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The Institute of
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(Statutory body under an Act of Parliament)

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THE INSTITUTE OF COST ACCOUNTANTS OF INDIA

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Foreword

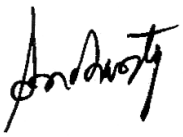
It gives me an immense pleasure to present before you the current edition of the Research Bulletin of the Institute. I believe this volume of Research Bulletin will definitely enrich the knowledge base of readers and prospective researchers.

The CMAs with expertise understanding and knowledge of the enterprise cost management systems can play a key role in spearheading the economic recovery process in the Indian Economy by efficiency, productivity and competitiveness of industry. The Cost and Management Accountants possess the expertise which can help in value maximization and business sustainability. The cost accountants help the management in regulating production operations and go beyond processes of production. In the recent years, Cost and Management accounting shows a remarkable development which will significantly influence the academicians and the professionals.

Cost management is a culture. It is about influencing people's behavior towards cost management and has to be imbibed in the organizations for sustainable growth. Cost competencies have become critical to survival of businesses. Total Cost management involves a holistic approach to optimize costs for competitive advantage. Nowadays, there are challenges and cut-throat competition in every sector, be it in industry or in case of professionals and the key mantra of sustainability should be to assess the situation properly and frame optimal strategies to achieve the desired target.

This present volume of the Research Bulletin comprises of empirical studies based on blazing issues like EVA, banking & finance, stock market, tax issues, financial inclusion, TRIPS, risk-return relationship, etc.

I hope that the readers will definitely enjoy reading the articles placed in this volume.



CMA Suresh Chandra Mohanty
President
The Institute of Cost Accountants of India

Chairman's Communiqué

It is my pleasure to present before you the 39th volume of the Research Bulletin of the Institute. Our Research Bulletin mainly emphasizes on empirical research papers and case studies on cost, management and finance related contemporary issues.

Research is a systematic inquest to describe, explain, predict and control the observed phenomenon. To research is to purposely and methodically search for new knowledge and practical solutions in the form of answers to questions formulated beforehand and accomplished with a certain objective. Research constitutes the moral fiber of the socio-economic activities.

I would like to express my heartfelt thanks to my fellow members of the Research, Innovation and Journal Committee, esteemed members of the Review Board, the eminent contributors and the entire research team of the Institute for their sincere effort and support to publish this volume in time.

I am sure the readers will find the Bulletin effective and would love to go through all the articles and I welcome the readers to put forward their valuable feedback which would help us improve upon the Research Bulletin further.

CMA Manas Kumar Thakur
Chairman, Research, Innovation & Journal Committee
The Institute of Cost Accountants of India

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A Comparative Study on Corporate Governance Practices across the Ownership Pattern of Banks Operating in India

Amit Majumder

Abstract:

Here, in this paper, an attempt has been made to examine the extent of compliance of the Corporate Governance Codes by selected major banks operating in India across the ownership status like public, private and foreign. The study indicates that there exists significant difference in corporate governance disclosure practices among these banks. The overall governance scenario in these surveyed banks also depicts a mixed portrait with respect to some significant parameters like independence in boards, formation of different board committees, separation of role of chairman and managing director etc. The appropriate regulatory authority and the apex bank should consider various measures to ensure independence of activities, transparency of operations for protecting overall stakeholders' interests. The issue of appointment of nominee directors, remuneration to the directors, formation of different board committees, separation of dual role of CEO and Chairman should be adhered to at earliest.

Key Words*: Corporate Governance; Board of Directors; Independence in Boards; Board Committees.*

JEL Classification*: G34, G21, D71.*

Introduction:

The word (good) governance is a current buzzword not only in management literature but also in every walk of life. It implies how an organisation is directed and controlled under a set of mission, values, and philosophy (Cadbury, 1992). But unfortunately, over time, the common investors all over the globe have suffered a lot in the hands of the greedy managers and scams like Enron, Adelphia, Tyco, Worldcom, Xerox, Paramalt, and Satyam have shattered the trust in the very mechanism of corporate management and governance. However, despite a lot of initiatives taken around the world in the form of codes/laws for ensuring good governance for corporate sector, the issue of governance practices of banks operating in India had not been discussed in detail. But, in view of the growth of that industry and the magnitude of public funds these entities are managing over the years, a renewed interest on its governance mechanism is the need of the hour.

Objective of the Study:

Here, in this paper, an attempt has been made to make a comparative analysis of corporate governance practices of major listed public, private sector banks and foreign banks operating in India.

Hypothesis of the Study:

H_0= The distribution of Corporate Governance Score is same across the categories of banks (H_0: CGS_{psb}=CGS_{pvb}=CGS_{fb}).

H_1= The distribution of Corporate Governance Score is different across the categories of banks (H_1: $CGS_{psb} \neq CGS_{pvb} \neq CGS_{fb}$).

Research Methodology:

Design

The financial system of any country is comprised of financial institutions, financial markets, financial instruments and financial services. But the Indian financial system is dominated by the banks clearly with 63% market share of Financial Assets. Moreover among the various banking sectors Scheduled Commercial Banks (SCBs) dominated the banking systems in India and among the SCBs the lions share goes to 26 Public Sector Banks with 72.8 percent of total banking assets. While 20 Private Sector Banks claimed 20.2 percent, the 41 Foreign Banks, on the other hand, claimed merely 7 percent of total banking assets (RBI Publications, 2012). However in order to understand the governance mechanisms of banks operating in India the researcher had chosen the leading market indicator for banks listed in Bombay Stock Exchange. That is why the present study has been envisaged on 12 major listed Indian banks considered for constructing the S&P BSE-BANKEX as on 1st December 2013 (as on that the indices consisted with five banks from public sector and seven banks from private sector) as well as 6 top foreign banks operating in India based on Capital, Reserves and Surplus (as per ranking made by Live mint and Wall Street Journal, 2013). Hence total sample size is 18. Those banks are Bank of India, Bank of Baroda, Canara Bank, Punjab National Bank and State Bank of India [*Public Sector Banks*], Axis Bank, Federal Bank, HDFC Bank, ICICI Bank, IndusInd Bank, Kotak Mahindra Bank, and Yes Bank [*Private Sector Banks*] Standard Chartered Bank, Citibank, HSBC, Deutsche Bank, J.P. Morgan Chase Bank and Barclays Bank [*Foreign Banks operating in India*]. In this study, the variables that have been considered are stated below.

board structure; separation of role of chairperson and CEO; frequency of board meeting; nature, formation and effectiveness of different board committees, e.g., Audit Committee, Remuneration Committee, Investors' Grievance Redressal Committee, Nomination or Corporate Governance Committee, Asset Management Committee, and Risk Assessment Committee; frequency of meetings of board committees, etc.

Data

Data have been collected from the secondary sources. Different versions of PROWESS (Prowess 2.6, 3.0, 3.1 and 4) Corporate Database (prepared by the Center for Monitoring Indian Economy [CMIE], Mumbai) have been made use of. Moreover, annual reports of banks; electronic disclosures; relevant research publications, books, journals, reports in newspapers, materials in electronic newsletters of different professional institutions as well as corporate houses; and corporate rankings by different Indian and foreign agencies have been consulted as and when necessary.

Study Period

The present study is envisaged on the reported corporate governance disclosure practices of the surveyed banks for the financial year 2012-13.

Scheme of Investigation

This study has tried to examine the extent of compliance of the Corporate Governance Codes by the selected 18 major banks operating in India 5 from public sector, 7 from private sector and 6 foreign banks operating in India. For such purpose, 61 significant recommendations made in 15 nationally-and internationally-accepted Corporate Governance Codes have been selected. The said Corporate Governance Codes are mentioned below.

K.M. Birla Committee's Recommendations/Clause 49 of the Listing Agreement of the SEBI (1999), Naresh Chandra Committee's Recommendations on Corporate Audit and Governance (2002), Narayana Murthy Committee's Report (2003), J.J. Irani Committee Report (2005), Cadbury Report/ Financial Aspects of Corporate Governance (UK, 1992), Greenbury Report/ Directors' Remuneration: Reports of a Study Group Chaired by Sir R.A. Greenbury (UK, 1995), Viénot II Report/ Recommendations of the Committee on Corporate Governance chaired by Mr. Marc Viénot (France, 1999), NØrby Report (Denmark), Eurosharehoders Guidelines (Europe, 2000), Cromme Committee's Report (Germany, 2002), King-III Committee's Report (Republic of South Africa, 2009), ICGN Corporate Governance Guidelines (International Corporate Governance Network, 2005), NYSE Listing Standard (USA, 2003), The Higgs Report on Non-Executive Directors (UK, 2003), and Guidance on Audit Committee/ Smith Guidance (UK, 2003).

A Brief Survey of Literature:

Due to the special nature of financial services, most academic papers of home and abroad on corporate governance exclude financial firms from their data and focus on non-financial firms [*Shleifer and Vishny* (1997) and *Adams and Mehran* (2010)]. However, a brief review of some of the serious studies on governance in the banking sector has been attempted here.

Anderson and Campbell (2004) have investigated into the corporate governance activities in the Japanese banks. The results indicate that, though significant relationship between bank performance and non-routine turnover of bank presidents was not there in the pre-crisis (1985-90) period, significant relationship was there in the post-crisis (1991-96) period.

Banking sectors role has been severely criticized for its role in the recent financial crisis. Notably, the weak governance of banks is frequently identified as a major cause of the crisis (*Kirkpatrick, 2009*). In the UK, Sir David Walker was commissioned to recommend measures to improve board-level governance at banks to the government (*Walker, 2009*). The commission's recommendations served as the basis for the 2010 UK Governance Code.

