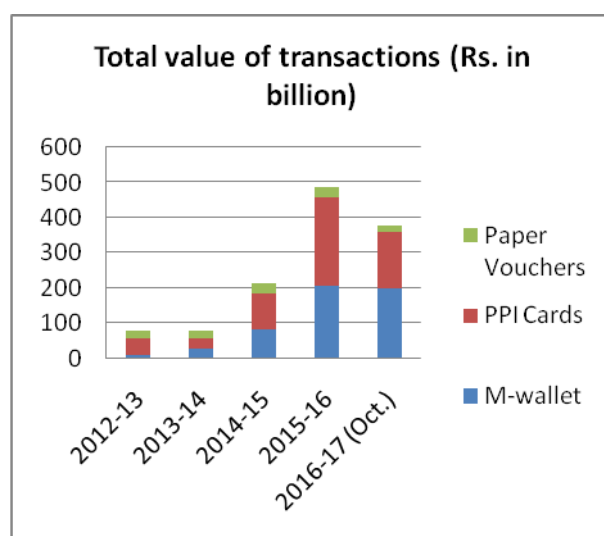


Figure 6: Category wise performance (Value)



b. After the de-monetization drive: De-monetization of Rs. 500 and Rs. 1000 notes and subsequent cap imposed on daily and weekly withdrawals from banks and ATMs had given a significant push to the digitization initiatives in India overnight. Moreover, the delayed process of re-monetization made digital transactions a forced choice for many. As a result, a significant rise in various modes of digital transactions, in almost all formats including PPIs, was visible just after the de-monetization announcements.

As evident from the monthly data, the total number and value of PPI transactions went up remarkably from November 2016 (de-monetization was made effective from 08.11.2016). The effect was more prominent from December 2016 onwards. (Fig.7 and 8).

Figure 7: Total no. of PPI transactions

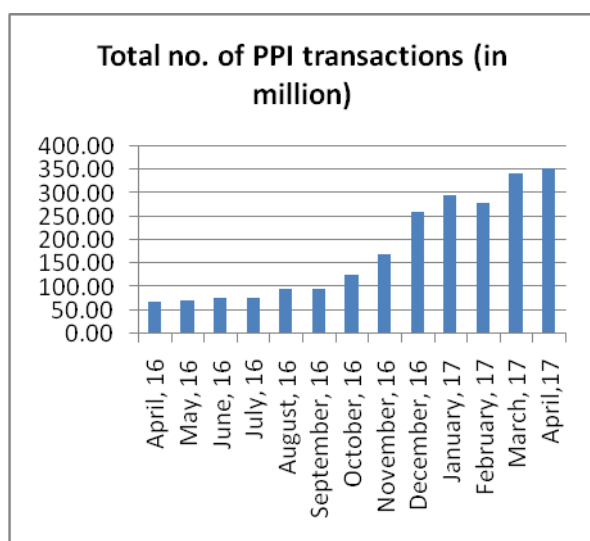
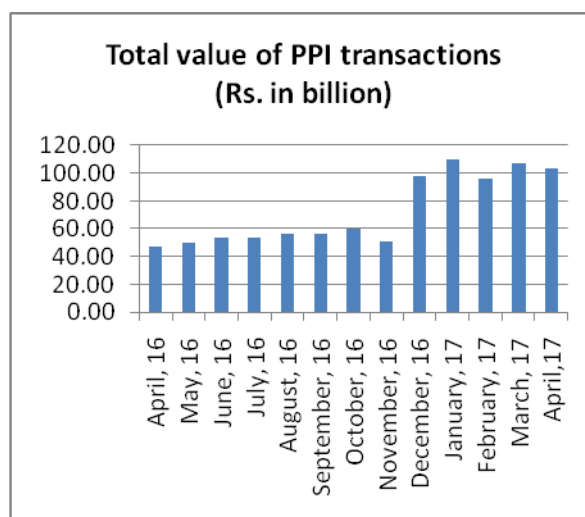


Figure 8: Total value of PPI transactions



Further, among all the three variants of PPI, the increase was the most for m-wallets both in terms of number and value of transactions, thanks to Paytm, Mobikwik, Freecharge and many more mobile wallet providers. (Fig. 9 and 10).

Figure 9: Category wise performance (Value)

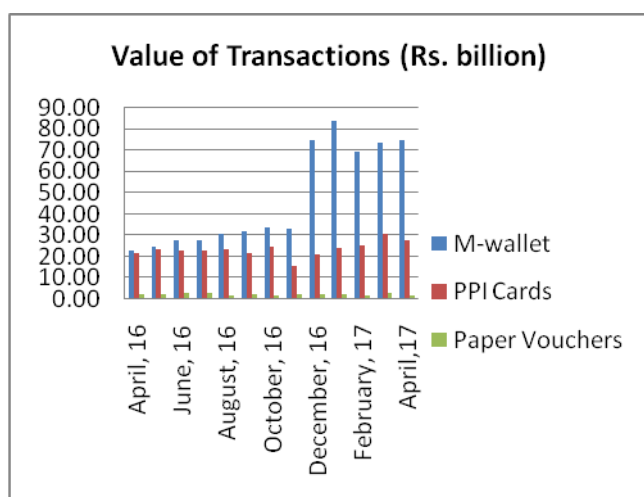
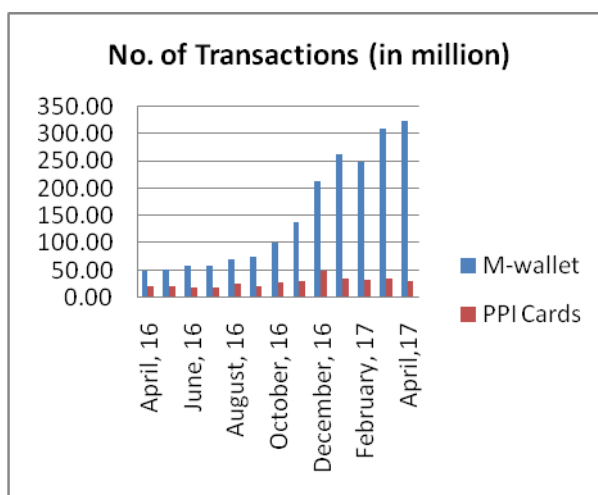


Figure 10: Category wise performance (No.)



The monthly average of total and category-wise number and value of transactions (for six months pre and post de-monetization) also proves the above impact of de-monetization on the use of prepaid payment instruments. (Figure 11 and 12).

Figure 11: Monthly Average Number of PPI Transactions Pre and Post De-monetization

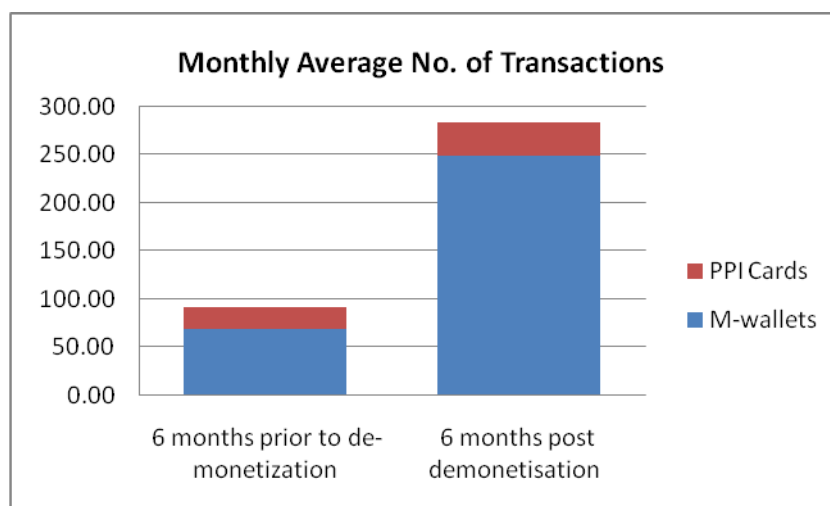
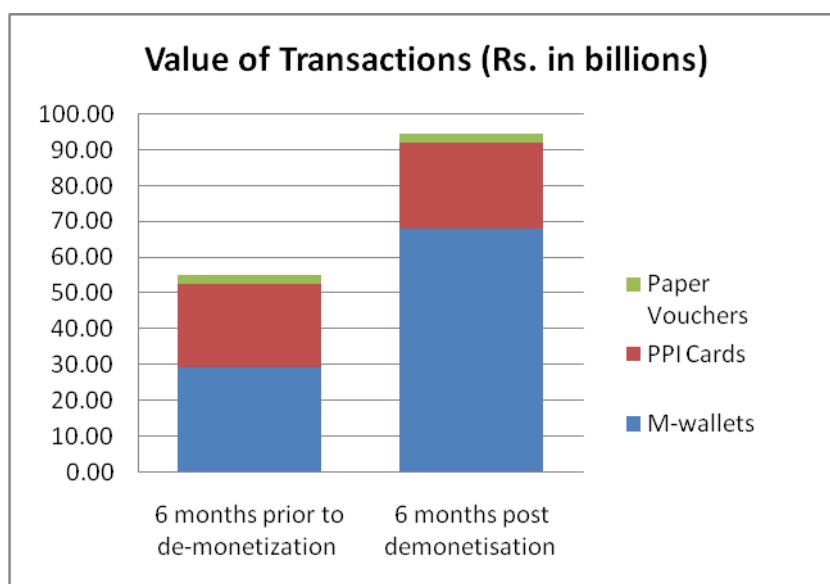


Figure 12: Monthly Average Value of PPI Transactions Pre and Post De-monetization



It is important to note in this context that, even though, re-monetization process is almost at its end, the number and value of PPI transactions has not deepened anymore but is maintaining a steady level across months. This shows a clear trend of increasing adoption of prepaid payment instruments in India given a choice between cash and non-cash modes of transactions. This is definitely a very good sign.

(Note: All data were compiled from 'Payment System Indicators' available in Database on Indian Economy; RBI's Data Warehouse. For compiled dataset see Annexure)

III. The Current State of PPIs in India:

As mentioned earlier, PPIs in India exist in three forms- closed system, semi-closed system and open system PPIs. However, semi-closed system PPIs contributes the majority of the transactions.

As regards to closed system PPIs, no specific data is available. However, a number of govt. and non-govt. organizations are using the same. For example, a number of metro railway service providers issue smart cards to the customers. Many organizations also issue meal coupon to their employees which are redeemable at their canteen. Very recently RBI allowed Amazon a PPI issuance license against which a closed system PPI 'Amazon Pay' has been issued by the company for its customers.

As regards to semi-closed system PPIs, there are a wide variety of instruments available in India on different formats. These include mobile account or mobile wallets such as- Paytm (very recently migrated into Paytm Payments Bank), Mobikwik, Freecharge, Phonepay, Vodafone m-pesa, Olamoney, various paper vouchers or cards such as Sodexo coupons, Ticket or Ticket Restaurant etc. as well as various co-branded cards issued by banks. A very new entrant in this category is the PPI-MTS (Mass Transit Syatem) card.

As regards to open system PPIs, banks are the main issuers. Examples include ICICI Travel Card, SBI Foreign Travel Card, State Bank Achiever Card, State Bank Smart Payout Card, State Bank e-Z Pay Card and State Bank Gift Card etc.

As per the recent RBI publication, currently, there are 54 authorized non-bank entities who can issue different categories of PPI instruments subject to the available RBI guidelines and terms of license issued to them.

8. Future of PPIs in India

It is true that de-monetization has given all the digital modes of transactions an unexpected momentum. However, a consistent growth of these instruments and more specifically PPIs (mainly semi closed m-wallets) even after re-monetization clearly suggests that these modes are increasingly getting accepted by Indian public. This is because there exists a considerable number of factors that are accelerating this growing adoption of digital modes of transactions including different variants of prepaid payment instruments. These are:

- a. Transactions at bank branches and even ATM withdrawals are becoming costly. Even public sector banks such as SBI is imposing charges for various types of branch transactions or cap on ATM withdrawals. On the other hands different digital modes and especially PPIs (m-wallets, prepaid cards) are ushering additional benefits in form of discount, cash back or reward points making these instruments more attractive.
- b. Transactions via cash and cheque are increasingly becoming hazardous due to a number of regulatory measures including adhaar linkage with PAN, requirement of quoting adhaar for branch

transaction beyond Rs.50000, mandatory disallowance of expenses beyond a given limit for taxation purpose etc. All these are making digital modes such as PPIs a forced choice.

- c. The digital ecosystem in India is looking really impressive. Information and Communication Technology is making communication easier, average internet speed is increasing, even in the rural sector 4G technology is penetrating really fast. All these are creating a conducive environment for the growth of digital payment modes including PPIs.
- d. Growth of PPIs issued on electronic format such as m-wallets largely depends on smart phone penetration as in most of the cases these are used via mobile applications (apps). For the past few years smart phone penetration in India is taking place at a remarkable pace. Availability of technology is making the adoption of these instruments really fast.
- e. During the past few years the gap between India and Bharat has really narrowed down. Though they are still miles apart in terms of quality of life, at least they have come closer in terms of digitization thanks to numerous initiatives on the part of the government. Literacy rate has also improved considerably. All these have made these digital payment instruments acceptable to the rural population.
- f. Opening and operating a semi closed system PPI account or subscribing a prepaid card is much easy and hassle free as compared to opening even a basic service savings account. This is giving these instruments an edge over traditional bank accounts and associated digital modes like debit/credit cards and net banking.
- g. Last but not the least, government is really looking aggressive in its approach to make India a less cash digital economy. Introduction of new instruments and relaxation of existing guidelines have paved the way for a faster adoption of all the digital payment modes including PPIs. However, security seems to be a big concern for quality transactions.

All the above factors are likely to contribute a lot for a consistent growth of various digital transaction modes and more specifically PPIs (semi closed or open system instruments). Thus the future of these instruments is really looking impressive in India.

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- <https://en.wikipedia.org>
- <https://rbi.org.in>
- <https://www.economictimes.indiatimes.com>

Annexure 1

Total no. (in million) and value (in Rs. billion) of PPI transactions

Year	All		m-wallet		PPI cards		Paper Vouchers	
	No.	Value	No.	Value	No.	Value	No.	Value
2011-12	30.6	62.01	N.A	N.A	N.A	N.A	N.A	N.A
2012-13	66.93724	79.22204	32.6986	10.00937	33.75654	49.62317	0.484644	19.59855
2013-14	133.6304	81.04546	107.5076	29.05403	25.59606	28.36022	0.526822	23.63122
2014-15	314.4633	213.4218	254.9994	81.83847	58.9108	105.3484	0.55317	26.23501
2015-16	748.0174	487.5832	603.985	205.8416	143.4706	253.7735	0.561793	27.96815
2016-17 (Up to Oct. 2016)	615.34	376.51	462.71	199.11	152.31	160.99	0.33	16.40

(Compiled from Database on Indian Economy; RBI)

Annexure 2

Co-efficient of Variation of monthly no. and value of PPI transactions

Year	No. of Transactions (in million)	Value of Transactions (in Rs. billion)
2011-12	38.21833	30.70462
2012-13	37.70623	18.17049
2013-14	21.35665	17.04546
2014-15	41.28144	35.98983
2015-16	12.74656	21.83148

(Compiled from Database on Indian Economy; RBI)

Annexure 3

Total no. (in million) and value (in Rs. billion) of PPI transactions

Month	All		M-wallet		Prepaid Cards		Paper Vouchers	
	No.	Value	No.	Value	No.	Value	No.	Value
April, 16	69.30	46.72	48.76	22.93	20.49	21.68	0.04	2.11
May, 16	70.95	49.95	50.31	24.35	20.60	23.43	0.04	2.18
June, 16	76.98	53.47	58.63	27.74	18.29	23.01	0.05	2.71
July, 16	77.85	53.40	59.45	27.60	18.35	23.09	0.05	2.71
August, 16	96.28	56.46	70.68	30.74	25.56	23.69	0.04	2.03
Sept, 16	97.07	56.28	75.30	31.92	21.72	21.74	0.05	2.62
October, 16	126.90	60.22	99.57	33.85	27.29	24.34	0.04	2.03
November, 16	169.32	50.74	138.09	33.06	31.19	15.34	0.04	2.34

December, 16	261.09	97.70	213.11	74.48	47.93	20.89	0.05	2.32
January, 17	295.80	110.01	261.67	83.53	34.08	24.22	0.05	2.26
February, 17	280.02	96.28	246.95	69.11	33.03	25.19	0.04	1.98
March, 17	342.09	106.77	307.45	73.12	34.58	30.88	0.06	2.77
April, 17	352.23	103.71	320.87	74.42	31.32	27.45	0.04	1.85

(Compiled from Database on Indian Economy; RBI)

Taguchi's Approach to Quality – An Overview

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Abstract: Taguchi defines quality in a negative way as 'loss imparted to society from the time the product is shipped'. According to Taguchi, a product does not cause a loss only when it is outside specification limit but whenever it deviates from its target value. Any quality improvement programme should have its main objective, the minimisation of the variation of product performance about its target value. Taguchi's recommended technique is a straightforward, well integrated system for implementing statistical experimental designs. It encourages proper experimentation and closer association between statisticians and engineers and increases statistical awareness in industry.

Key-words: Taguchi loss function, target control factors (TCF), variability control factors (VCF), total quality loop

1. Introduction

Professor, Genichi Taguchi, director of the Japanese Academy of Quality and four times recipient of the Deming Prize, devised a quality improvement technique that uses experimental design methods for efficient characterisation of a product or process, combined with a statistical analysis of its variability. This approach allows quality considerations to be included at the early stage of any new venture: in the design and prototype phase for a product; during routine maintenance; or during installation and commissioning of a manufacturing process.

Taguchi's main objective lies in his definition of quality (or non-quality): 'Quality is the amount of damage incurred to society from the moment the product has left the factory.' Taguchi defines quality in a negative way as 'loss imparted to society from the time the product is shipped'. By, 'society' he means the customer as well as the employees of the company; because, if the customer suffers, the whole company will eventually suffer through rework, guarantee cost, loss of reputation, loss of market share, and eventually loss of jobs. Therefore, serving society is also Taguchi's aim. (Logothetis, 2001)

Taguchi uses his loss function approach to establish a value base for the development of products. The function recognises the need for average performance to match customer requirements and the fact that variability in this performance should be as small as possible. According to Taguchi, a product does not cause a loss only when it is outside specification limit but whenever it deviates from its target value. Any quality improvement programme should have its main objective the minimisation of the variation of product performance about its target value. Smaller the performance variations better the quality.

Larger the deviation from the target; larger the society's (producer's and consumer's) loss. This loss can be approximately evaluated by Taguchi's loss function, which unites with the function specification through a quadratic relationship.

2. Objectives of the study

The paper tries to understand the approach towards improvement of product quality as proposed by Taguchi, one of the doyens of quality management. It tries to relate the difference between the traditional /conventional loss function and Taguchi's loss function. The paper addresses the issue of variability in product performance which is the cause of quality loss and tries to measure the loss through Taguchi's loss function.

3. Research Methodology

The study is essentially theoretical in nature. The materials for this study has been obtained from relevant books, journals, magazines and published work of various research scholars in the field of quality management.

4. Conventional Loss function and Taguchi's Loss Function

The traditional quality metric suggests

- All products within specifications are equally good
- All products outside specifications equally bad.

Unfortunately, this definition has led to the mindset which becomes a barrier towards improvement in products.

Figure 1: Traditional Loss Metric

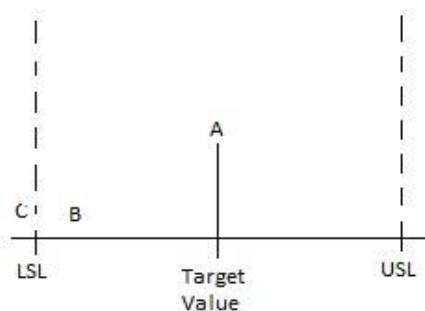


Figure 1 shows the target value, lower specification limit (LSL) and upper specification limit (USL). Both the products A and B are considered equally good although product A meets the specifications as per the target and product B is within the specification limit but far away from the target. Product C is considered to be non acceptable or equally unacceptable as it is beyond the lower specification limit.

It was Taguchi who defined and quantified quality loss via his 'Loss Function' which is quite different from the traditional concept. He unites the financial loss with the functional specification through a quadratic relationship that comes from a Taylor Series Expansion (which is an approximation method). Taguchi's loss function is as under:

$$L(Y) = M/D^2 (Y-t)^2$$

Where $L(Y)$ = the quality loss function

t = target value/most desirable value of a product

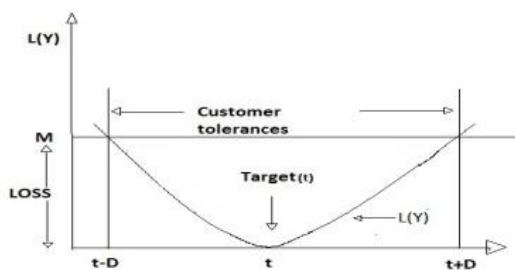
Y = performance of a product/the response found in test or analysis

M = producer's loss (in monetary terms)

D = customer's tolerance

The figure 2 shows the Taguchi's loss function

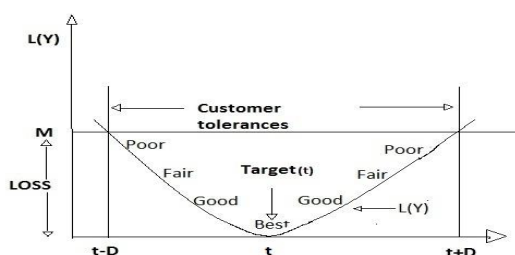
Figure 2: Graphical representation of Taguchi's Loss Function



Source: Ross (1988)

As per figure 2 the loss to the society increases as the performance characteristic deviates from the target value (t). In general this loss is square of the deviation from the target. In the figure $t + D$ and $t - D$ are the functional limits beyond which 50% of system product needs customer maintenance.

Figure 3: Relationship between quality loss and deviation from the target value (t)



In figure 3 the relationship between quality loss and deviation from the target value (t) as per Taguchi is shown. It is observed that as the measured value of the product characteristics/ customer tolerances increases the product moves away from the target (best) to poor, unlike the traditional approach. The loss to the society is measured by the function $L(Y)$ which is continuous.

5. Taguchi Loss Function- A Case

The cost of repairing a failed processor in the factory is ₹ 1000 per unit and the tolerance interval ranges from $0.325+0.025$ (GHz) to $0.325-0.025$ (GHz).

a. The Taguchi Loss Function is given as follows

$$L(Y) = M/D^2 (Y-t)^2 \text{ equation (1)}$$

where,

$L(Y)$ = the quality loss function

t = target value/most desirable value of a product

Y = performance of a product/the response found in test or analysis

M = producer's loss (in monetary terms)

D = customer's tolerance

Substituting the values in equation (1) we get

$$1000 = M/D^2 (0.025)^2$$

$$\text{or, } M/D^2 = 1000/(0.025)^2$$

$$\text{or, } M/D^2 = 1600000$$

Therefore, Taguchi's Loss Function is given by

$$L(Y) = 1600000 (Y-t)^2$$

b. Supposing a team of experts after carefully studying the root cause of scrap found out that the cost of scrap can be reduced to ₹ 500. If the process deviation from the target can be held at 0.015 GHz, then the Taguchi's loss will be as follows:

$$L(Y) = M/D^2 (Y-t)^2 \text{ equation (2)}$$

$$\text{or, } 500 = M/D^2 (0.025)^2$$

$$\text{or, } M/D^2 = 8,00,000$$

substituting the value of $M/D^2 = 800000$ in equation (2) we get

$$L(Y) = 800000 (Y-T)^2$$

$$\text{or, } L(Y) = 800000 (0.015)^2$$

$$\text{or, } L(Y) = ₹ 180$$

Therefore one can conclude that the losses can be reduced from ₹ 500 to ₹ 180 by reducing external failures/reducing process deviations.

6. Taguchi Technique and division of factors

There are two main aspects to the Taguchi technique.

First, the behaviour of a product or process is characterised in terms of factors (parameters) that are separated into two types:

- Controllable (or design) factors – those whose values may be set or easily adjusted by the designer or process engineer.
- Uncontrollable (or noise) factors- the sources of variation often associated with the production or operational environment; overall performance should, ideally, be insensitive to their variation.

Second are the controllable factors, which are divided into

- Those which affect the average levels of the response of interest, referred to as *target control factors* (TCF), sometimes called *signal factors*.
- Those which affect the variability in the response, the *variability control factors* (VCF); and
- Those which affect neither the mean response nor the variability, and can thus be adjusted to fit economic requirements, called the cost factors.

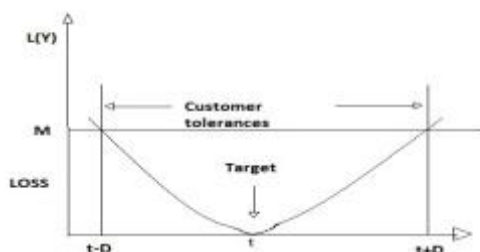
It is this concentration on variability which distinguishes the Taguchi approach from traditional tolerance methods or inspection-based quality control. The idea is to reduce variability by changing the variability control factors, while maintaining the required average performance through adjustments to the target control factors.

7. Taguchi's Loss function and its characteristics

The three characteristics that shape the definition of Taguchi loss function are as follows:

i) *Nominal – The Best*

Figure 4: Nominal- The Best



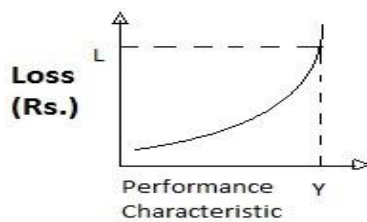
Source: Uthayakumar, 2014

Taguchi observed that many situations are approximated by the quadratic function $[L(Y) = M/D^2 (Y-t)^2]$ which is called the Nominal- the best type. As shown in figure 4 nominal- the best, where the best characteristic or target value (t) is the median of the specified upper and lower acceptable limits and the losses owing to the deviance from the target value rise proportionately to the extent of deviance on either side of the mean. The frequency settings in radio and wireless equipments can be a good example of such characteristic. When the equipment does not conform exactly to the set frequency it is considered defective, thereby increasing the social costs for repair or replacement.

ii) *Smaller – The Better*

Smaller – The Better, where the ideal target value or best quality standard is zero, and the higher the actual value, the higher the private and social costs. Examples of such cases include heat loss in heat exchanger, or carbon-dioxide emissions. For instance, the more heat lost by the heat exchanger, the less efficiently it functions, and higher the social costs.

Figure 5: Smaller-The Better



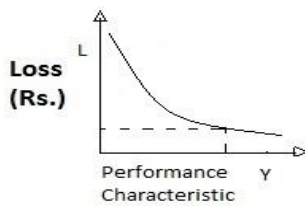
Source: Uthayakumar, 2014

The figure 5 shows the smaller –the better concept. The target value for smaller- the better is 0. There are no negative values for the performance characteristic (Y). The dotted lines represent a particular point of performance characteristic(Y) which corresponds to loss (L). It shows that the loss increases as Y increases. Example of such cases include the radiation leakage from a microwave appliance, the response time for a computer, pollution from an automobile, out of round for a hole, etc. where these are the performance characteristics for this concept.

iii) *Larger – The Better*

Larger – The Better, where the ideal characteristic or best quality standard is infinity and the higher the actual value, the better, and the lower the actual value, the more the private and social costs. Examples of such cases include maximising product yield from a process, agricultural output, and the like. For instance, the higher yields indicate better quality seeds, and lower yields increase the social costs.

Figure 6: Larger- The Better



Source: Uthayakumar, 2014

In figure 6 larger – the better, the target value is ∞ (infinity), which gives a zero loss. There are no negative values and the worst case is at $Y = 0$. The dotted lines represent a particular point of performance characteristic (Y) which corresponds to loss (L). It shows that the loss decreases as Y increases. Actually, larger – the better is the reciprocal of smaller – the better. Examples of such cases include bond strength of adhesives, welding strength, etc.

8. Taguchi Philosophy – The main points

Taguchi's philosophy focuses on the need to change

- the timing of the application of quality control from on line to off line, so that one can cease to rely on inspection, can build quality into the product and the process and thus 'do it right the first time'.
- the experimental procedures from varying one factor at a time to varying many factors at a time, through statistical experimental design techniques.
- the objectives of the experiments and the definition of quality from 'achieving conformance to specification' to 'achieving the target and minimising the variability'.
- the attitude for dealing with uncontrollable factors: remove the effect not the cause, by appropriately tuning the controllable factors.

9. Conclusion

Taguchi prefers to measure quality by *statistical reliability* such as standard deviation or mean square error (such as the loss function) rather than percentage defects or other more traditional tolerance-based criteria. The main criterion is keeping the performance at the target value while minimising variability so that the output is optimised in every aspect. In fact, this criterion is not new, already being the basis for on-line control engineering (such as *quadratic control*). But the use for *static control* of engineering seems to be very new. The principal idea in the Taguchi's philosophy is that statistical testing of a product should be carried out at the design stage in order to make the product and the process robust to variations in the manufacturing and environment.

Taguchi's recommended technique is a straightforward, well integrated system for implementing statistical experimental designs. It encourages proper experimentation and closer association between statisticians and engineers and increases statistical awareness in industry. More importantly, it completes the *total quality loop*.

Every organisation demands a real understanding of variation and an adequate appreciation of the damage which variation causes. Taguchi's loss function can satisfy both the demands. Statistically speaking, the problem of establishing constancy and maintaining consistency of purpose can be related to Taguchi's problem of achieving the mean (target) and minimising dispersion (variability) around the mean. One can only say that with regards to the problem of variability, the cause of non- quality is usually the more difficult to resolve. But one must keep trying as the search for excellence is a never ending journey.

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Ensuring Customer Satisfaction in Banking Sector through Service Quality – A Study with Reference to Select Branches of State Bank of India

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Abstract: The banking industries are facing a rapidly changing market, new technologies, economic uncertainties, increasing competition, and especially more demanding customers. The income and business growth of the banks depends on loyal and satisfied customers. As a result, in today's competitive environment, banks are continuously trying to retain their existing customer and attract new customers by providing better quality services. The objectives of the study are (i) to understand the concept of service quality and customer satisfaction, and to examine the relationship between them and (ii) to appraise the level of service quality and customer satisfaction in select branches of State Bank of India. Primary data have been collected through a structured questionnaire by direct interacting with 110 banking customers of SBI from different areas of Burdwan district. Bar chart, cross tabulation, Chi-square test, etc. have been used for interpreting the data. The study found that the service quality of SBI bank is not so satisfactory in Burdwan district. The study suggests that the banks should increase their number of ATMs, cash counting machines, and number of front desk employees to improve their quality of services.

Key-words: Service Quality, State Bank of India, SERVQUAL Model, Tangibility, Reliability.

1. Introduction

Banking, an important segment of the service sector, plays a very crucial role in the economic development of every country. In these days of intense competition, the banks are very particular in identifying the needs of their customer and how effectively that can be met. They continuously struggle and develop new strategies to differentiate

themselves from their competitors by providing their customers with high quality banking services and high technology innovative products.

Although, banking sector of India has been improved gradually for the last two decades. But it is also facing lot of challenges and difficulties such as, increasing customer's demand and awareness, increasing competition, growing population, etc. Beside these, another important challenge that the sector is facing is technological changes. As the sector is growing fast, a number of new private banks have emerged. Therefore customers are getting many options for selecting their suitable financial service provider. Due to increasing customer awareness, they would select those particular banks that can provide standard services and fulfill their expectation. In the Indian scenario, where all banks offer almost similar products and services, need based efficient customer service and the service quality can differentiate a bank.

So, to ensure customer satisfaction the banks have to improve their service quality, as service quality and customer satisfaction are interrelated to each other. It means if banks provide service as per customer's expectation then only the customers will be satisfied. As a result, to cope up this changing market condition banks have to retain old customers and have to attract new customers by providing better quality of services.

2. Review of Literature

Several studies have been conducted by the academicians and researchers on different aspects of service quality and customer satisfaction of banking sector. Few of them are summarized below:

Oppewal and Vriens (2000) used SERVQUAL model to find out the dimension which yield maximum improvement in bank's utility among different dimension such as different service attributes, strategically important service dimensions, and overall preference for banks or banking products. Chinwuba (2013) measured the customer perceived service quality and their satisfaction level by using SERVQUAL model through the help of 117 respondents. They found that assurance, empathy and responsiveness dimensions have positive relationship between them and no significant effect on customer satisfaction and there was a negative relationship and no significant impact between reliability and customer satisfaction. But the dimension tangibility has significant positive relationship with customer satisfaction.

Sheetal et.al (2004) attempted to examine the role of nature of service in knowing the order of importance of service quality dimension and found out that tangibility is least important and empathy is second least important in banking service marketing. Agarwal (2009) observed that the customers are influenced in their usage of e-banking services by the kind of account they hold, age, profession, etc. The study clearly emphasizes the need for banks to understand that the financial products and services supplied over the Internet must not only be tailored to fulfill wants, preferences, security and quality expectations of customers at the present time, but also be required to induce customers to demand and

use e-banking on a wider scale in the future. Siddiq (2011) attempted to identify the interrelationships and critical factors between service quality, customer satisfaction and customer loyalty in retail banking sector in Bangladesh. He found that all the service quality attributes are positively related to customer satisfaction and customer loyalty in the retail banking sector. Empathy demonstrates the highest positive correlation with customer satisfaction and tangibility shows the least positive correlation with customer satisfaction. Jani (2012) identified relative important factors affecting the areas of strength and weaknesses of public and private sector banks in terms of different technologies offered to customers and future growth of e-channels in retail banking. The result revealed that use of technology inferred a positive perception of customers of public sector and private sector banks. Vasantha and Rani (2011) have analyzed the practicality of determining the retail service quality opinions and its effect on demographic aspects in Bangalore city. Findings of this study delivered guidelines regarding enhancement of service offerings by various organizations and effort to provide a primary understanding on the direction of the customer's opinion about the service quality in retail banking.

Haidar and Islam (2011) determined the importance of perceived service quality factors of private commercial banks (PCB) in Bangladesh. Sample size of this study was 300. The results revealed that tangibility is the most important factor in determining the service quality followed by reliability, empathy, accessibility and assurance. Rahaman et al. (2011) conducted the study on Bangladesh to measure service quality of PCBs on expectation and perception of customers regarding the services on diverse five dimensions. Authors concluded that three factors were responsible in determining service quality gaps viz. reliability, responsiveness, and assurance. The results revealed that the gap existed between perceived services and customers' expectation in PCBs which implies that customers were not satisfied with the services provided by private sector banks.

Shanka (2012) made an on working mechanism of private banks on Ethiopia. By using SERVQUAL model, author found out that empathy and responsiveness play a important role in customer satisfaction level and the author also concluded that providing excellent service increases the customer satisfaction and customer loyalty. Muyeed (2012) conducted a study in Bangladesh to examine the service quality in retail banking by taken the sample size 250 respondents of public and private sector banks. The author found that customers are highly satisfied in prompt and accuracy in transaction but less satisfied in the service of modern equipment of the bank. Mary (2014) conducted a study in Chennai city and the study found out that the customers in private sector banks are more satisfied than customers of public sector banks. There exists a strong relationship between expectation level of the customer and level of satisfaction and customer loyalty in banking sector.

3. Objectives of the study

The main objectives of the study are as follows:

- To understand the concept of customer satisfaction and service quality, and to examine the relationship between them.
- To appraise the level of service quality in select branches of State Bank of India.

4. Database and methodology

Database

The study is both *exploratory* and *empirical* in nature. The explorative part of the study is based on the existing literature on the subject including books, journal, articles, etc. The empirical analysis in the study has been done on the basis of primary data which have been collected through field survey as mentioned below.

Methodology

For appraisal of service qualities and customers satisfaction in the banks, SBI bank has been selected as it is the largest public sector bank in India. Three semi-urban branches of SBI bank from different area of Burdwan district have been considered for collection of primary data on the basis of convenient sampling method. The selected branches of SBI are; CAC Burnpur Branch, Rupnarayanpur Branch and Niyamatpur Branch.

The information related to quality of services has been collected through a structured questionnaire by direct interaction with 110 customers of SBI bank from the three selected semi-urban branches. The questionnaire is based on SERVQUAL Model which was developed by Zeithmal, Parsuraman and Berry in the year of 1988. For appraising the service quality of the selected banks, five parameters of service quality have been used from this model. The parameters are; tangibility, reliability, responsiveness, assurance and empathy. Simple percentage, cross tabulation, bar charts, pie charts and Chi Square tests have been used to present and interpret the data.

5. Customer Satisfaction

The dictionary meaning of ‘customer’ is a person who buys goods and services. So, customer services involve three entities i.e., seller, buyer and goods/services. Customer service is, therefore, encapsulation of all these entities for the mutual benefits so as to increase the value of all the participants in the process of buying and selling.

As per Reserve Bank of India’s (RBI) definition, the customer of a bank may include:

- A person or entity that maintains an account and/or has a business relationship with a bank;
- One on whose behalf the account is maintained (i.e. the beneficial owner);
- Beneficiaries of transactions conducted by professional intermediaries, such as, stock brokers, Chartered Accountants, solicitors, etc., and

- Any person or entity concerned with a financial transaction, which can pose significant reputational or other risk to the bank, e.g., issue of a high value demand draft as a single transaction.

The Talwar Committee (1977) deserved that the main purpose of banking is “to create and deliver customer – needed services in a customer satisfying manner”. This implies that there are two elements that are required for the banking services, viz., creating and delivering services. While creation indicates the creation/introduction of new technology in services, carrying out these services effectively constitutes the delivering of services. These two elements greatly determine the level of satisfaction of the customers.

According to Kotler and Keller (2009), “customer satisfaction is a person’s feeling of pleasure or disappointment resulting from comparing a products perceived performance in relation to his or her expectation.” Rao (2008) draws the basic formula of customer satisfaction,

Customer satisfaction = Customer perception of the service received - Customer expectation of service.

In this way it is easy to generalize that if the perception of the service received exceeds the expectation of the service, customer’s satisfaction will be positive. On the other hand if the perception of the service received is less than the level of expectation of the service, it would lead to customer dissatisfaction. But customer satisfaction is highly effected by the other factors like experience, purchase decision, service provider, price, etc. There is a substantial body of empirical literature that establishes the benefits of customer satisfaction for firms. It is well established that satisfied customers are key to long-term business success. Companies that have a more satisfied customer base also experience higher economic returns. Consequently, higher customer satisfaction leads to greater customer loyalty; which in turn leads to higher future revenue.

Indian banking industries is facing various kind of ups and downs in the current scenario. There are some specific reasons like lowering of entry barriers, increasing product line of banks and non-banks, etc. Since the financial reforms, bank are also facing huge competitive pressure therefore it is inevitable for the banks to maintain loyal customers based, besides banks are trying to make strategies towards customers satisfaction and loyalty through improved service quality to achieve and improve their marker and profit position.

6. Service Quality and its Different Models

A service is an act or performance offered by one party to another. They are economic activities that create value and provide benefits for customers at specific times and places as a result bringing desired change. It can be said that service is a transaction where no physical goods are transferred. Service quality means a form of an attitude, related but not equivalent to satisfaction that results from the

comparison of expectation with performance. The customers generally use certain criteria to evaluate service quality by examining reliability, responsiveness, assurance, empathy and physical aspects. The aim of providing quality services is to satisfy customers. Measuring service quality is a better way to dictate whether the services are good or bad and whether the customers will or are satisfied with it.

According to business dictionary “Service quality means an assessment of how well a delivered service conforms to their client’s expectation”. Reeves and Bednar (1994) defined service quality as excellence, value, conformance to specifications and meeting or exceeding customers’ expectations. Service quality is defined as the degree of discrepancy between customers’ normative expectations for service and their perceptions of service performance (Parasuraman et al., 1985). Customer always wants good services from their service provider. But from above definition we can say that delivered service will become as the quality service if it meets the customer expectation. But customer expectation depends on his perception which varies from person to person. So service quality is a comparison between perceived expectation of a service and perceived performance of a service. As per Parasuraman, Zeithmal and Berry (1985) the service quality may be expressed as:

$$\text{Service quality} = \text{Perception} - \text{Expectation}$$

Therefore if the customer gets same services as they expect then difference will be zero, we can say service quality is very good. If the customer does not get the expected services then service quality is bad. Customer perception depends on various factors like age, gender, occupation, technological changes, etc. which again influence the service quality.

Service Quality Models

Numbers of service quality model have been developed by different researchers around the world like Gronroos model, GAP Model, Attribute Service Quality Model (Haywood-Farmer, 1988), Alignment Model (Berkley and Gupta 1994), SERVPERF Model, and SERVQUAL Model. Among these SERVQUAL model is one of the popular model that has been used globally for measuring service quality of different institutions including banking sector. In this study we have applied SERVQUAL model for measuring the service quality and customer satisfaction among the selected customers of State Bank of India.

SERVQUAL is a well-known multidimensional research instrument for measuring and evaluating service quality in any service sector. This model perfectly covers the dimensions that are considered by a customer in evaluating quality of service in a service sector. The objective of this survey instrument is to determine the value that the service sector is currently delivering to the customers and the value that the customer expects. The SERVQUAL model of measuring the scale of quality in service was developed by Valerie Zeithaml, Parasuraman and Len Berry in 1985. In this method data are collected via surveys of a sample of customer. In these surveys the customer responds to series of questions based around a number of key service dimensions. The methodology was originally based around 5 key dimensions. The questionnaire consists of matched pairs of items; 22

expectation items and 22 perceptions items, organized into five dimensions which are believed to align with the consumer's mental map of service quality dimension. The 5 dimensions that are used in this model are:

- **Reliability:** The ability to perform the promised service dependably and accurately.
- **Assurance:** The knowledge and courtesy of employees and their ability to convey trust and confidence.
- **Tangibles:** The appearance of physical facilities, equipment, personnel and communication materials.
- **Empathy:** The provision of caring, individualized attention to customers.
- **Responsiveness:** The willingness to help customers and to provide prompt service.