Cornett et al. (2010) investigated the relationship between several corporate governance mechanisms and bank performance in the crisis in a sample of approximately 300 publicly traded US banks and found that a more independent board is positively related to banks' performance during the crisis, while *de Andres and Vallelado (2008)* report a hump-shaped relationship between board independence and performance. *Beltratti and Stulz (2012)* investigate the relation between corporate governance and bank performance during the credit crisis (July 2007 – December 2008) in an international sample of 164 large (i.e., with more than $50 billion of assets) banks. They find that banks with more shareholder-friendly boards had lower buy-and-hold returns during the crisis. Moreover, *Erkens et al. (2012)* investigate the relation between corporate governance and performance of financial firms

during 2007-2008 using an international sample of 296 financial firms from 30 countries. In line with the findings of *Beltratti and Stulz (2012)*, these authors report that firms with more independent boards experienced worse stock returns during the crisis.

In the Indian context, *Jalan (2002)* has examined the issues of corporate governance in the Indian banks. *Reddy (2002)* has discussed the issues relating to governance in the public sector banks and has found that corporate governance in such organizations is important because such issues not only happen to dominate the banking industry at present but are also likely to remain relevant in the future. Because there is public ownership of these banks, the role of the government as owner and the complex principal-agent relationships continue to be there. These banks cannot be expected to blindly follow the private sector banks in terms of governance though the general principles of governance continue to remain relevant. Problems arise when there is a widespread feeling of uncertainty regarding the ownership and public ownership is treated as something transitional. The anticipation or threat of change in ownership has also some impact on governance because it is not merely the expected change of the owner but the very nature of the owner. Mixed ownership, where the government has controlling interest, is an institutional structure that generates significant issues relating to difference between one set of owners looking for commercial return and another set of owners seeking something more and different to justify ownership. Moreover, the expectations, the reputation-related risks and the implied, even if not exercised, authority vis-à-vis the part-ownership of government in the context of governance in such banks should be appreciated. In brief, the issues relating to corporate governance in such banks are both important and complex.

Das and Ghosh (2004) conducted a survey on the corporate governance practices of the public sector banks for the period of 1996 to 2003 and have observed that, among the bank-specific variables, there exists a negative correlation between the dependent variable (i.e., corporate governance) and performance (measured by RoA), suggesting lower CEO turnover in the banks with better performance.

Kaushik and Kamboj (2011) in a study on corporate governance practices of 15 large listed banks (10 from public and 5 from private) for a period of five years from 2006-2010 had revealed that in most cases an improvement in Capital Adequacy Ratio (CAR) led to better asset quality, higher returns and share prices (taken as a proxy measure for corporate governance). Moreover, measures like reduction in Non-Performing Assets (NPA) also led towards higher profitability and better EPS (taken as a proxy measure for corporate governance). Finally they concluded that RBI, through its policies, had insulated Indian economy from the effects of global financial crisis of 2008 due to limited exposure to toxic assets owing to counter-cyclical prudential norms prescribed by the RBI.

Summary of Findings:

The study was undertaken to enquire into the compliance of nationally-and internationally-acclaimed Corporate Governance Codes by the selected major 18 banks covering the public, private sector and foreign banks domain. Such banks' corporate governance practices have been measured based on 61 aspects relating to corporate governance, viz., board composition; elements of independence in board; frequency of board meeting; formation of different board committees like audit committee, remuneration committee, nomination

committee, asset liability management committee, and investors grievance committee; frequency of meetings of different board committees; corporate governance disclosure and certification. Based on the texts relating to the banks available on Prowess 2.6, the state of affairs of corporate governance practices of the banking companies (considered for constructing the BSE-BANKEX) has been assessed by using the binary scale, i.e., assigning '1' for compliance and assigning '0' for non-compliance. The relative 'corporate governance scores' for each of those banks has been worked out and presented below.

Table#1: Corporate Governance Score of the Surveyed Public, Private and Foreign Banks

Rank	Name of the Banks	Corporate Governance Score
1	HSBC	93.44
1	Barclays	93.44
3	SCB	83.61
4	Deutsche	78.69
5	ICICI Bank	77.05
5	Indusind Bank	77.05
7	HDFC Bank	75.41
7	Kotak Mahindra Bank	75.41
9	JP Morgan Chase	73.77
10	Citi	72.13
10	AXIS Bank	72.13
12	Punjab National Bank	65.57
13	Yes Bank	63.93
14	Bank of Baroda	60.67
14	Bank of India	60.67
16	Federal Bank	60.66
17	State Bank of India	57.38
18	Canara Bank	55.74

***Source**: Computed on the basis of PROWESS Data and Disclosures by Banks*

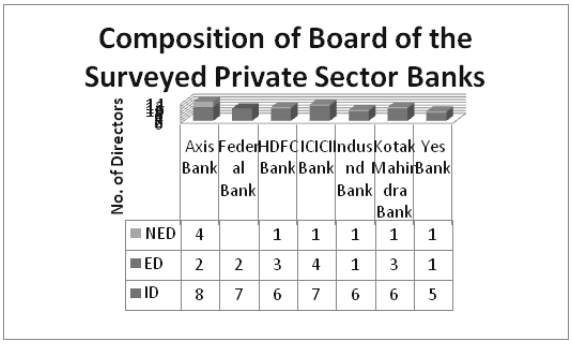
While the average corporate governance score (CGS_{fb}) of selected foreign banks is 82.51 with standard deviation 9.37, the private sector banks register the CGS_{pvb} 71.66 with standard deviation 6.67. On the other hand the average corporate governance scores of PSU Banks CGS_{psb} is only 60.01 with standard deviation 3.77.

Now the performance of the surveyed banks with respect to various parameters of corporate governance is discussed below.

(i) Composition of Board:-

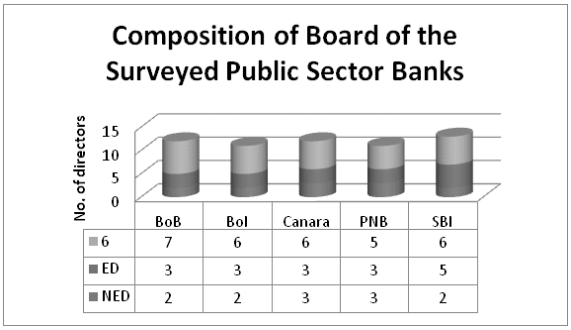
So far as the composition of the Board is concerned, the surveyed major private sector banks have shown a commendable performance by including more number of Non-executive Directors and Independent Directors vis-à-vis the Executive Directors. All the surveyed banks have, at least, half of the Board composed of Independent Directors.

Figure 1: Composition of Board of the Surveyed Private Sector Banks



However, the situation is not an encouraging one, if one looks back into the composition of the Boards of the major listed public sector banks. Here, one can observe the dominance of Nominee Directors (both from the Central Government and the RBI) and Official Directors recommended by the Central Government. Besides, the presence of the employees' representative in the Board can also be observed. Although, by virtue of the relevant provisions of the existing regulations, the Nominee Directors recommended by the Central Government and the RBI and the Official Directors recommended by the Central government should be considered as Independent Directors, but, in view of their direct and indirect interests, there is every doubt about the 'independence' of such types of directors.

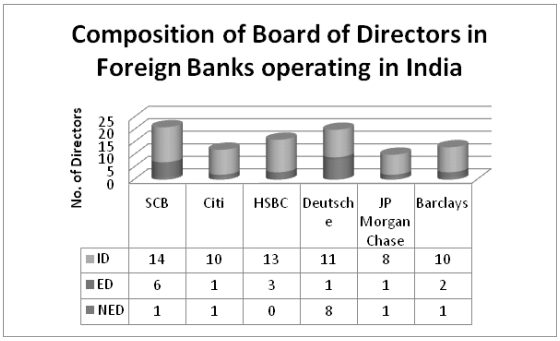
Figure-2: Composition of Board of the Surveyed Public Sector Banks



On the other hand, major foreign banks operating in India had registered an impressive figure so far as promoting independence in board is concerned. Almost all the foreign banks had unitary board system in place except Deutsche Bank with dual board system. However, the

average board size of these group banks is much higher than their counterparts In India with 15.33.

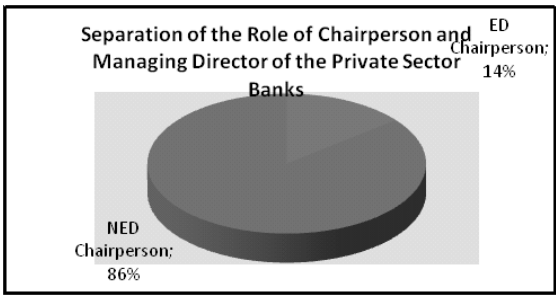
Figure-3: Composition of Board of the Surveyed Foreign Banks



(ii) Separation of Role of Chairperson and CEO:-

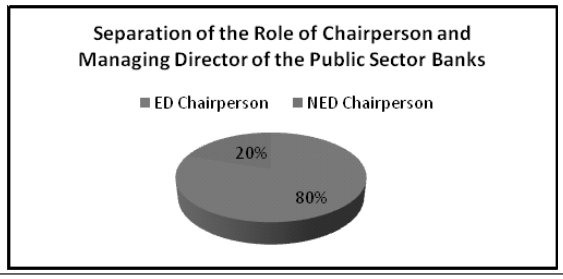
So far as the separation of the role of Chairperson and Managing Director is concerned, it has been observed that, among the surveyed banks, 6 out of 7 private sector banks have Non-Executive Director as the Chairperson and the only one bank has Executive Director as the Chairperson of the Board.