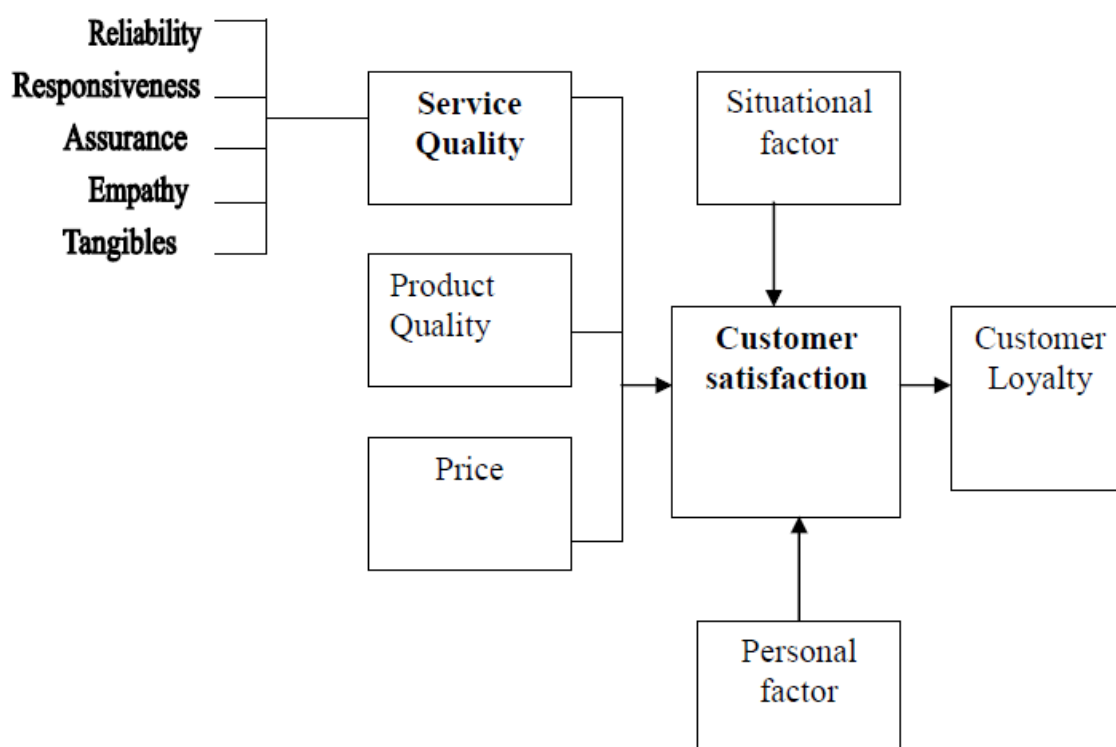
7. Relation between Customer Satisfaction and Service Quality

Customer satisfaction and service quality are inter-related. The higher the service quality, the higher is the customer satisfaction. Many agree that in the banking sector, there are no recognized standard scales to measure the perceived quality of a bank service. Thus, competitive advantage through high quality service is an increasingly important weapon to survive. As a process in time, service quality takes place before, and leads to overall customer satisfaction. Service quality has been found to be an important input to customer satisfaction.

Service quality is one of the important areas of business especially for service industries like bank to retain their customer and to attract new one. Poor customer service could cause a banking business loss of millions of dollars and also 'its credibility'. Good customer service and service quality is what attracts people to a business. When customers are pleased they become long-term assets of the bank. Building strong customer relations can tie a customer and a business together. When customers are satisfied they feel well treated and are willing to treat the business well. Perfect and smiley customer service definitely improves customer satisfaction. From the customer's perspective service quality significantly influence customer satisfaction and customer satisfaction has direct influences on purchase intentions.

Some researchers have found empirical supports for the view of the point mentioned above; where customer satisfaction came as a result of service quality. As said by Wilson et al. (2008), service quality is a focused evaluation that reflects the customer's perception of reliability, assurance, responsiveness, empathy and tangibility while satisfaction is more inclusive and it is influenced by perceptions of service quality, product price and quality, also situational factors and personal factors. The relationship between service quality and customer satisfaction is becoming crucial with the increased level of awareness among bank customers.

Exhibit 1: Customer perception of quality and customer satisfaction



(Source: Wilson et al., 2008)

8. Appraisal of Service Quality and Customer Satisfaction in SBI Bank

In this section for appraising the service quality, three branches of SBI bank have been considered from semi-urban areas of Burdwan district. The information related to quality of services has been collected through direct interview with the 110 customers of SBI by filling up the questionnaire.

8.1. Demographic Profile of the Respondent

The demographic profile of the respondents are summarized below:

a. Branch wise distribution of the Customers

The Table 1 in below shows that 45.50% respondents are from Rupnarayanpur branch, 32.70% are from CAC Burpur branch and remaining from Niyamatpur branch.

Table 1

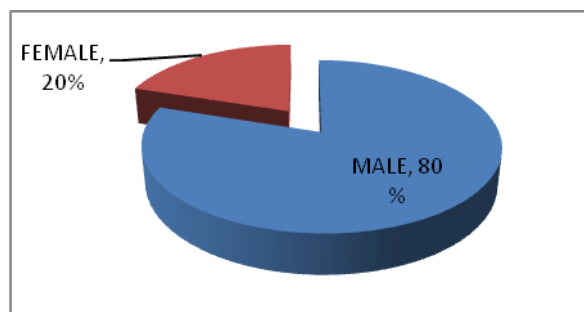
SBI BANK- NAME OF THE BRANCH	NO. OF CUSTOMER	PERCENTAGE
CAC Burnpur branch	36	32.70%
Rupnarayanpur branch	50	45.50%
Niyamatpur branch	24	21.80%

Total	110	100%
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(Source: Field survey by the Researcher)

b. Gender of the Respondents

Exhibit 2: Gender wise distribution of the customers

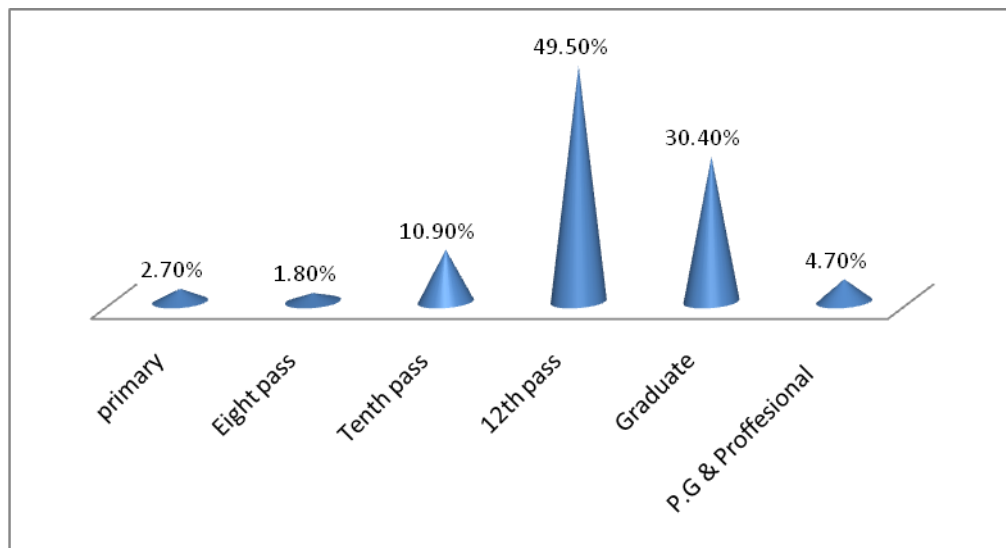


(Source: Field survey by the Researcher)

Exhibit (2) indicates that for SBI bank (80%) most of the respondents are male.

c. Educational qualification of the Respondents

Exhibit 3: Educational qualification of the Respondents

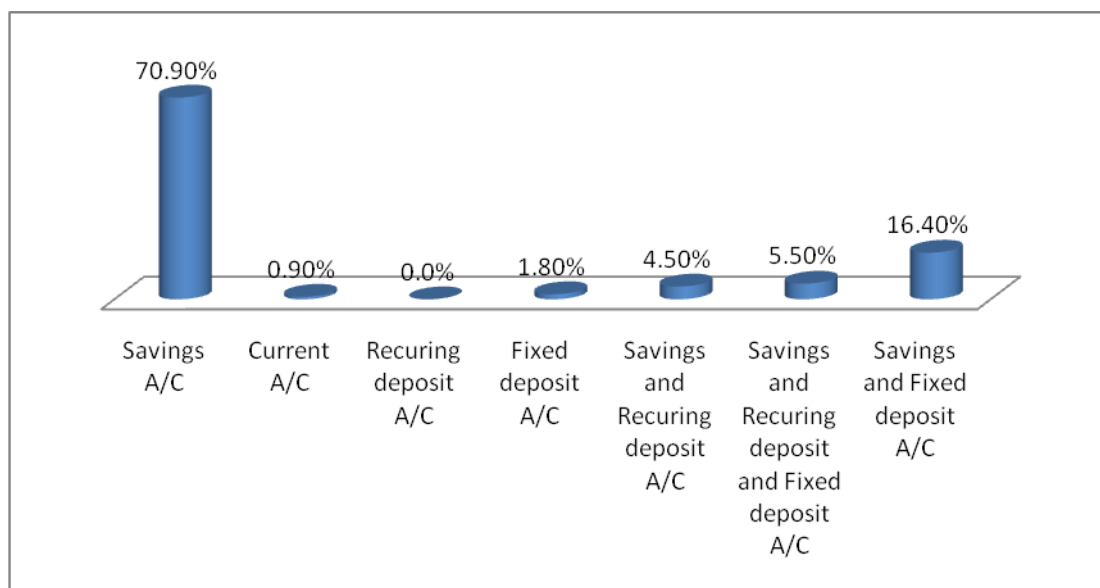


(Source: Field survey by the Researcher)

Exhibit (3) shows that most of the customers are '12 th' pass (49.50%) and 'graduate' (30.40%), and few are 'primary level educated' and 'eight pass' and Post Graduate (PG) and Professional.

e. Type of account selected by the Respondents

Exhibit 4: Type of account selected by the customers



(Source: Field survey by the Researcher)

From the above Exhibit (4) it can be said that most of the respondents (70.90%) have only Savings Account with SBI and very few of them have Current Account (0.90%) and Fixed Deposit Account (1.80%). 16.40% of the respondents have both Saving and Fixed deposit Account.

8.2. Analysis of the Service Quality and Customer Satisfaction by using SERVQUAL Model

In this section, we have analysed the primary data collected from 110 customers of three branches of SBI bank through questionnaire designed on the basis of the five parameters of SERVQUAL model. We have collected the customer's feedback in five point likert scale regarding their satisfaction level out of the services provided by SBI to examine the customer's satisfaction in regards to the quality of services. Chi-Square tests have been done to compare between the desired level and perceived level of satisfaction of the respondents regarding the five parameters. The findings of the analysis have been summarized below:

a) Tangibility

For collecting the information regarding the 'Tangibility' or physical infrastructure of the bank eleven (11) sub-parameters or questions were set up. The findings are as follows:

(i) Sub-parameter - 1: Availability of sufficient number of counter in the Banks

Availability of sufficient numbers of counters in the banks is an important factor of service quality. A Chi-Square test has been done to examine whether there is any significant difference between the desired level and perceived level of the customers regarding the availability of sufficient number of counters in the banks.

Chi Square test

Hypothesis -1

Ho – There is no significant difference between desired level and perceived level regarding sufficient number of counter available in the branches.

H1 – There is a significant difference between desired level and perceived level regarding sufficient number of counter available in the branches.

Table 3 and 4 describe the table of cross tabulation test and Chi-Square test result.

Table 3 : Cross tabulation table of desired level and perceived level of Sufficient number of counter available in the branches

					Desired tangibility		
					Sufficient number counter available		
Name of the Bank					Highly satisfied	Satisfied	Total
SBI	Perceived tangibility Sufficient number counter available	Highly satisfied	Count	27	2	29	
			% of Total	24.5%	1.8%	26.4%	
		Satisfied	Count	34	12	46	
			% of Total	30.9%	10.9%	41.8%	
		Not Decided	Count	16	7	23	
			% of Total	14.5%	6.4%	20.9%	
		Dissatisfied	Count	10	2	12	
			% of Total	9.1%	1.8%	10.9%	
		Total	Count	87	23	110	
			% of Total	79.1%	20.9%	100.0%	

Table 4 : Chi-Square Tests

Name of the Bank		Value	df	Asymp. Sig. (2-sided)
SBI	Pearson Chi-Square	5.582 ^a	3	.134
	Likelihood Ratio	6.364	3	.095
	Linear-by-Linear Association	1.693	1	.193
	N of Valid Cases	110		

In the above table 4, for SBI, Pearson Chi-Square value is 0.134, which is greater than 0.05 at 5% level of significance. So, we accept the Null Hypothesis (Ho). Now we can say that for SBI there is no significant difference between the desired level and perceived level regarding sufficient number of counter available in the branches. Hence, we may conclude that SBI bank has sufficient number of counter available for providing smooth services to the customer and the bank has met the customer's expectation level.

In the same way, we have done Chi-Square tests for the other ten (10) sub-parameters of 'Tangibility'. The findings of the Chi-Square test of all the eleven (11) sub-parameters are summarized in the following table

Table 5: Summary Table of the Chi Square tests of the parameter 'Tangibility'

<i>Sl no.</i>	<i>Hypothesis</i>	<i>P value</i>	<i>Remarks</i>
1	Ho= There is no significant difference between desired level and perceived level relating to sufficient number of counter available in the bank.	0.134	Ho accepted
2	Ho= There is no significant difference between desired level and perceived level regarding availability of cash depository machine in the branch.	0.496	Ho accepted
3	Ho = There is no significant difference between desired level and perceived level relating to sufficient number cash counting machine.	0.014	Ho rejected

4	Ho = There is no significant difference between desired level and perceived level relating to sufficient number of ATM machine in the bank.	0.121	Ho accepted
5	Ho = There is no significant difference between desired level and perceived level relating to sufficient space to serve customer with reasonable comfort in the branch of this bank.	0.015	Ho rejected
6	Ho = There is no significant difference between desired level and perceived level relating to availability of bank slip, Challan and pamphlets.	0.000	Ho rejected
7	Ho= There is no significant difference between desired level and perceived level relating to adequate staff at the bank to meet customer requirements in the bank	0.024	Ho rejected
8	Ho = There is no significant difference between desired level and perceived level relating to bank has sufficient passbook up to date machine.	0.117	Ho accepted
9	Ho= There is no significant difference between desired level and perceived level parking facilities in the bank premises.	0.13	Ho accepted
10	Ho = There is no significant difference between desired level and perceived level relating to seating facilities, drinking water and toilet facilities are convenient.	0.357	Ho accepted
11	H0= There is no significance difference between desired level and perceived level relating to E-corner facilities in the bank.	0.137	Ho accepted

(Source: Compiled by Researcher)

Table 6: Consolidated result of the Chi-Square tests for Tangibility

SBI Bank	
Accept	7
Reject	4
Total	11

(Source: Compiled by Researcher)

The above table (6) shows that regarding tangibility, seven (7) hypotheses have been accepted and four (4) hypotheses have been rejected. The acceptance of the hypothesis means that there is no significant difference between the desired level and perceived level among the customers regarding any particular service. That means, the customers are satisfied with the services if the hypothesis are accepted and vice-versa. Again, rejection of hypothesis means that there is a significant difference between the desired level and perceived level among the customer i.e. the customers are not getting the expected services regarding this parameter of ‘Tangibility’.

a) Reliability

As the same way, we have also done Chi-Square tests for the seven (7) sub-parameters of ‘Reliability’ also and got the findings which are summarized in the following table:

Table 7: Summary Table of the Chi Square tests of the parameter ‘Reliability’

<i>Sl.no</i>	<i>Hypothesis</i>	<i>P value</i>	<i>Remarks</i>
1	Ho= There is no significance difference between desired level and perceived level relating to bank renders service as promised.	0.215	Ho accepted
2	Ho = There is no significance difference between desired level and perceived level relating to standard time taken to process transaction .	0.004	Ho rejected
3	Ho = There is no significance difference between desired level and perceived level relating to staffs are sincere in solving customer problems.	0.483	Ho accepted
4	Ho= There is no significance difference between desired level and perceived level relating to level of services are same at all times of day .	0.035	Ho rejected
5	Ho= There is no significance difference between desired level and perceived level relating to accurate information are provide on website.	0.000	Ho rejected

6	Ho = There is no significance difference between desired level and perceived level relating to banks insist error free records.	0.082	Ho rejected
7	Ho = There is no significance difference between desired level and perceived level relating to customers can feel a sense of security during the transaction process.	0.000	Ho rejected

(Source : Compiled by the Researcher)

Table 8: Consolidated result of the Chi-Square tests for Reliability

SBI Bank	
Accept	2
Reject	5
Total	7

(Source : Compiled by the Researcher)

The above table (8) shows that for SBI, two (2) hypotheses have been accepted and five (5) hypotheses have been rejected and for all rejected hypothesis, desire level of the customer is greater than the perceived level regarding the parameter '*Reliability*'.

c. Responsiveness

In this case, we have also selected six (6) Sub parameter and also have done Chi-Square tests for that of 'Responsiveness' and got the findings which are summarized in the following table.

Table 9: Summary Table of the Chi Square test of the parameter '*Responsiveness*'

<i>sl.no</i>	<i>Hypothesis</i>	<i>P value</i>	<i>Remarks</i>
1	Ho = There is no significance difference between desired level and perceived level relating to your request are handle promptly.	0.003	Ho rejected
2	Ho= There is no significance difference between desired level and perceived level relating to bank alerts the customer after their every transaction through	0.001	Ho rejected

	SMS promptly.		
3	Ho= There is no significance difference between desired level and perceived level relating to response in case of emergency and seriousness.	0.434	Ho accepted
4	Ho = There is no significance difference between desired level and perceived level relating to bank delivers the information and product at proper time.	0.0183	Ho rejected
5	Ho= There is no significance difference between desired level and perceived level relating to banks performs the services right the first time.	0.011	Ho rejected
6	Ho = There is no significance difference between desired level and perceived level relating to sincerity of bank staff to answer when you have doubts and queries.	0.025	Ho rejected

(Source : Compiled by the Researcher)

Table 10: Consolidated result of Responsiveness

SBI Bank	
Accept	1
Reject	5
Total	6

The above table (10) shows that for the bank SBI one (1) hypothesis have been accepted and five (5) hypothesis have been rejected and as same way all five hypothesis are rejected. It means SBI have not been able to satisfy the customers regarding the parameter Responsiveness.

d. Assurance

For the parameter Assurance four (4) sub parameter or questions were setup and we have done Chi-Square tests on that. The findings of the Ch-Square test are summarized in the following table.

Table 11: Summary Table of the Chi Square test of the parameter ‘Assurance’

<i>sl.no</i>	<i>Hypothesis</i>	<i>P value</i>	<i>Remarks</i>
1	Ho= There is no significant difference between desired level and perceived level employee of the bank have knowledge to answer customer’s questions.	0.034	Ho rejected
2	Ho = There is no significant difference between desired level and perceived level relating to staff behavior with customers are polite and friendly.	0.026	Ho rejected
3	Ho = There is no significant difference between desired level and perceived level relating to employees are always willing to help you.	0.013	Ho rejected
4	Ho= There is no significant difference between desired level and perceived level relating to bank can honor their commitment.	0.006	Ho rejected

Table 12: Consolidated result of the parameter ‘Assurance’

SBI Bank	
Accept	0
Reject	4
Total	4

The above table (12) describe that for SBI bank all of the hypothesis have been rejected, it means that SBI have not been able to satisfy the customers of the parameter of ‘Assurance’. So we can say that for the selected branches of SBI, the customers are not getting better quality of service regarding the parameter of ‘Assurance’.

d. Empathy

In the same way, we have also set up and done Chi-Square tests for the five (5) sub-parameters of ‘Empathy’. The findings of the Ch-Square test of all the five (5) sub-parameters are summarized in the following table

Table 13: Summary table of chi square test of the parameter ‘Empathy’

<i>sl.no</i>	<i>Hypothesis</i>	<i>P value</i>	<i>Remarks</i>
1	Ho= There is no significant difference between desired level and perceived level relating to provisions of financial advice.	0.402	Ho accepted
2	Ho= There is no significant difference between desired level and perceived level relating to staffs try to determine what are the clients specific objectives.	0.519	Ho accepted
3	Ho = There is no significant difference between desired level and perceived level relating to helpdesk , call center of bank operate 24 hours.	0.118	Ho accepted
4	Ho = There is no significant difference between desired level and perceived level relating to bank’s operating hour are convenient to their customer.	0.107	Ho accepted
5	Ho = There is no significant difference between desired level and perceived level relating to employees give personal attention to their customer .	0.426	Ho accepted

(Source: Compiled by the Researcher)

Table 14: Consolidated result of the parameter ‘Empathy’

SBI Bank	
Accept	5
Reject	0
Total	5

The above table (14) indicates that for SBI, all and five (5) hypotheses have been accepted and none (0) of the hypothesis have been rejected. It means that SBI has been able to satisfy the customers for 100% of the sub-parameters (5 out of 5) of ‘Empathy’. So we can say that the customers of SBI are highly satisfied with the service quality regarding the parameter ‘*Empathy*’.

9. Conclusion

The study found that in today's competitive environment, service quality plays an important role for the long term sustainability of the banks. As a result, to cope up this changing market condition banks have to retain old customers and have to attract new customers by providing better quality of services. It has been evident from the study that there is a strong relationship between the customer satisfaction and service quality. To ensure customer satisfaction the banks have to improve their service quality as per the customer's expectation. The specific conclusions regarding the five parameters of service quality are as follows:

- (i) The appearance of physical facilities, equipment, personnel and communication materials in relation to '*Tangibility*' are not so strong in SBI Bank to satisfy their customer.
- (ii) Service quality of SBI bank is not so *reliable, accurate, secured and faithful* to satisfying their customers.
- (iii) In case of '*Responsiveness*' service quality of this bank could not meet their customer's expectation level.
- (iv) Regarding '*Assurance*' the feedback of customers of the banks is not good. Lack of assurance has been found for the bank.
- (v) Regarding '*Empathy*', SBI provide excellent services which have increased the customer's satisfaction.

10. Recommendations

Some recommendations are given below for betterment of the services in State Bank of India.

- (i) Now a day's technology is modernizing day by day therefore SBI Bank have to up to date there technology as per modern era, and banks have to install sufficient number of cash counting machine in every branches. The bank should ensure availability of bank slip, challan and pamphlets to serve customers in a better way.
- (ii) The bank should increase its staff to give personal attention to the customers and serve quickly.
- (iii) The bank should ensure that the employees are behaving politely and friendly with the customers.
- (iv) There are a huge number of customers in SBI bank. So the bank should increase its number of staff to serve the customers quickly, should improve seating facility to customers and increase the space inside the bank for providing smooth services to the customers.

- (v) Better and faster technology, swanky branches and best product/service offering are necessary but not sufficient for customer satisfaction. Hence, there is a need to transform the mindset of the staff through greater knowledge and enhanced communication skills.

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Non-Performing Assets of Public and Private Sector Banks in India: An Empirical Study

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Abstract: Priority sector lending, non-priority sector lending, corporate debt restructuring and accumulation of non-performing assets have now become an interesting topic of discussion and debate. Evolution of priority sector credit since social control of banks back in 1967 has a chequered history till emergence of micro finance as a tool of poverty alleviation. Various committees formed by RBI and the Government of India have reviewed progress of priority sector lending and recommended measures for revamping the structural and operational measures related to social banking. On the other side, non-priority sector NPAs and corporate debt restructuring seems to be alarming nowadays. Till the year 2011 the situation was different, but after 2011 with the implication of BASEL II, banks are bound to show their stressed assets and restructuring measures are in full swing. In 2015 the corporate debt restructuring was highest in last 10 years. With the introduction of financial sector reforms and adoption of prudential accounting norms following BASEL convention, the banks have been passing through tremendous crisis with phenomenal growth of non-performing assets.

This paper analyses the growth of priority sector non-performing assets, non-priority sector non-performing assets and its contribution towards building up total non-performing assets and investigates the relationship of non-performing assets with some economic parameters. It also analyses the association of corporate debt restructuring with non-performing assets and tries to find out relationship of the above two. A strong correlation is found between corporate debt restructuring and NPAs. A negative association is found between NPAs and GDP growth.

Key-words: Non-performing assets, priority sector, restructuring, growth, BASEL.

1. Introduction

Lending of a bank may be termed as asset. When this asset ceases to generate income, it becomes Non-Performing Asset. Now this lending is of two types i.e. priority sector lending and non-priority sector lending. It is widely discussed in different research papers and newspapers that priority sector contributes a lion share in the block of Non-Performing Assets. The genesis of the existing framework of the Priority Sector Lending (PSL) is way back to 1967. Morarji Desai, the Deputy Prime Minister

and Minister of Finance, Government of India made a statement in the Lok Sabha on December 14, 1967 that there have been persistent complaints that several priority sectors such as agriculture, small-scale industries and exports have not been receiving their due share of bank credit. This appears to be the first occasion that the term priority sector was used. Thus, the concept of priority sector lending was introduced. Social control on banks was instituted through Banking Laws (Amendment) Bill 1967, which was introduced in the Lok Sabha on December 23, 1967. Through social control, banks were directed to align their operations in line with the national objectives. At a meeting of the National Credit Council held in July 1968, it was emphasised that commercial banks should increase their involvement in the financing of priority sectors, viz., agriculture and small scale industries. In February 1968, before the nationalisation of banks, National Credit Council (NCC) was set up to look into the priorities of the bank's credit among various sectors of the economy. A study group (Gadgil Committee, 1969) was set up which recommended the adoption of Area Approach for bridging the spatial and structural credit gaps. Based on the recommendations 'Lead Bank Scheme' was adopted. The sectors that were identified as priority sectors were-

- Small scale industries
- Industrial estates
- Road and water transport operators
- Professional and self-employed persons
- Retail traders
- Education

The First Narasimham Committee (1991) on financial sector reform in 1991, acknowledged the role of the Priority Sector Lending programmes in extending the reach of banking system to the neglected sectors of the economy and therefore it recommended that the priority sector should be redefined to include the marginal farmers, tiny sector, small business and transport sector, village and cottage industries etc. The committee had drawn attention to the problem of low and declining profitability and stated that there is need for gradual phasing out of the directed credit programme. The committee had recommended reducing the 40% directed credit target to 10%, while simultaneously narrowing the definition of the priority sector to focus on small farmers and other low income target groups. This recommendation was not accepted by the government and the directed credit requirement continues unchanged.

Rajagopal Committee (1994) suggested that concessional credit or low rate of interest should be restricted only to the poorest of the poor and to the underprivileged sections of the society and recommended that commercial rate of interest should be charged from those who can afford it.

The Second Narasimham Committee (1998) observed that directed credit had led to an increase in non-performing loans and had adversely affected the efficiency and profitability of banks. It was observed that 47% of all non-performing assets have come from the priority sector. At the same time, the committee also accepted that a sudden reduction of priority sector targets could have the danger of a disruption in the flow of credit to these sectors. The committee recognized that the small and marginal farmers and the tiny sector of industry and small businesses have problems with regard to obtaining credit and some earmarking may be necessary for this sector. Under the present dispensation, within the priority sector, 10% of net bank credit is earmarked for lending to weaker sections. The Committee recommended that given the special needs of this sector, the current practice may continue. The Committee also proposed that given the importance and needs of employment oriented sectors (like food processing and related service activities in agriculture, fisheries, poultry and dairy), these sectors should also be covered under the scope of priority sector lending. It recommended for the removal of concessional rates of interest on loans up to Rs 2 lakhs and a phased moving away from overall priority sector targets and sub-sector targets. Debt securitisation concept was suggested within the priority sector. This would enable banks, which are not able to reach the priority sector target, to purchase the debt from other institutions.

Verma Committee (2000), Vyas committee (2001), Vyas Committee (2004), C.S. Murthy Committee (2005), RaghuramRajan Committee (2009), Malegam Committee (2011), Nachiket Mor Committee (2014) pointed out several matters regarding priority sector lending. In 2015, RBI appointed Internal Working Group (Chair: Lily Vadera) to revisit the existing priority sector lending. This committee recommended several measures which may be implemented in future.

Banks are providing huge amount of loan to corporate sector which is a part of non-priority sector lending of banks to initiate economic growth, reducing unemployment and poverty elevation. When corporate sector fails to repay required amount of principal or interest the above loan which is an asset to bank turned to an asset which is not performing and income generated out of it should not be considered by banks. This continuous process simultaneously erodes capital and reduces profitability. Due to this fear, bank are providing fresh loan to revive the non-performing asset which is known as corporate debt restructuring. Now this process brings the entire banking industry in front of dangerous situation. In 2015, the corporate debt restructuring was Rs 2067.30 billion which was 20 times more than 2005. Another important reason for which corporate debt is increasing is the NPAs' regulation. If in a block of 20 account of a certain company only 1 account become NPA, the entire block of asset becomes non-performing asset. Due to this, banks are bound to provide restructuring measures. The paper analyses the growth of priority, non-priority sector non-performing assets and find out relationship of non-performing assets with GDP and inflation. This paper also analyses corporate debt restructuring with non-performing assets and tries to find out relationship, if any, in the above two.

2. Literature Review

Shajahan (1998) made an analysis of Non-Performing Assets in public sector banks for the period 1995-97 and found almost one half of all Non-Performing Assets of Public sector banks are accounted for by the priority sector. It is clear that it was because of the netting procedure adopted by RBI that the proportion of total NPAs accounted for by priority sector appears so inflated.

Miwa et al. (2000) found no significant role of commercial banks in economic growth from the history of Japan.

Burzynska (2009) identified long-run equilibrium relationship between economic growth and financial development.

Uppal (2009) found that NPAs of public sector banks have increased because of high priority sector advance.

Krishnakutty (2011) studied that credit has no impact on economic growth in north-eastern state of India.

Prasad et al. (2011) argued that NPAs can be described as the best indicator for the health of banking industry.

Malyadri et al. (2011) found there is a significant improvement in the management of NPAs of public sector banks in India.

Rajput et al. (2012) found negative correlation between NPAs and return on assets of public sector banks.

Gupta (2012) argued that despite the efforts of banks in containing the NPAs, the amount of slippage is still high and public sector banks are more at threat while private sector banks are able to consolidate with technology and improved methods.

Banerjee (2012) found that the direction of causality between bank credit and economic growth has changed over time from credit lending output to output lending credit.

Veerakumar (2012) found more NPAs in priority sector lending in public sector banks than foreign banks.

Sevarajan and Vadivalagan (2013) studied management of Non-Performing Assets in priority sector with reference to Indian bank and other public sector banks for the period 2001-2011 found NPAs is more in priority sector compared to other PSBs in Indian Banks.

Shabbir et al (2014) discussed the trend of Priority Sector Advances and of NPAs (Non-Performing Assets) in Public, Private and Foreign Banks from 2001 to 2011.

Laveena (2014) examined the trend of NPAs over the past 8 years and the relationship between NPAs and profitability of public sector banks.

Jain et al (2015) analysed priority sector lending for banks in India through primary survey and recommended certain limit in different priority sector.

Mishra (2016) intended to explore a brief comparison between priority and non-priority sectors NPAs with respect to public sector banks in India based on secondary source of information.

Gupta and Kesari (2016) found that global economic slowdown and its impact on Indian economy was the primary reason for rising of the NPAs.

Khosla and Kumar (2017) found that the Indian banks were confronting more than Rs. 90,000 crores NPAs issue and were running under loss of benefit. The common laws of the nation were excessively awkward, making it impossible to deal with so as to recoup the awful credits.

Sengupta and Bhardhan (2017) argued that regulatory forbearance does not facilitate resolution and can actually worsen the banking crisis by providing incentives to the banks to defer NPA recognition and delay action. Restructuring of a loan should be the commercial decision of a bank and should not automatically qualify for regulatory concessions in terms of deferment of recognition of NPAs.

3. Objective and Methodology

Growth and sustainability in banking sector are imperative for attainment of economic objectives. Performance of banks is measured in terms of both income generation and quality of assets. Non-Performing Assets reveal the quality of assets, possibility of losses and reduction in income levels due to provision against such losses. Many studies have been conducted focusing NPAs, but a gap is found regarding relationship of NPAs and GDP and impact of corporate debt restructuring in NPAs generation. Focusing on this, the objectives are summarised below.

- To analyse bank-wise as well as sector-wise movement of non-performing assets and find out contribution of each sector towards building up non-performing asset in Indian commercial banks.
- To find out relationship of non-performing assets with gross domestic product.
- To examine whether corporate debt restructuring has any association with non-performing assets.

The study is based on secondary data only. Data has been procured from publications of RBI, journals, research publications of IIBF etc. For the purpose of analysis the data are taken for 13 years i.e., from 2005-2017. Due to non-availability of data on certain parameters prior to 2005, these are not considered. Correlation analysis is used to check the relationships between NPAs and economic parameters.

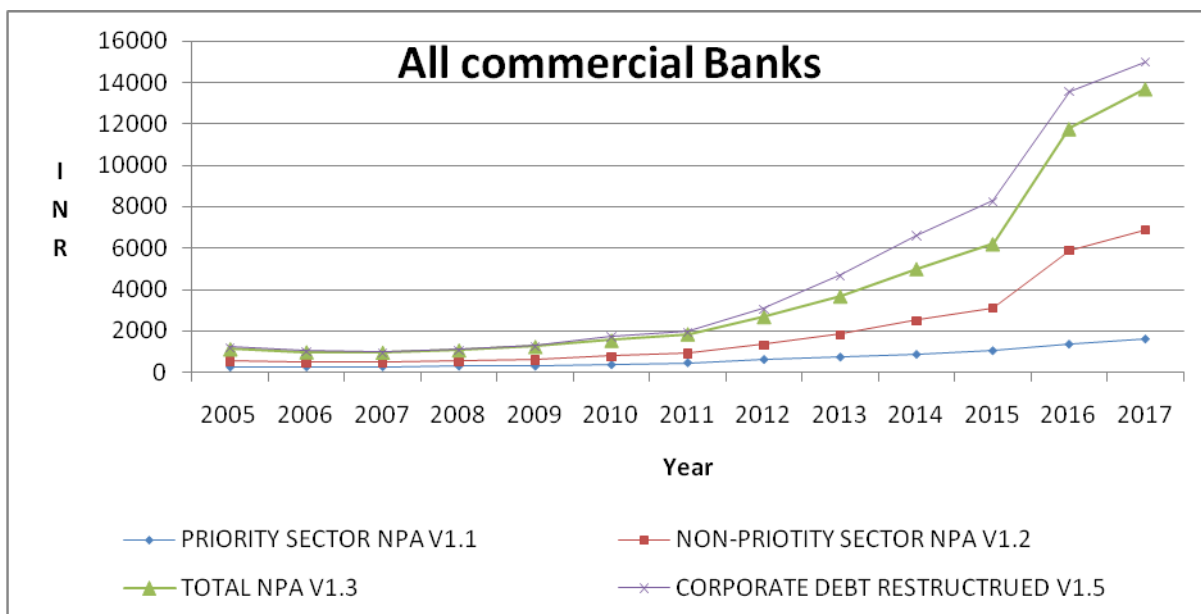
4. Analysis of Non-Performing Assets in Banking Sector

Adequate and cheap credit is a boon for the economic development of a country. Economic progress can easily be achieved by providing credit to farmers, industries, traders and business and this sector is termed as priority sector. The banks play a very crucial role in the process of economic development of any country that is why the availability of banking infrastructure is considered as pre condition for

rapid and balanced development of the country. The impact of banking system on economic growth can be seen by enhancing resources to those sectors which are employment intensive and have greater contribution to GDP (Gross Domestic Product) of the country. But in recent times the default in loans which is termed as non-performing assets increased in priority sector. We already come to know that NPA is the menace for the banking industry so we need to analyse more and more the origin of NPAs to save our industry and economy. Another very interesting fact on which very few research are found is corporate debt restructuring. We have noticed that in recent years it is increasing rapidly. Banks are restructuring loans of big corporate house in the hope that it may be turned into performing assets but in turn every year billions of money goes into drain when the revival process completely fails and the loans become non-performing assets. Now the time has come to think how far we are able to absorb the shock and tolerate this. Our analysis mainly focuses on NPAs in priority and non-priority sector along with impact of corporate debt restructuring on the overall incidence of non-performing assets.

4.1 Analysis on all Commercial Banks

Figure 1: Priority Sector NPAs, Non-Priority Sector NPAs, Corporate Debt Restructuring of all Commercial Banks (Amount in billion rupees)

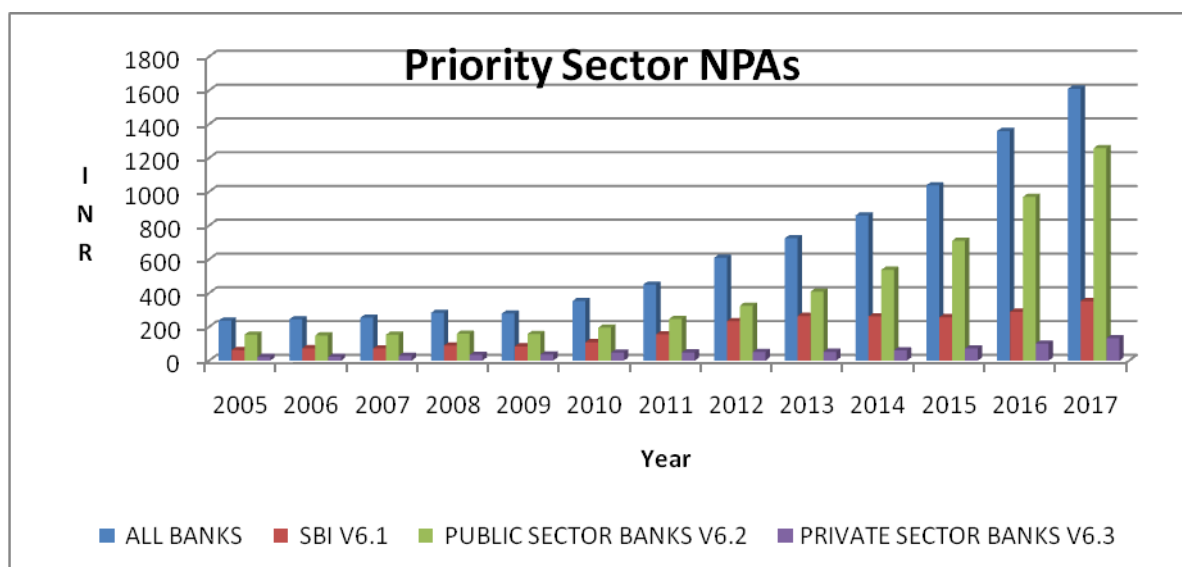


Data Source: <https://dbie.rbi.org.in>

It is seen from Fig. 1, priority sector NPAs of all the banks in 2005 is Rs. 237.24 billion and in 2016 it is Rs. 1359.09 billion i.e., there has been 5.73 times increase in NPAs. On the other hand NPAs in non-priority sector in 2005 is Rs 321.06 billion and in 2016 is Rs. 4523.48 billion i.e., a 13.09 times increase, and in case of total NPAs, in the year 2005 it is 564.22 billion and Rs. 5883.57 billion in 2016 i.e., a 9.42 times increase. It is clearly seen that non-priority sector NPAs increases almost 2.28 times than priority sector NPAs. It is very interesting to see that corporate debt restructuring in 2005 is Rs 103.98 billion and in 2015 and 2016 is Rs. 2067.30 and Rs. 1779.50 billion respectively i.e., 17.11

times increase in 2016 than 2005. In 2017 the restructuring is slightly reduced than 2016. It may be said from the above data that as soon as the corporate debt restructuring increases, the non-priority sector NPAs and the total NPAs increases. Wilful default, insolvency, poor performance in certain core sectors such as power, coal, steel, infrastructure etc. are the reasons for this restructuring. When the performance of core sectors deteriorates, banks provide more amount of loan to revive it but how far it should be beneficial for the banking industry is a big question to the policy maker and regulators.