Figure-4: Separation of the Role of Chairperson and Managing Director of the Private Sector Banks



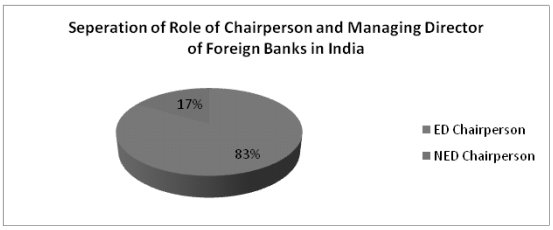
In this particular case, the situation of the public sector banks is just the reverse. Barring the SBI, no other public sector banks have separated the role of Chairperson and CEO/CMD.

Figure-5: Separation of the Role of Chairperson and Managing Director of the Public Sector Banks



Just like the private banks, 5 out of 6 major foreign banks operating in India had separated the role of chairman and managing directors in the board.

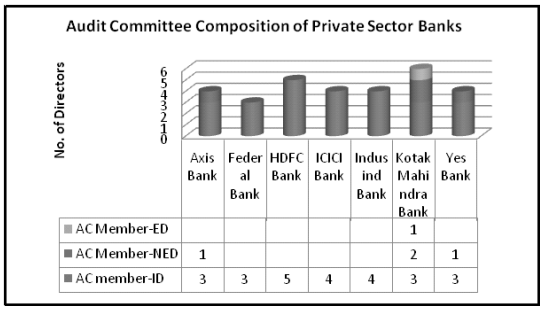
Figure-6: Separation of the Role of Chairperson and Managing Director of Foreign Banks operating in India



(iii) Composition of Audit Committee:-

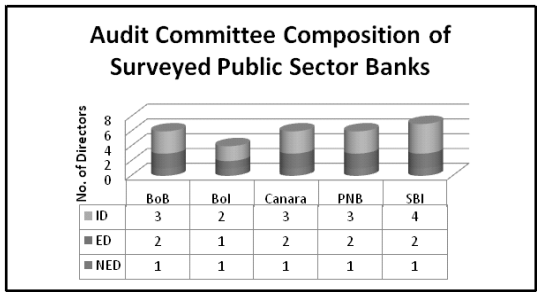
It has been observed that, among the surveyed banks, 6 out of 7 private sector banks have Audit Committees composed exclusively of Non-Executive Directors (NEDs) and their Audit Committees have formal written charters approved by the full board. However, regarding composition of Audit Committee exclusively by Independent Directors, 4 out of 7 surveyed private sector banks have been found to conform it. But, it has been found that all the surveyed banks have, if not all, at least, one member with a strong background in accounting and financial discipline. Moreover, all the surveyed banks have not appointed any person who was the former member of the Executive Board as the Chairperson of the Audit Committee.

Figure-7: Audit Committee Composition of the Surveyed Private Sector Banks



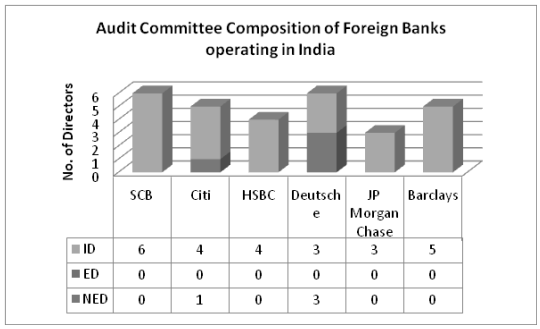
The situation of the public sector banks is somewhat different from that of the private sector banks. While barring one bank, no other private sector banks is allowing their Executive Directors to become members of Audit Committee, the public sector banks, on the other hand, have included their Executive Directors as members of Audit Committee.

Figure-8: Audit Committee Composition of the Surveyed Public Sector Banks



So far as composition of Audit Committee is concerned, it can be observed that almost all the six major foreign banks operating in India had an absolute dominance of Independent Directors. The average committee size is around 4.84 with standard deviation 1.17.

Figure-9: Audit Committee Composition of the Surveyed Foreign Banks



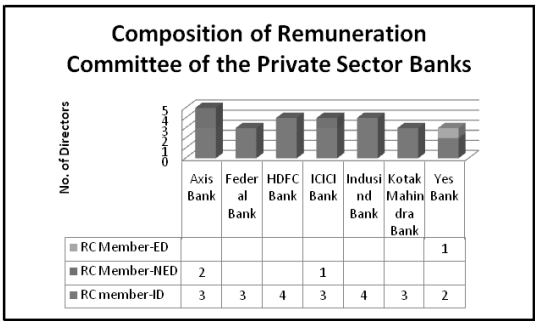
(iv) Functioning of Board and Board Committees:-

Regarding meetings of Board and Audit Committee, almost all the banks conduct a minimum of four Board meetings in each year with a time gap of not more than 4 months between any two Board meetings and conduct Audit Committee meetings 4 times a year and one before finalization of accounts. The maximum numbers of Board meetings and Audit Committee meetings are 12 and 11 respectively. But regarding the disclosure of minutes of the Board meetings and the Audit Committee meetings in the annual reports, no Indian banks have anything in their corporate governance reports. But the foreign banks like Barlclays Banks, HSBC had a fair disclosure of major issues discussed within the board and various committees along with time devoted for each issue during the year.

(v) Composition of Remuneration Committee:-

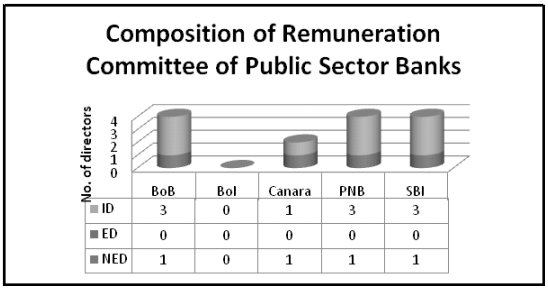
Regarding the composition of the Remuneration Committee fully by at least 3 Non-Executive Directors, 6 out of 7 surveyed private sector banks have been found to follow that. Besides, for the same number of banks, Chairpersons of Remuneration Committees remain present in the Annual General Meeting to respond to the queries.

Figure-10: Remuneration Committee of Surveyed Private Sector Banks



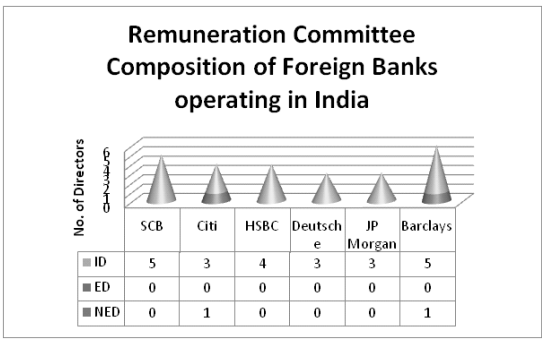
Since the salary of the public sector banks are based on a specific pay scale determined by appropriate pieces of legislation, a few public sector banks have formally constituted their Remuneration Committees.

Figure-11: Remuneration Committee of Sample Public Sector Banks



On the other hand, so far as formation of Remuneration Committee (RC) is concerned, the surveyed Foreign Banks operating in India had well-defined and entirely independent RC in place. The average size of RC is around 4.17 with standard deviation1.17.

Figure#12: Remuneration Committee of Sample Foreign Banks



(vi) Disclosure of Directors Pay Package:-

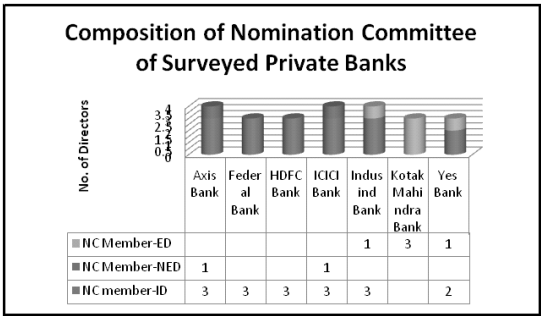
Almost all the surveyed private and public sector banks as well as major foreign banks

operating in India had disclosed the remuneration of corporate officers by breaking down into fixed and variable part. But almost all the surveyed banks had registered the dismal performance regarding inviting shareholders specifically to approve all new long-term incentive plans which potentially commit shareholders' funds over more than one year or dilute the equity'.

(vii) Composition of Nomination Committee:-

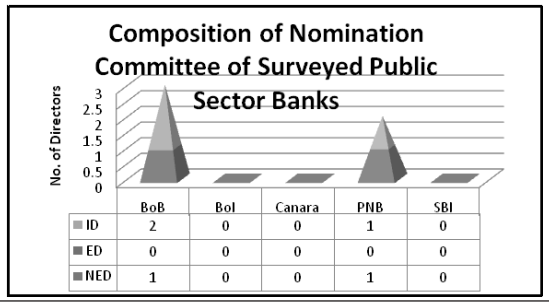
Another significant committee that every alternative code of promoting effective and transparent corporate governance has prescribed is nothing but the Nomination Committee whose main responsibility is to formulate the succession policy of the board, recommend the appointment and/or removal of directors (both executive and non-executive directors) in different committees of the board. It was revealed from the study that the all the surveyed private banks had such a Nomination/Corporate Governance Committee. However, regarding composition of such committee, the surveyed banks had a wide variety- where two banks had NC fully comprised of independent directors, one bank had NC fully comprised of executive directors (really an issue of concern). Other banks had a combination of executive and non-executive directors in that committee.