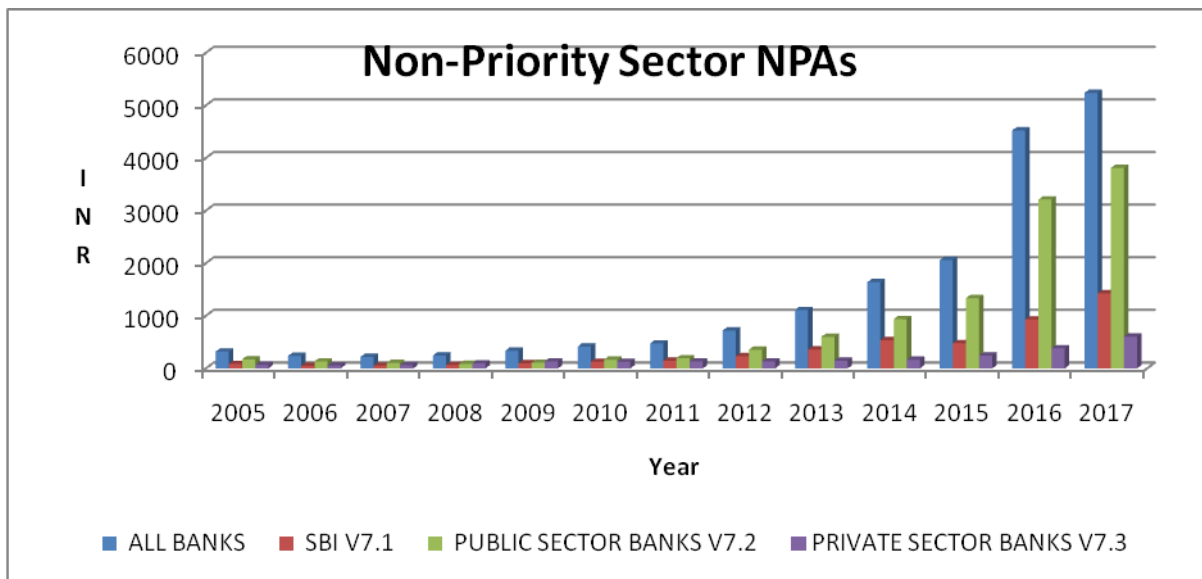
Figure 2: Priority Sector NPAs of all Commercial Banks (Amount in billion rupees)



Data Source: <https://dbie.rbi.org.in>

It is observed that priority sector NPAs in public sector banks increased 10.49 times in 2017 than 2005. In 2005 the priority sector NPAs in above sector was Rs. 153.36 billion. It increased steadily up to 2017 and has become Rs. 1609.42 billion. Because of priority sector NPAs of Public sector banks, the industry NPAs in priority sector has increased. Faulty loan sanction process, improper KYC verification, loan waiver policy of Government, faulty due diligence in the banking system are mainly responsible for this hike in priority sector NPAs in public sector banks. In case of SBI and private sector banks the priority sector NPAs increased to 5.76 times from 2005 to 2017, and the NPAs in priority sector compared to industry average is much lower up to 2017. As per Figure 2 the priority sector loan management policy of SBI and private sector banks is much better than other public sector banks up to 2017.

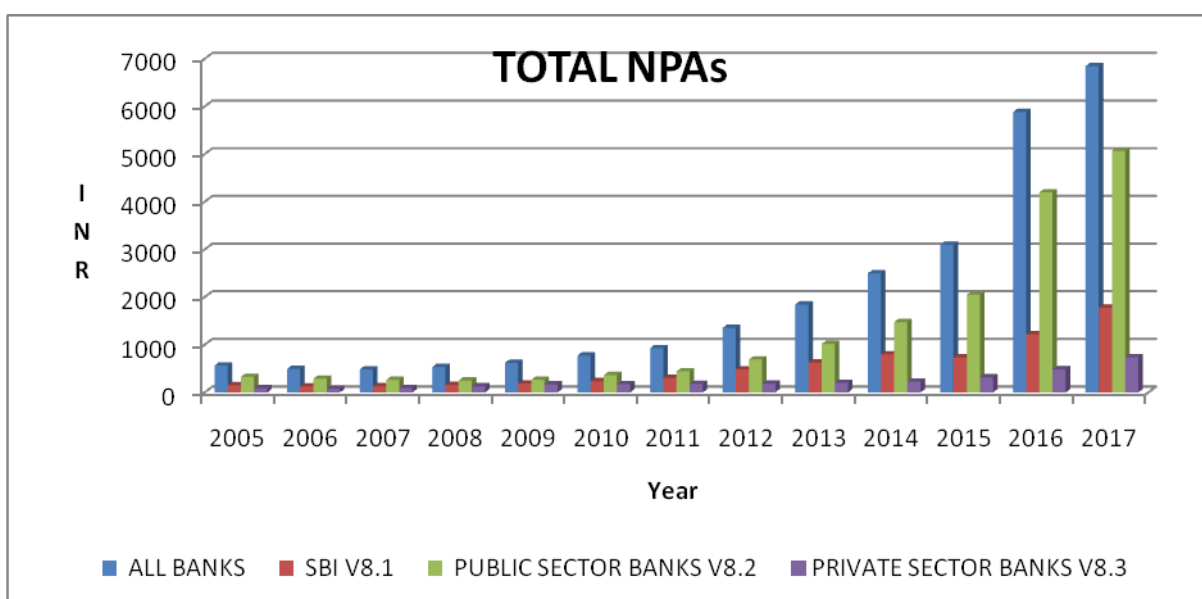
Figure 3: Non-Priority Sector NPAs of all Commercial Banks (Amount in billion rupees)



Data Source: <https://dbie.rbi.org.in>

As per Figure 3 non-priority sector NPAs in public sector banks is highest among other banks. In 2005 non-priority sector NPAs was Rs. 170.62 billion and in 2017, it is Rs. 3811.93 billion i.e., 22.34 times more than 2005. In case of SBI, non-priority sector NPAs in 2017 is Rs.1425.98 billion i.e., 16.91 times of 2005. Due to the increase in NPAs in above two sectors of banks, the total industry NPAs have become higher and stands at Rs. 6847.32 billion in 2017. But in case of private sector banks, the non-priority sector NPAs is much lower than public sector banks and State Bank of India. The management and the regulators have to look into this rising non-priority sector NPAs in public sector for the survival of banking industry as this menace in one hand can erode the capital and hamper capital adequacy, on the other it stops future flow of income.

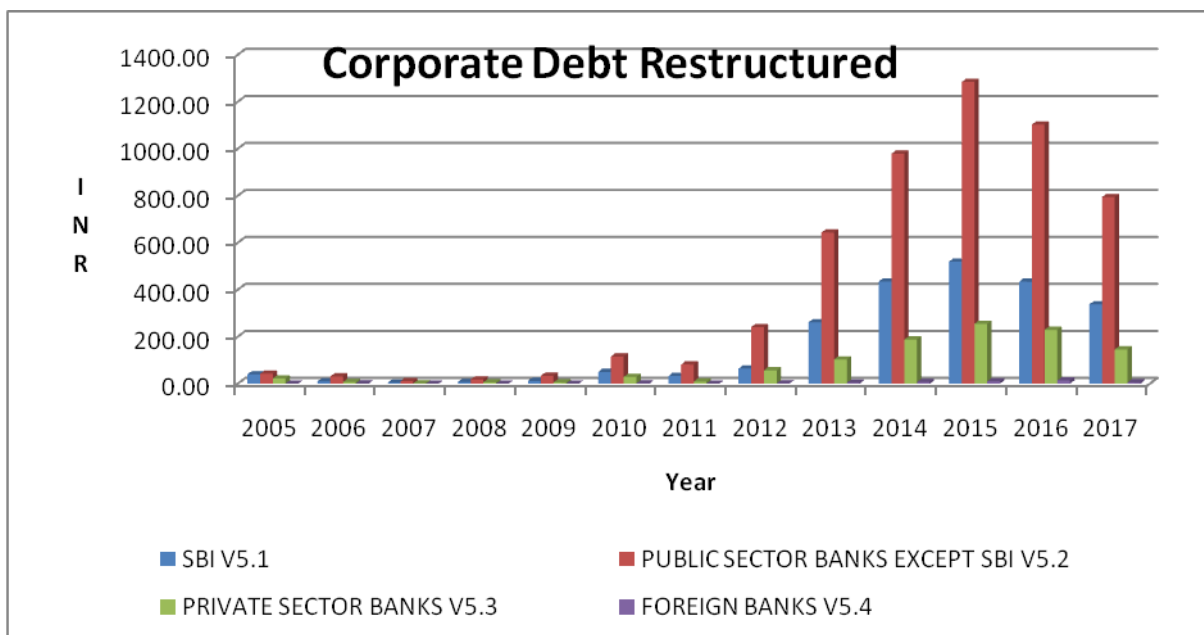
Figure 4: Total NPAs of all Commercial Banks (Amount in billion rupees)



Data Source: <https://dbie.rbi.org.in>

It is seen from the Figure 4, total NPAs of all the banks, SBI, public sector banks and private sector banks increased rapidly from 2011. In 2017, the public sector NPAs become Rs. 5069.22 billion which is more than double of 2015 when the figure was Rs. 2049.59 billion. In case of SBI, the figure increased in 2016 than 2015 by almost 1.5 times, and in 2017 the figure is increasing. Because of the combined effect of SBI and public sector banks the total NPAs also increased through the years. However the NPAs in private sector banks increased at a comparatively lower pace than public sector banks. In 2005 the NPAs in private sector was Rs. 88 billion and in 2017 the figure is Rs. 738.42 billion.

Figure 5: Corporate Debt Restructuring of all commercial banks (Amount in billion rupees)

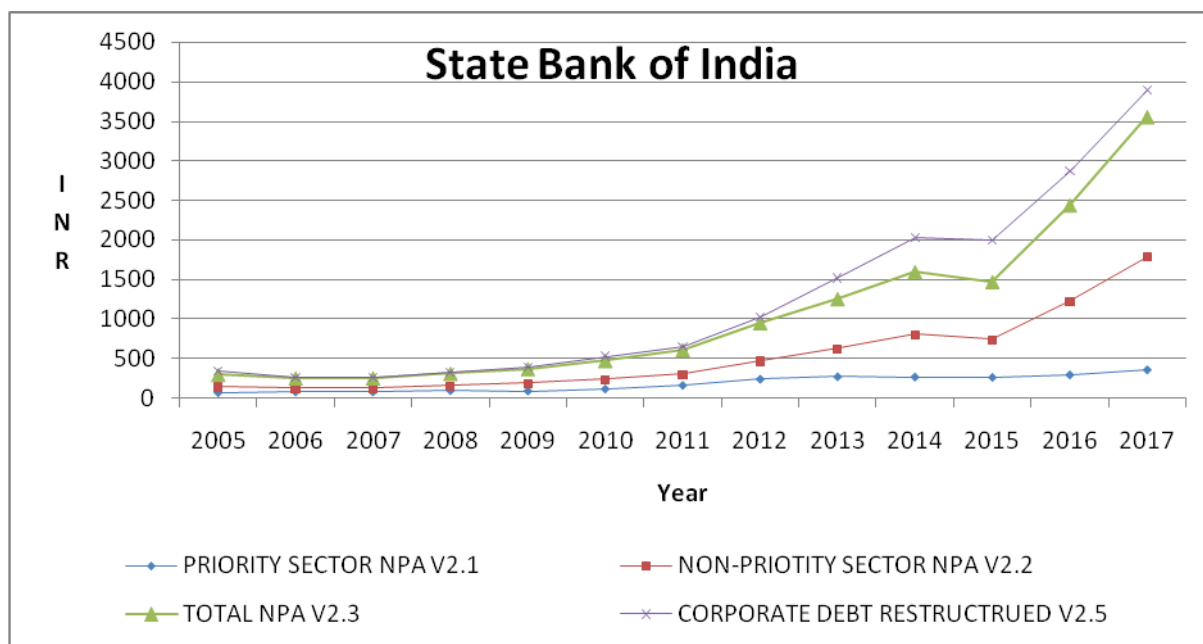


Data Source: <https://dbie.rbi.org.in>

Figure 5 reflects that corporate debt restructuring in all the banks increased substantially from 2013. In the year 2005 corporate debt restructuring was Rs. 39.31 billion and in 2016 it was Rs. 433.97 billion in SBI i.e., 11.03 times increase. In the case of public sector banks, the situation is dangerous. In 2005 corporate debt restructuring was only Rs. 42.16 billion, but in 2013, 2014, 2015, 2016, 2017 it was Rs. 433.97, Rs.978.96, Rs.1283.78, Rs.1102.73 and Rs. 794.003 billion respectively. It is the reason for facing capital shortage in the public sector banks in recent times. In private sector banks the situation is alarming from 2012, but the situation is not like public sector banks. In foreign banks the situation is under control till now. The total corporate debt restructuring increased mainly due to corporate debt restructured in public sector banks from 2013 onwards. A positive correlation is found between Non-priority sector NPAs and Corporate debt restructuring ($r = 0.937$, $p\text{-value} = 0.000$) which indicates that the primary objective of restructuring of reducing NPAs is not fulfilled.

4.2 Analysis on State Bank of India

Figure 6: Analysis of NPAs of SBI (Amount in billions rupees)

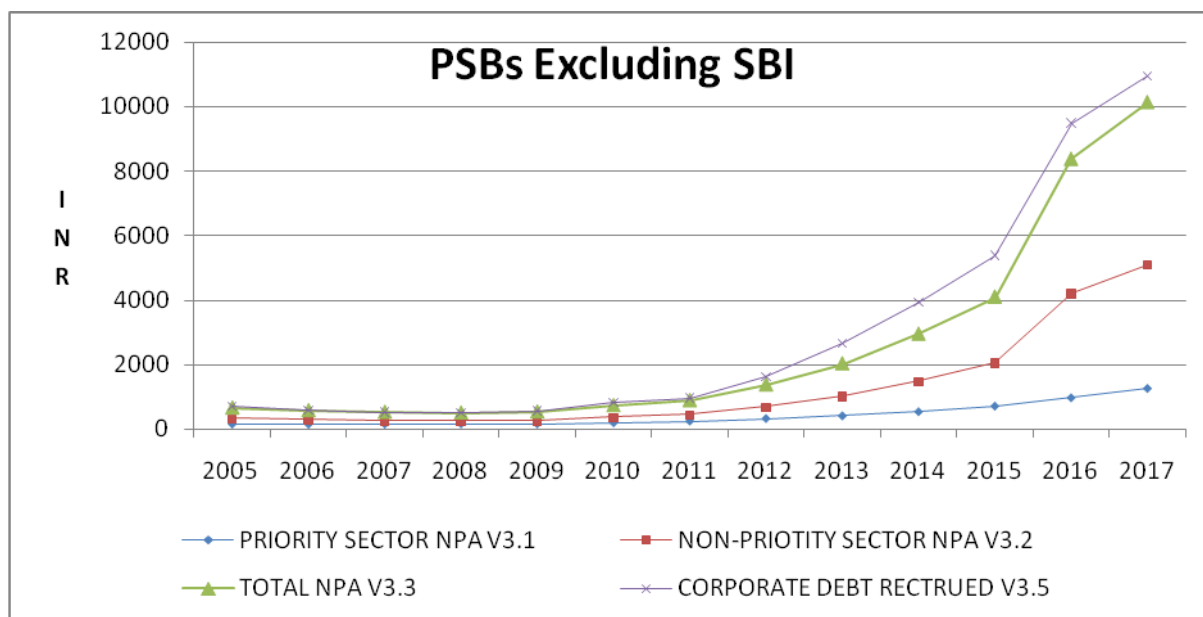


Data Source: <https://dbie.rbi.org.in>

It is noticed from Figure 6 that priority sector NPAs in SBI increased 5.67 times in 2017 compared to 2005, where as non-priority sector NPAs and corporate debt restructuring increased more than 10 times for the same period. It is interesting to see that in the year 2014, non-priority sector NPAs and the corporate debt restructured almost doubled in compared to 2013, and the total NPAs increased in the same pattern with non-priority sector NPAs and the corporate debt restructuring in SBI. However, priority sector NPAs shows a normal trend through the years. In the above situation, SBI has to think carefully on their non-priority sector NPAs and corporate debt restructuring to sustain in the business. Still it's NPAs and restructuring is much lower than public sector banks, which demonstrate a better loan monitoring mechanism followed by SBI than the Public sector banks.

4.3 Analysis of NPAs on Public Sector Banks Excluding SBI

Figure 7: Analysis of NPAs of Public Sector Banks excluding SBI (Amount in billion rupees)

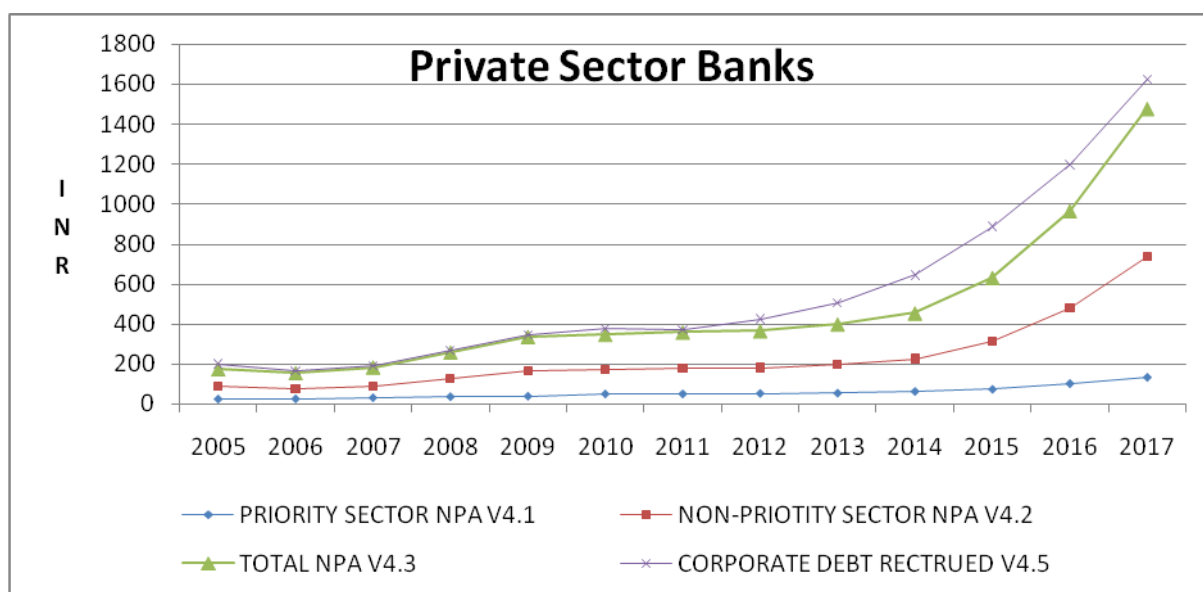


Data source: <https://dbie.rbi.org.in>

It is seen from Figure 7 priority sector NPAs of public sector banks in 2005 was Rs. 153.36 billion and in 2017 it was Rs. 1257.29 billion i.e., 8.12 times increase in NPAs. On the other hand, NPAs in non-priority sector in 2005 was Rs. 170.62 billion and in 2017 was Rs. 3811.93 billion i.e., 22.34 times increase and in case of total NPAs, in the year 2005 total NPAs is Rs. 328.04 billion and Rs. 5069.22 billion in 2017 i.e., 15.45 times increase. It is clearly seen that non-priority sector NPAs is almost 3 times than priority sector NPAs. It is very interesting to see that corporate debt restructuring in 2005 was Rs. 42.16 billion and in 2017 it was Rs. 794.003 billion i.e., 26.15 times increase in 2017 than 2005. It may be said from the above data that as soon as corporate debt restructuring increases the non-priority sector NPAs and the total NPAs increases. Wilful default, insolvency, poor performance in certain core sectors such as power, coal, steel, infrastructure etc. are the reasons for this restructuring. When the performance of core sectors deteriorates banks provide more amount of loan to revive it but how far it is beneficial for the banking industry is a big question before the policy maker and regulators.

4.4 Analysis of NPAs of Private Sector Banks

Figure 8: Analysis of NPAs of Private Sector Banks (Amount in billion rupees)



Data source: <https://dbie.rbi.org.in>

It is noticed from Figure 8 that priority sector NPAs in Private sector banks increased 6.07 times in 2017 compared to 2005 where as non-priority sector NPAs and total NPAs increased more than 9 times for the same period. It is observed that corporate debt restructuring increased Rs 22.11 billion in 2005 to Rs. 228.97 billion in 2016 and 145.62 billion in 2017. Although in terms of absolute figures, all the parameters are much lower than SBI or Public sector banks. As the non-priority sector NPAs increases, the corporate debt restructuring also increases through the years and this implies private sector has to look into the matter of non-priority sector NPAs and corporate debt restructured to sustain in the banking sector. Here also the restructuring measure fails to reduce the amount of NPAs in absolute terms.

4.5 Association of Different Variables

Statistical analysis exhibits a positive correlation between NPAs and Corporate Debt Restructuring (CDR) [$r = 0.910$, $p\text{-value} = 0.000$] and CDR is strongly correlated with non-priority sector NPAs ($r = 0.937$, $p\text{-value} = 0.000$). In case of public sector banks, the association of above two variables signify the same result ($r = 0.937$, $p\text{-value} = 0.000$). In case of SBI, the situation is similar ($r = 0.849$, $p\text{-value} = 0.000$). The result of private sector banks shows slightly better result compared to other sectors ($r = 0.839$, $p\text{-value} = 0.001$). It means that the objective of this restructuring procedure to reduce NPAs is not fulfilled by banks and hence bank has to re- think the restructuring procedure. On the other hand, NPAs is negatively correlated with GDP ($r = -0.179$, $p\text{-value} = 0.577$) which means surging NPAs has a negative impact on GDP, but as the p value shows NPAs does not have any significant impact on GDP. Inflation has no significant impact on NPAs ($r = -0.269$, $p\text{-value} = 0.398$).

5. Concluding Remark

Total NPAs increases in banking sector with a parallel increase in non-priority sector NPAs but priority sector NPAs increases comparatively lower than non-priority sector NPAs. Corporate debt restructuring increases rapidly from 2013 in the banking sector as well as non-priority sector NPAs increased substantially which demands huge provisioning, reduces profitability and erodes capital. In case of State Bank of India, total NPAs increases parallel with non-priority sector NPAs, but priority sector NPAs seems to be under control. Corporate debt restructuring in State Bank of India shows a declining mode and is totally under control. Total NPAs increases in Public Sector Banks with a parallel increase in non-priority sector NPAs and priority sector NPAs increases comparatively lower than non-priority sector NPAs which demands a close supervision on Non-priority sector NPAs. Corporate debt restructuring increases rapidly from 2013 in the Public Sector Banks as well as non-priority sector NPAs increases substantially thereby indicating that the objective of restructuring to reduce NPAs has failed. Total NPAs increases in private sector banks with a parallel increase in non-priority sector NPAs, but priority sector NPAs increases comparatively lower than non-priority sector NPAs. Corporate debt restructuring in private sector banks shows a declining mode and is totally under control. Public Sector Banks has higher NPAs in priority sector through the years than the SBI and private sector banks. Non-priority sector NPAs, corporate debt restructuring shows higher figure in public sector banks than SBI and private sector banks that leads to lack of capital adequacy in Public Sector Banks. Corporate debt restructuring in the banking sector increases mainly due to its increase in other Public Sector Banks. SBI, private sector banks have much lower restructuring figures along with total NPAs figure than Public Sector Banks, which ensures comparatively better position for them in the industry. NPAs have no significant impact on GDP and Inflation. A positive correlation is found between corporate debt restructuring and NPAs which reflects that the objective of restructuring to reduce the NPAs has failed.

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Growth and Trend in Indian MFIs Sector – A Study

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Abstract: Microfinance Institutions (MFIs) in India has grown rapidly in the last decade both in terms of client's outreach and loan portfolio. But the sector encountered serious setbacks in their developments after the Andhra Pradesh Crisis (2010). The present study is a humble attempt to evaluate the recent trend and growth in Indian MFIs sector by analyzing different issues like client outreach, loan portfolio, per capita loan size, workforce, bases of the clients, client protection practices, etc.

Key-words: MFIs, clients, MFIN, loan, trend.

1. Introduction

Currently a range of institutions in both the public sector and private sector offer microfinance services in India. Such institutions are broadly classified into two categories, namely formal institutions and non-formal institutions. The formal category comprise of apex Development Financial Institutions, Commercial Banks, Regional Rural Banks and Co-operative Banks that provide microfinance services in addition to their general banking activities. The informal institutions that undertake microfinance activities are referred as Microfinance Institutions (MFIs) and are mainly found in private sector. In this study, we have considered only the informal institutions i.e., MFIs for our discussion and analysis.

The Microfinance Institutions (MFIs) in India has grown rapidly since the last few years both in terms of client's outreach and loan portfolio. At the same time, the MFIs have become an effective tool for poverty reduction, women empowerment and financial inclusion both in rural and urban India. But the sector encountered serious setbacks in their developments after the Andhra Pradesh Crisis (2010). The loan portfolio and the client outreach faced negative growth for the first time in 2012 due to the crisis. However, the sector has shown the sign of recovery from the crisis since 2013.

2. Review of Literature

Mahajan (2001) stated that sustainability of an MFI eventually depends on the sustainability of its customers' cash-flows. He also pointed out that there is no point talking about sustainability of MFIs unless the principle of full cost recovery is accepted. Banks (and Government) have to first learn to adopt sustainable pricing methods before the microfinance sector. Fisher (2002) examined that the lack of professionalism and technical expertise among many has prevented the MFIs from achieving scale, impact sustainability. Among the thousands of MFIs operating worldwide, only a small proportion is pursuing best practices in their technical aspects of microfinance programme. Mishra and Tripathi (2003) opined that microfinance programme through NGOs and MFIs can make rapid progress in the absence of parallel formal rural formal financial systems.

Sa-Dhan and Micro-Credit Rating International Limited (M-CRIL) (2006) described the legal and regulatory framework under which the entire microfinance sector operates at present. They found that in Indian MFIs, typically, the members of the board comprise the promoters, local academics or social workers and representatives from the executive in the form of the chief executive officer (CEO). M-CRIL and Microfinance Information Exchange (2008) commented that over the past few years the structural shift in Indian microfinance has given way to a push for growth and now Indian MFIs are among the fastest growing as well as the most efficient internationally. But, high growth brings with it possible dangers of mission drift as many MFIs emphasise commercial behaviour and may not strategically balance this with their original social mission, or with social values expected in microfinance.

Indian Institute of Banking and Finance (2009) made a study on different perspectives and operating systems of microfinance in India. It has analysed the profitability, efficiency and productivity of the MFIs. It concluded that a minimum amount of profit or surplus is essential for the MFIs to ensure sustainability. Most of the MFIs in their initial stage of operations have to incur high amount of fixed cost due to which the operating expense ratio of the MFIs in their initial stages of operation is high. Panda (2009) made an elaborate study on different aspects of microfinance in India. His study covers the conceptual issues, evolution, regulatory framework and lending methodology of microfinance programme in India. He also deals with risk involved and marketing strategy of MFIs. He identified that the product demand is different across various segments, various geographical areas and changes over time period. MFIs develop products as they want to reach more people and thereby increase their market share.

Chowbey and Sharma (2010) made a thorough study on the cost structure and other complexities faced by the small MFIs in Bihar. They found that maximum of the MFIs in Bihar are charging flat rate of interest varying between 12-18% p.a. They also found that the processing fees, service charges, non-interest bearing cash security along with flat interest rate has made the real cost of lending non-transparent and exorbitant.

Sa-Dhan (2012) prepared and presented the summarised data of 184 MFIs state-wise, legal form-wise, district-wise, region-wise and organisation-wise in a very useful manner. Puhazhendhi (2013) has outlined the recent trend and scenario of Indian microfinance sector. He pointed out that a number of MFIs are providing other products and services such as savings, micro insurance, micro pension, health and housing loans, loans for water supply and sanitation etc. He also found that MFIs in India have historically displayed mixed enthusiasm experimenting with new products on account of their own imperatives as well as regulatory limitations. While many of the products showed the success for replication, still there are several unresolved issues which need to be appropriately considered while up scaling these innovations.

Sinha (2007) argued that MFIs certainly need to be nurtured, but banks also need to be encouraged to take a more direct interest in down-scaling their products and services to suit micro-clients. The first step in this process must be the removal of the interest rate cap on small loans. The only impact of the interest rate cap is to reduce banks' interest in making such loans. He also stated that if the government wants a much larger proportion of the country's low-income people to gain access to financial services, it should both loosen interest rate controls for banks and create enabling regulations for MFIs. Kothari and Gupta (2007) mentioned that inadequate regulation is one element curbing the microfinance sector's healthy expansion. The Reserve Bank of India is understandably hesitant to directly regulate the disclosure practices of all Indian MFIs. As such, the RBI has largely left MFI regulation to the MFIs themselves.

In March 2008, the Finance Minister tabled the 'The Micro Financial Sector (Development and Regulation) Bill, 2007' in the Lok Sabha, which was then referred to the Lok Sabha Standing Committee on Finance. But somehow the Bill has not been passed in the Parliament. Malegam Committee (2011) has suggested creating a separate category for Non-Banking Financial Company (NBFC) operating in the Microfinance sector, such NBFCs being designated as NBFC-MFI. It also recommended an interest cap of 24% on individual loans and many other recommendations to bring transparency in the sector and to protect the clients from unethical business practices.

The Government of India made another draft regulation named ‘Microfinance Institutions (Development and Regulation) Bill 2011’ for the sector. The Bill proposed the Reserve Bank of India as the sole regulator and puts industry under a strict watch. The draft Bill gives sweeping power to the RBI by bringing all aspect of microfinance under its oversight. Finally, the ‘Microfinance Institutions (Development and Regulation) Bill, 2012’ – was tabled in the Indian Parliament on 29 May 2012 with slight modification, in the draft Microfinance Bill, 2012. The bill provides flexibility of RBI to apply different measures, vary the same and delegate the powers to regulate to NABARD.

3. Objectives of the Study

The objectives of the study are:

- (i) To understand the genesis and concept of Microfinance Institutions (MFIs),
- (ii) To analyse the growth in client outreach and loan portfolio by the Indian MFIs,
- (iii) To examine the recent trend in Indian MFIs sector.

4. Database and Methodology

The study is *exploratory* in nature and is based on the existing literature on the subject including books, journals, articles, newspaper reports, reports of concerned committees and institutions, research based articles on microfinance published in journals and international best practices, etc. The analysis part has been done on the basis secondary data which have been collected from various sources including State of the Sector Report, Sa-Dhan Report, MFIN Newsletter, different websites, etc.

5. Microfinance Institutions in India – Genesis and Concept

“Micro Finance Institution” means an entity (irrespective of its organisational form), which provides microfinance services in the form and manner as may be prescribed but does not include (i) a banking company; (ii) a co-operative society. “Micro-finance services” means one or more of the following financial services involving small amount to individuals or groups: (i) providing micro credit; (ii) collection of thrift; (iii) remittance of funds; (iv) providing pension or insurance services; (v) any other services as may be specified.

Beginning with the first registered MFI, Self Employed Women’s Association (SEWA) at Ahmadabad in 1974, the numbers of MFIs operating in India have reached to almost 1000 as estimated by M-CRIL. Not only the numbers of MFIs have changed but also the features and characteristics of the MFIs have changed significantly. In 1990’s, the MFIs were initially

started as a mode of development work but today these are an alternative of viable business along with social development. Presently the MFIs do not only rely on the bank loan or donor fund, they are arranging fund through Securitization, Non-Convertible Debenture, Private Equity, Mutual Fund, etc. The features of ‘First Generation MFIs’ and ‘New Generation MFIs’ have been summarized in the Table - 1 below.

Table 1: Characteristics of First Generation and New Generation MFIs

Category	First Generation MFIs	New Generation MFIs
Promoter profile	Development workers	Management graduate, first-generation entrepreneurs
Objectives	Financial Inclusion with social intermediation	Aggressive expansion, social impact with growth
Legal forms	Not for profit structure	Start as NBFC
Capital structure	Look at debt as main instrument	Start with Private Equity (PE) or Equity investors, securitization, access to capital market
Areas of operation	Usually Southern India	National, even global ambitions.
Management and HR Structure	Socially motivated and locally picked staff	Professional advisors & external consultants, outsourcing operational job work, leverage investor relation
Sustainability	Longer incubation period supported by donors	Break even in 1-2 years

(Source: The International Finance Corporation (2009))

The following Table-2 highlights the major milestone for the Indian MFIs.

Table 2: Major milestone for Indian MFIs

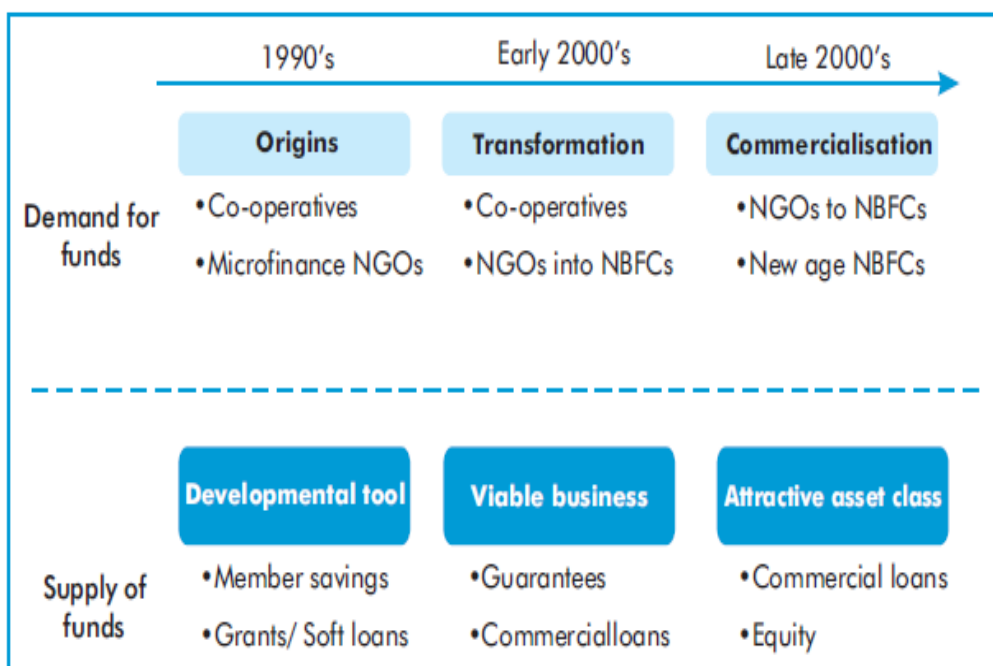
Year	Achievements
1974	First registered MFI, Self Employed Women’s Association (SEWA) at Ahmadabad
1984	NABARD advocated SHG Linkage as an important tool for poverty alleviation and other Government agencies followed.
2004	RBI included MFI lending in priority sector lending and recognize MFI as a tool for financial inclusion.
2009	Microfinance Institutions Network (MFIN) was started as a self regulatory body for the sector and all the NBFC-MFI are eligible for membership.
2010	a) 9.2 million borrowers in Andhra Pradesh (AP) in default on

	MFI loans, largest number of defaulters in any single location in the world. b) AP crisis strikes; state issues ordinance to regulate MFI sector while banks refuse to lend to the MFI companies.
2011	RBI releases Malegam Committee regulations.
2012	Margin cap revised to 10% from 12% (for MFIs with portfolios >1,000 million)
2013	Malegam recommendations fully implemented and industry back on the growth path.
2014	a) The RBI issues Universal Banking license to Bandhan, the largest micro-lender in terms of assets. b) MFIN was formally recognized as a self regulatory body by the RBI.
2015	MUDRA Bank announced; and RBI eases lending norms for MFI companies
2015	Small Finance Bank (SFB) license awarded to 8 MFI companies namely Disha, ESAF, JFS, RGVN, Suryoday, Ujjivan, Equitas and Utkarsh

(Source: Compiled by the researcher)

The following Exhibit-1 shows the demand for and supply of funds for the MFIs in India from 1990's to late 2000's. In 1990's, the savings, grants and soft loans were the main sources of fund, whereas in late 2000's commercial loans and equity are the main source of funding to the sector. The exhibit again depicts that the MFIs have been transformed from developmental tool to viable business and finally as an attractive asset class.

Exhibit 1: Demand and Supply of Funds for the MFIs



(Source: The International Finance Corporation (2009))

MFIs in India have made significant progress during the last two decades in terms of outreach and penetration in unbanked areas through several innovations in credit delivery and terms of lending, thereby emerging as a structural addition to the financial system. India's microfinance sector was in a state of flux, presenting an abundance of opportunities for investors, policy makers and microfinance professionals alike. However, high growth of MFIs has encountered serious setbacks in their development due to adverse consequences of Andhra Pradesh crisis and its dark shadow over the entire sector across the country. The negative growth in terms of outreach and loan portfolio from the second half of the crisis year 2010-11 continued in 2011-12. Despite the stagnating top line, the sector has been cautiously optimistic on account of strong regulatory initiatives, greater emphasis on client protection and improving governance with social focus.

A study conducted by 'Economist Intelligence Unit' on the global microfinance business environment reveals that the relative position of the Indian microfinance sector in the global context has made a significant downfall during the last three years. The overall MFI business environment of India which was in 4th position in 2009 and in 8th position in 2010 has come down to 27th position by the year 2011. At the same time, the relative position of 'Regulatory Framework Practices' and 'Supporting Institutional Framework' have also shown drastic downfall during the last few years. The Table - 3 shows the global relative position of Indian microfinance sector.

Table 3: Global Relative position of Indian Microfinance Sector

Particulars	Rank			
	2009	2010	2011	2013
Overall MFI Business Environment	4	8	27	16
Regulatory Framework & Practices	13	14	22	28
Supporting Institutional Framework	3	7	20	5

(Source: Microfinance India – State of the Sector Report, 2012)

But the Indian microfinance sector has regained its lost reputation by developing its 'Supporting Institutional Framework' (Rank 5th) and 'Overall MFI Business Environment' (Rank 16th) from the year 2013.

6. Recent Trend and Growth in Indian MFIs – An Analysis

This section deals with the recent trend and growth in Indian MFIs over the years. The growth and trend in client outreach, loan portfolio outstanding, outreach to special segments of the society, workforce of the MFIs, etc have been discussed with facts and figures.

6.1. Client Outreach and Loan Portfolio Outstanding of Indian MFIs

The total number of clients served by MFIs stood at 371 lakh as on 31st March, 2015. Client outreach of MFIs had grown substantially from 2005 to 2011, reaching a level of 371 lakh. This trend slowed down during 2012 and 2013 and the number of clients slumped to 275 lakh. The trend reversed in 2014 with a growth and reached a level of 330 lakhs. This trend continued in 2015 with an astounding rise in clients/borrowers to an all-time high of 371 lakh.

The loan portfolio growth trajectory has changed direction a little and posted a decline in 2012, nearly by three percent, as compared to that in 2011. Cautious bankers releasing lesser funds to the sector and the operational constraints faced by the Andhra Pradesh based MFIs would have contributed to the decline. However, the growth in the states outside Andhra Pradesh and southern states are normal. Table 4 summarised the year-wise clients' outreach and loan portfolio outstanding by the Indian MFIs along with percentage increase and decrease.

Table 4: Clients Outreach (in Lakhs) and Loan Portfolio Outstanding (Rs. in crore) over the Years

Year	Client Outreach (in lakhs)	Percentage increase/decrease over the previous year	Loan Portfolio Outstanding Rs. (in crore)	Percentage increase/decrease over the previous year
2001	3	--	64.5	--
2002	3	--	183.5	184.50
2003	9	200.00	283.4	54.50
2004	33	266.66	433.9	53.10
2005	35	6.06	468	7.85
2006	40	14.28	2070	342.30
2007	100	150.00	3456	66.95
2008	141	41.00	5954	72.28
2009	226	60.28	11734	97.07
2010	267	18.14	18343.9	56.33
2011	317	19.10	24332	32.64
2012	275	(15.72)	24607	1.13
2013	275	---	25699	4.44
2014	330	20.00	33517	30.42

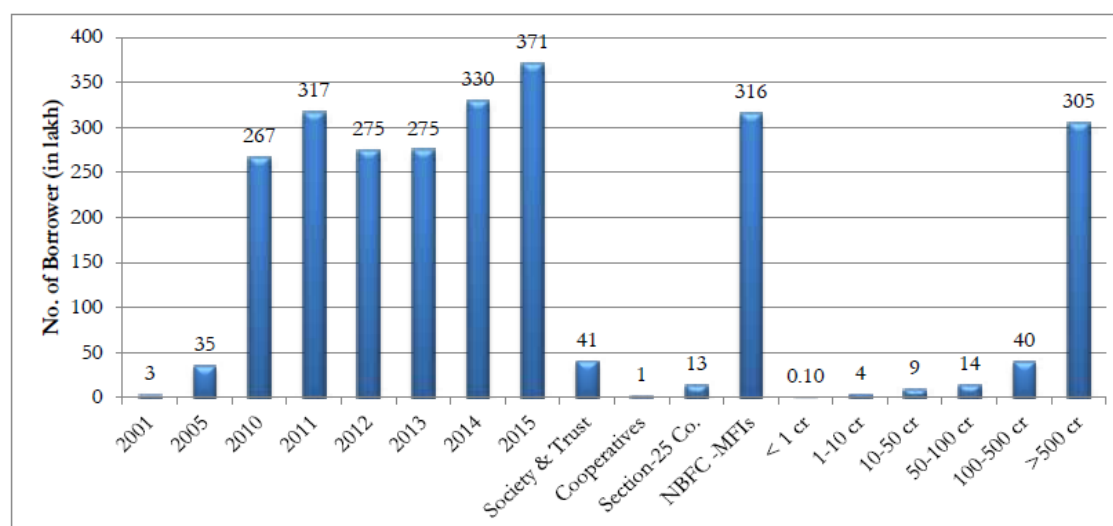
2015	371	12.4	48882	45.84
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(Source: The Bharat Microfinance Report 2012 and 2015, Sa-Dhan)

But for the first time the client outreach has decreased by 15.72% in the year 2012 in terms of 2011. At the same time the loan portfolio has been stagnant in the year 2012 and 2013. The percentage of increase in loan portfolio has declined from 97.07% in 2009 to 1.13% in 2012 and 4.44% in 2013.

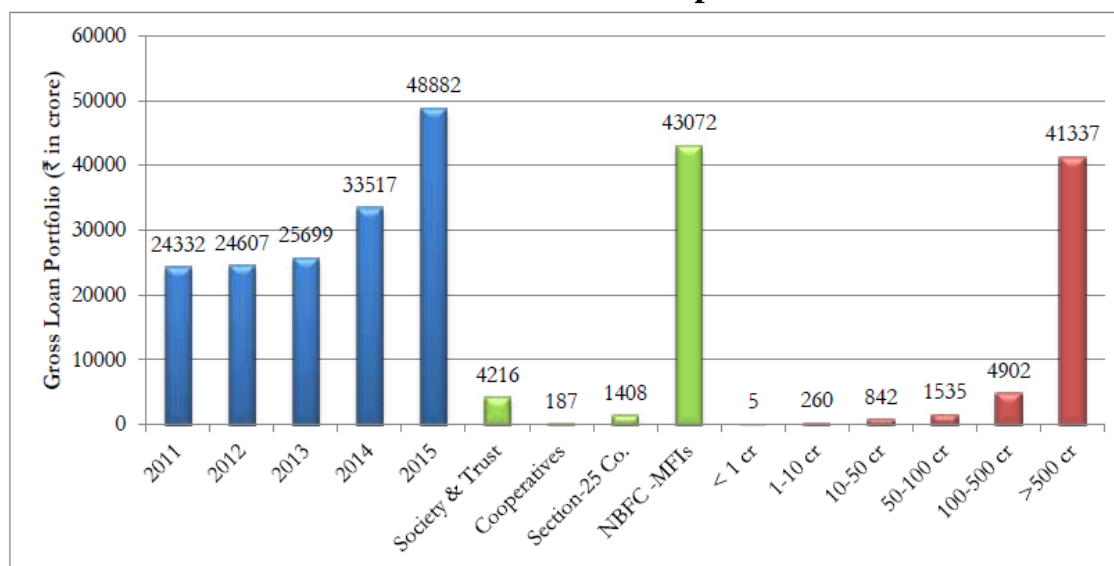
The main reason behind the fall was the issue related to client protection practices, multiple lending, and over-indebtedness of the clients which led to Andhra Pradesh crisis in 2010. The crisis has not only affected the MFIs in Andhra Pradesh but also the overall sentiment and microfinance business in the country. That is why client protection mechanism is an important issue for long term sustainability of the MFIs.

Exhibit 2: Graphical Presentation of MFI's Client Outreach over the years and Break up of 2015



(Source: The Bharat Microfinance Report 2015, Sa-Dhan)

Exhibit 3: Graphical Presentation of MFI's Loan Portfolio Outstanding over the years and Break up of 2015



(Source: The Bharat Microfinance Report 2015, Sa-Dhan)

The above exhibit shows that the total loan portfolio of the sector has reached to Rs. 48,882 crore as on 31 March, 2015. The above two exhibit depicts that majority of these clients are being served by NBFC-MFIs (85.18%), primarily the larger ones. MFIs with outstanding portfolio above Rs. 500 crore are responsible for reaching out to 82.21% of the clients in the industry.

6.2. Outreach to Special Segment of Borrowers (Women, SC/ST, and Minorities)

Globally, microfinance has always focused on women while delivering their services. A large segment of people from Scheduled Castes (SCs), Scheduled Tribes (STs), and Minorities are served by the Indian MFIs. Women clients constitute 97% of the total clients of MFIs. Similarly, SC/ST borrowers also constitute a substantial chunk (27%) of the clients. A trend analysis of women borrowers, SC/ST borrowers and minority borrowers is shown in percentage in terms of total borrowers using a table.

Table 5: Category wise Composition of Borrowers

Year	Women Borrower	SC/ST Borrower	Minority Borrower
2012	95%	20%	23%
2013	96%	21%	23%
2014	97%	19%	14%
2015	97%	28%	18%
2016	97%	30%	27%

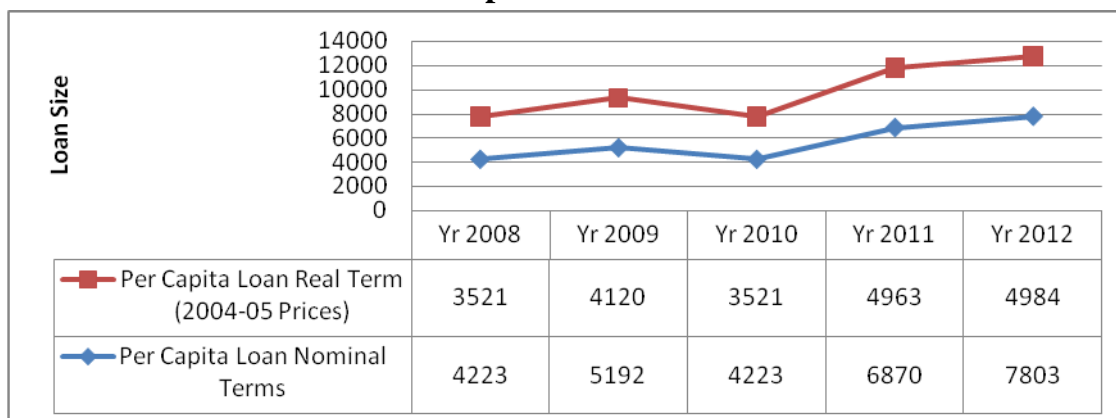
(Source: The Bharat Microfinance Report 2016, Sa-Dhan)

From the above Table - 5 it is observed that the percentage of women borrowers, SC/ST borrowers and Minority borrowers have been consistently increasing for last four years.

6.3. Average Per Capita Loan Size

The average per capita loan size during 2012 was Rs. 7,803 which was about 15 percent higher than the previous year 2011. Exhibit – 4 depicts the per capita loan size from 2008 to 2012.

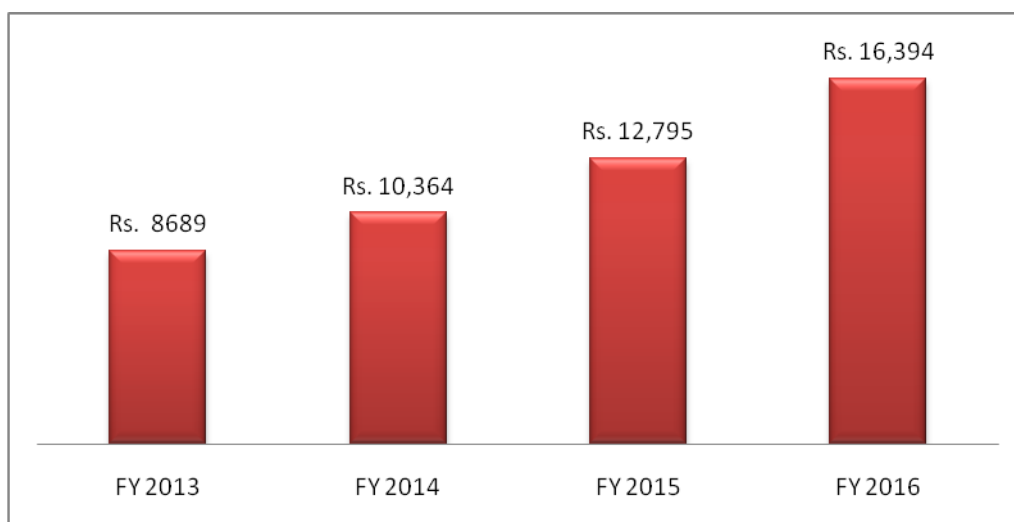
Exhibit 4: Per Capita Loan Size over the Years



(Source: Microfinance India – State of the Sector Report 2012)

Exhibit –5 depicts the per capita loan size from 2013 to 2016.

Exhibit 5: Average loan outstanding per client (in Rs.)



(Source: Evolving Landscape of Microfinance Institution in India, ASSOCHAM)

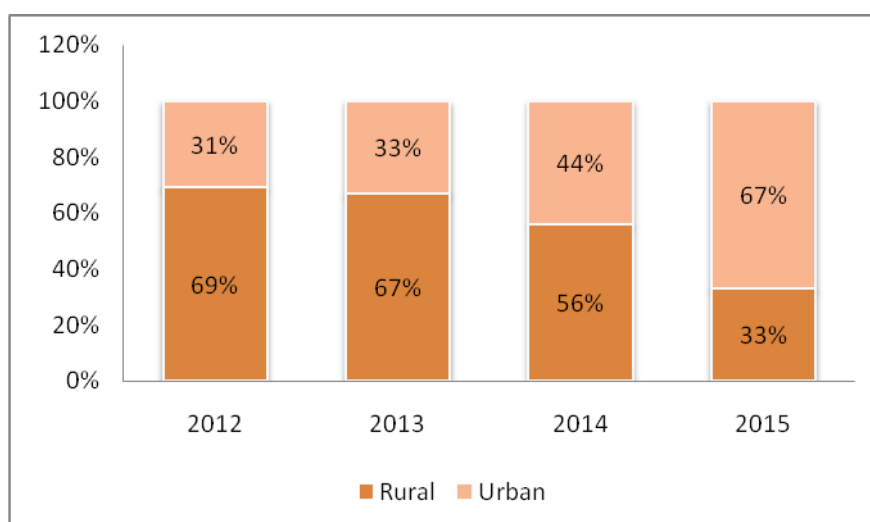
MFIs have reported a 58% jump in average loan size per client from Rs. 10,364 in 2014 to Rs. 16,394 in 2016.

6.4. *Base of Borrowers*

Indian MFIs have always focused and preferred the rural clients for delivering their services. In 2012, the portion of rural clients was 69% among the total clients in India. But, after that the trend has changed and it has almost reversed in the year 2015 when only 33% of the clients are from rural area and 67 are from urban.

The shift in the customer base of MFIs has been due to several factors, like strong growth of urban focused MFIs, shift in business model of many MFIs and reluctance of banks to lend to small borrowers. As per RBI guidelines the MFIs cannot charge more than 10% over the cost of loan taken from banks while fixing the loan price. So, to cut down their operating cost and to maximize their operational efficiency, a large number of MFIs have shifted to an urban centric business model.

Exhibit 6: Percentage of Rural and Urban Borrower over the years

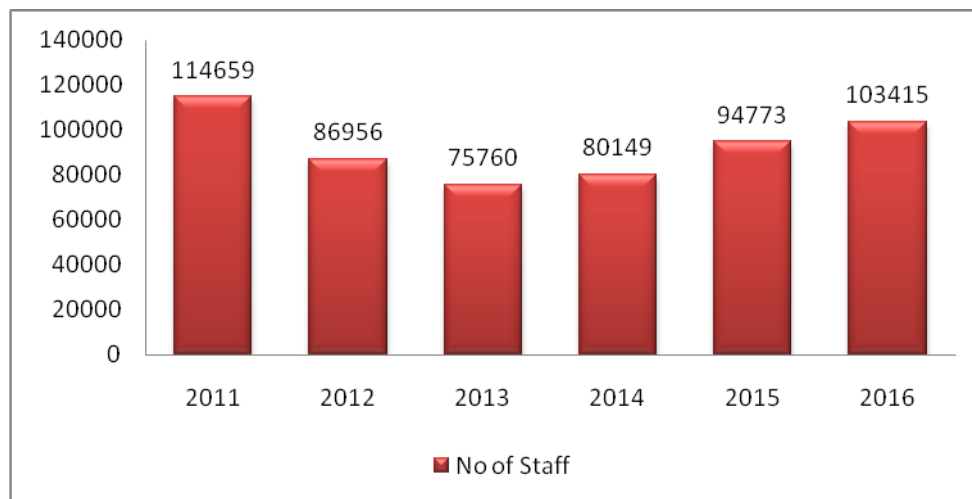


(Source: Evolving Landscape of Microfinance Institution in India, ASSOCHAM)

6.5. *Trend of Workforce in Indian MFIs*

Human Touch i.e., the relation between the field staff and clients plays a significant role in microfinance sector. Even after the introduction of technology in the sector, these services still predominantly depend on human resources for ensuring effective delivery. That is why the personnel costs contribute substantially i.e., 24% to the total expenses of MFIs. After the Andhra Pradesh crisis, 2010, the MFI sector had brought down its workforce significantly from 1,14,659 in 2011 to just 75,760 in 2013. But after recovery from the crisis the workforce have been increased to 1,03,415 in 2016 in order to support their enhanced activity.

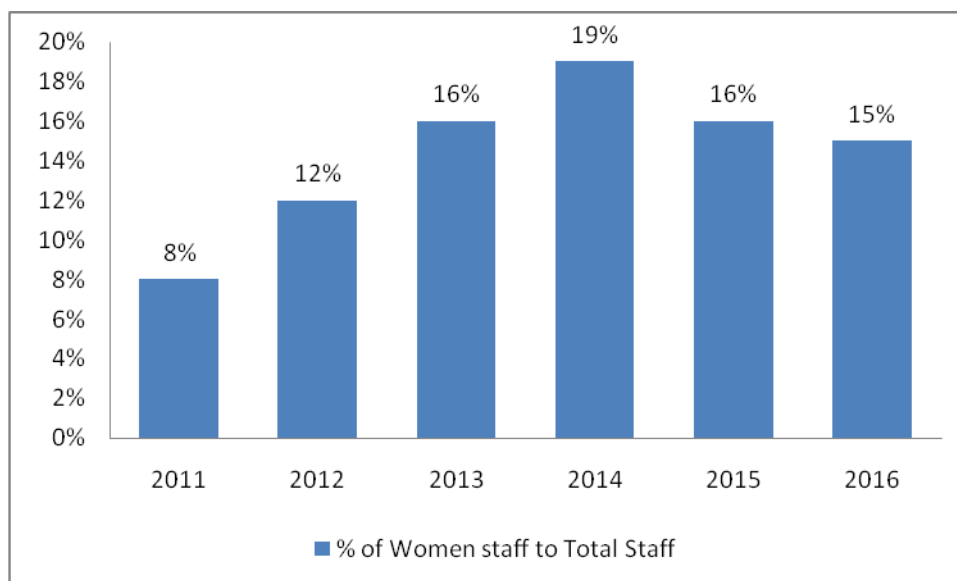
Exhibit 7: Yearly Trend of No. of MFI Staff



(Source: The Bharat Microfinance Report 2016, Sa-Dhan)

In 2016, the female staff comprises of approximately 15% of the total workforce of MFIs. Female staff has been reduced to 15% in 2016 from 16% in 2015 otherwise this proportion has been increasing over the year still 2014 as shown in Exhibit-8. .

Exhibit 8: Yearly trend of Total Staff vs. Women Staff



(Source: The Bharat Microfinance Report 2016, Sa-Dhan)

6.6. Growing importance towards Client Protection Practices

Client protection is all about protecting the clients from over indebtedness, high interest rates and providing them more transparent, friendly and professional services. Adoption of client protection measures by MFIs ensures that the clients are treated with transparency, respect, and prudence. This is especially important because MFIs operate within limited government regulations and the clients that are served by MFIs are vulnerable.

Client protection principles have been adopted widely by Indian MFIs under the umbrella of Social Performance Management. The codes of conduct of MFI networks Sa-Dhan and Microfinance Institutions Network (MFIN) embody a set of core principles for the fair treatment of microfinance clients while transacting with a microfinance institution that incorporate client protection principles. Microfinance codes of conduct in India adopt the Smart Campaign's client protection principles. Sa-Dhan brought out the code of conduct for adoption by member MFIs in 2007 and in 2010 made efforts into having its members adopt the code of conduct and implement these principles in their operations and practices.

Role of Smart Campaign in Ensuring Client Protection by Indian MFIs

The Smart Campaign is a global campaign consisting of microfinance leaders from around the world who believe that protecting clients is not only the right thing to do but the smart thing to do. The Smart Campaign works with key players in Indian microfinance sector who are committed to making client protection an integral part of the industry. The Campaign's main target audiences are MFIs and the key actors in the ecosystem in which MFIs work. The Campaign views its role as building the capacity of local stakeholders so that MFIs that are committed and ready to improve their client protection practices will have access to the support they need.

Exhibit 9: Smart Campaign Partners in India

Partners	How Actor Can Influence MFI Behavior
MFI (NBFCs and Section 25 Companies)	Individuals inside MFIs, especially board and management, can take leadership.
National Associations (ACCESS-ASSIST, MFIN, Sa-Dhan)	Training, codes of conduct and staff training.
Funders (IFC, Maanaveeya, Triple –Jump, SIDBI)	Include CPP assessment in their due diligence and monitoring.
Technical Providers (ACCESS-ASSIST, EDA, Microsave)	Equip MFIs to translate CPPs into practice.
Raters (M-CRIL)	Certify MFIs.

(Source:Bansal, Hema (2013))

Client Protection Certification

Client Protection Certification is an independent, external evaluation to publicly recognize financial institutions that meet adequate standards of care in how they treat clients.

Certification enables financial institutions to demonstrate adherence to the microfinance industry's Client Protection Practices (CPPs), as measured against industry wide accepted Client Protection standards. Certification is a way to demonstrate such a commitment. To date, the Smart Campaign has licensed four specialized microfinance rating agencies to conduct client protection certifications:

- M-CRIL
- Planet Rating
- Micro Finanza Rating
- Micro Rate

Comparison of Client Protection Mechanism in India with the other Asian Countries

A study has been done by The Small Enterprise Education and Promotion Network (SEEP) in 2015 to examine the client protection (CP) policies and practices in nine microfinance markets in Asia: India, Pakistan, the Philippines, Myanmar, Cambodia, Bangladesh, Nepal, Sri Lanka, and China. The findings in this report have been gleaned from assessments conducted by the national microfinance associations in these countries from August to November 2014, using the SEEP Client Protection Market Diagnostic Tool. This tool is based on the CGAP (Consultative Group to Assist the Poor) methodology used to conduct CP diagnostic exercises in various countries and uses the Smart Campaign's Client Protection Principles as a reference.

Exhibit 10: Summary of the State of Practice of Client Protection in Asian Countries

Industry Practices	China*	Nepal	Pakistan	India**	SriLanka*	Myanmar	Cambodia	Bangladesh	The Philippines*
Transparency									
Credit Products	◐	◐	●	●	◐	◐	●	○	●
Deposits & Other Products	N/A	○	◐	◐	N/A	○	◐	○	○
Fair Treatment	○	○	○	●	◐	◐	●	●	◐
Protection of Clients									
Borrowers	◐	○	◐	◐	◐	○	●	◐	◐
Depositors	N/A	●	○	N/A	N/A	◐	◐	●	N/A
Recourse Mechanisms	◐	◐	◐	◐	◐	○	◐	◐	◐
Data Protection	◐	◐	●	●	◐	●	●	◐	●

* credit market only;

** MFIs in India and the Philippines must disclose microinsurance costs and conditions

Legend

- Meets basic conditions
- ◐ Work in progress, but needs improvement
- Inadequate

(Source: SEEP (2015))

The above table shows that Indian MFIs are relatively in better position in terms of client protection issues. Indian MFIs are providing better ‘Transparency’ for credit products than the Philippines and Pakistani MFIs. They are also providing better protection to their clients and data protection compared to other Asian countries.

7. Conclusion

The last decade witnessed an outstanding growth for the MFIs sector in India. The sector has been changed from its traditional donor based concept to commercial loan and equity based sustainable MFIs. Now a day these are an alternative or proposition of viable business along with social development. At the same time the sector faces huge criticism and challenges from every stakeholders after the Andhra Pradesh crisis in 2010. But the sector has again gets its momentum and gradually recovering from the crisis from the year 2013 onwards in terms of client outreach, loan portfolio, per capita loan size, etc.

The MFIs had brought down its workforce significantly in 2013 but the workforce has again increased in 2016 in order to support their enhanced activity. At the same time the percentage of women staff has declined in last year. One major change in trend has been found in relation to bases of the clients, i.e. the focus of the MFIs has been shifted from rural clients towards urban client in the recent past. In terms of client protection, Indian MFIs have performed better than the other Asian countries.

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A Content Analysis of the Whistleblowing Policies of Selected Central Public Sector Enterprises

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Abstract: The existence of a policy as well as the content coverage has significant impact upon the effectiveness of the policy. In absence of written guideline, the violations and illicit activities tend to rise exponentially. However, the content of the written guideline also needs to be checked carefully so that the expected outcomes can be achieved. Whistleblower policy has been framed by many Central Public Sector Enterprises (CPSEs) as per the Central Vigilance Commission (CVC) recommendations; however, the number of voices raising concern against malpractices is not very satisfactory. This study is an effort to examine the content coverage of the whistleblower policy framed by such companies and understand the challenges that needs to be addressed through such policies.

Key-words: Whistleblower policy, CPSEs, recommendations, violations, malpractices, CVC.

1. Introduction

Employees are the first observer of malpractice in workplace. Thus, for a committed employee, raising an alarm against the wrongdoing is part of the duty. Organizations must structure a system under which such employees can raise their concerns and the problems can be resolved in their budding state itself. Miceli and Near (1992) defined the term whistleblowing as the act of raising concern against malpractices within organization to a powerful authority. In long run such effort leads the organization towards stable and efficient system deficient of malpractices. It is beneficial for the overall well-being of the organization as well as keeps the employee morale high.

In spite of high corruption perception index as 79 in the year 2016 in India (Transparency International, 2016), the instances of whistleblowing is significantly less in our country. It indicates that all employees are not motivated to come forward and speak up. The key reason behind such hesitation can be sought in the way the organization frames the whistleblower policy and the ways it adapts to ensure its implementation.

On global platform, all major economies such as the United States of America, the United Kingdom, Germany, European countries, G20 countries etc. have implemented whistleblowing provisions in one way or the other to ensure better governance.

This study is an effort to assess the content coverage of whistleblower policies in the Central Public Sector Enterprises. Government of India issued a circular in 2010 to incorporate whistleblower provision in form of a policy or as a component in Corporate Governance measures (Government of India, 2010). The legal provisions in this context has been strengthened in our country in last 8 years, however, the desirable impact has been absent. A strong whistleblower policy can play pivotal role in building confidence among the employees to come forward for the right reason.

2. Brief Survey of Literature

The literature review revealed that internal whistleblowing has been accepted as more effective to save the organization's public image as well as the employee from severe repercussions of malpractice expose in media (Dworkin and Baucus, 1998), (Barnett, 1992). Also, attention towards an adverse issue in its nascent stage can reduce the extent of damage that may be caused in the long run (Puri, Trehan and Kakkar, 2010). The opportunity for malpractice arises due to excessive power in the hands of a bureaucratic corporate structure (Bansal, 2005), (Punch, 1996). Hence, whistleblower policy must be incorporated as an essential part of corporate philosophy (Puri, Trehan and Kakkar, 2010).

In order to understand the subjects included in such policies, Content Analysis technique can prove to be an effective technique. Content Analysis has been adopted by researchers as an important technique for gaining valuable insights embedded within text documents. It can be used to identify valid and definite features of documents in systematic and objective manner (Stone, Dunphy, Smith, & Ogilvie, December 15, 1966), (Weber, 1990). Also, it is important to understand that a feature may have several interpretations in multiple contexts. Hence, it has been established that there is a relationship between the data and its context (Krippendorff, 1980). In 1998, researchers accepted that quantitative content analysis helps to scientifically identify various texts, assigns numerical values and helps to draw inferences about the data from text documents (Riffe, Lacy and Fico, 1998), (Neuendorf, 2002). Krippendorff (2012) stated that content analysis is “.... exploratory in process and predictive or inferential in intent. It transcends traditional notions or symbols, contents and intents.”

3. Research Gap

Indian research has a void in this particular area. Certain studies on whistleblowing in Indian context have been done such as (Keenan, 2002), (The World Bank, 2006). However any study on Indian public sector with regard to the whistleblower policy has not been noticed. Surprisingly, on international platform also there is only countable research done in this area. Significant contributors in this area are Brown (2007), Hassink, Vries, and Bollen (2007) and Robinett, Marathe, and Kikeri (2010). This study is an attempt to address the gap to the extent possible. This research is focussed on understanding the existing mechanism for internal reporting

4. Objectives

The present study, therefore, finds a real void in this field when it comes to the Indian scenario. As the country gradually emerges as one of the future powers in the global arena, an exploratory journey into the field of institutionalized whistleblowing in order to ensure effective corporate governance seems to be extremely relevant.

This study, therefore, attempts to address the issues below.

To what extent institutionalised whistleblowing has been incorporated in the public sector enterprises (PSEs) in India

The above objective can, therefore, be translated into the following research questions:

Whether the listed PSEs really have effective ‘whistleblower policy’ under the head ‘Corporate Governance’?

Content analysis has been done to understand the contents of the whistleblower policies framed by CPSEs in our country and then to find the extent to which these are really effective.

5. Methodology for Data analysis - Content Analysis

In order to address the objective, answer to the following questions has been sought:

1. Whether companies have addressed the key issues that should be covered under the policy?
2. Whether companies provided necessary details for dealing with the key issues?
3. Identifying the areas that need attention.

The available policies of 32 companies have been intensely analysed for the contents. The research question number 1 and 2 has been addressed in the content analysis table (Table 2). The Hassink’s work divided the policy content into 6 groups in European context. However, as per the policy contents and the range of information gathered from the policies, the policy contents are classified into 8 groups

in order to suit Indian context. The percentage has been calculated to find how many companies have covered the important issues under the policy and also to assess the extent of coverage of such issues.

The observations have been categorized under 8 categories labelled as Category 1 to Category 8 as listed below:

1. Category 1- General content, scope and tone
2. Category 2- Nature of violations to be reported
3. Category 3- Officials or bodies to whom wrongdoing should be reported
4. Category 4- Reporting guidelines and procedures
5. Category 5- Investigation procedure
6. Category 6- Confidentiality and anonymity
7. Category 7- Protection from retaliation
8. Category 8- Whistleblower accountability

6. Sampling scheme and dataset

The primary research population of this study is the central public sector companies that are listed on the Bombay Stock Exchange. The name of such companies has been collected from the website of the Department of Public Enterprises (DPE) under Government of India (GOI) as on 31.03.2012. The names have been enlisted in the Public Enterprise Survey Report 2011-2012 (Volume 1, Chapter 1, Performance Overview, page number 19, Table 1.15)¹ conducted under GOI. The total number of companies stood at 45.

The following process has been followed:

Phase I :

1. The company website links were searched to find out the whistleblower policy or vigil mechanism prevailing in the company.
 2. Total number of companies – 45 [i + ii + iii]
- (i) Number of companies having whistleblower policy which is publicly accessible – 33
- (ii) Number of subsidiary company – 1
- (iii) Number of companies whose whistleblower policy is not accessible publicly - 1
- Number of companies following CVC resolution on whistleblowing – 11

Phase II :

1. Attempts were then made to retrieve the company contact information (email id and phone number) for the company whose policy is not available on the public website.
2. The company was approached for providing the policy; however, no response has been received.

Table 1: Sample Collection

Particulars	Count	Percentage
Total No. of companies selected	45	
Number of companies including subsidiary having whistleblower policy which is publicly accessible	33	
Number of subsidiary company	1	
Number of companies whose whistleblower policy is not accessible publicly	1	
Number of companies not having explicit whistleblower policy and following CVC resolution on whistleblowing	11	
WB ² policy framing rate (34/45)		75.56%
WB Policy		
No. of WB Policy collected from company websites	32	
No. of WB Policy collected from other websites	0	
No. of WB Policy unavailable on internet	1	
WB Policy collection rate (32/45)		71.11%
Email		
No. of Email searched for companies	1	
Email id available	1	
Email id not available	0	
Email sent to company	1	
Email Response Rate (0/1)		0.00%
Phone Calls		
Phone contact searched for companies	1	
Phone contact available	1	
Phone contacts made	1	
Response received	0	
Companies not responded	1	
Phone call response rate (0/1)		0%
Total WB documents required	33³	
Total WB documents available	32	
Total WB documents unavailable	1	
WB documents availability rate (32/33)		96.97%

Initially the sample size was 45. Since all listed CPSEs do not have whistleblower policy in place, the sample is further divided into 2 groups-

1. Sub Sample I – 34 companies having whistleblower policy. Since, policy of 1 company is not accessible and 1 company is the subsidiary of another company (means same policy is followed in both cases), Sample I is considered to be 32.

2. Sub Sample II – 11 companies who are following CVC guidelines on whistleblowing directly.

The study has been done covering the significant area of whistleblowing policy. It does a content analysis of the whistleblower policies existing in the CPSEs.

7. The Study - Content Analysis

Table 2: Content Analysis			
SL NO	DESCRIPTION	Count	Percentage
		Out of 32	Sub-Sample 1 (32)
I	GENERAL CONTENT, SCOPE AND TONE		
1	The possibility of reporting is stated neutrally	18	56.3
2	Stated that employees are explicitly encouraged to report	7	21.9
3	Stated that the policy applies to all employees	27	84.4
4	Stated that the policy applies to the entire group	7	21.9
5	Stated that the policy applies to ex-employees also	2	6.3
6	Stated that the policy includes suppliers also	5	15.6
7	Policy applies to other stakeholders	5	15.6
8	Stated that the policy is framed as per DPE guidelines	12	37.5
9	Stated that the policy follows SEBI norms	7	21.9
10	Stated that the policy is in compliance with the Clause 49 of the Listing Agreement requirement 2014	26	81.3
11	Policy is in compliance with PIDPI 2004	2	6.3
12	Policy is in compliance with Companies Act 2013	8	25.0
13	Stated that the policy do not cover the issues which comes	11	34.4

	under Public Servant's Inquiries Act 1850		
14	Stated that the policy do not cover the issues which comes under Inquiry Act 1952	13	40.6
15	Policy do not cover issues which is likely to prejudicially affect the interest of the sovereignty and integrity of India	1	3.1
16	Stated that Audit Committee is constituted u/s 292A of Companies Act 1956	16	50.0
17	Stated that Audit Committee is constituted in accordance with the Corporate Governance guidelines issued by DPE	2	6.3
18	Audit Committee is constituted u/s 177 (9) of Companies Act 2013	11	34.4
19	Stated that unit heads are required to notify and communicate the existence and contents of whistle blower policy to employees	13	40.6
20	Stated that whistle blower policy must be displayed on all notice boards	4	12.5
21	Stated that whistle blower policy and amendments should be available on company's intranet	11	34.4
22	Policy on website	2	6.3
23	Stated that policy does not replace or dilute existing vigil mechanism	16	50.0
II	NATURE OF VIOLATIONS TO BE REPORTED		
1	Violation of law	20	62.5
2	Infringement of company's Code of Conduct for members of Board/ Sr. Management, CDA ⁴ Rules	23	71.9
3	Infringement of company's CDA Rules	24	75.0
4	Mismanagement and misappropriation of monies	19	59.4
5	Actual or suspected fraud	26	81.3
6	Substantial and specific danger to public health and safety	9	28.1
7	Abuse of authority	20	62.5
8	Unethical and improper practices	28	87.5
9	Wrongful conduct / Incompetence / Gross inefficiency	23	71.9

10	Manipulation or disclosure of company data or records	16	50.0
11	Breach of contract	10	31.3
III	OFFICIALS OR BODIES TO WHOM WRONG SHOULD BE REPORTED		
1	Chairman of Audit Committee	23	71.9
2	Chairman cum Managing Director (CMD) of the company	23	71.9
3	Any person delegated by CMD in his absence	22	68.8
4	Company Secretary	6	18.8
5	General Manager (Legal)	2	6.3
6	Audit Committee	14	43.8
7	Immediate Supervisor / Any other senior official	1	3.1
8	Ombudsperson	2	6.3
9	Whistle Authority / Empowered Committee / Ethics Committee	7	21.9
10	CVO	2	6.3
11	CEO	1	3.1
IV	REPORTING GUIDELINES AND PROCEDURE		
1	Stated that PDCL ⁵ must be written (handwritten or typed or printed)	27	84.4
2	Stated that the reporting should be factual and not speculative	26	81.3
3	Stated that PDCL can be written in Hindi / English / Regional language	14	43.8
4	Translation is required with the PDCL as applicable	0	0.0
5	Stated that violations should be reported in sufficient relevant detail in PDCL to allow preliminary review	27	84.4
6	PDCL – email	8	25.0
7	Stated that anonymous / pseudonymous PDCL will not be entertained	25	78.1
8	Mentions that the identity of whistleblower (name, employee number and location)	26	81.3
9	Explicitly mentions the contact details of the Competent	18	56.3

	Authority for Protected Disclosure		
10	Assures the confidentiality of the Protected Disclosure	6	18.8
11	Stated that PDCL must be in sealed envelope	25	78.1
12	Mentions that the PDCL envelop must be super-scribed as "Protected Disclosure"	21	65.6
13	Mentions that the whistle blower must communicate at the earliest	15	46.9
14	Mentions the time frame of reporting from the occurrence of the incident	7	21.9
15	Stated that there is no need to cite evidence at the time of reporting	7	21.9
16	Stated that evidence should be cited at the time of reporting	2	6.3
17	Requires that whistle blower should not conduct investigation on his own	20	62.5
18	Mentions that whistleblower has secondary appeal option	10	31.3
V	INVESTIGATION PROCEDURE		
1	Mentions that the Competent Authority shall submit PDCL to the Screening Committee	29	90.6
2	Stated that the Screening Committee should follow natural fact finding process	18	56.3
3	Stated that frivolous complaints should be identified and discarded by Screening Committee	14	43.8
4	Stated that the Screening Committee shall forward the legitimate PDCL to Investigators	27	84.4
5	Subject should be informed about the commencement of the investigation	17	53.1
6	Stated that the Screening Committee Should act within 15 days of receipt of PDCL	9	28.1
7	Stated the time frame to complete investigation	21	65.6
8	Investigation time extension may be provided by the Competent Authority with documented reasons	16	50.0

9	Explicitly mentions the permissible maximum time extension	1	3.1
10	Mentions time-frame to retain documents of investigation and results thereon	9	28.1
11	Investigators should ensure that evidence shall not be withheld, destroyed or tempered with	23	71.9
12	Identity of the Subject and the Whistle blower must be kept confidential	24	75.0
13	Subject should be given an opportunity to be heard	22	68.8
14	Mentions that the subject should not influence the witnesses in any manner	16	50.0
15	Stated that the subject have the obligation to cooperate in the investigation	17	53.1
16	Subject should be informed about the outcome of the investigation	18	56.3
17	Whistle Blower should be informed about the commencement of the investigation	20	62.5
18	Whistle blower should be informed about the outcome of the investigation	16	50.0
19	Describes the actions to be taken after investigation	20	62.5
20	Mentions that if offence is punishable under law, it will be referred to CVO by Competent Authority	21	65.6
21	For proved offence, Competent Authority should take remedial measures to correct and stop such offence in future	23	71.9
22	For unproved offence, report shall be filed by the Confidential Secretary to the Director (HR)	21	65.6
23	Competent Authority should submit quarterly report of Protected Disclosures statistics and procedure followed to Audit Committee	25	78.1
24	Competent Authority should annually declare in the corporate governance report that direct access to Audit Committee is provided	15	46.9
25	Competent Authority should annually declare in the corporate governance report that protection from retaliation	16	50.0

	is provided		
26	Any amendment in the whistle blower policy must be notified immediately to the Audit Committee	26	81.3
VI	CONFIDENTIALITY AND ANONYMITY	0	0.0
1	Ensures complete confidentiality of whistle blower	30	93.8
2	Mentions that the identity of the subject shall be kept confidential by investigators	13	40.6
3	Explicitly mentions that disclosures made under whistle blower policy or super-scribed as protected disclosure will only be kept confidential	13	40.6
4	Stated the circumstances where confidentiality cannot be guaranteed	7	21.9
5	Stated that anonymous protected disclosures shall not be considered for investigation	22	68.8
6	Stated that pseudonymous protected disclosures shall not be considered for investigation	20	62.5
7	Stated that violations can be reported anonymously	0	0.0
8	Stated that third parties cannot report anonymously	0	0.0
9	Allows anonymous reporting for third parties	0	0.0
VII	PROTECTION FROM RETALIATION	0	0.0
1	Mentions that whistle blower should not be victimized	31	96.9
2	Mentions that persons processing disclosures should not be victimized	8	25.0
3	Stated that any employee assisting in the investigation will be protected	19	59.4
4	Stated that whistle blower may report to the Competent Authority about victimization experienced	19	59.4
5	Biased / delayed / unfair decisions affecting employment are considered as retaliation	13	40.6
6	Whistle blower shall be protected from unfair termination from job	10	31.3
7	Reporting should be done in good faith	26	81.3

8	Requirement of reasonable ground or belief	12	37.5
9	Right of protection can be lost in case of external reporting	1	3.1
10	Explicitly mentions that whistle blower will be facilitated with required assistance in citing evidence for criminal / disciplinary proceedings	17	53.1
11	Mentions that whistle blower will be reimbursed the expenses incurred in the context	11	34.4
12	Retaliation will be punishable	9	28.1
13	Whistleblower shall not be protected if involved in wrongdoing	10	31.3
VIII	Whistleblower – Accountability		
1	Must inform immediately	15	46.9
2	Mala-fide allegations may attract disciplinary actions	25	78.1
4	Whistleblower making 3 consecutive malicious complaints shall be disqualified from reporting further	8	25.0
5	Whistleblower should maintain confidentiality about the subject and subject matter	12	37.5

8. Summary Findings

1. Category 1- General content, scope and tone

More than 80% of the companies framed whistleblower policy on the basis of the recommendations given in revised Clause 49 of the Listing Agreement 2014 and the Companies Act 2013. Generally companies follow neutral tone while stating about the reporting procedure and are not so proactive in sensitizing employees about the positive effects of whistleblowing (56.3%). Interestingly, 32 policies have been collected from the company's public website. Law restricts certain issues to be dealt under the whistleblower policy. However, 59.4% companies did not mention it clearly in their policy leaving a scope for ambiguity.

2. Category 2- Nature of violations to be reported

More than 70% of the companies consider similar issues as violations to be reported namely infringement of company CDA rules, unethical and improper practices, existence of already occurred and suspected fraud, wrongful conduct and gross inefficiency. Also, violation of law, abuse of authority and misappropriation of monies are considered as violations to be reported by 60 % of the

companies. Surprisingly, in today's electronic business age, only 50% of the companies considered data and document manipulation as an important violation to be reported.

3. Category 3- Officials or bodies to whom wrongdoing should be reported

More than 72% of the companies consider Audit committee chairman, CMD and a person delegated by CMD in his absence as the most reliable competent authority for receiving complaints under the policy. Only 44% companies mentioned explicitly that violations can be reported to the Audit committee as well. Very few (less than 25%) companies established a dedicated authority to handle whistleblowing cases only. There is a serious need to establish dedicated authority to handle such cases to encourage and protect potential whistleblowers.

4. Category 4- Reporting guidelines and procedures

More than 80% of the companies clearly stated that PDCL must be written and factual, prohibits anonymous reporting, verification and establishment of whistleblower identity and the requirement of submitting PDCL in sealed envelope super-scribed as "Protected Disclosure". Though it is not legally mandatory, only 22% companies explicitly mentioned that citing evidence is not mandatory while reporting. Also, less than 50% companies mentions explicitly that violations must be reported to the competent authority only (mandatory requirement under the Act). Timely reporting helps in settling the malpractices better. However, less than 30% companies have clear statements about timeframe for reporting and secondary appeal procedure. Also, language has not been considered as important factor by majority. Another significant observation is that inspite of being a member of online community, very few companies (25%) allowed to ledge the complaint under the policy through email.

5. Category 5- Investigation procedure

Clarity in investigation procedure plays a major role in trust building among the potential whistleblower. 91% companies explicitly stated that competent authority shall receive the PDCL and forward to the screening committee. However, around 35% to 45% companies have not mentioned key issues relevant for investigation in the policy such as time frame for investigation and results, grounds for time extension for investigation and grounds for discarding PDCL, rights of the subject, rights of the whistleblower, actions to be taken for proved and unproved offences and ways of protection from retaliation. Also only 28% stated about the documentation of the PDCL, its corresponding investigation, supporting evidence and documentations and the holding period for the same. Regular reporting requirement brings more accountability in the system, though 22% did not mention about the quarterly report to be submitted to the Audit committee.

6. Category 6- Confidentiality and anonymity

93.8% companies stated that confidentiality must be maintained. However, 78.1% did not mention the circumstances where confidentiality cannot be guaranteed. So although confidentiality clause has been mentioned, ways to ensure it has not been stated clearly and it directly affects the whistleblower

protection. Although the Act states anonymous and pseudonymous PDCL will be discarded. Only 62.5% to 68.5% mentions it explicitly in the policy.

7. *Category 7- Protection from retaliation*

Institutionalised whistleblowing is protected and external whistleblowing is unprotected under the Act as well as in the company policy. Although, 97% companies stated that whistleblower should not be victimised, only 40.6% clearly stated for job status protection and 31.3% for job protection from termination. There is no other explicit mention about the ways of protection for whistleblower from retaliation (such ambiguity leaves tremendous scope for victimization). Also, only 53.1% companies provide their support to whistleblower for citing evidence and only 34.4% companies are ready to reimburse the expenses incurred in the context (such step is motivating but more companies should come forward and support whistleblowers).

8. *Category 8- Whistleblower accountability*

The whistleblower also needs to act in responsible manner. Such clause has not been included in the Act. However, in-line with international developments, 78.1% stated that disciplinary actions can be taken for intentional malicious reporting. However, only 25% clearly stated that 3 consecutive mala-fide reporting will disqualify the employee from further reporting. Only 46.7% companies demand that whistleblower must inform immediately about the wrongdoing. Delay in reporting increases the damage and is against the basic concept of institutionalised whistleblowing.