Figure-13: Nomination Committee of Surveyed Private Banks



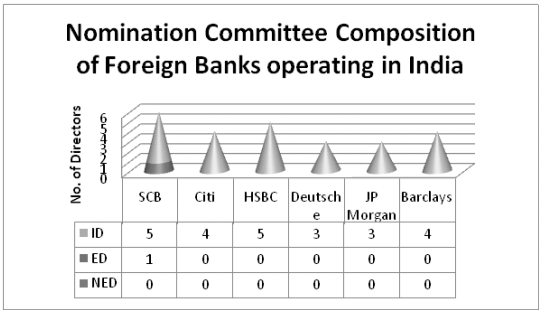
However, since the appointment of nominee directors by the Central Government and apex bank as well as by the employees and shareholders are the prevalent traditions of public sector banks in India, hence the need of a properly constituted board committee in the form of Nomination Committee is a redundant proposition. Yet, a few banks, three to be specific, had a Nomination Board Committee in their place.

Figure-14: Nomination Committee of Surveyed Public Sector Banks



Finally, Foreign Banks are very methodical about succession planning and formation of Nomination Committee preferably by the Independent Directors to ponder over the issue of tenureship, recruitment, replacement and nomination of directors in various board committees respectively. The average board size is around 4.17 with standard deviation 1.17.

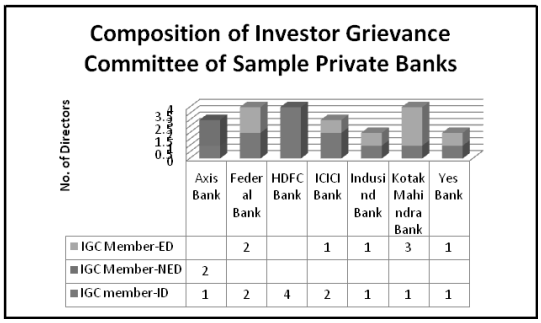
Figure-15: Nomination Committee of Surveyed Foreign Banks



(viii) Formation of Investor Grievance Committee:-

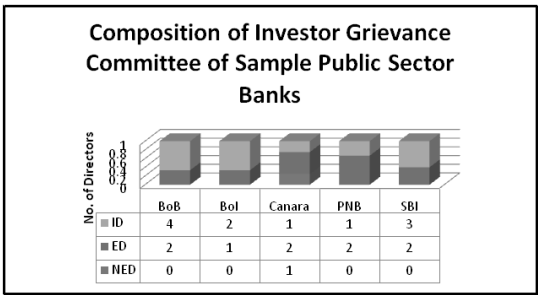
Regarding offering shareholders rights, the surveyed banks had shown commendable performance. All the surveyed private banks had grown up the habit to communicate through electronic media and disclosure of price-sensitive information. Moreover, for all the listed companies in India, it is mandatory to allow shareholders the right to vote in proportion to their economic stake in the company. Besides, all the banks had established a separate Investors Grievance Committee under the chairmanship of a non-executive director, thanks to the mandatory provision of Clause 49 of Listing Agreement.

Figure-16: Investor Grievance Committee of Surveyed Private Banks



The similar scenario can be observed in these public sector banks (PSBs) regarding formation of Investor Grievance Committee under the chairmanship of a non-executive director. All the surveyed PSBs conform to this mandatory provision of clause 49 for addressing to the complaints of investors and addressing their concerns.

Figure-17: Investor Grievance Committee of Surveyed Public Sector Banks



The formation of Investor Grievance Committee (IGC) is a unique feature of Indian model of corporate governance which remain absolutely absent in corporate governance mechanism of developed world. Hence, all the sample foreign banks had no proper IGC in place although they are very minute in maintaining the spirit of investor protections.

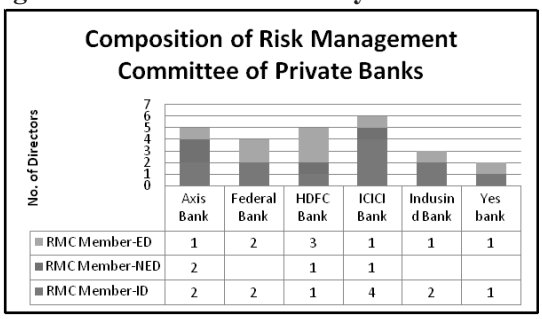
For promoting transparent and effective corporate governance, it was prescribed (Review of the role & effectiveness of NEDs, Higgs Report, U.K.,2003) that the non-executive directors should meet as a group at least once a year without the chairman or executive directors present and the annual report should include a statement on whether such meetings had occurred. In that context no such meeting had been organized by any surveyed private and public banks so far as disclosure of governance practice is concerned.

However, the formation of Investor Grievance Committee (IGC) for attending investor complaints is a unique feature of Indian model of corporate governance which is not a prevalent practice around the world. Hence, reference of such type of committee cannot be found in leading foreign companies operating in India. However, in group structure of these banks a number of evidences can be found leading towards transparent and vigilant practices for the sake of protection of investors interests.

(x) It was believed as well as prophesied by the RBI that in order to promote good corporate governance, the existence of "Whistle Blower Policy" in terms and conditions of service contract of employees should be there. It was a matter of satisfaction to note that almost all the surveyed banks across categories had adhered to such issue.

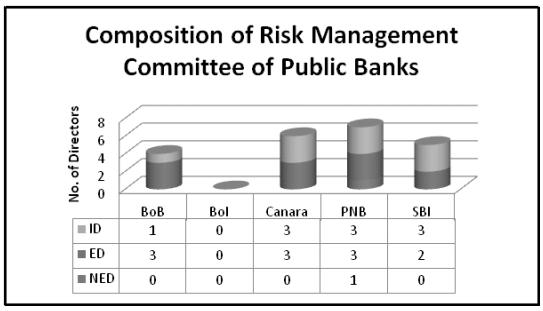
(xi) Another significant board committee relevant to banking sector is Risk Management Committee whose main purpose is to effectively minimise the risk in day-to-day operations of banks in pursuance of the Risk Management Guidelines issued periodically by RBI and Board and to monitor the business of the Bank periodically and also to suggest the ways and means to improve the working and profitability of the Bank from time to time. In this context, all surveyed major public sector banks (with average committee size 4.17 with standard deviation 1.47) had a properly constituted risk management committee in operation as per disclosure in their respective latest corporate governance reports.

Figure-18: Risk Management Committee of Surveyed Private Sector Banks



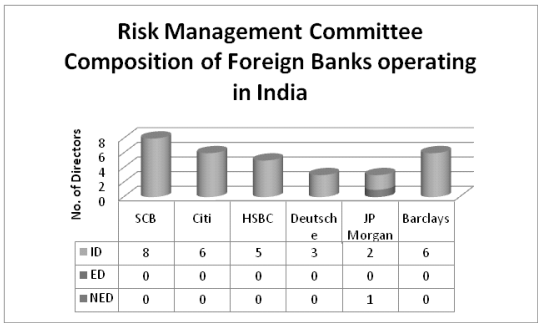
On the other hand, 4 out of 5 surveyed public sector banks had a properly constituted Risk Management Committee in place for mitigation of various operating, strategic, financial and no-operating risks that may crop up during the functioning of banks.

Figure-19: Risk Management Committee of Surveyed Public Sector Banks



As far as formation of Risk Management Committee is concerned, all the surveyed foreign banks had fully independent committee in operation. The average committee size is around 5.17 with standard deviation 1.94.

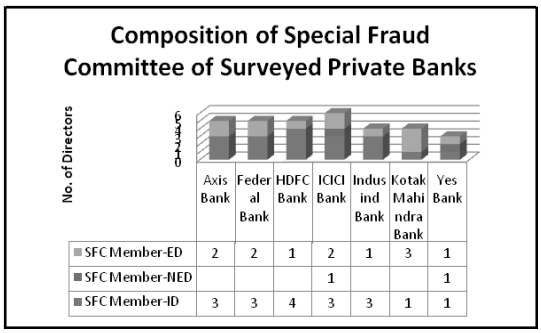
Figure-20: Risk Management Committee of Surveyed Foreign Banks



(xii) Pursuant to the directions of the Reserve Bank of India, banks have to constitute a Fraud Monitoring Committee exclusively dedicated to the monitoring and following up of cases of fraud involving amounts of Rs.1 crore and above. The objectives of this Committee are the effective detection of frauds and immediate reporting of the frauds and actions taken against

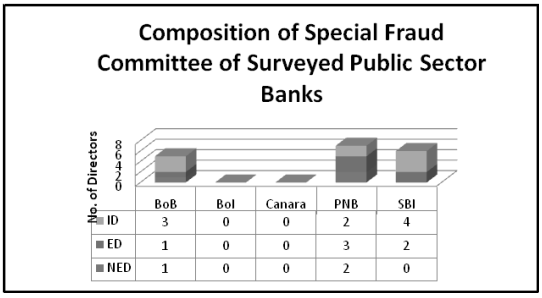
the perpetrators of frauds to the concerned regulatory and enforcement agencies like CBI etc. In this context, all the surveyed private sector banks had a properly constituted Special Fraud Committee in operation.

Figure-21: Special Fraud Committee of Surveyed Private Sector Banks



However, two surveyed public sector banks do not have any proper constructed Special Frauds Committees in place but the remaining five public sector banks had this special board committee to monitor and follow up the frauds with high magnitude.

Figure-22: Special Fraud Committee of Surveyed Public Sector Banks



However, no foreign banks operating in India had such type of committee in operation.