Table 3: Content Analysis Summary		
Categories	Label	% of mean compliance
Category 1	General content, scope and tone	29.56
Category 2	Nature of violations to be reported	61.93
Category 3	Officials or bodies to whom wrongdoing should be reported	29.26
Category 4	Reporting guidelines and procedures	43.15
Category 5	Investigation procedure	58.17
Category 6	Confidentiality and anonymity	36.46
Category 7	Protection from retaliation	43.08
Category 8	Whistleblower accountability	43.75

Table 3 indicates that details for Category 2 and Category 5 are somewhat maintained by CPSEs to certain extent. However, all other areas need attention (as reflected in Table 4).

Table 4: Key Strength and Challenges of Whistleblower Policies	
STRENGTH (>=50%)	CHALLENGES (<50%)
Nature of violations to be reported (<70%)	Whistleblower accountability
Investigation procedure (<60%)	Reporting guidelines and procedures
	Protection from retaliation
	Confidentiality and anonymity (36%)
	General content, scope and tone (<30%)
	Officials or bodies to whom wrongdoing should be reported (<30%)

9. Recommendations and Conclusion

This section is an attempt to identifying the areas that need attention in context of whistleblower policy. The detailed study on the whistleblower policy of listed CPSEs in India has been considered. On the basis of the Hassink model developed to cover the policy study for listed companies in European countries in the year 2007 (Hassink, Vries and Bollen, 2007), a revised framework has been considered as per the applicability in Indian context. In order to be effective the whistleblower policy must be very structured and cover all key areas with sufficient details. It has been observed that although many key issues are covered under the policy, many failed to incorporate the required detailing to make the policy transparent and understandable for employees. The basic framework for the whistleblower policy should include the following key issues as mentioned below:

Table 5: Recommended Basic Structure of Whistleblower Policy in Indian Scenario		
Sl. No.	Category	Component
I	General Content, Scope and Tone	<ul style="list-style-type: none"> • Tone • Applicability • Norms followed • Constraints • Constitution of Audit Committee • Sensitization / Awareness • Vigil mechanism status
II	Nature of violations to be reported	Explicitly mention various types of violations to be reported
III	Officials or bodies to whom wrongdoing shall be reported	<ul style="list-style-type: none"> • Competent Authority • Audit Committee Chairman or CMD of the company or a person delegated by CMD in his absence • Whistle Authority or Ethics Authority
IV	Reporting guidelines and procedures	<ul style="list-style-type: none"> • Reporting method • Contact details

		<ul style="list-style-type: none"> • Time-frame for reporting • Confidentiality • Miscellaneous
V	Investigation procedure	<ul style="list-style-type: none"> • Mechanism • Time-Frame • Subject • Whistleblower • Actions • Reporting the outcome
VI	Confidentiality and anonymity	<ul style="list-style-type: none"> • Whistleblower's identity • Sensitive issues must be kept confidential. • Anonymous or pseudonymous complaints have been highly discouraged • Circumstances not guaranteeing confidentiality
VII	Protection from retaliation	<ul style="list-style-type: none"> • Protection • Criteria • Assistance • Punishment
VIII	Whistleblower Accountability	<ul style="list-style-type: none"> • Whistleblower must inform immediately • Mala-fide allegations made may call for disciplinary action • Whistleblower must maintain confidentiality

On the basis of the findings, each segment should address the following issues:

1. Recommendations for Category I-

- a) Companies should encourage employees to raise their concerns. This message should be evident from the language of the policy. Hence, explicit use of phrases such as “encouraged to report” is recommended. (45% companies remained silent.)
- b) Clarity about the stakeholders covered under the policy should be there. (15% remained silent.)
- c) Companies must clearly mention the norms followed for framing the policy. (12.5% companies remained silent.)
- d) Issues that are strictly not covered under the policy must be clearly mentioned. (60% companies remained silent.)
- e) Constitution of Audit Committee should be legal and clearly declared to build more reliability. (18.9% companies remained silent.)

- f) Methodical approach should be adopted to create awareness among employees. Clear cut mechanism for sensitization has been lacking and hence, vague for managers to take steps for the same. (43.7% companies remained silent.)
- g) Other vigil mechanism for receiving complaints other than PDCL should remain unaffected by this policy. This should be clearly mentioned. (50% companies remained silent.)

2. Recommendation for Category 2 –

- a) Common and significant issues are considered under the policy. However, clear examples to understand the violations clearly are not mentioned.
- b) Data has become crucial corporate asset in the society leading towards information age. Companies should have a separate independent policy to deal with the issues related with data manipulation and misuse.

3. Recommendation for Category 3 –

- a) In Indian context CMD, Chairman of Audit Committee and the respective members are the most preferred bodies for reporting malpractices under the policy. However, the possible options for reporting malpractices to the Competent Authority should be increased.
- b) Dedicated Whistle Authority may work more efficiently and independently compare to a person who is delegated with multi-facet responsibilities.

4. Recommendation for Category 4 –

- a) Documentation has its own weightage. It can be used as a reference as well as evidence. (15% companies remained silent.)
- b) Language specification should also be given so that people can report in their regional language and competent authority can understand and act upon it by translating into legitimate language understandable by them
- c) From organizational perspective, facility to lodge complaints through email must also be extended due to technological advancement and to overcome the barrier of location, non-availability of website contents, website downtime etc.
- d) Complete communication details must be mentioned to ensure smooth accessibility to the competent authority
- e) Prohibition of anonymous or pseudonymous reporting must be clearly stated. It is very positive approach from organizational perspective, as it results significant fall in the quantity of baseless allegations and increase in productivity of investigation team as their valuable time is not wasted in enquiring the false reports. Only valid complaints will be investigated further. However, employees feel scared also to disclose their identity due to fear of retaliation.
- f) Immediate reporting should be encouraged and a valid time frame should be clearly specified. It needs more clarity because productive results may not be yielded for the cases reported due to long time gap, the damage already occurred, loss of evidence and unavailability of witness.

- g) As per the Act, this is not mandatory and must be stated clearly in the policy, otherwise, employees who are aware about a malpractice may not report due to lack of sufficient evidence.
- h) To avoid ambiguity and ensure confidentiality, all companies should mention clearly that PDCL must be in sealed envelope and super scribed so that it can be considered as case under the policy separately.
- i) Whistle blower may not be an expert in investigation process and hence inspite of good spirit, may end up destroying the evidences and increased difficulty in reaching the facts. So WB must be restricted from doing investigation clearly.
- j) Secondary appeal option is a very significant to motivate whistleblower to keep their belief in the malpractice issue they raised. So, if a whistleblower is not satisfied with the outcome of investigation, they must have another body to raise the matter and such information must be provided in the policy itself.

5. Recommendation for Category 5 –

- a) More companies must have a firm statement about the first initiative and the time frame for addressing the PDCL. (72% remained silent.)
- b) Companies must mention the time frame to complete the investigation process it clearly in the policy. A clear cut dead line to perform with target and come up with results.
- c) For legitimate reasons, extension in time limit may be allowed but must be clearly mentioned with upper limit. Supporting documents in this regard should also be maintained. A clearly mentioned maximum time limit leads to more transparent investigation which is lacking here.
- d) Documentation related with the whole investigation process leads to systematic reference to the cases whenever required. Lack of clarity in this regard also brings ambiguity in document / evidence handling.(72% companies remained silent.)
- e) Subject and the whistleblower, both have equal right to know the outcome of investigation. So if not immediately, the results should be communicated in due course as per case.
- f) Subject should be heard but due care should be taken so that he may not influence the witness and have no access to the evidences. Proper mechanism needs to be devised.
- g) Clarity in the action mechanism followed after the investigation completes, builds more trust among employees. So, general guideline about the actions to be taken for proved and unproved offences should be provided. (38.5% remained silent.)
- h) Periodic reporting about the whistleblowing cases makes the related machinery more accountable.
- i) Direct access to Audit Committee must be facilitated and must be clearly declared in the policy.
- j) Protection from retaliation must be clearly mentioned and ensured. (50% companies did not mention it clearly)

6. Recommendation for Category 6 –

- a) Clarity with respect to declaration about maintaining confidentiality must be there.
- b) Circumstances where confidentiality cannot be guaranteed must also be mentioned clearly.

7. Recommendation for Category 7 –

- a) There must be clarity about the designated authority to which retaliation must
- b) be reported. Also, most of the companies support whistleblower on policy paper, but they do not mention whom such cases shall be reported.
- c) Job protection /status quo maintenance has been considered by 30 – 40% companies; however, retaliation has many facets like peer group isolation, boycotting, non-allocation of serious jobs, unequal treatment by seniors etc. Such issues are not clearly covered in the policies.
- d) Investigation process starts on the basis of the seriousness of the matter that has been reported. Whistleblower must report in good faith and also must have sufficient reasons to prove that. Although citing evidence is not mandatory but whistleblower should have strong argument ready in favour of the concerns raised. This will improve accountability of employees as well as save lot of effort from the side of the investigating team. The responsibility is both on the employee as well as the organization.
- e) However, in order to execute no. c mentioned above, organization must be helpful to the whistleblower in gathering evidence and must also reimburse the expenses in this connection. This step will encourage employees to identify the issues carefully.
- f) Although the provision of punishment has been mentioned for retaliation or internal reporting, the required details are not mentioned anywhere- means type of punishment, extent / severity of punishment etc.

8. Recommendation for Category 8 –

- a) Time frame of reporting has not been mentioned
- b) Details not mentioned about the disciplinary steps that can be taken against intentional malicious reporting
- c) Majority remained silent on the disqualifying an employee from raising concern under the policy. Also the criteria for deciding if the report is malicious or not has not been clearly stated.(75% remained silent)
- d) Whistleblower's report act as the basis for initiating the whole process. Thus, employees must act responsibly and maintain the confidentiality of the issue. The policy framed must also make this point clear.(62.5% remained silent)
- e) If reporting is done immediately as soon as the incident takes place, it becomes somewhat easy for the investigation team to collect evidence and do investigation. As the time gap increases, the likelihood of loss of evidence and non-availability of witness increases and in the same

context the extent of damage may also increase manifold. Hence, there should be a reasonable time gap and must be explicitly mentioned in the policy.

On the basis of policy analysis, it becomes clear that inspite of having whistleblower policy framed in public sector companies; the instances of whistleblowing are very few. Lack of reporting does not mean flawless system and absence of wrongdoing, it simply means less confidence in the reporting mechanism. Unreported issue becomes very fatal to organization's health in long run. Hence, organizations must take a proactive approach. Rather than just fulfilling the formality of making the whistleblower policy, organizations must also take necessary steps to make it effective. The approach of the executives, clarity in the procedure to report, reporting authority, general information about the complaint outcome, investigation process, confidentiality and safety of the whistleblower are among the key issues that requires specific attention. In order to be effective the whistleblower policy must be very structured and cover all key areas with sufficient details. It has been observed that although many key issues are covered under the policy, many failed to incorporate the required detailing to make the policy transparent and understandable for employees. Also, mere framing of the policy or making it mandatory does not ensure that it will be used efficiently. The effectiveness of a policy depends upon the content coverage as well as its sufficient sensitization among the end-users. Whistleblower policy is very much needed to build an efficient organization having healthy work environment.

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¹http://dpe.nic.in/sites/default/files/Chapter%20merge%20file_2.pdf- (refer Annexure 1)

²Whistleblower Policy

³ Documents required = No of companies – (no of companies not having the WB policy including subsidiary + No of WB policy unavailable)
= 45 – (11 + 1) = 33

⁴Conduct, Discipline and Appeal Rules

⁵Protected Disclosure Complaint Letter

Annexure 1

Listed CPSEs as per Public Enterprise Survey Report 2011-2012		
Sl. No.	Name of the CPSE	Whistleblower Policy
1	Andrew Yule and Co. Ltd.	CVC Resolution
2	BEML Ltd.	Yes
3	BalmerLawrieand Co. Ltd.	Yes
4	BalmerLawrie Investment	Subsidiary of 3
5	Bharat Electronics Ltd.	Yes
6	Bharat Heavy Electricals Ltd.	Yes
7	Bharat Immunologicals and BiologicalsCorpn. Ltd	CVC Resolution
8	Bharat Petroleum Corpn. Ltd.	Unavailable
9	Chennai Petroleum Corpn. Ltd.	Yes
10	Coal India Ltd.	Yes
11	Container Corpn. Of India Ltd.	Yes
12	Dredging Corpn. Of India Ltd.	Yes
13	Engineers India Ltd.	Yes
14	Fertilisersand Chemicals, Travancore Ltd.	Yes
15	GAIL (India) Ltd.	CVC Resolution
16	HMT Ltd.	CVC Resolution
17	Hindustan Copper Ltd.	Yes
18	Hindustan Organic Chemicals Ltd.	CVC Resolution
19	Hindustan Petroleum Corpn. Ltd.	Yes
20	ITI Ltd.	Yes
21	India Tourism Devp. Corpn. Ltd.	Yes
22	Indian Oil Corpn. Ltd.	Yes
23	MMTC Ltd.	Yes
24	Madras Fertilizer Ltd.	Yes
25	Mahanagar Telephone Nigam Ltd.	CVC Resolution
26	Maharashtra Elektros melt Ltd.	Yes

An Analysis of the Patterns of CSR Reporting Practices of Indian MNCs

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Abstract: In the recent era, Corporate Social Responsibility (CSR) has gained added significance in India among the multinational corporations (MNCs). After the introduction of Section 135 of the Companies Act, 2013, it is legally binding upon *companies* to disclose *expenditures* pertaining to CSR activities. Interestingly, the practice of CSR is not entirely new to the MNCs as they have been practicing it morally from the beginning of the 21st century. Thus, MNCs clearly have added experience and advantage over other companies in terms of CSR disclosure. An attempt has been made in this paper to highlight industry-specific CSR disclosure practices of selected Indian MNCs in pre and post Companies Act (2013) eras on the basis of GRI G3 guidelines using cluster analysis.

Key-words: Corporate Social Responsibility (CSR), Multinational Company (MNC), Companies Act, 2013.

1. Introduction

The advent of globalization and proliferation of international trade have given rise to some new controversies about the concept of CSR. The controversies surrounding the process of globalization have raised concerns that MNCs might be pursuing profit at the expense of vulnerable workforces, environmental degradation and so on. In response to such concerns, MNCs have increasingly taken steps aimed at demonstrating their social responsibility as business organizations. One prominent development has been the elaboration and adoption of a code of conduct concerning CSR. Moreover due to increased and intense competition, MNCs have started to believe that expenses on social welfare pay in the sense that the prosperity and growth of business is achieved through the combined and collective efforts of the stakeholders and therefore, content and satisfied stakeholders create value for the company as a whole in the long run. Most of the MNCs have begun to identify CSR as a business tool to promote a positive image to business stakeholders and as a way to improve the quality of life among citizens of the host countries.

2. Objectives

In this article an effort has been made to find out the pattern of CSR reporting practices of Indian MNCs in pre and post Companies Act (2013) eras, i.e. to see how responsibly they are responding to their social and environmental obligations. The objective is to understand, review and judge the CSR initiatives of Indian MNCs over a selected time period.

3. Methodology

The proposed study seeks to be both exploratory and empirical in nature and involves several conceptual issues that are dealt with based on an analytical approach. The information to be used for this study has been collected from secondary sources like Government publications, websites, audited and published financial statements and Annual reports of selected Indian MNCs. We have also used multivariate analysis-average linkage model for cluster analysis.

Incidentally, we have chosen those MNCs whose headquarters are in India and studied their annual reports over a period of 10 years from 2006 to 2016 following GRI G3 guidelines. The time period 2006–2016 was selected for certain specific reasons –

- Firstly, the period from 2006 to 2014 saw voluntary environmental reporting at a very nascent stage in India.
- Secondly, the subsequent period (2015-16) represents the impact of the Companies Act, 2013 on the reporting trends of Indian MNCs.

Annual reports from 2006 to 2016 (subject to the availability) of the 25 companies –Asian Paints Limited, Bharat Forge Limited, Bharti Airtel Limited, Cyient, Dishman Pharmaceutical and Chemicals Limited, Dr. Reddy Laboratories, Essel Propack, Exilant Technology, HCL Technologies, Hindalco Industries Limited, Infosys, KPIT Technologies, Larsen & Toubro Infotech, Mahindra and Mahindra, Micromax Informatics, Mindtree Limited , Nucleus Software Exports, Oil and Natural Gas Corporation, Profoundis, Ranbaxy Laboratories Limited, State Bank of India, Suzlon Energy, Tata Group, Thermex Limited and Welspun India Limited – have been selected. But due to unavailability of the annual reports of 4 companies, namely Exilant Technology, Micromax Informatics, Profoundis and Tata Group, the analysis has been made on the remaining 21 companies. To judge the CSR reporting practices within the MNCs as well as to understand the industry-specific CSR reporting pattern we have adopted the following procedures:

- ❖ To examine the CSR reporting practices of selected Indian MNCs we have followed the GRI G3 guidelines[Refer-5.2];
- ❖ To examine the content-category themes of CSR disclosure following these guidelines we have taken environmental and social aspects excluding the economic aspect;
- ❖ To determine the extent of CSR disclosure on each parameter we have considered the number of words used in the annual reports;
- ❖ Considering all sub-categories we have summed up the frequency of occurrence of all that come under the environmental and social parameters. The finalised version of the analysis consisted of 5 content categories sub-divided into 32 sub-categories (Annexure-3). Then we have summed up scores of 5 parameters – environmental (p1), labour practices (p2), human rights (p3), society (p4), and product responsibility (p5). Parameters p2 to p5 come under the head of social parameter;
- ❖ After that we have divided the total period into two parts –that before the Companies Act was framed, termed as the pre-Companies Act period (2006-13) and that after the introduction of the Companies Act, the post-Companies Act period (2014-16) – for each parameter ;

- ❖ Then we have calculated the average score of those 5 parameters for the pre-Companies Act (2006-13) – whose parameters are p1, p2, p3, p4, and p5 – and post-Companies Act – whose parameters are p6, p7, p8, p9 and p10 – periods (2014-16);
- ❖ Next to that we have employed cluster analysis model using Stata 12 to compare the changes across different industries in pre and post-Companies Act eras on selected parameters.

4. Literature Review

De George (1993) has developed seven guidelines for multinationals operating in developing countries. He illustrates considerations that multinationals, which want to operate ethically and with integrity, should address. The seven guidelines are appropriate for multinationals from different nations, although he has created them based on American multinationals.

Larrison (1998) criticized current CSR research and observe the behaviours' of MNCs in developing countries. He suggested that individual and organizational factors should also be taken in consideration. Fitzpatrick (2000) sensed public pressures to comply with societal expectation behind MNCs having to initiate CSR activities.

Hopkins (2003) opined that CSR is helpful to improve corporate acceptability by its domestic and international stakeholders; assisting MNCs in attracting new investors; improving corporate industrial relations; boosting customers' loyalty; improving corporate reputation; contributing to sustainable development and human development.

Chahoud, Dr. Tatjana, Johannes Emmerling, Doro Theakold, Iris Kubina, Gordon Resinski, Catarina Schlager (2007) revealed that Indian CSR is not well balanced between internal & external stakeholders. Indian companies tend to aim their CSR engagement at external stakeholders. However, the long tradition of CSR in India indicates – and the recent changes in the Indian CSR agenda further underline that CSR in India has considerable potential for improving corporate, environmental and social conduct.

Khanna, Parul; Gitika Gupta (2011) found that among other countries India has one of the richest traditions of CSR. Much has been done on recent years to make Indian entrepreneurs aware of social responsibility as an important segment of their business activity but CSR in India has yet to receive widespread recognition. If this goal has to be realized then the CSR approach of corporates has to be in line with their attitudes towards mainstream business-companies setting clear objectives, undertaking potential investment, measuring and reporting performance publicly.

Satish, Ramya (2011) studied that CSR has come a long way in India. From responsive activities to sustainable initiatives, corporates have exhibited their ability to make a significant difference in the society and improve the overall quality of the life. In the current social situation in India, it is difficult for one single entity to bring about change, as the scale is enormous. Corporates have the expertise, strategic thinking, manpower and money to facilitate extensive social change. Effective partnership between corporates, NGOs and the government will place India's social development on a faster track.

5. Analysis of CSR disclosure practices

For the purpose of our analysis we have to acquaint ourselves with the Companies Act, 2013, GRI G3 Guidelines and cluster analysis which have been discussed briefly in the next section.

5.1 Companies Act, 2013

The Companies Act, 2013 (“the 2013 Act”) introduces mandatory CSR provisions for the first time. These mandatory CSR provisions may be classified as

- (i) CSR provisions which are universally applicable to all companies and
- (ii) CSR provisions which are applicable to specified companies.

Section 166(2) of the 2013 Act requires a director of a company to act in good faith to promote the objects of the company for the benefit of its members as a whole, and in the best interests of the company, its employees, its shareholders, the community and for the protection of environment.

Section 135 of the 2013 Act states that

(1) Every company having net worth of rupees five hundred crore or more, or turnover of rupees one thousand crore or more, or a net profit of rupees five crore or more during any financial year shall constitute a Corporate Social Responsibility Committee consisting of three or more directors, out of which at least one director shall be an independent director.

(2) The Board's report under sub-section (3) of section 134 shall disclose the composition of the Corporate Social Responsibility Committee.

(3) The Corporate Social Responsibility Committee shall –

(a) formulate and recommend to the Board, a Corporate Social Responsibility Policy which shall indicate the activities to be undertaken by the company as specified in Schedule VII (Annexure-1)

(b) recommend the amount of expenditure to be incurred on the activities referred to in clause (a); and

(c) monitor the Corporate Social Responsibility Policy of the company from time to time.

(4) The Board of every company referred to in sub-section (1) shall —

(a) after taking into account the recommendations made by the Corporate Social Responsibility Committee, approve the Corporate Social Responsibility Policy for the company and disclose contents of such Policy in its report and also place it on the company's website, if any, in such manner as may be prescribed' and

(b) ensure that the activities as are included in the Corporate Social Responsibility Policy of the company are undertaken by the company.

(5) The Board of every company referred to in sub-section (1), shall ensure that the company spends, in every financial year, at least two percentage of the average net profits of the company made during the three immediately preceding financial years, in pursuance of its Corporate Social Responsibility Policy: provided that the company shall give preference to the local area and areas around it where it operates, for spending the amount earmarked for Corporate Social Responsibility activities: provided

further that if the company fails to spend such amount, the Board shall, in its report made under clause (o) of sub-section (3) of section 134, specify the reasons for not spending the amount.

5.2 GRI G3 Guidelines

The sustainability Performance Indicators are organized by economic, environmental and social categories. Social Indicators are further categorized into Labour, Human Rights, Society, and Product Responsibility.

The economic dimension of sustainability concerns the organization's impact on the economic conditions of its stakeholders and on economic systems at local, national, and global levels which is not taken into consideration for our study.

The environmental dimension of sustainability concerns an organization's impact on living and non-living natural systems including ecosystems, land, air, and water. Environmental Disclosure Aspects are categorized as– Materials, Energy, Water, Biodiversity, Emissions, Effluents and Waste, Products and Services, Compliance, Transport and Overall.

Social aspects have moved beyond the scope of society/ community considerations to include labour practices, human rights, society and product responsibility.

Labour practices and decent work performance can be categorized as Employment, Labour/Management Relations, Occupational Health and Safety, Training and Education and Diversity and Equal Opportunity.

Human rights aspects include Investment and Procurement Practices; Non-discrimination; Freedom of Association and Collective Bargaining; Abolition of Child Labour; Prevention of Forced and Compulsory Labour; Complaints and Grievance Practices; Security Practices; and Indigenous Rights. Society Aspects consider Community; Corruption; Public Policy; Anti-Competitive Behaviour; and Compliance.

Product responsibility aspects pertain to Customer Health and Safety; Product and Service Labelling; Marketing Communications; Customer Privacy; and Compliance. By following this guideline we have tried to capture the totality of the environmental and social narratives from selected MNCs' annual reports.

5.3 Procedure of analysis

For our analysis we have applied the frequency of words used [Refer-Annexure-3] in the annual reports (from 2006-2016) for environmental and social parameters. Then we have summed up the frequency of occurrence of all the subcategories that come under the environmental (p1) and social parameters (p2-p5). Next to that we have calculated the average score of each of the 5 parameters during two periods, i.e. that prior to the introduction of the Companies Act of 2013 (2006-14), whose parameters are p1, p2, p3, p4, and p5 and that after its introduction (2015-16), whose parameters are p6, p7, p8, p9 and p10. The values for each of the parameters have been taken into consideration to

judge the industry-specific disclosure in pre and post Companies Act periods of 21 selected MNCs using Cluster Analysis.

5.4 Cluster Analysis

Cluster analysis or clustering is the method of grouping a set of objects in such a way that objects in the same group (called a cluster) are more similar (in some sense or the other) to each other than to those in other groups (clusters). A "clustering" is essentially a set of such clusters usually containing all objects in the data set. Hierarchical clustering (also called hierarchical cluster analysis or HCA) is one of the methods of cluster analysis which seeks to build a hierarchy of clusters.

In order to decide which clusters should be combined (for agglomerative), or where a cluster should be split (for divisive), a measure of dissimilarity between sets of observations is required. In most methods of hierarchical clustering, this is achieved by use of an appropriate metric (a measure of distance between pairs of observations) and a linkage criterion which specifies the dissimilarity of sets as a function of the pair-wise distances of observations in the sets. For this study we have employed average linkage cluster model to get the similarity or dissimilarity matrix of different industries against a set of parameters prefixed above.

5.4.1 Average linkage or UPGMA ("Unweighted Pair Group Method with Arithmetic Mean")

Group average distance between clusters C_i and C_j is the average distance between any object in C_i and any object in C_j

$$D_{avg} = 1/|C_i|*|C_j| \sum d(x,y)$$

$$x \in C_i, y \in C_j$$

The UPGMA algorithm constructs a rooted tree (dendrogram) that reflects the structure present in a pairwise similarity matrix (or a dissimilarity matrix). At each step, the nearest two clusters are combined into a higher-level cluster. The distance between any two clusters C_i and C_j each of size (*i.e.*, cardinality) $|C_i|$ and $|C_j|$ is taken to be the average of all distances $d(x,y)$ between pairs of objects x in C_i and y in C_j , that is, the mean distance between elements of each cluster:

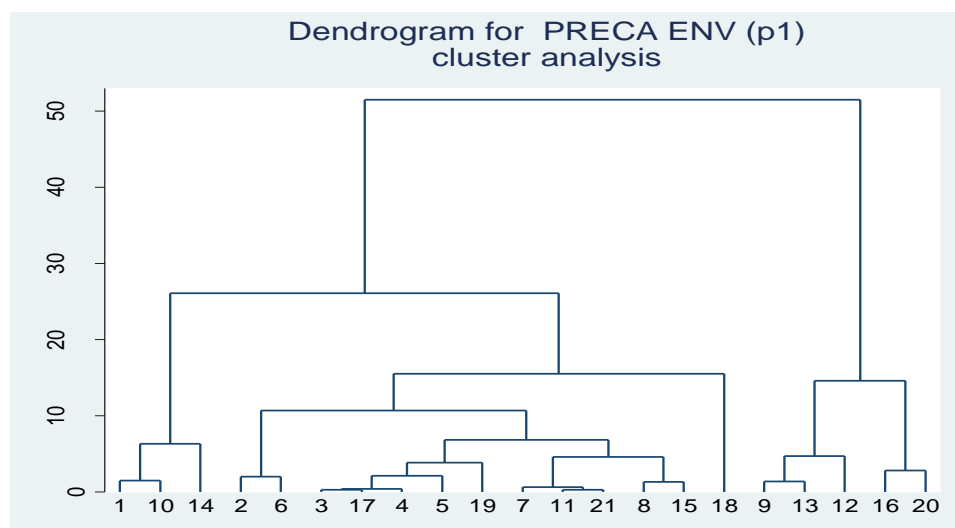
$$(1/|C_i||C_j|) \sum_{x \in C_i} \sum_{y \in C_j} d(x,y)$$

In other words, at each clustering step, the updated distance between the joined clusters $C_i \cup C_j$ and a new cluster X is given by the proportional averaging of the $d_{C_i, X}$ and $d_{C_j, X}$ distances:

$$d(C_i \cup C_j, X) = \frac{|C_i|d_{C_i, X} + |C_j|d_{C_j, X}}{|C_i| + |C_j|}$$

By using this average linkage model of cluster analysis we have drawn the following dendrogram to make comparisons on CSR disclosure practices within various industries in pre and post-Companies Act eras by using five selected parameters from p1 to p5 (Refer-3). For the sake of our analysis, 21 selected MNCs have been named numerically (1 to 21) to observe the pattern of clustering within the same industry or different ones. [Annexure-2A and 2B]

5.4.1.1. Environmental parameter cluster prior to the Companies Act, 2013



Source – Annual Reports, 2006-2013[

Asian Paints as a chemicals industrial company was clustered with Infosys which is an information technology consulting and services company. So it can be said that although the sector is different, the pattern of environmental disclosure is the same. From the above dendrogram we can also observe that Mindtree Limited, an IT consulting company, was clustered with the two above-mentioned companies. Therefore, it can be observed that in the pre Companies Act period, Infosys and Mindtree form a single cluster which belongs to the same industry.

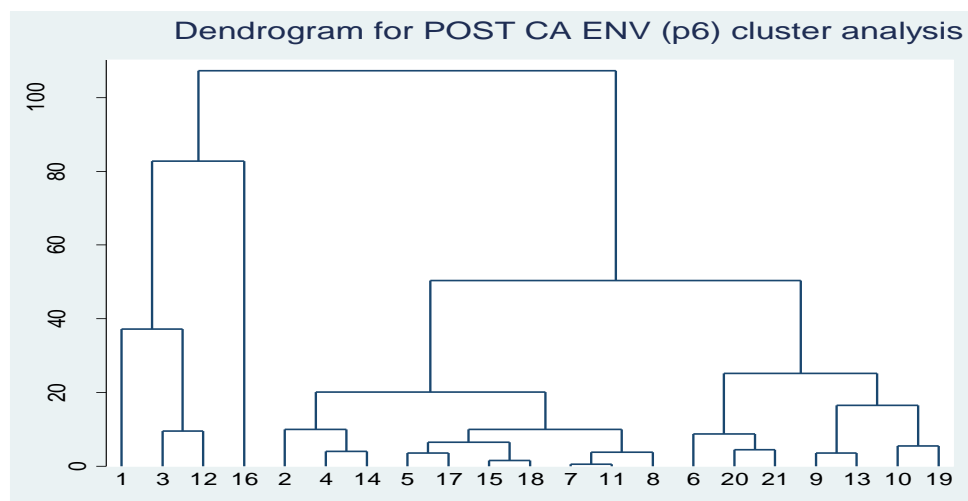
BFL, a forging company was clustered with Dr. Reddy's Laboratories, a pharmaceuticals company. BAL, a telecommunication company was clustered with Ranbaxy and then these two companies were clustered with Cyient, a conglomerate company. All these three companies were clustered with Dishman, a Pharmaceuticals company. After that, all these four companies were finally clustered with SEL, a renewable energy company.

KPIT Technologies, product engineering, IT Consulting and Information Service Company, was clustered with WIL, a textile company with respect to environmental parameter. With these two companies Essel Propack, a tube packaging company formed another cluster. The pattern of environmental disclosure is similar for HCL, IT service and IT consulting company and Nucleus Software Export Ltd., IT Service Company.

HIL, a metal company was clustered with M&M, an automotive company with respect to environmental disclosure in annual reports. Larsen and Toubro Infotech, a conglomerate company was clustered with both these companies.

ONGC, an oil and gas company was clustered with Thermex, an energy company with regard to environmental disclosure. Hindalco provides the highest disclosure on environmental parameter amongst all the selected companies. It is also concluded from the above discussion that there is no industry-specific disclosure pattern with regard to environmental parameter in pre-Companies Act era except for Infosys and Mindtree Ltd. and HCL and NSE (which belong to IT industry).

5.4.1.2 Environmental parameter cluster after the enactment of Companies Act, 2013



Source – Annual Reports, 2014-2016

We can observe from the above dendrogram that after introduction of the Companies Act, 2013 the pattern of environmental disclosure practices has changed. APL, a chemical company formed a cluster with one that was formed already by BAL, a telecommunication company and L&T, a conglomerate company. It implies that the pattern of environmental disclosure is almost same for these three companies. With these three companies another cluster was formed by ONGC, an oil and gas company. With regard to environmental disclosure practices, Cyient a conglomerate company formed a cluster with Mindtree Limited an IT consulting company which has further clustered with BFL, a forging company.

Dishman was clustered with Ranbaxy Laboratories as both companies belong to same industry i.e. pharmaceuticals. NSE, an IT service company was clustered with SBI, a banking company and EPL, a tube packaging company was clustered with KPIT technologies. With the formation of these two clusters another cluster is formed for HCL Technologies with regard to environmental disclosure.

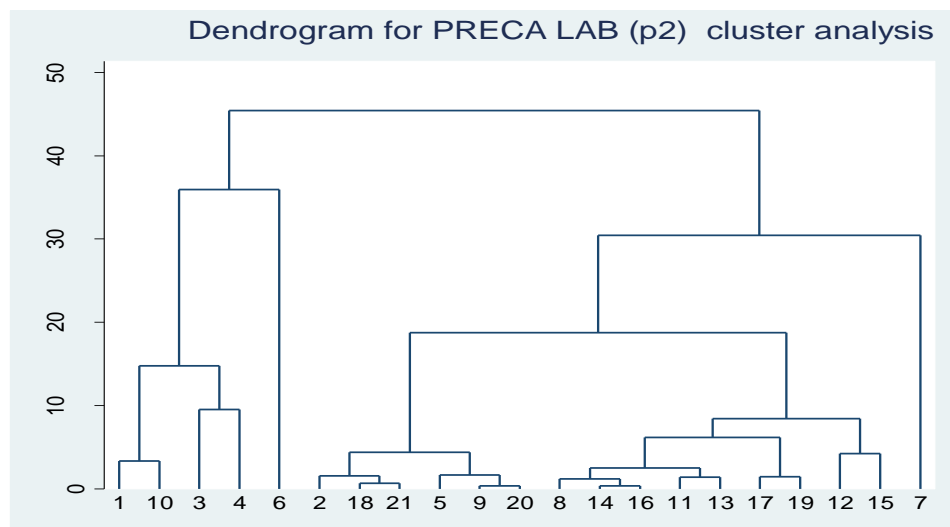
Thermex, energy and environment engineering company was clustered with WIL, a textile company. With these two companies another cluster is formed by Dr. Reddy's which is a pharmaceutical company.

Another separate cluster is formed by Hindalco, metal company and M&M, automotive company. It means that during the post Companies Act period, both the companies are showing same types of disclosure in the environmental parameter.

As the disclosure pattern of Infosys, IT service and IT consulting company and SEL, renewable energy company are same w.r.t. environmental parameter, these two companies formed a cluster. So, from the above analysis it can be concluded that the pattern of environmental awareness is not the same in pre and post Companies Act periods. Also it has been observed that same category of industries does not show similar patterns of disclosure with respect to environmental parameter in post Companies Act period except two pharmaceutical companies (Dishman and Thermex). ONGC provides highest

disclosure in environmental parameter in post Companies Act periods which can be visualized through a separate dendrogram formed by this company.

5.4.1.3 Labour practice parameter cluster prior to the Companies Act, 2013



Source – Annual Reports, 2006-2013

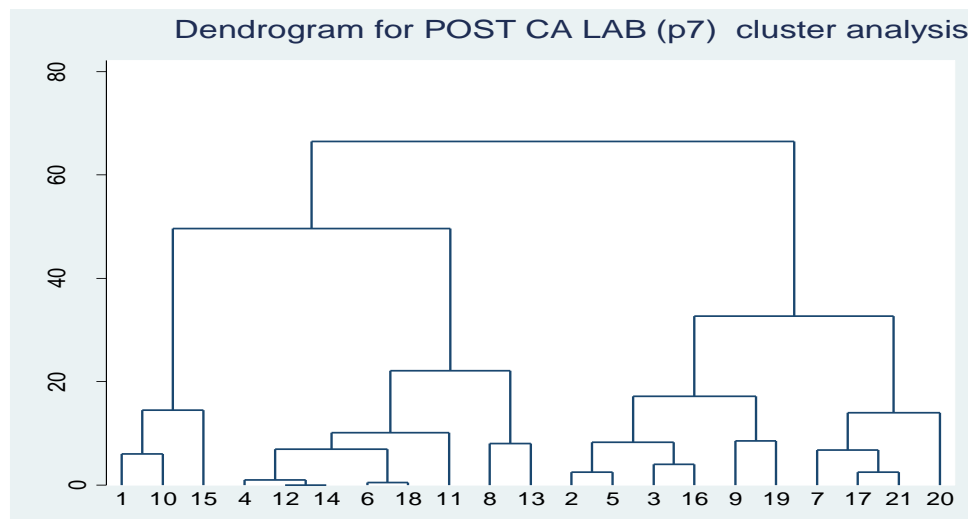
Attention towards labour practice parameter is almost same for APL, chemical company and Infosys, IT consulting and IT service company which thus form a cluster. BAL, a telecommunication company was clustered with Cyient which is a conglomerate company. With all these four companies a new cluster is formed for Dr. Reddy's, a pharmaceuticals company. Importance given towards disclosure of labour practice parameter happens to be the same in SBI, banking company and WIL, Textile company. With this cluster a new cluster is formed by BFL, a forging company. A new cluster is formed by Hindalco, metal company and Thermex, energy and environment engineering company with the same pattern of disclosure towards their employees. With this cluster another cluster is formed by Dishman, a pharmaceuticals company with regard to labour practice parameter.

A new cluster was formed by ML, IT consulting company and ONGC, oil and gas company with the same pattern of disclosure towards their employees. With this cluster HCL, IT service and IT consulting forms another cluster in terms of providing benefits towards their employees.

KPIT and M&M, Ranbaxy and SEL, L&T and NSE – these six companies form three different sets of clusters with regard to employee parameter. Although all these three sets of clusters belong to different industry categories, all these six companies come under a single cluster.

From the above dendrogram it is clear that with respect to employee parameter, in pre Companies Act period, Dr Reddy's forms a separate cluster. It implies that highest disclosure is made by Dr. Reddy's with respect to the labour practice parameter. Here we have to mention that we cannot find any industry-specific results with regard to labour practice parameter in pre Companies Act period except ML and HCL (belonging to IT industry) and KPIT and NSE (also belonging to IT industry).

4.12.2-4 Labour practice parameter cluster after the enactment of Companies Act, 2013



Source: Annual Reports, 2014-2016

APL, a chemical company and Infosys, an IT consulting and IT service company form a cluster with respect to employee parameter after introduction of the Companies Act, 2013. With these two companies NSE, IT service, form another cluster.

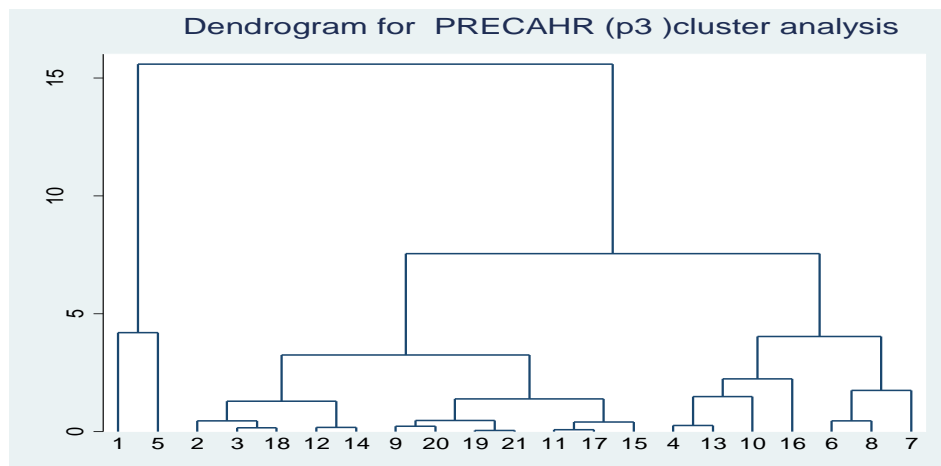
L&T, a conglomerate company was clustered with ML, an IT consulting company, as the disclosure pattern of both these companies are almost same towards labour practice parameter. With these two companies Cyient forms another cluster. Another cluster is formed with the help of Dr. Reddy's, pharmaceutical company, and SBI, banking company. With all these five companies KPIT, Information service and IT consulting company join to form another cluster which shows almost same patterns of disclosure towards their employees.

With regard to labour practice parameter HCL, IT service and IT consulting company, and M&M, an automotive company provides the same pattern of disclosure and thus these two companies form a cluster. Another cluster is formed by BFL and Dishman belonging to different industries with regard to employee parameter. BAL and ONGC, also belonging to separate industries are clustered with respect to employee parameter. With regard to employee value, although the Industry category is dissimilar, Hindalco and SEL give the same importance and thus these two companies form a cluster.

Here we can observe congruence among two companies – Ranbaxy and Welspun India Ltd, from diverse industry categories – regarding labour practice parameter in post Companies Act era. Then a new cluster is formed by EPL, a tube packaging company with nearly the same disclosure pattern regarding their employees.

So it can be concluded that after the introduction of the Companies Act, 2013 a change can be observed with regard to labour practice parameter. The change reflects an increasing disclosure in this parameter. Infosys has the highest concentration on labour practice parameter amongst all the selected companies. Also in the post Companies Act era we cannot observe any industry-specific results except Infosys and NSE (belonging to IT industry) and ML and KPIT (also belonging to IT industry).

4.12.2-5 Human rights parameter cluster prior to the Companies Act, 2013



Source – Annual Reports, 2006-2013

With regard to human rights parameter in pre Companies Act periods (i.e. before 2014) APL as a chemical company forms a cluster with Dishman which is a pharmaceutical company. So it can be said that although the sector is different, the pattern of disclosure is almost the same for this parameter.

From the above dendrogram we can observe that as a telecommunication company, BAL was clustered with SBI, a banking company. With this cluster another cluster is formed by BFL, a forging and metal company. Another cluster is formed by Larsen and Turbo Infotech, conglomerate company and Mindtree Ltd, IT consulting company. As the pattern of human rights disclosure is more or less same in the above-mentioned five companies, these companies come under a single cluster.

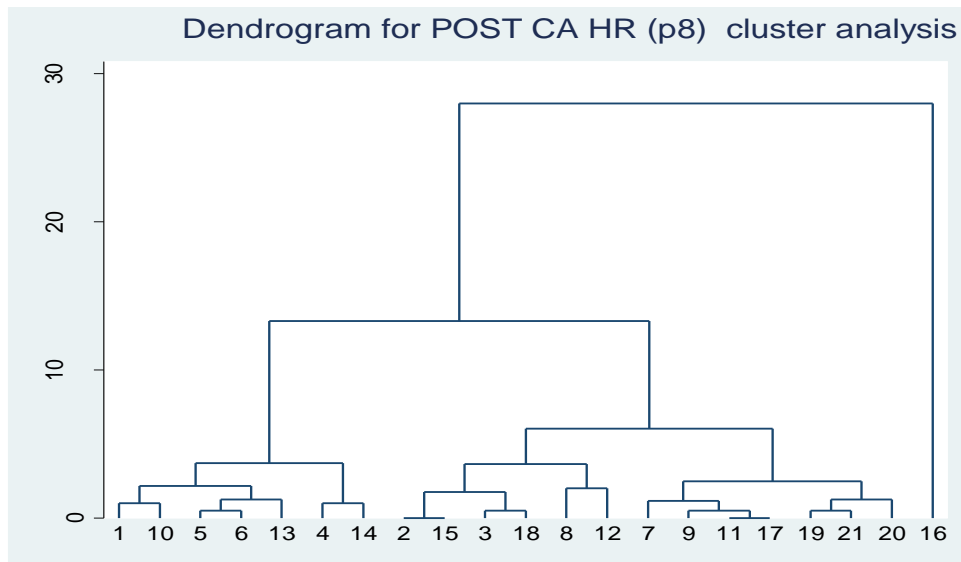
Hindalco, a metal company was clustered with Thermex, energy and environment engineering company with respect to human rights disclosure practices. Suzlon as an energy company was clustered with WIL, a textile company. KPIT an information service, IT consulting and product engineering company was clustered with Ranbaxy Laboratories, a Pharmaceuticals company. Then these two companies were clustered with NSE, IT Service Company. As the awareness of the above-mentioned seven companies are quite similar with regard to human rights parameter, these companies ultimately come under a single cluster.

Cyient, a conglomerate company was clustered with Mahindra and Mahindra which belong to automotive industry and then these two companies are clustered with Infosys, an IT consulting and IT Service Company. All these three companies are clustered with ONGC, an oil and gas company with regard to human rights disclosure.

Dr. Reddy's Laboratories, a pharmaceutical company was clustered with HCL technologies, an IT service and IT consulting company. With this cluster EPL, a tube packaging company makes another cluster with regard to disclosure of human rights of the employees. As the pattern of human rights disclosure is more or less same in the above-mentioned three companies, they come under a single cluster.

So it can be concluded from the above discussion that there is no certain pattern with regard to human rights disclosure within same industry category, except for KPIT and NSE (belonging to IT industry). From the above dendrogram it can also be concluded that Dishman Pharmaceutical shows the highest disclosure compared to the other selected companies with regard to the human rights parameter which can be understood from the separate cluster formation.

4.12.2-6 Human Rights parameter cluster after the enactment of Companies Act, 2013



Source – Annual Reports, 2014-2016

APL, a chemical company was clustered with Infosys, IT consulting and IT service with regard to human rights parameter, as the pattern of disclosure for both companies are nearly the same. Dishman forms a new cluster with Dr. Reddy's, which belongs to same industry (Pharmaceuticals). With these prior mentioned two companies M&M, automotive company joined to form another cluster. Although these two companies belong to different industry categories, Cyient and ML have almost the same priorities on disclosure of human rights in post Companies Act era; so these two are able to form a new cluster. As the trends of disclosure pattern in human rights parameter for all these seven companies are roughly the same, these companies are able to form near-by clusters.

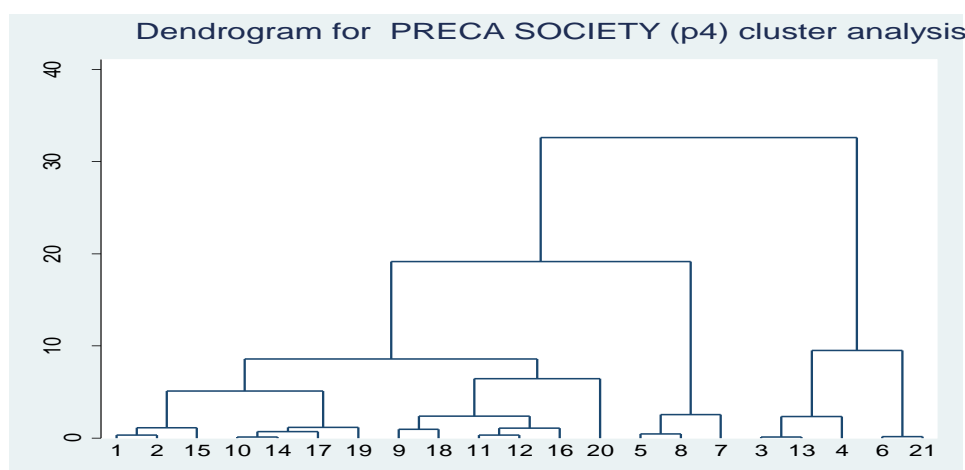
Although BFL and NSE belong to different industry categories, they form a cluster as the reporting patterns of these companies are almost the same with regard to human rights parameter. BAL and SBI and HCL and L&T form two sets of clusters for the same parameter and belong to separate industry. As the patterns of disclosure for all six companies are nearly in the same range, these companies form a single cluster.

With respect to human rights parameter, KPIT and Ranbaxy form a new cluster because both have the same state of awareness although they belong to different industry categories. With this cluster Hindalco, metal company forms a new cluster w.r.t. human rights parameter. EPL, a tube packaging company is clustered with Hindalco to form a new cluster.

SEL and WIL form another cluster by way of showing same types of disclosure on human rights parameter although they do not belong to the same industry. Thermex, an energy company forms a new cluster with these two companies. Ultimately all these seven companies come under a single cluster as the disclosure patterns are nearly the same.

ONGC form separate cluster with regard to the human rights parameter. ONGC discloses maximum words in the annual reports in post Companies Act periods among all other selected companies. It is also observed that during the post Companies Act period, with regard to human rights parameter there is industry-specific results, such as Dishman and Dr. Reddy's (belonging to pharmaceutical industry), NSE and HCL(belonging to IT industry) and SEL and Thermex (belonging to energy industry). It can be concluded that the overall performance of the selected companies in this parameter is very poor even after introduction of the Companies Act, 2013.

4.12.2-7Society parameter cluster prior to the Companies Act, 2013



Source – Annual Reports, 2006-2013

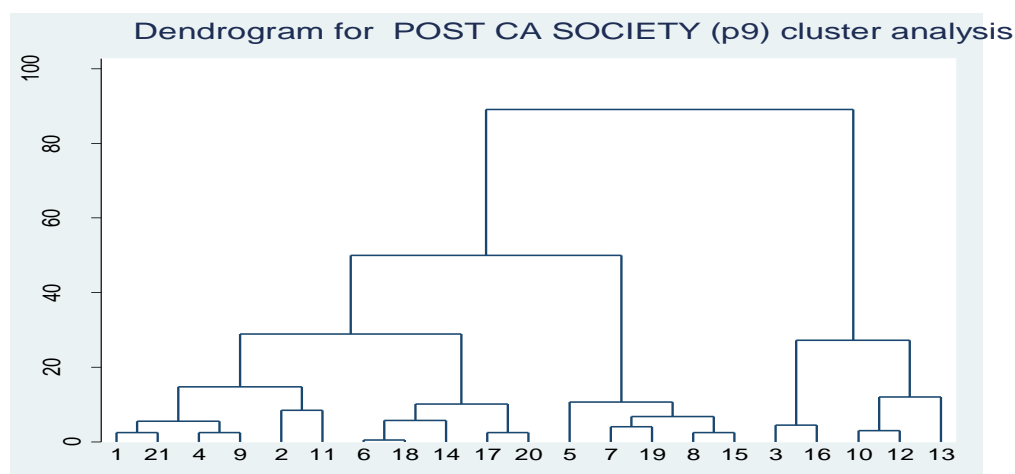
When considering the society parameter it is observed that APL, chemical company was clustered with BFL, forging company. With this cluster NSE, IT Service Company forms another cluster in society parameter. Infosys and ML, belonging to the same industry (IT) are thus able to construct another cluster in society parameter. With this cluster two new clusters are formed by Ranbaxy and SEL consecutively (which belong to different industry categories). As the patterns of disclosure of these seven companies are almost the same, they come under a single cluster.

Another cluster is formed by Hindalco, metal company and SBI, banking company as both the companies are disclosing in the same pattern on society parameter. A new cluster is formed by KPIT with L&T which belong to different sectors. With this cluster ONGC, oil and gas company join to form another cluster w.r.t. society parameter. After that Thermex forms a new cluster because both had the same type of disclosure. Although the companies belong to different industry categories, Dishman is clustered with HCL. With this cluster, EPL, tube packaging company forms another cluster for society parameter.

Another separated cluster is formed by BAL, telecommunication, and M&M, automotive as both the companies come up with similar type of disclosure on society parameter. With this cluster Cyient, a conglomerate company joins to form another cluster.

A new cluster is formed by Dr. Reddy's and WIL (which are from different industry sectors) with regard to society parameter in pre Companies Act period. Here also we observe that in society parameter there are no industry-specific results except for IT industry which is formed by Infosys, ML, NSE. BAL shows the highest disclosure with regard to society parameter in pre Companies Act period which can be visualized from the separate cluster formation.

4.12.2-8 Society parameter cluster prior to the Companies Act, 2013



Source – Annual Reports, 2014-2016

APL, a chemical company and WIL, a textile company show almost same kind of disclosure with regard to society which helps them form a cluster. With the formation of this cluster another cluster is formed by Cyient and Hindalco which belong to different industry sectors. Another cluster is formed by BFL, forging company, and KPIT Technologies, information service, IT consulting, product engineering company w.r.t. society parameter in post Companies Act era. The disclosure patterns of all these six companies are almost identical; therefore all these companies come under a single cluster.

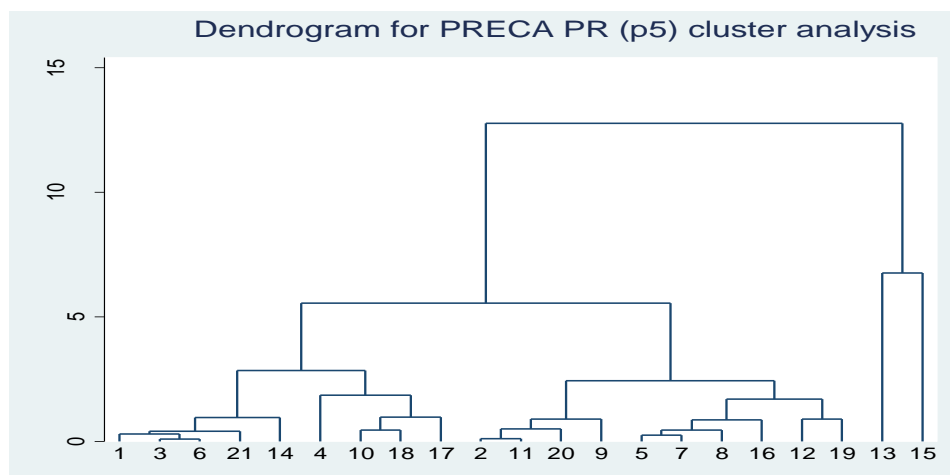
Dr. Reddy's and SBI form a new cluster for their similar type of disclosure towards this parameter and thus they form a cluster but they belong to separate industry sectors. With this cluster a new set of cluster is formed by the ML, IT consulting company for their social disclosure. Ranbaxy and Thermex form a new cluster as both the companies show the same type of disclosure for this parameter, although they belong to different industry sectors. As the patterns of disclosure are same for these above-mentioned five companies, they come under a single cluster.

EPL, tube packaging and SEL, an energy company both pay the same kind of attention to this parameter and thus they form a cluster. Another cluster is formed with the help of HCL and NSE which belong to same industry (IT). Dishman, pharmaceutical company, joins to form another cluster w.r.t. society parameter with all these four companies. Ultimately these five companies come under a single cluster as the reporting patterns are same for all these companies.

According to their respective disclosure practices towards society BAL and ONGC, Infosys and L&T form two different sets of clusters and are from diverse industry sectors. M&M, automotive company, joins with the above-mentioned cluster which was formed by Infosys and L&T w.r.t. the society parameter. Finally these five companies come under a single cluster as the pattern of reporting is nearly the same.

It may be concluded that after introduction of the Companies Act, 2013, if the group of clustering is minimized, it implies that the patterns of reporting are almost the same for those groups of companies which finally come under a single cluster. It is also observed that there are no industry-specific result except HCL and NSE which belong to IT sector. ONGC shows the maximum disclosure in the society parameter which is visualized from the separate cluster formation. It may be concluded that after introduction of the Companies Act, 2013 we can observe an increase in consciousness of the society parameter w.r.t. CSR disclosure.

4.12.2-9 Product Responsibility parameter cluster prior to the Companies Act, 2013



Source – Annual Reports, 2006-2013

With regard to product responsibility parameter BAL, a telecommunication company, was clustered with Dr.Reddy's Laboratories, a pharmaceutical company. APL, chemical company forms another cluster with these two companies with respect to product responsibility. With the formation of this cluster, another cluster is formed by WIL, textile company w.r.t. this parameter. With the above-mentioned three companies ML,IT consulting company forms another cluster for this parameter.

As Infosys, an IT consulting and service company &SBI, a banking company exhibit the same kind of reporting pattern for this parameter, these two companies are able to form another cluster. With this cluster another cluster is formed by Ranbaxy, a pharmaceutical company w.r.t. product responsibility. With these two clusters Cyient which is a conglomerate company forms another cluster.

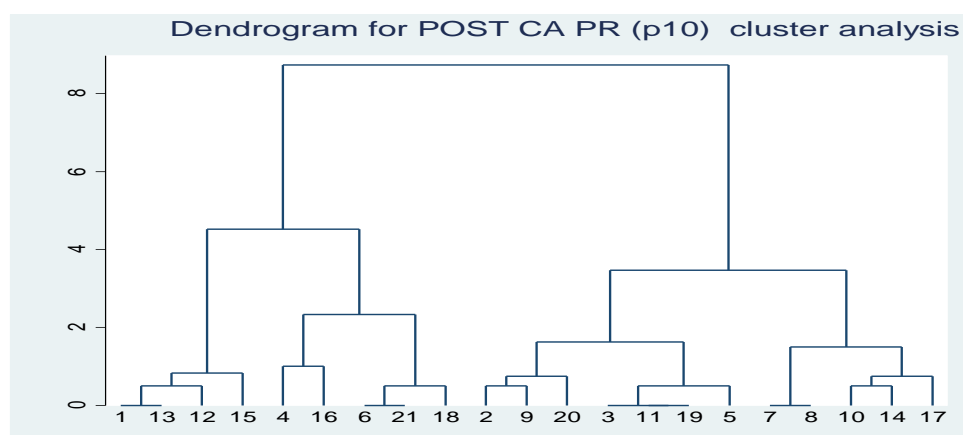
For formation of cluster, BFL joined with KPIT as both the companies show the same trend of disclosure for this parameter despite belonging to different industry categories. Thermex, an energy and environment engineering company forms another cluster with these two companies with respect to

product responsibility. With the above-mentioned three companies Hindalco, a metal company joins to form a new cluster.

A new cluster is formed by Dishman and EPL w.r.t. product responsibility parameter in pre Companies Act periods, but they do not belong to the same industry. With this cluster another cluster is formed by HCL, IT service and IT consulting company w.r.t. product responsibility. With these two sets of clusters ONGC, oil and gas company, forms another cluster w.r.t. product responsibility.

L&T and SEL, M&M and NSE – these two pairs of companies form two different sets of clusters with regard to this parameter although they belong to different industry categories. Among all the selected companies NSE comes up with the highest disclosure here which can be seen by its separate cluster formation with M&M. It has also been observed that there is no industry-specific cluster analysis. For this parameter, overall, very poor performance of the companies is observed.

4.12.2.10 Product Responsibility cluster after the enactment Companies Act, 2013



Source – Annual Reports, 2014-2016

Asian Paints, chemical company is clustered with M&M, automotive company, with respect to the product responsibility parameter. L&T as a conglomerate forms another cluster which has joined with the above cluster. Another cluster is formed by NSE, IT Service Company which has joined with the above cluster.

Cyient joined with ONGC to form another cluster as both the companies happen to show the same kind of disclosure for this parameter, but belong to different industry categories. As both the companies are showing the same kind of awareness in this field, Dr. Reddy's, a pharmaceutical company and WIL, a textile company, form a cluster. SBI joins with this cluster to form another cluster.

BFL is clustered with Hindalco w.r.t. this parameter as the pattern of disclosure is almost the same for both the companies despite belonging to different industry categories. Thermex, energy and environment engineering company joined with this cluster to form another cluster.

BAL, a telecom company joined with KPIT, information service, IT consulting and product engineering company to form another cluster as both the companies happen to show the same kind of disclosure for this parameter in the post Companies Act period. SEL, an energy company, forms

another cluster with the above-mentioned companies. Another cluster is formed by Dishman a pharmaceutical company which has joined with the above cluster.

Although both companies belong to different industry categories, EPL joined with HCL to form another cluster w.r.t. product responsibility parameter. Infosys clusters with Mindtree w.r.t. this parameter as the disclosure pattern is almost the same for both the companies and these two companies also belong to the same industry (IT). Ranbaxy, pharmaceutical company formed another cluster with the above-mentioned companies.

To conclude, we can observe an increasing disclosure after 2014 for most of the companies with regard to product responsibility. Compared to all the other companies studied here, APL and M&M show the highest disclosure with regard to product responsibility in post Companies Act period which can be seen from the separate cluster formation. Here it is also observed that no industry-specific result can be derived from the product responsibility parameter in the post Companies Act period except for Infosys and Mindtree (both belonging to IT industry).

4.11 Observations

It is observed that in the pre-companies act era, different companies had different ways much of which varied greatly. There were also wide differences in the CSR activities within the same category of industries. In the post-companies act periods, the scenario has changed. Companies are showing greater awareness in each of the five (Environment, Labour Practice, Human Rights, Society and Product Responsibility) parameters. As the patterns of disclosure amongst companies appear to be more similar, they come under a single cluster. Certain specific observations are:

- In the pre-Companies Act era, Hindalco disclosed highest number of words in the annual reports compared to other selected companies in the environmental parameter.
- Dr. Reddy's provided the highest disclosure on labour practice parameter before introduction of the Companies Act, 2013.
- Dishman used highest number of terms with regard to human rights parameter in the pre-Companies Act period.
- With respect to society parameter, highest disclosure was made by the Bhatia Airtel Limited.
- NSE stood out in the product responsibility parameter in the pre-Companies Act period with regard to highest disclosure of terms.
- In the post-Companies Act periods, ONGC disclosed highest number of terms in the environment, human rights and society parameters compared to the other companies.
- Infosys came up with the highest information in the labour practice and decent work performance in the post-Companies Act period.
- Mahindra and Mahindra and APL came up with the highest disclosure trend towards product responsibility parameter in the post-Companies Act era.
- In case of labour practice, human rights and society parameters we can observe a cluster within IT industry in the pre-Companies Act period.
- No industry-specific result was found in product responsibility parameter in the pre-Companies Act period.

- In case of the post-Companies Act period, with regard to environmental parameter a cluster has been formed for pharmaceutical industry (Dishman and Thermex).
- In case of labour practice, society and product responsibility parameters, an industry- specific cluster can be observed in IT industry in the post-Companies Act period.
- In case of human rights parameter, we can observe industry-specific results in Pharmaceutical, IT and Energy industries in the post Companies Act period.

7. Conclusion

From the above analysis it may be concluded that industries within the same category do not show similar patterns of disclosure with respect to a particular parameter. In the Pre-Companies Act era we can observe an industry-specific result in IT only with regard to disclosure in annual reports for all selected parameters except product responsibility. In post-Companies Act era more industry-specific results can be derived with regard to disclosure in the annual reports. Although in labour practice, human rights and product responsibility parameters we can observe an industry-specific result in IT, with regard to environmental disclosure, an industry-specific result in pharmaceutical can be found. Also in human rights parameter we can observe pharmaceutical, IT and energy industry-specific results. What we find, is that, with an unfailing awareness of the Companies Act 2013, there has been a remarkable upsurge in the CSR disclosure practices of the companies selected for this study. The change reflects an increasing awareness of almost all selected parameters.

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Annexure-1

Schedule VII (Companies Act,2013)

(i) Eradicating hunger, poverty and malnutrition, [‘‘promoting health care including preventive health care’’] and sanitation [including contribution to the Swachh Bharat Kosh set-up by the Central Government for the promotion of sanitation] and making available safe drinking water.

- (ii) Promoting education, including special education and employment enhancing vocation skills especially among children, women, elderly and the differently abled and livelihood enhancement projects.
- (iii) Promoting gender equality, empowering women, setting up homes and hostels for women and orphans; setting up old age homes, day care centres and such other facilities for senior citizens and measures for reducing inequalities faced by socially and economically backward groups.
- (iv) Ensuring environmental sustainability, ecological balance, protection of flora and fauna, animal welfare, agro forestry, conservation of natural resources and maintaining quality of soil, air and water [including contribution to the Clean Ganga Fund set-up by the Central Government for rejuvenation of river Ganga].
- (v) Protection of national heritage, art and culture including restoration of buildings and sites of historical importance and works of art; setting up public libraries; promotion and development of traditional art and handicraft
- (vi) Measures for the benefit of armed forces veterans, war widows and their dependents;
- (vii) Training to promote rural sports, nationally recognised sports, paralympic sports and olympic sports
- (viii) Contribution to the prime minister's national relief fund or any other fund set up by the central govt. for socio economic development and relief and welfare of the schedule caste, tribes, other backward classes, minorities and women;
- (ix) Contributions or funds provided to technology incubators located within academic institutions which are approved by the central govt.
- (x) Rural development projects
- (xi) Slum area development. [For the purposes of this term 'slum area' shall mean any area declared as such by the Central Government or any State Government or any other competent authority under any law for the time being in force.

Annexure 2A - Industry-wise specification of different Companies

Cluster assignment no.	Company Name	Industry
1	Asian Paints Limited (APL)	Chemicals
2 [#]	Bharat Forge Limited (BFL)	Forging, Metal, Machinery, Engineering
3	Bharti Airtel Limited (BAL)	Telecom
4	Cyient	Software Engineering
5**	Dishman Pharmaceuticals and Chemicals	Pharmaceuticals

	(Dishman)	
6**	Dr. Reddy's Pharamaceuticals (Dr. Reddy's)	Pharmaceuticals
7	Essel Propack Limited (EPL)	Tube packaging(service)
8*	HCL technologies(HCL)	IT Service, IT Consulting
9 [#]	Hindalco Industries Ltd (HIL)	Metal
10*	Infosys Limited (Infosys)	IT Service, IT Consulting
11*	KPIT Technologies (KPIT)	Information Service, IT Consulting,
12	Larsen & Toubro Limited (L&T)	Conglomerate
13	Mahindra & Mahindra (M&M)	Automotive
14*	Mindtree Limited(ML)	IT Consulting
15*	Nucleus Software Export (NSE)	IT Service
16	Oil and Natural Gas Corporation Limited (ONGC)	Oil and Gas
17**	Ranbaxy Laboratories Ltd.(RLL)	Pharmaceuticals
18	State Bank of India (SBI)	Banking
19 [^]	Suzlon Energy Limited (SEL)	Renewable Energy
20 [^]	Thermex	Energy and Environment Engineering
21	Welspun India Limited (WIL)	Textile

Source-Wikipidia

Forging , * IT ,** Pharmaceuticals,^ Energy

ANNEXTURE-2B											
Pre CA	p1	p2	p3	p4	p5	Post CA	p6	p7	p8	p9	p10
AP	49.33333	98.11111	18.55556	16.88889	8		164.5	167	20	95.5	14.5
BF	31	48	5	16.55556	2.111111		53	78.5	6	83.5	1
BA	24.75	80.25	4.625	56.875	7.75		132	83.5	8	163.5	2
CYNT	24.25	89.75	11.75	54.5	11.75		41	121.5	15	90	11.5
DISH	22.375	41.5	22.75	5.125	4.125		27	76	19	17.5	2.5
DR. REDDY	33	128.3333	8.333333	46.44444	7.666667		62.5	115	18.5	54.5	8.5
ESSEL	20.125	25.625	6.375	2.375	3.875		31	42	4	29.5	4
HCL	15.77778	61.66667	7.888889	4.666667	3.555556		34.5	95	9.5	23.5	4
HINDALCO	86.33333	43	0	28.66667	1.111111		100	68.5	2.5	92.5	0.5
INFOSYS	50.77778	101.4444	13.11111	21	10.44444		88	173	21	141	5.5
KPIT	19.66667	65.66667	1.555556	26.33333	2.222222		30.5	129.5	3	75	2
LARSEN	81	72.22222	3.333333	26	4.888889		122.5	122.5	11.5	144	14
MAHINDRA	85	64.25	11.5	56.75	15.25		103.5	103	17.5	130.5	14.5
MINDTREE	43.75	63	3.5	20.875	6.75		45	122.5	16	60	6
NSE	14.5	68	2	15.625	22		19.5	155.5	6	26	13.5
ONGC	70.88889	62.66667	9.888889	25.11111	3		222.5	87.5	37.5	168	10.5
RANBAXY	24.5	58	1.625	21.625	9.25		23.5	47.5	3	65	5
SBI	7.571429	46.14286	4.471528	27.71429	10		18	115.5	7.5	54	9
SUZLON	27.77778	56.55556	0.555556	22.33333	5.777778		82.5	60	0.5	33.5	2
THERMEX	68.11111	43.33333	0.222222	33.22222	1.666667		69	32.5	1.5	67.5	0
WELSPUN	19.4	46.8	0.6	46.6	7.4		73.5	50	0	98	8.5

ASIA	2013	12	21	12	0	19	2	5	1	72	133	5	7	5	1	151	0	1	0	2	2	27	0	0	32	10	1	0	1	0	12	1	3	9	1	1	15
	2014	18	34	36	0	20	18	4	2	132	126	7	7	21	2	163	3	1	0	2	1	19	0	0	26	66	1	0	1	0	68	1	1	8	3	5	18
	2015	21	48	52	0	31	22	5	2	181	149	12	5	30	4	200	6	3	1	2	2	8	0	0	22	93	1	0	1	0	95	1	2	8	6	5	22
	2016	33	34	38	0	22	18	0	3	148	86	16	7	23	2	134	6	3	2	4	3	0	0	0	18	93	0	0	1	2	96	0	0	7	0	0	7
		2006	NOT FOUND																																		
BHARAT FORGE	2007	NOT FOUND																																			
	2008	7	18	0	0	5	0	0	0	30	22	0	5	0	0	27	0	0	0	0	0	0	0	0	0	6	0	0	0	0	6	0	2	0	0	0	2
	2009	9	25	0	0	1	0	3	0	38	24	0	5	0	0	29	0	0	0	0	0	13	0	0	13	16	0	0	0	0	16	0	2	0	0	0	2
	2010	7	10	0	0	1	1	0	0	19	14	0	7	2	0	23	0	0	0	0	0	9	0	0	9	16	0	2	0	0	18	0	2	0	0	0	2
	2011	8	8	0	0	1	0	3	0	20	15	4	4	0	0	23	0	0	0	0	0	13	0	0	13	16	0	0	0	0	16	0	2	0	0	0	2
	2012	9	17	3	0	13	0	0	0	42	22	4	3	0	0	29	0	0	0	0	0	10	0	0	10	8	0	0	0	0	8	0	2	0	0	0	2
	2013	9	19	5	0	19	0	4	1	57	72	0	18	16	1	107	0	0	0	0	0	0	0	0	0	35	0	0	0	0	35	0	2	0	0	0	2
	2014	9	15	3	0	9	1	3	0	40	76	9	32	46	0	163	0	0	0	0	0	0	0	0	0	35	0	2	0	0	37	0	3	0	0	0	3
	2015	6	9	3	0	6	1	3	0	28	19	5	20	16	0	60	0	0	0	0	0	0	0	0	0	74	0	0	0	0	74	0	1	0	0	0	1
	2016	14	22	7	0	35	0	0	0	78	62	8	20	5	2	97	5	1	0	2	2	1	1	0	12	89	1	1	2	0	93	0	1	0	0	0	1

DISHMAN PHARMACEUTICALS	2006	NOT FOUND																																			
	2007	6	10	0	0	0	1	0	0	0	17	7	0	1	8	0	16	0	0	0	0	0	12	0	0	12	0	0	0	0	4	0	0	4			
	2008	8	10	1	0	2	0	0	0	21	31	0	2	6	0	39	0	0	0	0	0	22	0	0	22	0	0	0	0	1	1	1	0	4	1	0	6
	2009	8	11	1	0	2	0	0	0	22	25	0	3	7	0	35	0	0	0	0	0	20	0	0	20	0	0	0	0	1	1	1	0	4	0	0	5
	2010	8	7	1	0	1	0	0	0	17	29	0	2	8	0	39	0	0	0	0	0	21	0	0	21	8	0	0	0	1	9	0	0	4	0	0	4
	2011	8	9	1	0	6	0	0	0	24	25	0	2	9	0	36	0	0	0	0	0	22	0	0	22	6	0	0	0	1	7	0	0	4	0	0	4
	2012	8	10	2	0	3	0	0	0	23	28	0	2	14	0	44	0	0	0	0	0	30	0	0	30	6	0	0	0	1	7	1	1	2	0	0	4
	2013	9	12	1	0	3	0	0	0	25	31	0	2	13	0	46	0	0	0	0	0	31	0	0	31	10	0	0	0	1	11	1	1	2	0	0	4
	2014	8	12	3	0	6	0	1	0	30	55	4	4	14	0	77	0	0	0	0	0	24	0	0	24	4	0	0	0	1	5	0	0	2	0	0	2
	2015	10	9	1	0	2	1	1	0	24	58	5	4	15	0	82	1	0	0	0	0	12	0	0	13	21	0	0	0	1	22	1	2	2	0	0	5
	2016	13	9	3	0	5	0	0	0	30	56	4	2	11	0	70	0	0	0	0	0	25	0	0	25	13	0	0	0	0	13	0	0	0	0	0	0
DR. REDDY'S LABORATORIES	2006	12	2	1	0	4	0	0	0	19	73	5	12	19	4	113	0	0	0	0	0	16	0	0	16	27	0	0	0	3	30	3	0	2	0	0	5
	2007	6	2	3	0	9	0	0	1	21	57	4	18	20	5	104	0	0	0	0	0	10	0	0	10	37	0	0	0	3	40	0	0	6	0	0	6
	2008	13	4	4	0	16	0	0	0	37	57	4	14	30	2	107	0	0	0	2	0	2	0	0	4	37	0	2	0	3	42	1	0	5	0	0	6
	2009	10	7	5	0	14	0	0	0	36	36	4	30	37	3	110	0	0	0	0	0	5	0	0	5	35	0	1	0	4	40	4	1	4	0	0	9
	2010	13	6	4	0	15	0	0	0	38	55	4	19	57	3	138	0	0	0	0	0	5	0	0	5	73	0	1	0	3	77	4	0	2	0	0	6
	2011	11	2	1	0	6	0	0	0	20	41	4	9	50	8	112	0	0	0	0	0	1	0	0	1	56	1	2	0	3	62	0	0	2	0	0	2
	2012	11	8	9	0	5	0	1	0	34	88	4	19	77	0	188	0	0	0	1	0	8	0	0	9	57	0	1	0	3	61	0	0	4	0	0	4
	2013	7	9	9	0	17	1	2	0	45	90	5	19	24	5	143	0	2	2	1	1	5	0	0	11	27	2	1	0	3	33	8	1	2	0	0	11
	2014	7	12	15	1	10	0	2	0	47	88	6	18	21	7	140	0	1	2	1	1	9	0	0	14	24	4	1	1	3	33	18	1	1	0	0	20
	2015	12	25	6	0	20	7	1	0	71	109	6	2	11	10	138	0	1	2	2	2	11	0	0	18	41	0	0	1	2	44	3	5	2	0	0	10
	2016	13	12	4	0	20	3	1	1	54	65	7	4	12	4	92	9	1	2	2	2	3	0	0	19	64	0	0	1	0	65	1	2	4	0	0	7
ESSEL PROPAC	2006	5	2	0	0	0	0	0	0	7	5	3	9	0	1	18	0	0	0	0	0	6	0	0	6	1	0	0	0	2	3	1	1	2	0	0	4
	2007	6	5	0	0	2	0	0	0	13	17	3	1	0	0	21	0	0	0	0	0	7	0	0	7	0	0	0	0	2	2	0	1	2	0	0	3
	2008	6	14	0	0	0	0	0	0	20	15	3	3	0	0	21	1	0	0	0	0	6	0	0	7	0	0	0	0	1	1	0	2	2	0	0	4
	2010	5	14	0	0	0	0	0	0	19	16	3	2	0	0	21	0	0	0	0	0	7	0	0	7	1	0	0	0	1	2	0	1	2	0	0	3
	2011	5	14	1	0	0	0	0	0	20	16	3	6	0	0	25	0	0	0	0	0	5	0	0	5	1	0	0	0	1	2	1	2	3	0	0	6
	2012	8	15	0	0	1	0	0	0	24	27	3	2	4	0	36	0	0	0	0	0	6	0	0	6	2	0	0	0	1	3	0	1	1	0	0	2
	2013	9	16	0	0	3	0	0	0	28	24	3	3	0	0	30	0	0	0	0	0	7	0	0	7	2	0	0	0	1	3	1	3	2	0	0	6
	2014	8	18	0	0	1	0	3	0	30	25	3	5	0	0	33	0	0	0	0	0	6	0	0	6	2	0	0	0	1	3	2	0	1	0	0	3
	2015	8	26	1	0	0	3	0	0	38	36	6	10	4	3	59	0	0	0	0	0	8	0	0	8	17	0	0	0	1	18	3	1	1	0	0	5
	2016	7	17	0	0	0	0	0	0	24	16	3	5	1	0	25	0	0	0	0	0	0	0	0	0	40	0	1	0	0	41	2	0	1	0	0	3
HCL TECHNOLOGIES	2006	0	6	0	0	1	0	0	0	7	30	0	10	0	1	41	0	0	0	0	0	5	0	0	5	0	0	0	1	1	1	0	2	0	0	0	3
	2007	2	5	0	0	1	0	0	0	8	28	0	6	0	1	35	0	0	0	0	0	7	0	0	7	0	0	0	0	1	1	0	0	4	0	0	4
	2008	0	5	0	0	1	0	0	0	6	38	0	14	0	3	55	0	0	0	0	0	7	0	0	7	0	0	0	0	3	3	0	1	2	0	0	3
	2009	0	8	0	0	4	0	0	0	12	43	2	10	0	0	55	0	0	0	0	0	7	0	0	7	1	0	0	0	3	4	0	1	2	0	0	3
	2010	0	7	0	0	2	1	0	0	10	35	7	3	2	1	48	0	0	0	0	0	7	0	0	7	7	0	0	0	4	11	1	2	2	1	0	6
	2011	0	9	4	0	10	0	0	0	23	38	8	11	2	5	64	0	0	0	0	0	8	0	0	8	6	0	0	0	5	11	0	1	2	0	0	3
	2012	0	13	0	0	4	2	0	0	19	43	7	20	0	1	71	0	0	0	0	0	8	0	0	8	0	2	0	0	2	4	0	1	2	0	0	3
	2013	0	14	0	0	5	11	0	0	30	50	10	19	0	11	90	0	0	0	0	0	8	0	0	8	0	2	0	0	2	4	0	0	2	0	0	2
	2014	0	15	4	0	6	2	0	0	27	44	15	33	4	0	96	0	0	0	0	0	14	0	0	14	0	1	0	0	2	3	0	2	3	0	0	5
	2015	0	12	12	0	6	8	8	0	46	50	13	28	6	1	98	0	0	0	0	0	18	0	0	18	13	2	0	0	3	18	0	3	2	0	0	5
	2016	0	13	2	0	6	1	1	0	23	48	13	18	12	1	92	0	0	0	0	0	0	1	0	1	27	2	0	0	0	29	0	3	0	0	0	3
HINDALCO	2006	11	31	9	0	11	0	1	0	63	12	1	5	4	0	22	0	0	0	0	0	0	0	0	9	0	1	0	2	12	0	2	0	0	0	2	
	2007	13	28	9	0	11	0	0	0	61	14	1	5	0	0	20	0	0	0	0	0	0	0	0	18	0	0	0	2	20	0	0	0	0	0	0	
	2008	6	24	7	0	16	0	0	0	53	20	1	9	13	2	45	0	0	0	0	0	0	0	0	17	0	0	0	2	19	0	1	0	0	0	1	

INFOSYS	2006	0	19	7	0	15	0	0	0	41	56	4	31	30	0	121	7	2	2	2	3	0	0	0	16	14	0	0	0	3	17	0	1	13	0	0	14
	2007	0	30	43	0	40	0	0	0	113	49	3	38	87	4	181	7	2	2	2	2	0	0	0	15	16	0	0	0	3	19	0	2	15	0	0	17
	2008	0	17	3	2	20	0	0	0	42	57	3	54	45	6	165	7	2	2	2	2	0	0	0	15	28	0	0	0	2	30	0	1	17	0	0	18
	2009	1	14	2	2	17	0	0	0	36	58	2	44	41	3	148	8	3	2	2	2	1	0	0	18	31	3	0	0	2	36	0	2	16	0	0	18
	2010	0	15	3	0	6	1	2	1	28	21	2	21	0	1	45	4	1	1	1	1	0	0	0	8	9	1	0	0	2	12	0	1	6	0	0	7
	2011	1	19	11	0	4	0	2	0	37	25	4	39	0	1	69	0	1	1	1	1	0	0	0	4	18	1	0	0	2	21	0	1	4	0	0	5
	2012	0	11	8	0	2	0	3	0	24	36	3	0	2	2	43	3	1	1	1	1	0	0	0	7	4	1	0	0	2	7	0	2	4	0	0	6
	2013	0	44	3	0	7	1	3	0	58	38	5	6	2	0	51	4	1	1	1	1	0	0	0	8	18	1	0	0	3	22	0	1	2	0	0	3
	2014	1	21	21	5	25	0	5	0	78	42	8	26	10	4	90	11	3	3	1	1	8	0	0	27	15	7	1	1	1	25	0	2	3	1	0	6
	2015	0	24	21	6	31	0	5	0	87	50	12	73	12	6	153	14	4	1	1	1	6	0	0	27	91	1	0	1	2	95	0	2	2	0	0	4
	2016	1	23	21	5	34	3	2	0	89	83	10	65	33	2	193	1	3	4	1	1	5	0	0	15	172	4	0	2	9	187	0	1	6	0	0	7
KPIT TECHNOLOGIES	2006	0	11	1	0	0	0	0	0	12	23	1	9	0	0	33	0	0	0	0	0	0	0	0	0	10	0	0	0	0	10	0	4	0	0	0	4
	2007	0	3	0	0	1	0	0	0	4	29	7	5	0	0	41	0	2	0	0	0	0	0	0	2	30	0	0	0	1	31	0	1	0	0	0	1
	2008	0	3	3	0	1	0	0	0	7	45	6	24	0	0	75	0	0	0	0	0	0	1	0	1	16	0	0	0	1	17	0	2	0	0	0	2
	2009	0	7	4	0	1	0	0	0	12	41	5	21	0	0	67	0	2	0	0	0	0	1	0	3	33	0	0	0	1	34	0	6	0	0	0	6
	2010	0	11	5	0	2	0	0	3	21	46	4	12	0	0	62	0	2	0	0	0	0	0	0	2	51	0	0	0	1	52	0	2	0	0	0	2
	2011	0	12	6	0	3	0	0	2	23	36	3	15	0	0	54	0	2	0	0	0	0	0	0	2	24	0	0	0	0	24	0	0	0	0	0	0
	2012	2	16	6	0	5	0	0	0	29	66	4	10	2	0	82	0	2	0	0	0	0	0	0	2	21	0	0	0	1	22	0	1	0	0	0	1
	2013	0	15	13	0	12	0	0	0	40	71	4	9	13	0	97	0	0	0	0	0	0	0	0	0	16	0	0	0	0	16	0	4	0	0	0	4
	2014	11	10	2	0	5	0	1	0	29	64	4	6	6	0	80	0	2	0	0	0	0	0	0	2	30	0	0	0	1	31	0	0	0	0	0	0
	2015	8	7	5	0	8	0	0	0	28	120	4	20	9	0	153	0	0	0	0	0	1	0	0	1	31	0	0	0	1	32	1	2	1	0	0	4
	2016	5	11	8	9	0	0	0	0	33	66	5	20	15	0	106	0	4	0	0	0	1	0	0	5	118	0	0	0	0	118	0	0	0	0	0	0
LARSEN & TURBO INFOTECT	2006	3	20	1	0	4	0	2	0	30	8	1	23	3	1	36	0	0	0	0	0	0	0	0	25	0	0	0	2	27	0	0	0	0	0	0	
	2007	3	17	6	0	2	0	2	0	30	54	1	26	0	0	81	0	0	0	0	0	0	0	0	26	0	0	0	2	28	0	0	1	0	0	1	
	2008	5	27	20	0	5	0	1	0	58	49	1	27	4	0	81	0	0	0	0	0	0	0	0	17	0	0	0	2	19	0	4	1	0	0	5	
	2009	3	39	9	0	5	3	1	0	60	47	1	22	3	0	73	0	0	0	0	0	0	0	0	7	0	0	0	2	9	1	2	1	0	0	4	
	2010	6	53	17	0	20	0	1	0	97	52	1	22	11	0	86	0	0	0	0	0	0	0	0	12	0	0	0	2	14	1	4	1	0	0	6	
	2011	5	46	7	0	4	0	0	0	62	44	1	12	11	0	68	0	0	0	0	0	0	0	0	8	0	0	0	2	10	1	3	0	0	0	4	
	2012	9	35	15	1	23	3	1	0	87	51	1	2	7	0	61	0	0	0	0	0	0	0	0	35	0	0	0	2	37	0	0	1	1	0	2	
	2013	19	71	40	2	40	5	5	0	182	53	2	18	22	2	97	4	2	1	3	3	2	0	0	15	37	0	1	0	2	40	2	4	4	0	0	10
	2014	23	44	27	2	24	2	1	0	123	51	3	26	29	3	112	8	1	1	1	2	2	0	0	15	46	1	0	1	2	50	3	5	3	1	0	12
	2015	17	28	29	2	18	5	3	0	102	53	6	22	33	1	115	9	1	1	2	2	1	0	0	16	76	1	1	1	2	81	2	1	2	1	0	6
	2016	17	40	37	3	42	0	3	1	143	76	10	26	15	3	130	2	1	0	2	2	0	0	0	7	204	1	0	2	0	207	1	3	4	0	0	8
MAHINDRA & MAHINDRA	2006	NOT FOUND																																			
	2007	NOT FOUND																																			
	2008	NOT FOUND																																			
	2009	NOT FOUND																																			
	2010	NOT FOUND																																			
	2011	3	15	9	0	12	0	0	0	39	26	0	4	20	1	51	0	0	0	0	0	1	0	0	1	26	0	0	0	4	30	0	4	7	0	0	11
	2012	10	22	15	1	14	1	1	0	64	21	3	5	14	1	44	0	1	0	0	0	1	0	0	2	22	0	0	0	3	25	1	1	6	0	1	9
2013	11	44	18	0	27	6	6	0	112	28	4	14	22	1	69	4	2	0	2	2	8	0	0	18	60	1	4	3	2	70	6	7	6	2	0	21	
2014	12	46	22	1	33	4	7	0	125	33	7	15	37	1	93	8	2	0	3	2	10	0	0	25	92	1	3	3	3	102	3	6	7	4	0	20	
2015	10	27	25	3	23	4	4	0	96	27	9	20	27	2	85	9	1	0	2	2	13	0	0	27	136	1	2	1	2	142	6	5	5	4	0	20	
2016	12	40	20	4	29	4	2	0	111	47	10	20	44	0	121	0	1	2	2	2	1	0	0	8	116	1	1	1	0	119	1	2	6	0	0	9	