(xiii) Regarding the provisions of reporting (called as Integrated Sustainability Reporting) at least annually on the nature and extent of its social, transformation, ethical, safety, health and environmental management policies and practices, a few public and private banks had disclosed this issue. However, almost all the foreign banks had a proper disclosure of sustainability reporting as well as social responsibility disclosure both in their group website as well as in Indian homepage.

(xiv) So far as disclosure of Corporate Governance Guidelines/ Code of business ethics in organizations was concerned, all the surveyed banks strictly adhered to the issue. Moreover, regarding prescribing a separate code of conduct/ethics for the board members, almost all the surveyed companies had such a code in place.

Comparative Analysis of Corporate Governance Practices across the categories of Banks:

It appears from the corporate governance compliance and disclosure practices of these

surveyed banks that the foreign banks are dominating over private sector banks and private sector banks are in turn dominating over the public sector banks. While the average corporate governance score of foreign banks are 82.51 with standard deviation 9.37, the average corporate governance score of private sector banks is only 71.66 with standard deviation 6.67 and the average corporate governance score of public sector banks is only 60.01 with standard deviation 3.77.

Table-2: Corporate Governance Score of Surveyed Private Sector Banks

Rank	Name of the Banks	Corporate Governance Score
1	ICICI Bank	77.05
2	Indusind Bank	77.05
3	HDFC Bank	75.41
4	Kotak Mahindra Bank Ltd.	75.41
5	AXIS Bank	72.13
6	Yes Bank Ltd.	63.93
7	Federal Bank Ltd.	60.66

Table-3: Corporate Governance Score of Surveyed Public Sector Banks

Rank	Name of the Banks	Corporate Governance Score
1	Punjab National Bank	65.57
2	Bank of Baroda	60.67
3	Bank of India	60.67
4	State Bank of India	57.38
5	Canara Bank	55.74

Table-4: Corporate Governance Score of Surveyed Foreign Banks

Rank	Name of the Banks	Corporate Governance Score
1	HSBC	93.44
2	Barclays	93.44
3	SCB	83.61
4	Deutsche	78.69
5	JP Morgan Chase	73.77
6	Citi	72.13

Source: *Own computation based on Prowess and disclosures by banks*

Descriptive Statistics:

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Mean
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
CGSpsb	5	9.83	55.74	65.57	60.0060	1.68722
CGSpvb	7	16.39	60.66	77.05	71.6629	2.52230
CGSfb	6	21.31	72.13	93.44	82.5136	3.82513
Valid N (listwise)	5					

	Std. Deviation	Variance	Skewness		Kurtosis	Kurtosis
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
CGSpsb	3.77275	14.234	.598	.913	.253	2.000
CGSpvb	6.67337	44.534	-1.081	.794	-.621	1.587
CGSfb	9.36963	87.790	.280	.845	-2.053	1.741
Valid N (listwise)						

Ratio Statistics for CGSpsb / CGSpvb

Price Related Differential	Coefficient of Dispersion	Coefficient of Variation	
		Mean Centered	Median Centered
.999	.031	4.4%	4.6%

Ratio Statistics for CGSpsb / CGSfb

Price Related Differential	Coefficient of Dispersion	Coefficient of Variation	
		Mean Centered	Median Centered
1.004	.037	5.6%	5.9%

Ratio Statistics for CGSpvb / CGSfb

Price Related Differential	Coefficient of Dispersion	Coefficient of Variation	
		Mean Centered	Median Centered
1.005	.056	7.2%	7.2%

Generated from IBM SPSS 21

Testing of Hypothesis:

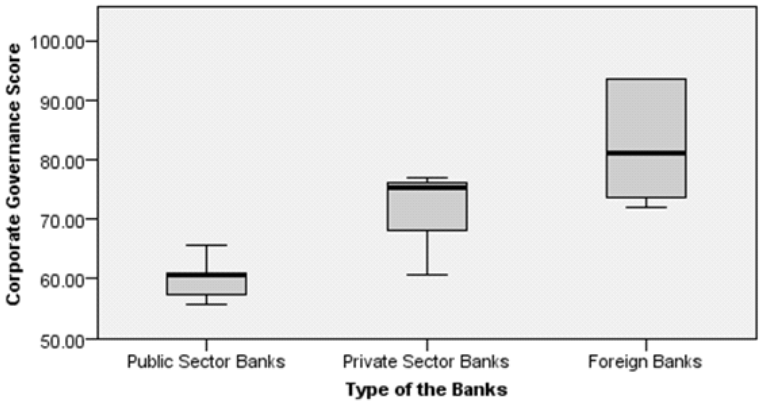
By using k-Independent Samples Kruskal Wallis Test it was observed that p value is less than 0.05 i.e p=0.006, rejecting null hypothesis (H_0: CGS_{psb}=CGS_{pvb}=CGS_{fb}) at 95% confidence

level; there lies significant difference among Corporate Governance Scores across the categories of the banks (H_1: $CGS_{psb} \neq CGS_{pvb} \neq CGS_{fb}$).

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Corporate Governance Score is the same across categories of Type of the Banks.	Independent-Samples Kruskal-Wallis Test	.006	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.



Total N	18
Test Statistic	10.180
Degrees of Freedom	2
Asymptotic Sig. (2-sided test)	.006

1. The test statistic is adjusted for ties.

Generated from IBM SPSS 21

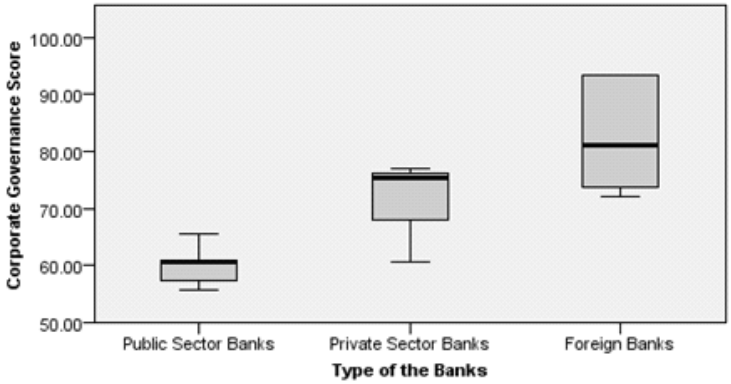
In order to have an idea about the trend corporate governance scores among the categories of bank k-Independent samples Terpstra-Jonckheere test had been administered with H_0= CGS_{psb}=CGS_{pvb}=CGS_{fb} against H_1= CGS_{psb}<CGS_{pvb}<$CGS_{fb.}$ It had been observed that p value is 0.001. So, we have to reject the null hypothesis and have to accept that Corporate Governance Scores of Foreign Banks are greater than the Private Banks and Corporate Governance Scores of Private Banks are greater than the Public Sector Banks.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Corporate Governance Score is the same across categories of Type of the Banks.	Independent-Samples Jonckheere-Terpstra Test for Ordered Alternatives	.001	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Independent-Samples Jonckheere-Terpstra Test for Ordered Alternatives



Total N	18
Test Statistic	12.500
Standard Error	12.290
Standardized Test Statistic	-3.336
Asymptotic Sig. (2-sided test)	.001

Generated from IBM SPSS 21

Conclusion:

It appears from the present study of top 18 banks operating in India that there exists a significant variations so far as corporate governance practices are concerned measured by various governance vectors like independence in board, board size, board committee composition, functioning and issues like duality in chairmanship and managing director position. Surveyed major foreign banks operating in India had outperformed their Indian counterparts in aforementioned various factors and leading private sector banks had also disclosed laudable corporate governance practices in many cases. Despite this fact the

overall performances in governance segments of the banks operating in India across the categories need to be improved under the able and timely guidance of our apex bank as well as other regulatory bodies.

Limitations of the study and scope for further research:

Research on corporate governance in India is in primitive stage. Though some of the studies have been made including the present one, there are other important areas that require attention and provide scope for further research.

(i) A few parameters of good governance are considered under the study. Study will be more effective if the causes for intra and inter variations of good governance can be analyzed in detail.

(ii) The study will be more fruitful if we measure the correlation between corporate governance and banks performance for a considerable period of time.

(iii) The corporate legal environment of India is going to observe a paradigm shift by the introduction of new Companies Act, 2013. In the present study this changing dimension could not be reflected unfortunately since the survey had been conducted for the financial period ending 2012-13 (However in the present study a few provisions of new Companies Act, 2013 that had close proximity with the recommendations of a number of internationally acclaimed Corporate Governance Codes had already been considered like separate meeting of independent directors, prohibition of stock options of independent directors, exclusion of nominee directors, compulsory rotation of auditors etc.). Hence a detailed study of corporate governance practices of banks in light of new Companies Act, 2013 should be undertaken.

(iv) The study is conducted only for 12 major Indian Banks responsible for construction of Bombay Stock Exchange BANKEX and 6 foreign banks operating in India. Since, it is a meager proportion of whole gamut of banks in India, so a broader survey should be conducted to find out the extent of corporate governance practices in Indian Banking sector.

(v) The research on the relevance of practicing 'ethical management' in day-to-day operation and decision making may be judged in light of Indian banking sector and their contributions towards increasing performances towards achieving noble objective of financial inclusion should also be conducted.

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Cointegration of Select Equity Indices of India and G7 Countries - An Empirical Study

Anandaraj Saha

Abstract:

India is one of the fastest growing economies in the world after China. It is increasingly being integrated with developed and emerging countries of the world. Since globalisation and liberalization of the economy and subsequent economic and political reforms, India has made tremendous influences in global economies, especially in equity markets of developed and emerging countries. This empirical analysis aims to examine and study the short-run and long-run dynamic linkages between India and global super power G7 countries. The study heavily depends on Econometrics models and their analysis for reaching at conclusion about the short-run and long-run linkages between India and G7 countries.