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ONGC	2007	6	17	3	0	19	0	1	0	46	42	5	12	7	1	67	0	0	0	0	0	0	0	0	0	10	0	0	0	0	10	0	0	4	0	0	4
	2008	10	35	3	0	18	0	1	1	68	56	4	11	7	2	80	0	0	0	0	0	0	0	0	0	13	0	0	0	1	14	0	0	4	0	0	4
	2009	6	29	0	0	4	0	1	0	40	29	1	3	12	1	46	0	0	0	0	0	0	0	0	0	9	0	0	0	0	9	0	0	0	0	0	0
	2010	7	32	3	0	6	0	1	0	49	32	1	10	13	1	57	0	0	0	0	0	5	0	0	5	10	0	0	0	0	10	0	0	1	0	0	1
	2011	5	35	5	0	12	1	1	0	59	30	2	12	15	1	60	0	0	0	0	0	9	0	0	9	12	0	0	0	0	12	0	0	2	0	0	2
	2012	5	40	8	0	14	1	1	0	69	40	4	13	18	2	77	0	0	0	0	0	12	0	0	12	15	0	0	0	0	15	0	0	4	0	0	4
	2013	5	56	28	0	15	2	2	0	108	45	8	17	21	3	94	11	1	0	2	2	25	0	0	41	33	4	0	0	0	37	2	1	1	1	0	5
	2014	5	67	44	1	49	1	3	0	170	38	7	17	10	4	76	11	1	0	4	2	4	0	0	22	106	2	0	1	1	110	5	1	0	1	0	7
	2015	7	55	55	1	86	0	5	0	209	38	7	15	14	8	82	10	1	0	4	2	19	0	0	36	121	1	0	0	1	123	3	5	1	1	0	10
	2016	12	57	58	3	97	2	7	0	236	40	9	18	16	10	93	10	1	0	3	2	23	0	0	39	210	2	0	0	1	213	4	5	1	1	0	11
RANBAXY LABORATORIES	2006	12	7	0	0	4	0	0	0	23	13	1	9	9	1	33	0	0	0	0	0	0	0	0	0	8	0	0	0	0	8	0	0	8	0	0	8
	2007	14	6	0	0	0	0	2	0	22	23	2	10	9	0	44	0	0	0	0	0	0	0	0	0	8	0	0	2	0	10	2	2	6	0	0	10
	2008	12	6	1	0	1	0	0	0	20	16	2	9	12	0	39	0	0	0	0	0	0	0	0	0	12	0	0	1	0	13	2	0	4	0	0	6
	2009	12	6	0	0	2	0	1	0	21	36	2	15	11	0	64	0	0	0	0	0	0	0	0	0	25	0	0	1	0	26	0	0	4	0	0	4
	2010	11	3	0	0	1	0	1	0	16	33	2	10	9	0	54	0	0	0	0	0	0	0	0	0	15	0	0	0	0	15	2	1	2	0	0	5
	2011	14	8	0	0	6	0	1	0	29	43	7	15	11	1	77	0	0	0	0	0	0	0	0	0	15	0	0	0	0	15	3	3	4	0	0	10
	2012	10	9	3	0	5	0	1	0	28	52	4	17	10	1	84	2	2	0	1	1	0	0	0	6	19	1	0	0	0	20	2	4	4	3	0	13
	2014	14	18	1	0	3	1	0	0	37	42	4	14	8	1	69	2	1	0	2	1	1	0	0	7	60	2	0	2	2	66	3	6	7	2	0	18
	2015	15	8	4	0	0	0	0	0	27	31	6	3	1	0	41	0	1	0	0	0	2	0	0	3	82	0	0	2	0	84	9	0	0	0	0	9
	2016	10	8	2	0	0	0	0	0	20	43	5	4	1	1	54	0	1	0	0	0	2	0	0	3	46	0	0	0	0	46	1	0	0	0	0	1

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	2010	9	2	0	0	6	0	0	0	17	39	2	1	0	0	42	0	0	0	0	0	0	0	0	0	0	49	0	0	0	2	51	0	0	10	0	0	10																										
	2011	4	2	0	0	2	0	0	1	9	39	2	3	0	0	44	2	0	1	0	0	0	0	0	0	0	3	35	0	0	0	2	37	0	2	6	0	0	8																									
	2012	11	2	0	0	2	0	0	0	15	35	2	2	0	0	39	0	0	0	0	0	0	0	0	0	0	46	0	0	0	2	48	0	1	6	0	0	7																										
	2013	15	4	3	0	5	0	0	0	27	36	3	0	3	1	43	0	0	0	0	0	0	0	0	0	0	39	0	0	0	2	41	0	0	6	0	0	6																										
2014	12	2	5	0	10	0	0	0	29	32	2	22	8	2	66	0	0	0	0	0	0	0	0	0	0	55	0	0	0	1	56	0	0	6	0	0	6																											
2015	13	13	20	5	23	0	2	0	76	28	2	5	1	1	37	0	0	0	0	0	0	0	0	0	0	0	92	0	0	0	1	93	0	0	8	0	0	8																										
2016	13	12	18	1	22	3	1	1	71	53	2	7	0	1	63	0	0	0	0	0	0	0	0	0	0	0	103	0	0	0	0	103	1	0	8	0	0	9																										

Mediating Role of CSR in Moulding Consumers' Purchase Decision on Toothpaste Brands: A Study in Kolkata Metropolis

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Abstract: An empirical study was carried out in Kolkata to evaluate the nature of involvement of corporate social responsibility (CSR) initiatives in strengthening the brand equity of selected toothpaste brands by modulating the consumers' purchase decisions. Data were collected using a questionnaire based survey among 322 resident respondents of the Indian metropolis. Findings suggest that while choosing a brand the respondents prioritised oral hygiene although they exhibited consciousness about the pricing and availability of the brand. The most preferred brands were successful in generating loyalty and association among the respondents through convincing portrayal of a responsible social image.

Key-words: CSR, FMCG, brand equity, purchase decision.

1. Introduction

The concept of corporate social responsibility (CSR) was created to mask the profit making attitude of a brand with a societal hue which could capture the emotion of stakeholders and provide an advantageous platform over the competing brands (*Carroll, 1979; Roy, 2010*). Building a healthy customer to brand relationship has become the priority of the companies which are trying every possible way to consolidate their social endeavours to safeguard the business acumen (*Popoli, 2011*). While one accepts that consumer awareness about CSR would generate better understanding of the CSR notions (*Lee and Shin, 2010*), it must also be reconciled that only responsible customers can recognise the social involvements of a company

(D'Amato *et al.*, 2009). Thus the multinational companies (MNCs) are finding it rational to promote their brands with social causes which have motivational as well as functional influence on the consumers (Keller, 2008). The fast-moving consumer goods (FMCG) industry which is the fourth largest sector of the Indian economy (Rishi, 2013; Mohan and Sequeira, 2016) has adopted the cause related marketing technique to make their brands noticeable and socially acceptable. Moreover, CSR was assimilated in the Companies Act, 2013 of India which provided a mandate to spend 2% of company's annual profit on social causes. However, this encouraging scenario also portrays a challenge for the entrepreneur in India where the consumers make their purchase decision (i) with relatively lower level of involvement with their chosen brand, and (ii) bother least to the technical specification of the product. The toothpaste brands in India are thus under intense competition to make their presence felt in the market and among consumers by adapting numerous social causes ranging from community health to environment conservation (Table 1). The conjecture provides a scope to carry out an empirical study in the populous Indian metropolis like Kolkata to evaluate the involvements of the CSR initiatives in modulating the purchase intentions of consumers for selected toothpaste brands. The investigation would be beneficial to assess the nature of consciousness of the consumers about the social endeavours with reference to the urban toothpaste market of India in the following manners: (i) the successful social outlooks of toothpaste brands influencing consumers' perception would be revealed; (ii) the findings would act as inventories to formulate future framework of marketing policies.

2. Literature Review

Several opinions were theorized over time to define the realistic attributes which might define or augment the image of a brand. It was Rust *et al.* (2004) who hypothesised the concept of "customer equity" while describing the evolving domain of consumer-centric marketing strategy. It was also opined that ethical attributes toward the consumers possibly affect the brand image, which might nurture brand loyalty (Mishra *et al.*, 2013; He and Lai, 2014). Further, consumers are often reported to be comfortably associated with brands which make their presence recognizable but in a subtle manner (Hoeffler and Keller, 2002). Thus, the brand information in

Table 1: Toothpaste brand specific CSR activities

Company	Brand	Brand image promotion policies and campaign	CSR outlook of brand/company
Colgate-Palmolive	Colgate	i. Colgate Bright Smiles, Bright Futures program for children ii. Colgate Cares Day globally to be a leader in volunteerism iii. Provide children with oral health education iv. Practice oral care packaging with Terracycle	Improvement of community health, education and environment; handwashing education; save water conservation campaign; provides educational scholarships

v. Support CGF resolution on forced labour

vi. UN Global Compact Endorser

vii. Signatory to UN CEO Water Mandate

Hindustan Unilever	Pepsodent	i. Pepsodent collaborated with the Indian Dental Association and the World Dental Association to help educate school children on the importance of regular brushing	Health and hygiene; improving nutrition; reducing greenhouse gases reduction in water use and waste; empowering communities
		ii. Vow to protect teeth while someone enjoys sweet eating	
		iii. Offers long lasting protection for teeth against cavity causing germs	
	Close Up	i. Close Up talks about “fresh breath confidence” that youth requires during social interactions	
		ii. India’s first gel toothpaste	
Jyothy Laboratories	Neem Active	i. Promotes oral health care by using natural ingredients.	Skill development; promotion of education; rural development
		ii. Promotes oral hygiene with herbal remedy	
Dabur	Babool	i. Babool was positioned as an economic toothpaste campaigning with taglines- - “Babool Babool paisa vasool” or, “Babool means value for money” - “Begin a great day, the Babool way”	Socio-economic development of the community; environmental sustainability; eradicating hunger, poverty and malnutrition; promoting health care; promoting education and gender equality and empowering women

Source: Companies’ annual disclosures

Table 2: Major findings on the impact of CSR on the components of brand equity

Components of brand equity	Key findings	Literature
Brand loyalty	CSR had a direct positive effect on brand loyalty	<i>Lombart and Louis (2014)</i>
	Perceived ethical responsibilities of brands may boost brand loyalty	<i>He and Lai (2014);</i>
Perceived brand quality	Relationship between perceived quality and emotional value has moderate influence on purchase intention	<i>Asshidin et al. (2016)</i>
	Perceived quality of a brand affects the purchase intention of the consumers	<i>Wongpitch et al. (2016)</i>
Brand awareness	Identity salience play a crucial role in the influence of CSR initiatives on consumer loyalty	<i>Marin et al.(2009)</i>
Brand association	Lack of customers’ awareness about CSR initiatives is a major limiting factor in their ability to respond to these initiatives	<i>Schuler and Cording (2006)</i>
	Consumers pay more for the products produced by corporates which have carried out social responsibilities	<i>Sen and Bhattacharya (2001)</i>
	CSR initiatives strengthens the cohesion between brand with consumer	<i>Park et al. (2010)</i>

the consumers’ memory has been defined as the strength of a brand (*Keller, 1993*) while lack of

awareness about the social initiatives have been often linked with restricted sensitivity about a brand (*Schuler and Cording, 2006*). Moreover, to nullify the effect of economic polarization on brand promotion the entrepreneurs are now actively involved in understanding the socio-economic background and traditional lifestyle of the stakeholders before formulating any CSR strategy (*Visser, 2008; Hah and Freeman, 2014*). Many a brands have successfully capitalized the trust attained through responsible acts to ward off rough times (*Dawar and Pillutla, 2000*), and many brands have been wrecked by for their false CSR claims which have been perceived by consumers as act of emotional disloyalty (*Balmer et al., 2011*) or ethical abuse (*Nasruddin, 2007*). Thus the relationship between consumers' brand perception and social image of brands has become a popular subject of study (Table 2). The cognitive attributes of a brand like pricing, quality, popularity, availability and promotional acts affect the purchase intention of consumers in diverse ways. *Chang and Wildt (1994)* suggested that the discourse between perceived price

and perceived quality of brands often creates a brand imagery which affects the purchase decision. *Mazumdar and Monroe (1990)* opined that informative consumers value pricing between competing brands while making purchase decisions. However, *Lodish and Mela (2007)* argued that over-attention on pricing rather than on quality might provoke the consumers to be price-sensitive. Further, the consumers' purchase behaviour is reportedly influenced by the brand popularity statements (*Magnini et al., 2013*) while availability of products has often been linked with stimulus for sales (*Hausman and Siekpe, 2009*). Brand promotion through advertisement is said to have influence on purchase decision of the consumers by fostering the socio-cultural and behavior outlooks (*Armitage and Conner, 2001*).

Chahoud et al., 2007 found that the Indian business entrepreneurs were reportedly involved in traditional philanthropic outlook only during state urgencies and *Planken et al. (2010)* opined that in relation to the CSR involvements, Indian corporations basically prefer to focus only on community development projects. Interestingly, *Thite (2012)* reported that prominent corporate boss perceives commitment to CSR in India as a "time and context invariant". Although the toothpaste companies in India has diverse CSR investments (Table 2), empirical studies reflecting the perceptions of the consumers regarding these social attributes and the outcome on purchase decision are wanted.

3. Framing of Hypotheses

The present study has tried to evaluate the customer based brand equity of selected toothpaste brands in India speculated after *Aaker (1991)* where the dimensions like brand awareness, brand associations, perceived brand quality and brand loyalty were judged to calibrate the perceived

brand equity (Figure 1). The study has tried to address the notion with the following four hypotheses:

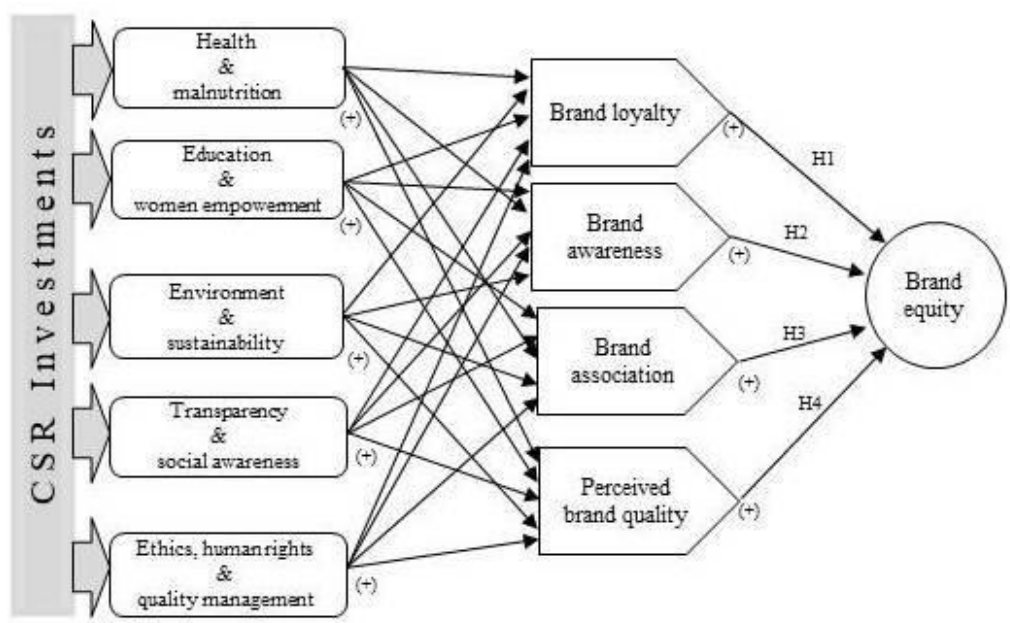
Hypothesis 1(H1): CSR has significant effect on the brand loyalty in FMCG toothpaste brands

Hypothesis 2(H2): CSR has significant effect on the brand awareness of the FMCG toothpaste brands

Hypothesis 3(H3): There is a relationship between CSR and brand association of the FMCG toothpaste brands

Hypothesis 4(H4): There is a relationship between CSR and perceived brand quality of FMCG toothpaste brands

Figure 1: Model depicting the involvement of diverse CSR investments in influencing the brand equity after Aaker (1991)



3. Methodology

The study involved a survey of potential FMCG consumers (respondents) from the population of Kolkata (currently placed around 4.5 million). The Survey Software available online at www.surveysystem.com/sscalc.htm was used to ascertain the sample size of the proposed study at

Table 3: Rank analyses of the cognitive criteria influencing purchase decision of toothpaste brands (*P<0.05; female: n=140; male: n=182)

Respondent	Mean rank of selection criteria						Kendall's W	Chi square (χ^2)	Df	P
	Reasonable pricing	Well-known brand	Taste and flavour	Oral-dental care	Availability	Advertisement				
Female	3.10	2.88	3.45	1.20	4.68	5.70	0.72	504.91	5	<0.001*
Male	3.96	2.93	3.18	1.57	4.07	5.29	0.45	415.71	5	<0.001*

95% confidence level. The respondents (140 female and 182 male) in the age group between 28- 57

years with higher educational background and/or professional experiences were considered for the survey. The study was done using a combination of probability and non-probability sampling methods after *Mohan and Sequeira (2016)*. The survey included five brands from the toothpaste sector (Colgate, Pepsodent, Neem Active, Babool and Close Up), which according to the Business Today (bt500.businessstoday.in) and Economic Times (economictimes.indiatimes.com/et500) had maintained market capitalization since 2013. Published literature like *Ray (1982)*, *Svensson (2001)*, *Park and Ghauri (2014)*, *Tan et al. (2016)*, *Mishra et al. (2016)*, *Mohan and Sequeira (2016)*, *Tanveer and Lodhi (2016)* were reviewed to justify the construct validity of the survey questionnaire (Appendix 1). Kendall's W test (*Boutsouki et al., 2008*) was applied for rank analysis and Pearson's correlation coefficient was calculated to ascertain the relationship among the criteria (*Medina et al., 2015*). Factor analysis was carried out to deduce the most influential criteria for product selection (*Osborne, 2015*). The comparison of gender based perception of the different cognitive attributes influencing purchase decision of toothpaste brands was carried out by the Kruskal-Wallis H test (*Fagerland and Sandvik, 2009*). The mediating role of the CSR components in enhancing the brand equity was analysed by multiple linear regression. Reliability analysis of the response to Likert's scale was ascertained by evaluating Cronbach's alpha values (alpha value > 0.700) (*Nunnally and Bernstein, 1994*). SPSS 16 statistical software package was used to compute and analysis of data.

4. Findings

Ranking of selection criteria

Oral dental care was identified as the most important criterion while the respondents intend to make a decision on the purchase of a toothpaste brand. The rank analysis by Kendall's W test identified the next important criterion as *well-known brand* by respondents and (Table 3).

Correlation among ranking of selection criteria and income

Significant correlation was observed in the response pattern between the criteria like: *reasonable pricing—well-known brand*, *reasonable pricing-availability*, *reasonable pricing-advertisement*,

Table 4: Pearson's correlation between the income and ranking of selection-criteria influencing the purchase intention of toothpaste brands of the female respondents (*P<0.05; n=140; SD= standard deviation; # in multiple of ₹ 1000.00)

Female respondent	Mean	SD	1	2	3	4	5	6	7	8
1. Reasonable pricing	2.60	0.98	1.00							
2. Well-known brand	2.60	0.87	*0.31	1.00						
3. Taste and flavour	2.85	0.69	0.06	*0.23	1.00					
4. Oral-dental care	1.30	0.47	-0.33	-0.33	-0.10	1.00				
5. Availability	3.90	1.02	*0.30	*0.59	0.03	-0.59	1.00			
6. Advertisement	4.85	0.92	*0.41	*0.82	*0.39	-0.42	*0.75	1.00		

7. Monthly income#	46.75	21.29	-0.16	*0.59	0.19	-0.06	0.15	*0.40	1.00	
8. Monthly family income#	85.25	35.07	-0.15	0.13	0.21	-0.15	-0.10	0.12	*0.66	1.00

Table 5: Pearson's correlation between the income and ranking of selection-criteria influencing the purchase intention of toothpaste brands of the male respondents (*P<0.05; n=140; SD= standard deviation; # in multiple of ₹ 1000.00)

Male respondent	Mean	SD	1	2	3	4	5	6	7	8
1. Reasonable pricing	3.71	1.49	1.00							
2. Well-known brand	2.71	0.99	0.15	1.00						
3. Taste and flavour	2.79	1.58	-0.16	-0.43	1.00					
4. Oral-dental care	1.50	0.85	0.18	0.09	-0.71	1.00				
5. Availability	3.93	1.54	*0.26	*0.39	-0.48	*0.61	1.00			
6. Advertisement	4.86	1.35	-0.17	-0.03	0.17	-0.07	*0.40	1.00		
7. Monthly income #	50.36	17.26	-0.25	-0.04	0.13	-0.12	0.15	*0.43	1.00	
8. Monthly family income #	79.29	32.81	-0.10	-0.42	*0.52	-0.29	-0.18	0.22	*0.64	1.00

for both of the male and female respondents. The female respondents correlated *monthly income* and *well-known brand* while it was *monthly income— taste and flavour* for the male (Table 4, 5). (Table 5).

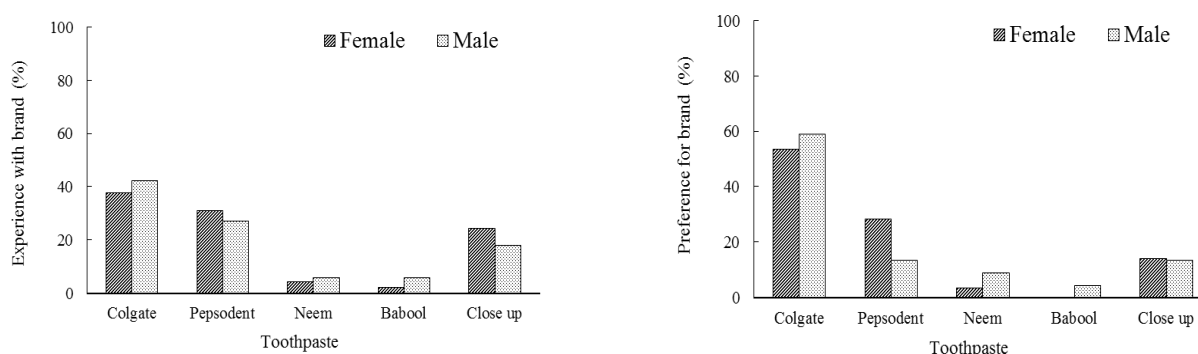
Factors ascertaining the criteria for selection of toothpaste brand

The factor deduced had significant Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's sphericity (Table 6) and it suggests that during making a purchase decision on a toothpaste-brand, the respondents had considered only two factors of significance, namely: *reasonable pricing* and *well-known brand* (Table 7). The Cronbach's alpha values suggest reliability in the internal consistency of the scale (Table 7).

Comparison of independent variables

Among the criteria which might influence the purchase decision of the toothpaste brands, the females exhibited significantly greater involvement with criteria like: *reasonable pricing*, *well-known brand* and *advertisement* (Table 8). However, with relation to the purchase decision of toothpaste brand on the issue of oral health and hygiene, the male respondents significantly

Figure 2: (a) Respondents' experience with toothpaste brands; (b) respondents' preference for toothpaste brands which were perceived to have addressed the issue of oral health and hygiene (female: n=140; male: n=182)



(a)

(b)

differed on the criteria like: *reasonable pricing, taste and flavour* and *advertisement* (Table 8). The concerns of the female respondents were significantly high with regard to the CSR attributes like: *affordable, follow guidelines of Indian Dental Care Association, and does not employ child/forced labour* (Table 8).

Experience with toothpaste brands

All the respondents were experienced with the toothpaste-brands under consideration, namely: Colgate, Pepsodent, Neem Active, Babool and Close Up (Figure 2a) and in the perspective of oral health and hygiene, the respondents exhibited consistent higher preference for the brand Colgate (Figure 2 b).

Selection of toothpaste brand on the basis of oral health and hygiene

The factor deduced had significant Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's sphericity (Table 6) and suggests in perspective of making purchase decision of toothpaste brand addressing the issue of oral health and hygiene, the respondents preferred the criteria: *well-known brand* and *reasonable pricing* (Table 7).

Correlation among the criteria for selection of toothpaste brand on the basis of oral health and hygiene

A significantly strong correlation was observed between the criteria like: *reasonable pricing- taste and flavour, well-known brand- taste and flavour, availability—well-known brand, advertisement—well-known brand* as perceived by the female respondents. The male respondents perceived the criteria *availability—well-known brand, taste and flavour—well-known brand* and *availability—reasonably priced, availability—taste and flavour* to have greater correlations (Table 9).

Table 6: Measurement of the adequacy and sphericity of response patterns of the respondents while deciding on the purchase of toothpaste brands (*P<0.05; female: n=140; male: n=182)

Cognitive component influenced	Kaiser-Meyer-Olkin measure of sampling adequacy		Bartlett's test of sphericity			
	Female	Male	Chi-Square (Female)	Chi-Square (Male)	Df	P
Purchase decision of a toothpaste brand	0.69	0.72	192.75	612.00	15	<0.001*
Purchase decision of toothpaste brand addressing the issue of oral health and hygiene	0.64	0.61	373.73	410.39	10	<0.001*
Judgment on CSR attributes of toothpaste brand addressing the issue of oral health and hygiene	0.66	0.51	387.76	454.42	15	<0.001*
Brand loyalty	0.61	0.59	113.91	428.56	3	<0.001*

Brand awareness	0.54	0.47	151.09	681.79	3	<0.001*
Brand association	0.61	0.69	153.77	295.06	3	<0.001*
Perceived brand quality	0.65	0.68	94.16	228.73	3	<0.001*

Table 7: Factor analysis for identification of the most significant criteria influencing purchase decision of toothpaste brands for domestic use (*P<0.05.; female: n=140; male: n=182)

Component influenced	Respondent	Influencing criteria/statement	Factor loading	Eigen values	Variance (%)	Cronbach's alpha
Purchase decision of a toothpaste brand	Female	<i>Reasonable pricing</i>	0.59	2.61	43.65	0.734
		<i>Well-known brand</i>	0.67	1.05	17.57	
	Male	<i>Reasonable pricing</i>	0.54	3.30	55.04	0.821
		<i>Well-known brand</i>	0.89	1.26	21.06	
Purchase decision of toothpaste brand addressing the issue of oral health and hygiene	Female	<i>Reasonable pricing</i>	0.96	2.94	58.97	0.784
		<i>Well-known brand</i>	0.77	1.08	21.69	
	Male	<i>Reasonably priced</i>	0.85	2.53	50.68	0.747
		<i>Well-known brand</i>	0.73	1.50	30.035	
Judgment on CSR attributes of toothpaste brand addressing the issue of oral health and hygiene	Female	<i>Have a strong social mission of free dental check-up and oral health initiative</i>	0.42	3.25	54.27	0.833
		<i>Have a strong social mission of free dental check-up and oral health initiative</i>	0.84	2.79	46.51	
	Male	<i>Affordable</i>	0.70	1.34	22.45	0.771
		<i>Affordable</i>	0.70	1.34	22.45	
Brand loyalty	Female	<i>I consider myself to be loyal to the toothpaste brand</i>	0.79	2.00	66.79	0.746
	Male	<i>I consider myself to be loyal to the toothpaste brand</i>	0.84	2.42	80.88	0.880
Brand awareness	Female	<i>I can quickly recall the colour/logo of the toothpaste brand</i>	0.81	1.96	65.32	0.717
	Male	<i>I can quickly recall the colour/logo of the toothpaste brand</i>	0.78	2.59	86.48	0.894
Brand association	Female	<i>I can recognize the toothpaste brand even if another toothpaste brand has the same features</i>	0.64	2.15	71.70	0.797
	Male	<i>I can recognize the toothpaste brand even if another toothpaste brand has the same features</i>	0.68	2.37	79.11	0.865
Perceived brand quality	Female	<i>The quality of the toothpaste brand is extremely high</i>	0.58	1.96	65.40	0.733
	Male	<i>The quality of the toothpaste brand is extremely high</i>	0.78	2.25	75.19	0.823
Gross brand image	Female					0.869
	Male					0.968

Note: Criteria having poor factor loading and Eigen value <1.000 have been excluded

Factors ascertaining the CSR criteria influencing the selection of toothpaste brand on the basis of oral health and hygiene

The factors with significant Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's sphericity (Table 6) suggests that with reference to selection of toothpaste brand on the basis of oral health and hygiene, the respondents exhibited preference for the CSR criterion like: *have a strong social mission of free dental check-up and oral health initiative* (Table 7). The Cronbach's alpha values suggest acceptable reliability in the internal consistency of the scale (Table 7).

Cognitive criteria influencing the overall brand image perception of toothpaste brands

The respondents were found to be loyal towards their selected toothpaste brand as observed from the deduced cognitive statement with relation to brand loyalty (*I consider myself to be loyal to the toothpaste brand*) (Table 7). The respondents were well versed with the colour and logo of their

chosen toothpaste brand (*I can quickly recall the colour/logo of the toothpaste brand*) which implies existence of strong brand awareness (Table 7). The respondents could recognise their chosen toothpaste brand (*I can recognize the toothpaste brand even if another brand have the same features*) which suggests presence of strong brand association (Table 7).

Table 8: Kruskal-Wallis H test for comparison of cognitive attributes influencing the purchase intention of toothpaste brands between the female and male respondents (*P<0.05.; female: n=140; male: n=182)

Cognitive component influenced	Influencing criteria	Mean rank (Female)	Mean rank (Male)	Chi square	Significance
Purchase decision of a toothpaste brand	<i>Reasonably priced</i>	187.73	141.32	24.09	<0.001*
	<i>Well-known brand</i>	176.36	150.07	7.29	0.007*
	<i>Taste and flavour</i>	163.08	160.29	0.09	0.766
	<i>Oral-dental care</i>	162.61	160.64	0.07	0.796
	<i>Availability</i>	163.17	160.21	0.09	0.755
	<i>Advertisement</i>	176.54	149.93	6.94	0.008*
Purchase decision of toothpaste brand addressing the issue of oral health and hygiene	<i>Reasonably priced</i>	121.48	192.29	60.01	<0.001*
	<i>Well-known brand</i>	159.48	163.06	0.139	0.709
	<i>Taste and flavour</i>	140.75	177.46	14.88	<0.001*
	<i>Availability</i>	167.48	156.90	1.24	0.264
	<i>Advertises well</i>	114.98	197.29	72.53	<0.001*
Judgment on CSR attributes of toothpaste brand addressing the issue of oral health and hygiene	<i>Have a strong social mission of free dental check-up and oral health initiative</i>	137.12	180.25	18.41	<0.001*
	<i>Affordable</i>	182.95	145.00	18.53	<0.001*
	<i>Follow guidelines of Indian Dental Care Association</i>	177.10	149.50	8.23	0.004*
	<i>Meets customer's health and safety regulation</i>	154.35	167.00	1.80	0.179
	<i>Transparent about brand's revenue and packaging</i>	147.20	172.50	7.86	0.005*
	<i>Does not employ child/forced labour</i>	174.50	151.50	7.58	0.006*

Table 9: Pearson's correlation between the rating of selection-criteria which influences the purchase decision of the toothpaste brands addressing the issue of oral health and hygiene (*P<0.05.; female: n=140; male: n=182)

Female respondent								Male respondent							
	Mean	SD	1	2	3	4	5	Mean	SD	1	2	3	4	5	
1. Reasonable pricing	2.95	0.67	1.00					3.52	0.51	1.00					
2. Well-known brand	3.35	0.73	0.04	1.00				3.45	0.78	*0.22	1.00				
3. Taste and flavour	3.10	0.70	*0.33	*0.72	1.00			3.40	0.66	0.07	*0.53	1.00			
4. Availability	3.20	1.03	-0.06	*0.71	*0.67	1.00		3.30	0.65	*0.31	*0.74	*0.70	1.00		
5. Advertises well	2.80	0.82	0.07	*0.54	*0.74	*0.47	1.00	3.58	0.57	*0.70	0.11	0.09	0.20	1.00	

Table 10: Multiple linear regression analysing the mediating role of the CSR components (independent variables) in enhancing the brand loyalty (dependent variable) of the toothpaste brands

Model coefficients		Female respondent		Male respondent						
Model FLT				Model MLT						
		CL	C5	CL	C6	C5	C3	C2	C4	C1
UC	B	3.93	0.19	2.43	-0.04	-0.05	0.63	-0.03	-0.04	-0.02
	SE	0.19	0.06	0.62	0.07	0.09	0.06	0.07	0.13	0.08
SC	β		0.26		-0.05	-0.04	0.63	-0.03	-0.02	-0.02
t		20.47	3.23	3.87	-0.57	-0.61	10.19	-0.49	-0.30	-0.31
P		<0.01*	<0.01*	<0.01*	0.56	0.53	<0.01*	0.61	0.76	0.75
VIF			1.00		2.87	1.52	1.09	1.31	2.04	1.64
R		0.26		0.61						
R ²		0.07		0.37						
Adjusted R ²		0.06		0.35						

*P<0.05; female: n=140; male: n=182

Note: UC- Unstandardized coefficients; SC- Standardized coefficients; SE- Standard error; VIF- Variance inflation factor; CL (dependent variable; L-loyalty)- I consider myself to be loyal to the toothpaste brand; C1- Have a strong social mission of free dental check-up and oral health initiative; C2- Affordable; C3- Clearly label products for the customers; C4- Meets customer's health and safety regulation; C5- Transparent about brand's revenue and packaging; C6- Does not employ child/forced labour; (C1-C6 :independent variables); F-female; M-male; T-toothpaste.

Table 11: Multiple linear regression analysing the mediating role of the CSR components (independent variables) in enhancing the brand awareness (dependent variable) of the toothpaste brands

Model coefficients		Female respondent					Male respondent	
Model FAT							Model MAT	
		CA	C2	C3	C4	C5	CA	C3
UC	B	2.92	0.41	-0.55	0.32	0.23	2.2	0.48
	SE	0.47	0.14	0.09	0.08	0.07	0.23	0.05
SC	β		0.26	-0.68	0.45	0.29		0.538
t		6.14	2.88	-5.58	3.95	2.98	10.14	8.55
P		<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*
VIF			1.68	2.93	2.57	1.94		1.00
R		0.55					0.53	
R ²		0.30					0.28	
Adjusted R ²		0.28					0.28	

P<0.05; female: n=140; male: n=182

Note: UC- Unstandardized coefficients; SC- Standardized coefficients; SE- Standard error; VIF- Variance inflation factor; CA(dependent variable; A-awareness)- I can quickly recall the colour/logo of the toothpaste brand; C2- Affordable; C3- Clearly label products for the customers; C4- Meets customer's health and safety regulation; C5- Transparent about brand's revenue and packaging; (C2-C5 :independent variables); F-female; M-male' T-toothpaste.

Further, the respondents assured their preference for the quality of their chosen toothpaste brand by preferring the cognitive statement “*the quality of the toothpaste brand is extremely high*”, which implies their faith on the perceived quality of the toothpaste brand (Table 7). The Cronbach's alpha values suggest acceptable reliability in the internal consistency of the scale representing the components: brand loyalty, brand awareness, brand association and perceived brand quality, and the overall brand image perception of toothpaste brands (Table 7).

Mediating role of the CSR components in enhancing the brand equity of toothpaste brands

In the context of brand loyalty of the female respondents (*I consider myself to be loyal to the toothpaste brand*), the model FLT draw strength only from the CSR component C5 ($R^2=0.07$). However for the male respondents, the robustness of the model MLT was maximum ($R^2=0.37$) where all the six components of CSR contributed together (Table 10). In case of brand awareness of the female respondents (*I can quickly recall the colour/logo of the toothpaste brand*), the model FAT exhibited significant impact ($R^2=0.30$) by deriving strength from C2, C3, C4 and C5. For the male respondents, the workable model was MAT ($R^2=0.28$) which was supported only by C3 (Table 11). In the cause of brand association (*I can recognize the toothpaste brand even if another brand have the same features*) for the female respondents, model FAST worked best ($R^2=0.42$) with contributions from C5, C6 and C1 components of CSR. The male respondents were best represented with MAST ($R^2=0.39$) where the CSR components C2, C5, C3 and C1 adhered together (Table 12). In relation with perceived brand quality (*the quality of the toothpaste brand is extremely high*), model FBQT ($R^2=0.03$; CSR component- C5) was workable with the female respondents and model MBQT ($R^2=0.22$; CSR component- C1, C5, C6) with the male respondents. The maximum variance inflation factor (VIF) for all the models were within the acceptable range of 5.0 which suggest multicollinearity was not high enough among the variables to create any disturbance.

5. Discussion

The respondents expressed similar preference for the intrinsic cognitive criterion, *oral-dental care* implying identical reasoning for toothpaste brand selection. However, in the relative scale, they preferred the extrinsic criteria: *reasonable pricing* and *well-known brand* (Table 3).

Table 12: Multiple linear regression analysing the mediating role of the CSR components (independent variables) in enhancing the brand association (dependent variable) of the toothpaste brands

Model coefficients		Female respondent				Male respondent				
		Model FAST				Model MAST				
		CAS	C5	C6	C1	CAS	C2	C5	C3	C1
UC	B	3.81	0.87	-0.53	-0.15	1.44	0.47	0.20	0.21	-0.15
	SE	0.31	0.09	0.11	0.07	0.31	0.05	0.04	0.05	0.03
SC	β		0.92	-0.43	-0.14		0.53	0.26	0.26	-0.27
t		12.32	9.66	-4.86	-2.03	4.59	8.86	4.21	4.15	-4.05
P		<0.01*	<0.01*	<0.01*	0.04*	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*
VIF			2.17	1.91	1.25		1.05	1.17	1.22	1.37
R		0.65				0.62				
R^2		0.42				0.39				
Adjusted R^2		0.41				0.37				

* $P < 0.05$; female: $n=140$; male: $n=182$

Note: UC- Unstandardized coefficients; SC- Standardized coefficients; SE- Standard error; VIF- Variance inflation factor; C (dependent variable; AS-association)- I can recognize the toothpaste brand even if another brand have the same features; C1- Have a strong social mission of free dental check-up and oral health initiative; C2- Affordable; C3- Clearly label products for the customers; C5- Transparent about brand's revenue and packaging; C6- Does not employ child/forced labour; (C1-C6 :independent variables); F-female; M-male; T-toothpaste.

Table 13: Multiple linear regression analyzing the mediating role of the CSR components (independent variables) in enhancing the perceived brand quality (dependent variable) of the toothpaste brands

Model coefficients		Female respondent		Male respondent			
		Model FPBQT		Model MPBQT			
		CPBQ	C5	CPBQ	C1	C5	C6
UC	B	4.10	0.14	3.92	0.43	-0.28	-0.20
	SE	0.20	0.06	0.40	0.06	0.11	0.08
SC	β		0.19		0.52	-0.18	-0.17
t		20.51	2.28	9.63	6.91	-2.55	-2.45
P		<0.01*	0.02*	<0.01*	<0.01*	0.01*	0.01*
VIF			1.00		1.30	1.15	1.14
R		0.19		0.46			
R ²		0.03		0.21			
Adjusted R ²	0.02		0.19				

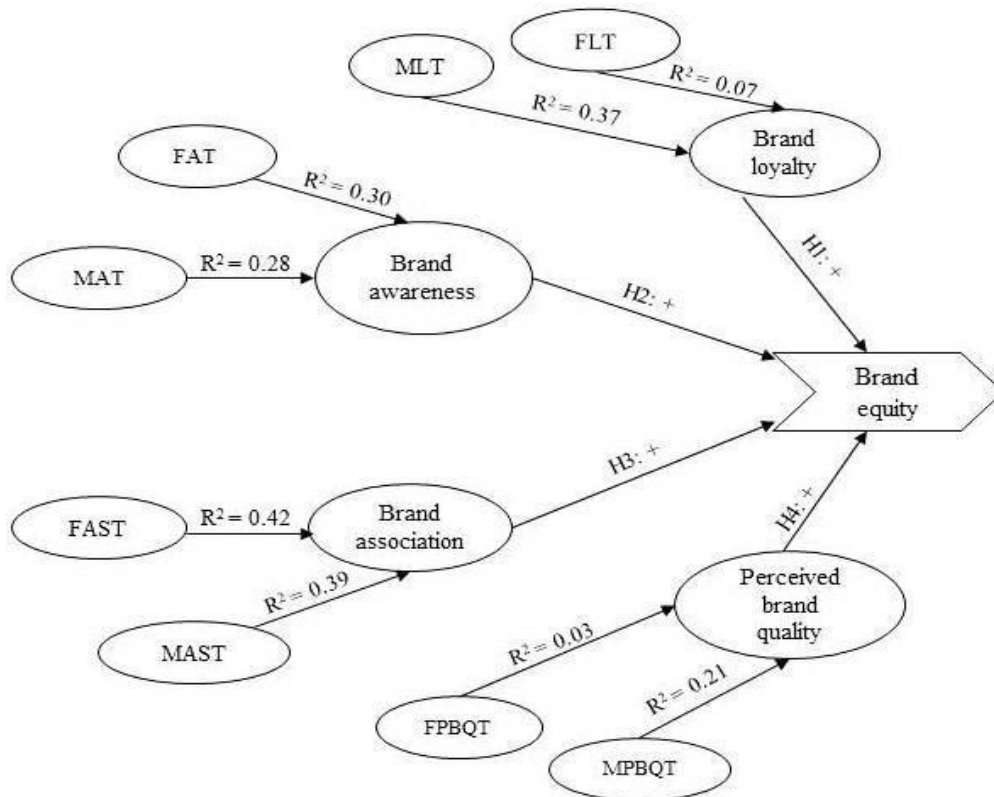
*P<0.05; female: n=140; male: n=182

Note: UC- Unstandardized coefficients; SC- Standardized coefficients; SE- Standard error; VIF- Variance inflation factor; C (dependent variable; PBQ-perceived brand quality)- I can recognize the toothpaste brand even if another brand have the same features; C1- Have a strong social mission of free dental check-up and oral health initiative; C5- Transparent about brand's revenue and packaging; C6- Does not employ child/forced labour; (C1-C6 :independent variables); F-female; M-male; T- toothpaste.

Findings on the correlation of criteria and factor analysis suggest similar nature of gross reasoning between the male and female respondents (Table 4, 5, 7). In the context of selection of toothpaste brand on the basis of oral health and hygiene, the respondents exhibited higher preference for the brands like Colgate (Figure 2 b). It may be noted that the mentioned brand exercises several CSR initiatives and strongly adhere to the oral health initiatives (Table 1). However, in the same context, the respondents preferred two extrinsic criteria, namely, *reasonable pricing* and *well-known brand* for making purchase decision on toothpaste brands (Table 7) suggesting poised state of mind weighing the qualitative as well as economic attributes of the brand. Among the CSR components investigated, the respondents expressed faith for the criterion- *have a strong social mission of free dental check-up and oral health initiative* while the male respondents additionally preferred *affordability* (Table 7). It also strengthens the conjecture that the consumers with a higher level of awareness for CSR may express an elevated purchase intention (Lee and Shin, 2010). Moreover, the respondents exhibited confidence with the cognitive statements on brand loyalty, brand awareness, brand association and perceived brand quality and thereby on gross

brand image which in turn enhances the brand equities of preferred toothpaste brands (Table 7). The evolving model as represented in Figure 3 (derived from Table 10-13) indicates the differential contribution of the CSR components which might enhance the brand equity of the preferred toothpaste brand. The present findings indicate comprehensive cognitive reasoning ability of both female and male respondents under complex condition of making purchase decision on FMCG brands of toothpaste, an act which somehow

Figure 3: Evolving model reflecting the nature of involvement of the different CSR components in enhancing the brand equity of the toothpaste brands. (F-female; M-male; T-toothpaste; L- loyalty; A-awareness; AS-association; PBQ-perceived brand quality)



partially contradicts the idea of female biased social norms of household purchase behaviour (Sinha et al., 2002; Silverstein and Sayre, 2009; Mukherjee et al., 2012).

The respondents exhibited solidarity in the social vision of their chosen toothpaste brands (*have a strong social mission of free dental check-up and oral health initiative*) and affirmed the cognitive statements on brand loyalty (Figure 3; Table 9, 10) which might suggest that CSR has a significant effect on the brand loyalty of FMCG toothpaste brands (H1). The findings also suggest that the respondents exhibited awareness regarding the preferred toothpaste brands' social mission and they could recognize the cognitive statement advocating for brand awareness (Table 7). The evolving model in the Figure 3 suggests involvement of CSR attributes in supporting the statement on brand awareness (Table 11). Thus it is plausible to suggest that there is a relationship between CSR and brand-awareness of the FMCG toothpaste brands (H2). Finally, the respondents could associate their realization with the cognitive statement of brand association (Table 7). The model in Figure 3 depicts significant contribution of the CSR components in manifesting the perception of brand association which might suggest that there is a relationship between CSR and brand association of the FMCG toothpaste brands (H3). The female respondents could prioritise the qualitative aspect of the selected toothpaste brand (oral dental care) while making purchase decision (Table 3) and they were able to recognize the cognitive statement on perceived brand quality (Table 7) which might suggest that CSR has significant effect on the perceived quality of the FMCG toothpaste brands (H4).

6. Conclusion and Limitations of the Study

The findings of the present study clearly identified the expectations of the oriental urban consumers from their preferred toothpaste brand. They knowingly appreciated the brand that exhibited maximum commitment to social and environmental causes and exhibited loyalty and association for the same. CSR investments coupled with awareness campaigns turned the table in favour of brand Colgate and the findings redefine the association of consumers for low- involvement FMCG product like toothpaste. Moreover, the brand equity of the toothpaste brands would gather greater momentum if the unexplored CSR initiatives depicted in the Figure 1 and the missing initiatives observable in Figure 3 are provided with due attention. However, the study

would have attained more robustness had it encompassed non-residential population who regularly traverse to the city for livelihood and shared identical life style.

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Appendix – I

(Questionnaire of the Survey) PART - A






Please rank the factors according to importance (A) and rate how much you think that each of the factors is important to you when you purchase toothpaste products (put tick mark in boxes that you feel appropriate) (B): (1= not important; 2= less important; 3= no idea; 4= moderately important; 5= very important)

(A) Factors	Rank	(B) Factors	1	2	3	4	5
Reasonably priced		Reasonably priced					
Well-known brand		Well-known brand					
Taste and flavour		Taste and flavour					
Oral-dental care		Oral-dental care					
Availability		Availability					
Advertisement		Advertisement					

PART – B

(I) Have you ever bought toothpaste from any one of the following brands? [put tick mark in box(es) that you feel appropriate];

(II) If you have purchased any of the above brands before, which brand you had selected for oral and dental care? [put tick mark in box(es) that you feel appropriate]

(I) Brands	Visuals	Yes	No	(II) Brands	Select (✓ mark)	Remark
Colgate				Colgate		
Pepsodent				Pepsodent		
Neem Active				Neem Active		
Babool				Babool		
Close up				Close up		

(If your response is No to all the above mentioned brands, please stop here. Thank you for your participation)

(III) Keeping the above brand(s) in your mind, please rate how likely you think that the brand above has each of the following characteristics (put tick mark in boxes that you feel appropriate): (1= not at all; 2= most likely; 3= no idea; 4= likely; 5=extremely likely)

Characteristics	1	2	3	4	5
Reasonable pricing					
Well-known brand					
Taste and flavour					
Better availability					
Advertises well					

PART- C

Keeping the above brand(s) in your mind, please rate how much you agree or disagree with each of the following remarks (even if you do not have exact information, please express what you think):(1= strongly disagree; 2= disagree; 3= no idea; 4= agree; 5= strongly agree)

Remarks	1	2	3	4	5
Have a strong social mission of free dental check-up and oral health initiative Affordable					
Follow guidelines of Indian Dental					
Care Association Meets customer's health and safety regulation					
Transparent about brand's revenue and packaging Does not employ child/forced labour					

PART - D

Keeping the above brand(s) in your mind, please rate how much you agree or disagree with each of the following remarks: (1= strongly disagree; 2= disagree; 3= no idea; 4= agree; 5= strongly agree)

Cognitive statements	1	2	3	4	5
I consider myself to be loyal to the toothpaste brand					
I would not buy other toothpaste brands if the brand is available in the store					
If there is another toothpaste brand as good as the considered brand, I prefer to buy the brand I can quickly recall the colour/logo of the toothpaste brand					
I can recognize the toothpaste brand among other competing brands I have no difficulty in imaging the toothpaste brand in my mind					
I can recognize the toothpaste brand even if another brand have the same features					
The brand would be my first choice among alternatives when I buy toothpaste that I need I will be disappointed if I hear that the toothpaste brand is involved in unethical business The quality of the toothpaste brand is extremely high					
I would like to recommend the toothpaste brand to my acquaintance					
Performance of the toothpaste brand is best among peers					

Liberalizing Trade in Services and Economic Growth in India during Post Reform period: A Quantitative Analysis using Granger Causality Test in a Vector Autoregressive Framework

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Abstract: The study seeks to examine the causal relationship, if any, between India's services trade and economic growth, in a Vector Auto Regressive (VAR) framework during the post-liberalization period. A simple regression model is used to predict whether services trade influences economic growth for the time period 1996-97: Q1 to 2014-15:Q2. In order to examine the causal linkages between the variables, the Granger Causality Test has been conducted. Service trade plays a crucial role in developing countries where proportionately higher services export are characteristics of high-growth countries while excessive dependency on imported services is characteristic of low growth countries. Effective development planning must include strengthening of both domestic and international service sectors to reduce relative dependency on imported services while providing incentives for services exports.

Key-words: Trade in services, economic growth, Vector Auto Regressive Framework, Granger Causality.

1. Introduction

The rapid expansion of trade in services contributes significantly to economic growth, both in developed and in developing economies (OECD, 2003). If liberalizing trade in goods, which typically accounts for less than half of the GDP in most countries and even less than a third of output in the industrial economies, can affect *economy-wide* growth, then there should be comparable gains from liberalizing services that are becoming increasingly tradable and that account for a larger and growing share of output in most

countries. The competitiveness of firms in open economies is increasingly determined by access to low-cost and high quality producer services – telecommunications, transport and distribution services, financial intermediation, etc. The role of services in economic growth is immense and more emphasis is needed on channels through which openness to trade in services may increase productivity at the level of the economy as a whole, industries and the firm. Growth in services trade is driven by numerous factors including liberalization of goods trade, deregulation of services, advances in information and communication technologies (as in e-commerce and telecommunications services) and increasing reliance on outsourcing by multinational corporations (MNCs). Services are heterogeneous and span a wide range of economic activities. Conceptually, this diversity marks a fundamental function that many services (which are inputs into production) perform in relation to overall economic growth. One dimension of this ‘input function’ is that services facilitate transactions through space (transport, telecommunications) or time (financial services) (*Melvin, 1989*). Another dimension is that services are frequently direct inputs into economic activities, and thus determinants of productivity of the ‘fundamental’ factors of production – labour and capital – that generate knowledge, goods and other services. Education, R&D and health services are examples of inputs into the production of human capital.

As firm size increases and labour specializes, more activity needs to be devoted to coordinating and organizing the core businesses of companies. This additional activity is partly outsourced to external service providers. The “producer services” that are demanded and supplied as part of this process are not just differentiated inputs into production. Those play an important distinct role in coordinating the production processes needed to generate even more differentiated goods and to realize scale economies. The associated organizational innovations and expansion of “logistics” (network) services yield productivity gains that in turn should affect economy-wide growth performance. The integration of countries through flows of goods and services, financial assets, technology and cultural interaction has reached unprecedented levels (*Stern, 2001*). As the world is becoming more integrated, the trade in goods and services are crossing borders in line with globalization and regionalization processes.

2. Literature Review

Economic theory postulates that aggregate growth is a function of increases in the quantity and productivity of capital and labour inputs with long-run (steady state) growth being driven by technological progress. *Goldsmith* (1969) stresses the role of financial services in channelling investment funds to their most productive uses, thereby promoting growth of output and income. Subsequent works have shown that financial services can affect economic growth through enhanced capital accumulation and/or technical innovation. *Francois* (1990a) notes that the growth of intermediation services is an important determinant of overall economic growth and development because it allows specialization to occur. Some of the theoretical models treat services as goods and producer services and are modelled as intermediate goods (*Robinson et al.*, 1999, *Dee and Hanslow*, 2000, *Brown, Deardorff and Stern* 2002) and show that multilateral trade liberalisation of services will increase global income and welfare. *Banga and Goldar* (2004) empirically determine the impact of trade liberalisation and find that trade liberalisation and development of the services sector in the 1990s had a significant impact on use of services in the Indian industry, which has further contributed to industrial output and productivity growth.

King and Levine (1993) postulate that financial services can affect growth through enhanced capital accumulation and/or technical innovation. They systematically control for other factors affecting long-run growth and construct additional measures of financial sector development such as the ratio of liabilities of the financial system to GDP and the ratio of gross claims on the private sector to GDP, which they use in growth regressions. *Francois and Reinert* (1996) have documented that the importance of services for export performance rises with per capita income; business, distribution, and communications services become the most important sectoral elements of overall exports in terms of inter-industry linkages. *Mattoo, Rathindran and Subramanian* (2006) find that, controlling for other determinants of growth, countries with open financial and telecommunications sectors grew, on an average, about 1 percentage point faster than other countries. *Bayraktar and Wang* (2006) show that the asset share of foreign banks has an economically and statistically significant positive effect on the growth rate of GDP per capita, after controlling for other determinants of growth, indicating a direct link between

the two variables. *Francois* and *Manchin* (2007) conclude that infrastructure is a significant determinant not only of export levels but also of the likelihood exports that will take place at all. They found that basic infrastructure (communications and transportation) explains substantially more of the overall sample variation in exports than do the trade barriers faced by developing countries.

3. Objective

The study seeks to examine the causal relationship, if any, between India's services trade and economic growth, in a Vector Auto Regressive (VAR) framework during the post-liberalization period.

4. Data

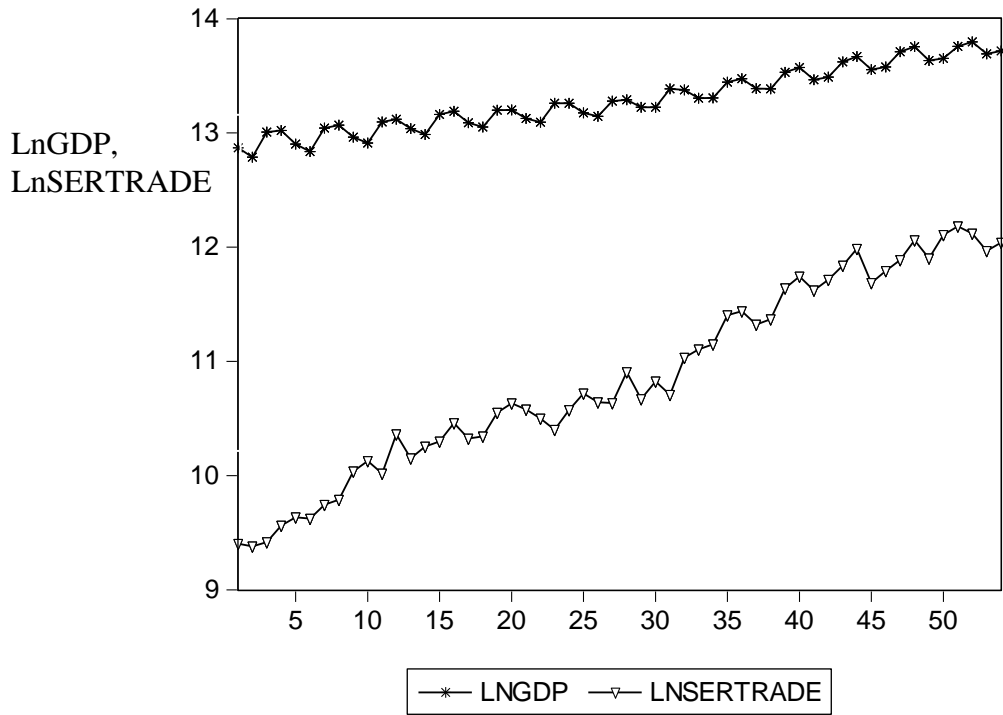
Quarter-wise data from 1996-97:Q1 to 2014-15:Q2 (comprising 58 observations) are taken for GDP at 1999-00 market prices and also for services trade to study the causal relationship between services trade and economic growth. The data are taken from Handbook of Statistics, Reserve Bank of India.

5. Methodology

The bivariate Vector Autoregressive (VAR) framework has been used to test the Granger causality between services trade and economic growth for the time period 1996-97: Q1 to 2014-15: Q2 (**FIGURE 1**). Regression Analysis is also done for the same time period with the same data set. Two methods are used.

- i. Statistical Method
- ii. Econometric method

Figure 1: Logarithmic Values of GDP and Services Trade



i. Statistical method

A simple regression model is used to predict whether services trade influences economic growth for the time period 1996-97: Q1 to 2014-15:Q2.

$$LnGDP = \alpha_1 + \beta_1 LnSERTRADE + \varepsilon_1$$

...(1)

where in equation (1) α_1 is the constant term, LnGDP represents logarithmic value of GDP and LnSERTRADE represents logarithmic value of services trade and ε_1 is the error term.

ii. Econometric method

Tests for Stationarity

The first step in the methodology is to test the stationarity of the variables (used as regressors in the model). *Augmented Dickey Fuller (ADF)* [1979], *Phillips-Perron (PP)* [1988] and *Kwiatkowski, Phillips, Schmidt and Shin (KPSS)* [1992] Tests have been conducted to investigate into the stationarity property of the series.

Tests for Cointegration

After examining the stationarity of the variables involved in the study, an attempt is made to figure out the level of cointegration between the examined variables, i.e., those tied in a long-run relationship. In this study, the Error-correction Cointegration technique of *Johansen* (1988) and *Johansen and Juselius* (1990) has been applied to identify the cointegration relationship between the variables. According to *Johansen* (1988), a p -dimensional VAR model, involving up to k -lags, can be specified as below.

$$Z_t = \alpha + \Pi_1 Z_{t-1} + \Pi_2 Z_{t-2} + \dots \Pi_k Z_{t-k} + \varepsilon_t \dots (2)$$

where Z_t is a $(p \times 1)$ vector of p potential endogenous variables and each of the Π_i is a $(p \times p)$ matrix of parameters and ε_t is the white noise term. Equation (2) can be formulated into an Error Correction Model (ECM) form as below.

$$\Delta Z_t = \alpha + \Pi_k Z_{t-k} + \sum_{i=1}^{k-1} \theta_i \Delta Z_{t-i} + \varepsilon_t \dots (3)$$

where Δ is the first difference operator, and Π and θ are p by p matrices of unknown parameters and k is the order of the VAR translated into a lag of $k - 1$ in the ECM and ε_t is the white noise term. Evidence of the existence of cointegration is the same as evidence of the rank (r) for the Π matrix. The rank of Π can be zero. This takes place when all the elements in the matrix Π are zero. This means that the sequences are unit root processes and there is no cointegration. The variables do not share common trends or move together over time. In this case, the appropriate model is a VAR in first differences involving no long-run elements.

Johansen and Juselius (1990) have developed two Likelihood Ratio Tests. The first test is the Likelihood Ratio Test based on the maximal Eigen value which evaluates the null hypothesis of ' r ' cointegrating vector(s) against the alternative of ' $r+1$ ' cointegrating vectors. The second test is the Likelihood Ratio Test based on the Trace Test which evaluates the null hypothesis of, at most, ' r ' cointegrating vector(s) against the alternative hypothesis of more than ' r ' cointegrating vectors. If the two variables are $I(1)$, but cointegrated, the *Granger Causality Test* will be applied in the framework of ECM in which long-run components of the variables obey equilibrium constraints while the short-run components have a flexible dynamic specification.

Tests for Granger Causality

In order to examine the causal linkages between the variables, the *Granger Causality Test* has been conducted. The direction of the impact of each of the variables is also determined from the analysis. In order to capture the impact of variables observed in the past time period in explaining the future performance, the optimal lag length p (which is 4 in the present study) is chosen (see **TABLE 1**) and the criteria used in selecting the VAR model and optimal lag length require the combination of information criterion (minimum of AIC or SBIC or HQIC or FPE value).

Table 1: VAR Lag Order Selection
[D(LnSETRADE),D(LnGDP)]

Lag	LL	LR	FPE	AIC	SIC	HQIC
0	74.41239	NA	0.000178	-2.955608	-2.878391	-2.926312
1	81.23648	12.81257	0.000159	-3.070877	-2.839225	-2.982988
2	121.5593	72.41650	3.62e-05	-4.553441	-4.167355	-4.406961
3	155.9177	58.90018	1.05e-05	-5.792561	-5.252041	-5.587488
4	178.5539	36.95693	4.93e-06*	-6.553219*	-5.858265*	-6.289554*

*indicates lag order selected by the criterion.

LL: Log Likelihood

LR: Sequential Modified LR Test Statistic (each test at the 5% level of significance)

FPE: Final Prediction Error

AIC: Akaike Information Criterion

SIC: Schwarz Information Criterion

HQIC: Hannan-Quinn Information Criterion

D: represents the first difference of logarithmic values of the concerned variables

The model used for testing Granger causality in a VAR framework at first difference form:

$$\Delta \text{LnGDP}_t = \sum_{j=1}^p \alpha_{11,j} \Delta \text{LnGDP}_{t-j} + \sum_{j=1}^p \alpha_{12,j} \Delta \text{LnSERTRADE}_{t-j} + \varepsilon_{t1}$$

...(4)

$$\Delta \text{LnSERTRADE}_t = \sum_{j=1}^p \alpha_{21,j} \Delta \text{LnSERTRADE}_{t-j} + \sum_{j=1}^p \alpha_{22,j} \Delta \text{LnGDP}_{t-j} + \varepsilon_{t2}$$

...(5)

where LnGDP and LnSERTRADE are the time series of GDP and Services trade respectively which are in the logarithmic and first difference form. ε_{t1} and ε_{t2} are white noise. p is the lag length of VAR and Δ the first difference operator.

Parameter Stability Tests

CUSUM test and CUSUM of squares (CUSUMSQ) test are used to check whether the parameters of the model are stable or not. The CUSUM test (*Brown, Durbin and Evans, 1975*) is based on the cumulative sum of the recursive residuals. This option plots the cumulative sum together with the 5% critical lines. The test finds parameter instability if the cumulative sum goes outside the area between the two critical lines. In case of CUSUM of squares test, similar to CUSUM test, movement outside the critical lines is suggestive of parameter or variance instability. If the cumulative sum of squares is outside the 5% significance lines, it would suggest that the residual variance is somewhat unstable.

Impulse Response Analysis

Impulse responses are the changes in the future predicted values due to a change in the current period values. Instead of static interpretation of the effects of changes in any of the variables in the system, Impulse Responses (IR) provide a dynamic response curve that depicts the effects of a change in one of the variables, considering the effects of the other variables in the system. IR analysis is a dynamic multiplier analysis among the variables in the VAR system, measuring how a standard deviation shock to a variable in the system is transmitted to others over time. The IR function can trace the response of the endogenous variables to a shock in another variable. In the present study, the orthogonalized IR analysis is done by changing the order of the equations to see whether any change in the IR function is revealed.

6. Findings

Time Series Properties of the Variables

TABLE 2 reports the results of the ADF and PP Tests of unit root by lag length chosen based on SIC. The tests are performed on both the level and the first difference of the lagged variables.

Table 2: Test of Unit Root Test Hypothesis (1996-97: Q1 – 2009-10: Q2) without trend

Series		ADF Statistic		PP Test		KPSS	
		Test Statistic	Lags	Test Statistic	Lags	Test Statistic	Lags
LnGDP	Level	0.688338	4	-0.329862	4	1.16681 ***	4
	First Difference	-2.765359*	3	-64.57951***	3	0.275288	3
LnSERTR ADE	Level	1.333826	3	-1.366488	3	1.4194***	4
	First Difference	-6.751363***	2	-35.31384***	2	0.0815314	3

(a)The critical values are those of *McKinnon* (1991).

1 % ADF-critical values = -3.571310, 5% ADF-Critical values = -2.922449, 10% ADF-Critical values = - 2.599224 in case of LnGDP (logarithmic value of Gross Domestic Product) and first difference of LnGDP

1 % ADF-critical values = -3.568308, 5% ADF-Critical values = -2.921175, 10% ADF-Critical values = -2.598551 in case of LnSERTRADE (logarithmic value of services trade) and first difference of LnSERTRAD.

1 % PP-Critical value = -3.560019, 5% PP-critical value =-2.917650, 10% PP-critical value =-2.596689 in case of LnGDP and LnSERTRADE

1 % PP-Critical value = -3.562669, 5% PP-critical value =-2.918778, 10% PP-critical value =-2.597285 in case of first difference of LnGDP and LnSERTRADE

1 % KPSS- critical values = 0.739, 5% KPSS-Critical values = 0.463, 10% KPSS-Critical values = 0.347 in case of LnGDP and LnSERTRADE and first difference of LnGDP and LnSERTRADE

(b)***, ** and * represents the rejection of null hypothesis at 1%, 5% and 10% levels of significance respectively.

The variables economic growth and services trade are I(1) processes according to ADF, PP and KPSS tests.

Table 3: Johansen -Juselius Cointegration Test Results
[no deterministic trend (restricted constant)]

H ₀	H ₁	λ_{trace}	$CV_{(trace,5\%)}$	Prob.**
$r = 0$	$r \geq 1$	15.73734	20.26184	0.1870
$r \leq 1$	$r \geq 2$	5.334333	9.164546	0.2487
H ₀	H ₁	λ_{max}	$CV_{(max,5\%)}$	Prob.**
$r = 0$	$r = 1$	10.40301	15.89210	0.2991
$r \leq 1$	$r = 2$	5.334333	9.164546	0.2487

(a) r is the number of cointegrating vectors.

(b) Trace test indicates no cointegrating equations at the 5% level of significance.

(c) Max-Eigen value test indicates no cointegrating equation at the 5% level of significance.

(d)** denotes rejection of the null hypothesis at the 5% level of significance.

(e) The critical values (i.e., CVs) are taken from *Mackinnon-Haug-Michelis* (1999).

Johansen Cointegration Test

Johansen Cointegration Test results for the cointegration rank r have been presented in **TABLE 3**. Going by the results of the *PP Test* and the *KPSS Test*, it has been observed that the variables have the same order of integration, i.e., I(1) and the *Johansen Cointegration Test* has been employed to find out the cointegration rank and the number of cointegrating vectors. The null hypothesis of $r = 0$ (i.e., there is no cointegration) cannot be rejected against the alternative hypothesis of $r = 1$ at the 5% level of significance in case of the Max-Eigen value statistic. Again the null hypothesis of $r \leq 1$ cannot be rejected against the alternative hypothesis of $r = 2$ at the 5% level of significance in case of Max-Eigen value statistic. Similarly, going by the result of the

Trace statistic, the null hypothesis of $r = 0$ cannot be rejected against the alternative hypothesis of $r \geq 1$. Again the null hypothesis of $r \leq 1$ cannot be rejected against the alternative hypothesis of $r \geq 2$ at the 5% level of significance. The results suggest that there is no long-run relationship among the variables considered for the study.

Granger-Causality Test

Although it has been concluded that there is no cointegration between GDP and services trade, it does not mean absence of causality or relationship in the short run. In cases where GDP and services trade do not move together in the long run (i.e., there is no cointegration), it is possible for the variables to affect each other in the short run. The null hypothesis is accepted or rejected based on F statistic to determine the joint significance of the restrictions under the null hypothesis. A unidirectional causality is observed from services trade to economic growth.

Table 4: Granger Causality Test (Time Period: 1996-97: Q1 to 2009-10:Q2)

Null Hypothesis	Obser	F-Statistic	Prob.
D(LnSERTRADE) does not Granger Cause D(LnGDP)	49	2.14079	0.0935*
D(LnGDP) does not Granger cause D(LnSERTRADE)		1.43097	0.2415

D(LnSERTRADE) \longrightarrow D(LnGDP)

*denotes rejection of the null hypothesis at 10% level of significance.

Parameter Stability Tests

The null hypothesis of parameter stability cannot be rejected at the 5% level of significance as the cumulated sum stays inside the 95% confidence band in case of both CUSUM and CUSUMSQ tests. The CUSUM test indicates stability in the equation during the sample period because the line (blue) lies within the 5% critical lines (**Figure 2**). The CUSUMSQ test shows that the cumulative sum of the squares is within the 5% significance lines, suggesting that the residual variance is stable (**Figure 3**).

Figure 2: Diagrammatic representation of CUSUM Test

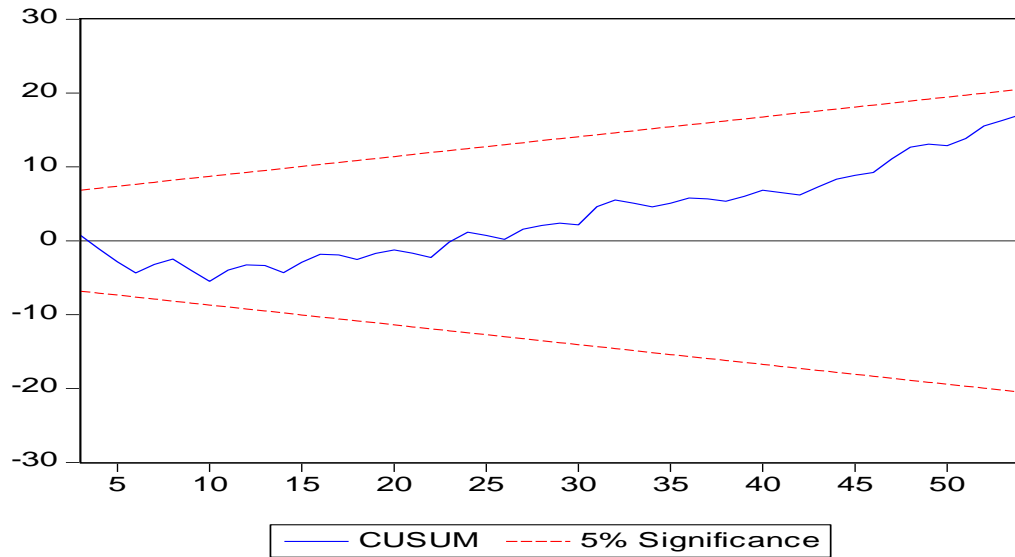
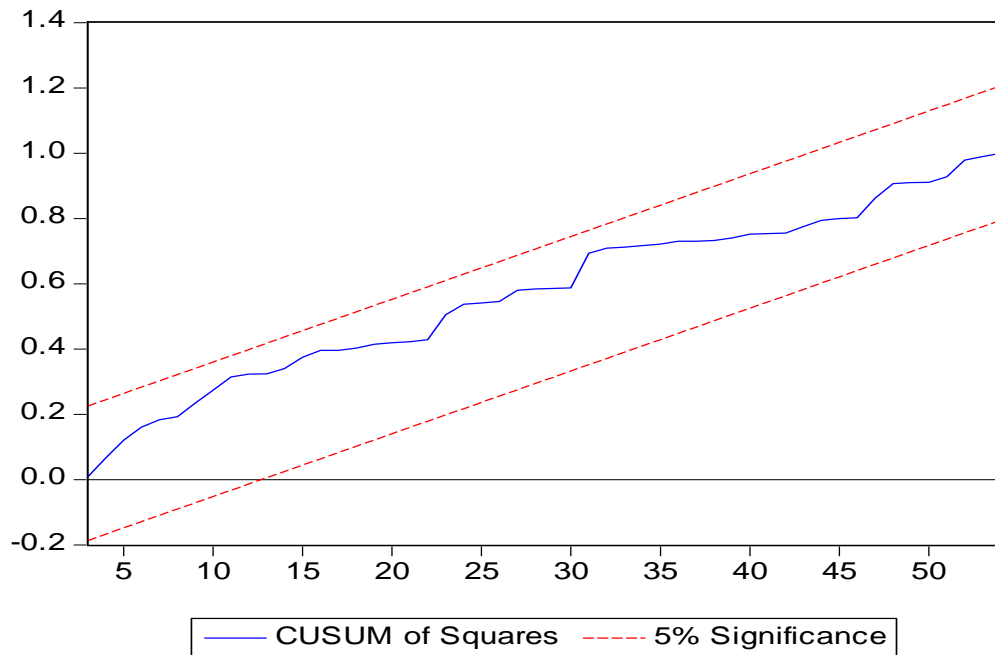


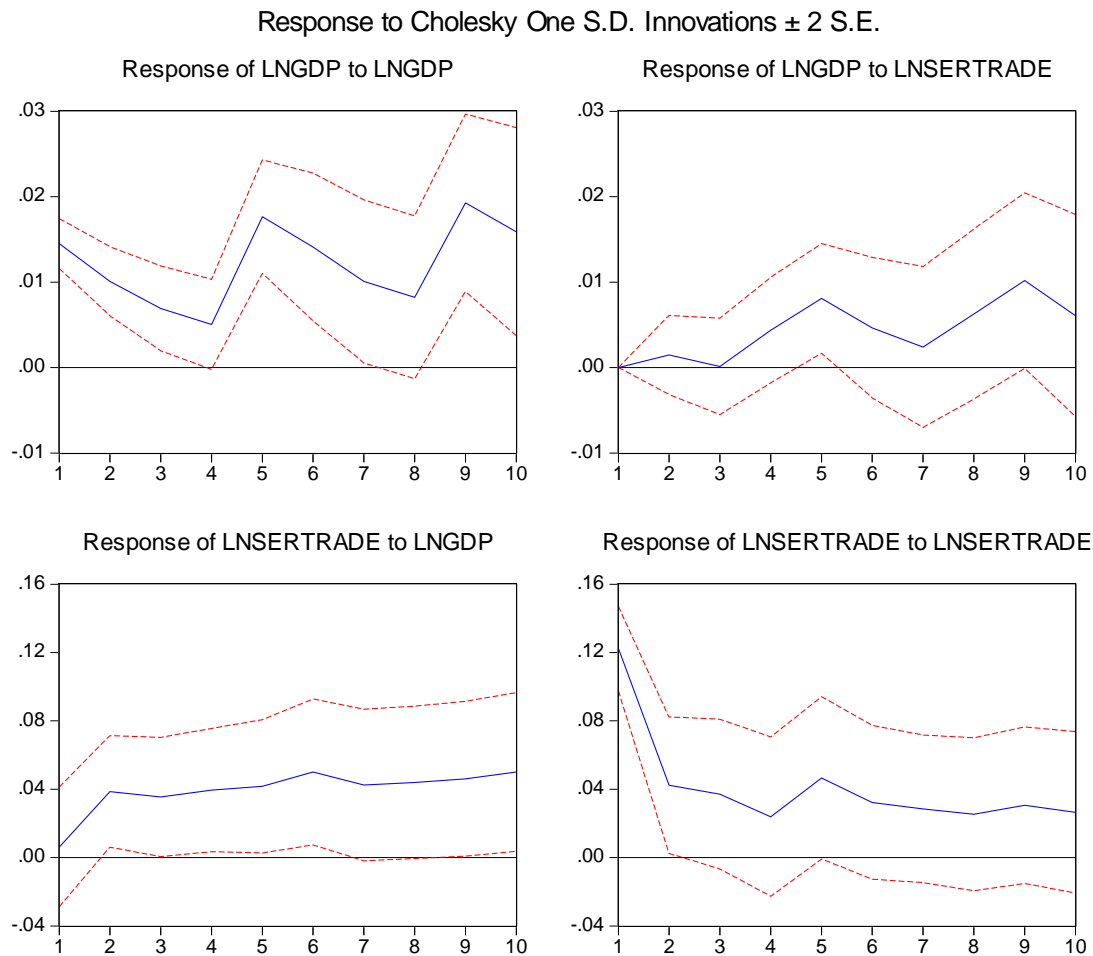
Figure 3: Diagrammatic representation of CUSUMSQTest



Impulse Response Analysis

The Impulse Response function for the VAR system is calculated in the order – GDP and services trade (**FIGURE 4**). The VAR is estimated at the levels of the variables and the optimal lag length is chosen to be 5. Thus, IR functions are computed to give an indication of the system's dynamic behaviour. The response of GDP to a unit shock in services trade is positive and increases over the quarters with a slight fall in the third and seventh quarter. The response of services trade to a unit shock in GDP is positive over the quarters. The Impulse Response Analysis is done by changing the order of the equations to see whether any change in the Impulse Response Function is revealed at the levels of the variables. The results of the impulse response functions are consistent with the t-statistics of the variables in estimated coefficients.

Figure 4: Impulse Response Analysis of the Variables



B. Statistical Analysis

Table 5: OLS estimates for the time period 1996-97:Q1 to 2014-15:Q2

	Constant	LnSERTRADE	R^2	\bar{R}^2	F Statistic
LnGDP	9.884408 (0.128148) [77.13301]***	0.314039 (0.011767) [26.68899]***	0.9319	0.9306	712.3022 (p-value=0.00001)

*** indicates significant at 1% level.

The results reveal that LnSERTRADE is significant at 1% level in explaining LnGDP. The R^2 value (0.9319) measures the goodness of fit of the regression model and the small p value (0.00001) of the F statistic reveals that the regression is significant.

7. Conclusion

The growth in the service sector is supported by two main factors. Those are technological innovation and increased tradability of services. The role of transnational corporations in this regard is important as FDI is an important channel for capital flows and transfer of technology. There is a beneficial economic effect of investments in services, particularly producer services like finance, distribution and research and development and these services raise economic growth and performance and, when such services are in short supply, all enterprises – both manufacturing and non-manufacturing – will be at a disadvantage.

Service trade plays a crucial role in developing countries where proportionately higher services export are characteristics of high-growth countries while excessive dependency on imported services is characteristic of low growth countries. Effective development planning must include strengthening of both domestic and international service sectors to reduce relative dependency on imported services while providing incentives for services exports. With markets becoming increasingly globalized, comparative advantage theory loses its significance with respect to trade in services since it is valid only if there is no mobility of factors of production. Services such as telefax, electronic mail, aligned databases and data processing in general must be interconnected

with a proper telecommunications infrastructure to be marketed internationally. Development in the telecommunications sector is therefore of utmost importance with respect to trade in services. Development of a good infrastructure with adequate transportation facilities and state of the art telecommunications facilities will not only enhance the country's attractiveness to foreign investment but will also improve competitiveness of domestic investment. Services trade draws FDI inflows into the country and further liberalisation of FDI and services trade flows could lead to higher growth and further economic development. In contrast, barriers to FDI or restrictions on cross-border services trade by foreign firms, whether motivated by economic, political, social and cultural reasons, could have a direct negative impact on the economic performance and prospects for development of India. Such market interventions would also distort the allocation of capital between foreign and domestic investment. This could result not only in more costly services but also in less consumer choice, lower productivity and perhaps slower technology transfer.

Services liberalization is different from trade in goods because the former necessarily involves factor mobility and leads to scale effects that are distinctive though not unique. Together these can have important positive effects on long run economic growth. It is possible to construct policy-based rather than outcome-based measures of openness for the services sectors that capture these differences. Unlike in trade in goods, where the policy openness measure needs to capture only the openness to foreign supply, in the case of services, policy openness measures must capture both openness towards inward flows of foreign factors and measures that promote domestic competition. There is some econometric evidence that openness in financial and telecommunications sectors and trade in services in those sectors influence long run growth performance.

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