Key Words: *Globalisation, Liberalisation, Co-integration, Equity indices.*

Introduction :

Due to the effects of Globalisation and Liberalization, the global stock markets of the world are towards intensive linkages during the last few years. Out of several reasons for the apparent increased linkages and dependencies amongst international and national stock markets, the major influences are stepwise removal of the entry restrictions in financial market of any country, relaxation of control over capital movements, emergence of new capital markets and instruments, rapid expansion of international markets, financial and economic crises, scams and their aftermath effects etc. Other important factors are improvement in the flow of information due to internet and telecommunication technology, reduction in transaction costs etc.

Literatures asserted that as a result of opening up of world economies, not only the developed countries but also the financial markets of developing and emerging countries have become interrelated with varying degree of intensity (Wong & Lim, 2004). Developed international markets are getting influenced by emerging and developing markets. As world's main trading partner, US holds a significant amount of total capital investments in global stock market, which gives birth to the notion when US sneezes, the other parts of the world gets flue. Recently, another important trend is the change in the national economies and their stock markets. There are also influences of stock markets of global super power groups like G7 countries (Canada, Japan, Germany, France, Italy, UK, US), G8 countries (G7 group and Russia) and newly emerged G20 countries.

There are evidences of extraordinary events, such as the US stock market crash in 1987, the breakdown of the European monetary system in 1992, bond market turmoil in 1994 and the Asia-Pacific crisis in 1997, subprime crisis in US in 2007 etc. which also churned out one stock market negatively and consequently had severe bad contagion effects over several stock markets (Huyghebaert and Wang, 2010; Saha and Bhunia, 2012).

In India, the process of liberalization started in 1991 with the Balance of Payment crisis, devaluation of rupee, subsequent transition to the market based exchange rate regime, elimination of the quantitative restrictions on imports and the drastic reduction in custom duties. With the process of liberalization, major Indian stock markets started to get integrated with the national and global stock markets. The recent global uncertainties have also added to the market's woes and the awarding of lower grades by international rating agencies had churned the markets too. In this backdrop, the present study aims at finding out empirically the linkages among stock markets of India and global super power countries G7.

Review of Empirical Literature :

Korajczyk (1995) examined integration of 20 emerging and 4 developed countries and revealed that barriers of capital flows into and out of the emerging markets **tend to** decrease over time with growing level of integration. **Kansas (1998)** considered US and six largest European equity markets and found that US market was not pairwise cointegrated with any of the European markets. **Masih & Masih (2001)** investigated linkages amongst nine major international stock price indices and found increasing linkages of majority of selected stock markets which increase data dissemination and increased stock market efficiency. **Nath & Verma (2003) examined** the interdependence of India, Singapore and Taiwan stock markets and found no co-integration and long run equilibrium between the stock markets. The empirical results of **Click & Plummer (2003)** suggested in favour of incomplete integration of ASEAN-5 stock markets. **Narayan, Smyth & Nandha (2004)** found that stock prices in Bangladesh, India and Sri Lanka Granger-cause stock prices in Pakistan in long run. **Cotter (2004)** examined the relationship between the Irish, German, U.K and US equity markets and found that Irish equity market depends heavily on trading activity in the other markets but not vise-versa. Study of **Lamba (2005)** explores that the Indian market is influenced by the US, UK and Japan and this influence has persisted following the September 11, 2001 terrorist attacks on the US. **Wong, Agarwal & Du (2005)** investigated linkage between the stock markets of India and major developed countries and found in short run, both U.S and Japan "Granger causes" the Indian stock market but not vice versa. **Chen, Maghyereh (2006)** empirically investigates the interdependence among the daily equity market returns of MENA emerging markets and found that none of the MENA markets is completely isolated and independent. **Mukherjee & Mishra (2007)** studied major equity indices of 23 sample countries including India. The countries from same region were found to be more integrated than those from the different regions. **Raj & Dhal (2008)** studied the extent of integration of Indian market with regional and global markets and supported international integration of Indian stock market. **Aktan et al. (2009)** examined the emerging market indices of BRICA and found that the US market has a significant effect on all BRICA countries in the same trading day. **Iqbal, Khalid & Rafiq (2011)** found out the dynamic linkages among the equity markets of USA, Pakistan and India. No co-integration was found among stock markets of USA, Pakistan and India, but evidence of unidirectional causality running from NYSE to Bombay and Karachi stock exchanges was observed. **Saha & Bhunia (2012)** studied the casual relationship between US and Indian Equity markets after Subprime Crisis and found long run equilibrium relation between the selected variables which suggested the evidence of feedback causality running between the six stock

exchanges. **Menezes et al**. **(2012)** analysed stock market relationships among G7 countries and revealed that stock markets were closely linked in terms of price levels and returns.

Objectives of the Study :

India is one of the fastest growing economies. Cointegration and financial correlation of Indian stock markets with that of G7 countries is the most important study. Despite its importance, almost very few studies have been made in this regard. This empirical study aims to study the stock market indices of India and G7 countries with a view to focus on the following aspects:

- To make a brief statistical overview of the selected equity market indices of G7 countries.
- To examine the existence of long-run and short-run linkages or comovement, if any, between India and G7 countries based on the select equity markets.
- To analyse the empirical results and make necessary conclusions.

Data Sources and Research Methodology :

Data source and Description of Data:

Table 1: Equity Indices of India and G7 countries

Country		*Stock Markets*	*Equity Indices*	*Nature*
India		Bombay Stock Exchange (BSE)	BSE SENSEX	Free Float Market Weighted
G7 Countries	Canada	Toronto Stock Exchange (TSE)	S & P TSX Composite	Market Capitalisation
	France	Euronext Paris	Cotation Assistée en Continu (CAC) 40	Capitalisation weighted
	Germany	Frankfurt Stock Exchange	Deutscher Aktien Index (DAX) 30	Capitalisation weighted
	Japan	Tokyo Stock Exchange	NIKKEI 225	Price Weighted
	Italy	Borsa Italiana	FTSE Milano Italia Borsa (MIB)	Capitalisation weighted
	UK	London Stock Exchange	FTSE 100	Market Capitalisation
	USA	New York Stock Exchange	S & P 500	Free float Capitalisation

This empirical study is based on secondary data of select equity indices of India and G7 countries obtained from Yahoo Finance. The representative indices for India and G7 countries (Table 1) are chosen based on the existing literatures and what was considered as the most comprehensive index for the country. As proxy for Indian market, BSE SENSEX 30 index has been considered here. The main reason for considering BSE over NSE is that BSE is considered as the 'core barometer' of the Indian stock market. It is the oldest stock exchange in Asia having the largest listing and popularity. Moreover it attracts a major chunk of FII (Hansda and Ray, 2002; Chattopadhyay and Behara; Sidiqui, 2009). The data

considered for the study is the daily (five days in a week) closing indices covering a 10 year period spanning from 6th January, 2003 to 30th December, 2013. Due to different stock exchange holidays, this study adopts a procedure to match the daily data of the above indices and finally reached at 2,415 observations. First the daily closing indices are converted into natural logarithmic forms and daily returns have been calculated taking first difference of the logarithmic indices. Therefore Return (R_t) $= \ln (P_t / P_{t-1}) = \ln P_t - \ln P_{t-1}$

Empirical Methodology:

Unit Root Test:

In any study involving time series data initial step is to check the stationarity of data and thereby finding out the order of integration of series through unit root test. Here Augmented Dicky & Fuller (ADF) is used which is based on equation (1):

$$\Delta Y_t = \alpha + \beta_t + (\rho - 1)Y_{t-1} + \sum_{i=1}^{k} \Phi \Delta Y_{t-1} + e_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where Y_t = Natural logarithmic equity stock price index of any country; is the first difference operator; t is time trend term, k denotes the optimal lag length and e_t is the white noise disturbance term. Here Akaike Information Criteria (AIC) is considered for selection of lag length (k). In addition Philip Perron (PP) unit root test is also used as an alternative nonparametric model.

Johansen's Cointegration Test:

Next Johansen & Juselius (1991) test has been used to examine the long-run cointegration or linkages among the equity indices of countries. Johansen's method can be illustrated by considering the following general autoregressive (AR) representation (2):

$$Y_t = A_0 + \sum_{i=1}^{k} A_i Y_{t-i} + \mu_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where Y_t is a (n *X 1*) vector of non-stationery I (1) equity indices, A_0 is a (n *X 1*) vector of constant, k is the number of lags, A_i is a ($n X n$) matrix of coefficients and μ_{tv} is assumed to be a (n *X 1*) vector of Gaussian error terms with zero mean. In order to use Johansen's test, the above VAR process can be reparametrized and turned into a VECM model of the form:

$$\Delta Y_t = A_0 + \Pi Y_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta Y_{t-i} + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

$$\text{where, } \Pi = -I + \sum_{j=1}^{k} A_j \text{ and } \Gamma_i = -\sum_{j=i+1}^{k} A_j$$

Δ = difference operator and I is an ($n X n$) identity matrix. The test of cointegration between Y's is calculated by looking at the rank of matrix via eigenvalues. The rank of a matrix is equal to the number of its characteristics roots (eigenvalues) that are different from zero. Thus, if rank of equals zero, the matrix is null and equation (3) becomes the usual VAR model in first difference. If the rank of is r where r < n, then there exist r cointegrating relationships in the above model. Johansen proposed two different likelihood ratio tests viz. trace (λ_{trace}) and maximum eigenvalues (λ_{max}) statistics, which are computed by using the following formulae:

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^{k} \ln (1-\hat{\lambda}_i) \quad \ldots\ldots(4)$$

and, $$\lambda_{max}(r, r+1) = -T \ln (1-\hat{\lambda}_{r+1}) \quad \ldots\ldots(5)$$

The trace statistic tests the null hypothesis of r cointegrating vectors against alternative hypothesis of n cointegrating vectors, while maximum eigenvalue tests the null hypothesis of r cointegrating vectors against alternative hypothesis of r+1 cointegrating vectors. But before implementing any test of Johansen cointegration, VECM and Granger causality, it is required to decide on the optimal lag length (k) as the results of these tests highly depend on the number of optimal lag.

Granger Causality Test:

Finally Granger Causality test has been conducted. If Johansen's Cointegration test shows the long-run dynamic relationship, there always exists a corresponding error correction representation. In the event of long-run cointegrating relationship, Granger Causality test is based on Error Correction Model (ECM). If two variables are not cointegrated and the coefficient of Error Correction Term (ECT) in ECM is not negative and insignificant, then causality test will be based on bivariate VAR model instead of ECM. Here Granger causality/ Block Exogeneity Wald test has been performed to test the causality of indices of the countries in the model.

Empirical Analysis :

Descriptive Statistics:

Table 2 presents the descriptive statistics of the daily equity indices (comprising 5 days in a week) at natural log levels. For the whole sample period under study, Italy shows the highest mean, median where India shows the highest SD i.e. 0.541218. India shows the highest risks and volatility among all countries. It is evident that skewness is negative in all the cases except Japan and France. All countries have excess kurtosis, which means that all country indices are leptokurtic except India and Canada. Jarque-Bera statistics and corresponding *p*-values are used to test for the normality assumption of the data. For all the countries, null hypothesis of normal distribution of Jarque-Bera test is rejected at 1 % level of significance.

Table 2: Descriptive Statistics of relative Stock Indices (at natural log levels)

	INDIA	US	CANADA	JAPAN	UK	GERMANY	FRANCE	ITALY
Mean	9.366054	7.111634	9.310587	9.347597	8.581712	8.636107	8.280284	10.11059
Median	9.602822	7.124478	9.379382	9.301685	8.619714	8.696376	8.245164	10.08677
Maximum	9.967702	7.518281	9.620667	9.812577	8.830587	9.168413	8.727154	10.70018
Minimum	7.980718	6.516977	8.736907	8.865881	8.097731	7.697557	7.784490	9.422423
Std. Dev.	0.541218	0.176667	0.206347	0.234686	0.157319	0.288291	0.197419	0.331770
Skewness	-0.951814	-0.357209	-0.942350	0.348612	-0.624829	-0.675863	0.381523	-0.011070
Kurtosis	2.690520	3.031100	2.938674	1.973326	2.450364	2.835784	2.428222	1.856518
Jarque-Bera	374.2824	51.45553	357.8079	154.9807	187.5393	186.5718	91.48518	131.6217
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	22619.02	17174.60	22485.07	22574.45	20724.83	20856.20	19996.89	24417.08
Sum Sq. Dev.	707.1027	75.34382	102.7861	132.9567	59.74491	200.6316	94.08393	265.7123
N	2415	2415	2415	2415	2415	2415	2415	2415

Table 3 presents descriptive statistics of non-annualised daily stock returns (not in % terms) for the respective countries. India has the highest returns and volatility in returns, whereas Italy shows the lowest and negative returns over the sample period. High kurtosis values indicate that data of none of the countries are normally distributed. Probability values of Jarque-Bera test also confirms the fact that distribution of returns series are not normal for all the countries and is rejected at 1 % level of significance.

Table 3: Descriptive Statistics of Stock Returns (at natural log first difference)

	INDIA	US	CANADA	JAPAN	UK	GERMANY	FRANCE	ITALY
Mean	0.000765	0.000283	0.000284	0.000259	0.000215	0.000459	0.000119	-0.000111
Median	0.001165	0.000854	0.000787	0.000640	0.000642	0.001026	0.000461	0.000795
Maximum	0.161147	0.104236	0.093702	0.132346	0.111112	0.134627	0.133048	0.144701
Minimum	-0.127960	-0.094695	-0.103756	-0.121110	-0.104834	-0.098282	-0.096097	-0.101367
Std. Dev.	0.017208	0.013539	0.012410	0.016423	0.013091	0.015593	0.015716	0.016580
Skewness	-0.036777	-0.259627	-0.690231	-0.580492	0.052964	0.110891	0.270879	0.034736
Kurtosis	11.38089	13.38646	15.66698	10.67276	13.03596	9.728095	10.81840	10.49078
Jarque-Bera	7065.450	10877.91	16330.52	6057.044	10131.93	4558.080	6177.916	5644.389
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	1.846870	0.683983	0.686308	0.625778	0.520124	1.107066	0.286595	-0.268267
Sum Sq. Dev.	0.714525	0.442328	0.371639	0.650845	0.413533	0.586732	0.596009	0.663289
N	2414	2414	2414	2414	2414	2414	2414	2414

Pearson's Pairwise Simple Correlation:

Table 4: Simple Correlations of Returns

Country	? INDIA	? US	? CANADA	? JAPAN	? UK	? GERM.	? FRANCE	? ITALY
? **INDIA**	1.000000							
? **US**	0.311711* (0.0000)	1.000000						
? **CANADA**	0.359118* (0.0000)	0.786702* (0.0000)	1.000000					
? **JAPAN**	0.433670* (0.0000)	0.236797* (0.0000)	0.311443* (0.0000)	1.000000				
? **UK**	0.431579* (0.0000)	0.640954* (0.0000)	0.636940* (0.0000)	0.421497* (0.0000)	1.000000			
? **GERMANY**	0.412344* (0.0000)	0.670786* (0.0000)	0.590231* (0.0000)	0.398869* (0.0000)	0.845556* (0.0000)	1.000000		
? **FRANCE**	0.420210* (0.0000)	0.650349* (0.0000)	0.613164* (0.0000)	0.418056* (0.0000)	0.912400* (0.0000)	0.909985* (0.0000)	1.000000	
? **ITALY**	0.404074* (0.0000)	0.609217* (0.0000)	0.575301* (0.0000)	0.376038* (0.0000)	0.823983* (0.0000)	0.826833* (0.0000)	0.902395* (0.0000)	1.000000

*Figures in ( ) are respective p values. * Indicates null hypothesis of no correlation is significant at 1 % level of significance.*

Pearson's simple pairwise correlation for return series have been shown in Table 4. From the table it is evident that correlations among the returns of the countries are moderate. India has moderate correlation with G7 countries. The highest correlation is shown 0.9023 between Italy and France, whereas the lowest is 0.2367 between Japan and US. All the correlations are significant at 1% level. However correlations show the association among the equity markets of the countries but can't show the long-run and short-run linkages among them. The correlations need to be further verified by means of other tests shown subsequently.

Unit Root Test Result:

In analysis of cointegration, test of non-stationarity of the time series data is considered as the precondition. The other condition is that all series should be integrated in the same order i.e. I (d), where d is the order of integration. For stationarity analysis, Augmented Dicky-Fuller (ADF) and Philip-Perron (PP) tests have been conducted. The results of both the tests are shown in Table 5. The results suggest that the null hypothesis of existence of a unit root cannot be rejected in respect of all the proxy stock indices in their natural log levels and hence indices are non-stationary in both models, with linear trend including both intercept and time trend. However they are all stationary in first difference forms as the test statistics in both ADF and PP tests are significant at 1% level. Therefore, all the indices and the respective countries are found to be integrated of order one, i.e. I (1).

Table 5: Unit Root Test

Country	At Levels				At First Differences			
	ADF		PP		ADF		PP	
	Intercept	Intercept + Trend	Intercept	Intercept + Trend	Intercept	Intercept +Trend	Intercept	Intercept +Trend
INDIA	-2.089004 [7] (0.2493)	-1.980165 [7] (0.6113)	-2.103901 [15] (0.2433)	-1.966281 [15] (0.6189)	-17.49216* [6] (0.0000)	-17.54219* [6] (0.0000)	-47.87922* [15] (0.0001)	-47.89870* [15] (0.0000)
US	-1.200982 [2] (0.6763)	-1.547215 [2] (0.8131)	-1.162144 [7] (0.6928)	-1.546388 [6] (0.8134)	-38.52098* [1] (0.0000)	-38.51538* [1] (0.0000)	-56.02090* [5] (0.0001)	-56.01262* [5] (0.0000)
CANADA	-2.407145 [17] (0.1398)	-2.303713 [17] (0.4312)	-2.161168 [8] (0.2209)	-2.128481 [7] (0.5290)	-11.63240* [16] (0.0000)	-11.67804 * [16] (0.0000)	-51.74707* [8] (0.0001)	-51.75854* [8] (0.0000)
JAPAN	-1.473960 [6] (0.5469)	-1.470492 [6] (0.8395)	-1.492980 [10] (0.5373)	-1.484115 [10] (0.8351)	-20.72125* [5] (0.0000)	-20.71735* [5] (0.0000)	-49.84409* [11] (0.0001)	-49.83374* [11] (0.0000)
UK	-2.243263 [12] (0.1911)	-2.363307 [12] (0.3989)	-1.952278 [11] (0.3084)	-2.279966 [10] (0.4443)	-15.26366 [11] (0.0000)	-15.27002* [11] (0.0000)	-52.20936* [13] (0.0001)	-52.19983* [13] (0.0000)
GERMANY	-1.887102 [15] (0.3387)	-2.319952 [15] (0.4223)	-1.376552 [11] (0.5953)	-2.033127 [9] (0.5823)	-13.17859* [14] (0.0000)	-13.18740* [14] (0.0000)	-49.11471* [12] (0.0001)	-49.10466* [12] (0.0000)
FRANCE	-1.705905 [5] (0.4282)	-1.771895 [5] (0.7183)	-1.807332 [15] (0.3773)	-1.860956 [15] (0.6743)	-25.38657* [4] (0.0000)	-25.38542* [4] (0.0000)	-51.87632* [17] (0.0001)	-51.87365* [17] (0.0000)
ITALY	-0.971689 [6] (0.7652)	-1.952857 [6] (0.6261)	-1.096376 [1] (0.7194)	-2.016235 [1] (0.5916)	-20.60400* [5] (0.0000)	-20.61153* [5] (0.0000)	-49.61252* [3] (0.0001)	-49.60900* [3] (0.0000)

*Figures in [ ] represent Lag Lengths based on AIC in case of ADF Test and Bandwidth based on Newey-West in case of PP Test, * Indicates the statistical significance level of 1 %; Figures ( ) represent MacKinnon (1996) one sided p values.*

Johansen's Cointegration Test:

The results of unit root test suggest that all the countries are integrated of same order i.e. I (1). Therefore Johansen's (1991) Maximum Likelihood method of cointegration test can be applied. It is a common practice to run unrestricted VAR model on log level variables and then Lag Lengths Criteria test is conducted. Primarily unrestricted VAR is run taking 2 lags before Lag Length test. Finally 7 lags for the models have been selected based on criterion of Final Prediction Error (FPE) and AIC.

Table 6 of Johansen's Trace test indicates that there exist two cointegrating equations, whereas Max-Eigenvalue test indicates one cointegrating equation at 5% level of significance. Therefore there is at least one cointegrating equation among the indices, which means that India and G7 countries are all together integrated in long-run. In other words there has been long-run co-movement or linkages between India and G7 countries.

Table 6: Johansen's Cointegration Test Results (With Lags 7)

Multivariate Cointegration among India, US, Canada, Japan, UK, Germany, France, Italy							
Hypothesized No. of CE (s)	***Eigenvalue***	***Trace Statistics***	***Critical Value***	***Prob.***	***Max-Eigen Statistic***	***Critical Value***	***Prob.***
None, r = 0	0.024896	214.5120	187.4701	0.0010*	60.75857	56.70519	0.0187*
At most 1, r ? 1	0.020585	153.7534	150.5585	0.0325*	50.12740	50.59985	0.0559
At most 2, r ? 2	0.014309	103.6260	117.7082	0.2748	34.73465	44.49720	0.3806
At most 3, r ? 3	0.010268	68.89136	88.80380	0.5505	24.87329	38.33101	0.6807
At most 4, r ? 4	0.008543	44.01807	63.87610	0.6917	20.67778	32.11832	0.5981
At most 5, r ? 5	0.004796	23.34029	42.91525	0.8647	11.58623	25.82321	0.8969
At most 6, r ? 6	0.002743	11.75406	25.87211	0.8287	6.619608	19.38704	0.9247
At most 7, r ? 7	0.002128	5.134454	12.51798	0.5772	5.134454	12.51798	0.5772

Trace Test indicates 2 cointegrating equ (s), whereas Max-Eigen value Test indicates 1 cointegrating equ at the 0.05 level. *Indicates rejection of null hypothesis of no cointegration at 0.05 level; *p*-values are MacKinnon- Haug-Michelis (1999) *p*- values. The indices of the countries are at logarithmic levels.

Next Johansen's pairwise cointegration is also tested and shown in Table7. The results show that India and none of the G7 countries are pairwise cointegrated in long-run. Therefore it can be concluded that India and G7 countries are not pairwise cointegrated in long-run, but is cointegrated as a whole.

Table 7: Johansen's Pairwise Cointegration Test Results (With Lags 7)

Hypothesized No. of CE (s)	***Eigenvalue***	***Trace Statistics***	***Critical Value***	***Prob.***	***Max-Eigen Statistic***	***Critical Value***	***Prob.***
India-US							
None, r = 0	0.002690	10.01074	25.87211	0.9245	6.482773	19.38704	0.9325
At most 1, r ? 1	0.001465	3.527964	12.51798	0.8088	3.527964	12.51798	0.8088
India-Canada							
None, r = 0	0.003844	14.90317	25.87211	0.5826	9.271394	19.38704	0.6963
At most 1, r ? 1	0.002337	5.631781	12.51798	0.5084	5.631781	12.51798	0.5084
India-Japan							
None, r = 0	0.002974	10.78949	25.87211	0.8869	7.168231	19.38704	0.8890
At most 1, r ? 1	0.001503	3.621258	12.51798	0.7960	3.621258	12.51798	0.7960
India-UK							
None, r = 0	0.002361	10.26040	25.87211	0.9134	5.689439	19.38704	0.9676
At most 1, r ? 1	0.001897	4.570961	12.51798	0.6587	4.570961	12.51798	0.6587
India-Germany							
None, r = 0	0.002397	9.595671	25.87211	0.9411	5.775586	19.38704	0.9646
At most 1, r ? 1	0.001586	3.820085	12.51798	0.7680	3.820085	12.51798	0.7680
India-France							
None, r = 0	0.002517	8.793604	25.87211	0.9660	6.065451	19.38704	0.9530
At most 1, r ? 1	0.001133	2.728153	12.51798	0.9072	2.728153	12.51798	0.9072
India-Italy							
None, r = 0	0.002847	10.53309	25.87211	0.9003	6.863270	19.38704	0.9098
At most 1, r ? 1	0.001523	3.669821	12.51798	0.7892	3.669821	12.51798	0.7892

Trace Test and Max-Eigen value Test indicate no cointegrating equ at the 0.05 level; *p*-values are MacKinnon- Haug-Michelis (1999) *p*- values. The indices of the countries are at logarithmic levels.

Granger Causality Test:

Here Granger Causality/ Block Exogeneity Tests have been performed considering 7 lags in Vector Error Correction (VEC) model.

Table 8: Granger Causality Test

Independent Countries ?	Dependent Countries ?							
	? INDIA	? US	? CANADA	? JAPAN	? UK	? GERM.	? FRANCE	? ITALY
? INDIA	-	0.5539	0.7362	0.5590	0.3297	0.2935	0.2434	0.2119
? US	0.0000*	-	0.0009*	0.0000*	0.0000*	0.0000*	0.0000*	0.0000*
? CANADA	0.0078*	0.0000*	-	0.2338	0.1361	0.0006*	0.0758***	0.1155
? JAPAN	0.0506***	0.1576	0.2536	-	0.6567	0.3698	0.6760	0.4516
? UK	0.2895	0.0006*	0.0015*	0.1396	-	0.0007*	0.0014*	0.0732***
? GERMANY	0.2332	0.0037*	0.0124**	0.0029*	0.0548***	-	0.0440**	0.0570***
? FRANCE	0.3726	0.0007*	0.0001*	0.0222**	0.0068*	0.0075*	-	0.0007*
? ITALY	0.0781***	0.7237	0.2973	0.0618***	0.5622	0.3179	0.4592	-
ALL	0.0000*	0.0000*	0.0000*	0.0000*	0.0000*	0.0000*	0.0000*	0.0000*

, ** and * indicate level of significance at 1%, 5% and 10% respectively. Figures are respective p-values of χ^2 statistics.*

From the table it is seen that US, Canada, Japan and Italy "granger cause" India in short-run. Hence there exists a unidirectional causality running from US, Canada, Japan and Italy to India. On the other hand India does not "granger cause" any G7 country and hence India does not have short-run causality with any of the G7 country. That means US, Canada, Japan and Italy has short-run influence on India while the converse is not true.

Summary and Conclusion :

The study shows that India has moderate association with Japan, UK and France while it has very negligible association with the other G7 countries. India and G7 countries all together have long-run dynamic relationship. But none of the countries are pairwise cointegrated in long-run. In the presence of long-run relationship, India and G7 countries move together which indicates shock in one country will have some implications in other countries; however small it may be. But as the countries are not pairwise linked, no country can influence directly the other country; rather movement in stock market of one country will have waving effect in all countries. Despite non-existence of pair wise link in long-run, countries may have short-run dynamic causal relationship. Results indicate that India is influenced by US, Canada, Japan and Italy in short-run, whereas the converse is not at all true. That means movement in markets of those countries will have some effects on Indian market. Although India is influenced by the said countries in G7, it has no influence on any of the G7 country, which is also consistent with empirical literatures. The study pin points that India has not yet emerged as one of the country that can influence the economies of G 7 countries. India has a strong potential to be one of the most influential country in the world. Recent reports indicate that India is now one of the fastest growing economies after China and India's short-run causal linkage with US and other G7 countries show that its movement in the short run is in sync with them and it will emerge as one of the most influential country in the world in time to come.

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Factors responsible for Financial Exclusion - Empirical evidence from district Co-operative banks in Kerala

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Abstract:

For promoting Financial Inclusion, the issue of exclusion of people, who desire the use of financial services but are denied access to it, needs to be addressed. Prominent among the explanations for financial exclusion is the lack of a basic bank account for everyday transactions (access exclusion) and access to credit (credit exclusion) within the mainstream banks and financial institutions. Access exclusion may be due to the denial of a basic bank account by the bank personnel. At times, people may not be interested in opening a basic bank account, which is considered as voluntary exclusion/self exclusion.

The basic factors responsible to be blamed for financial exclusion are self exclusion, access exclusion and credit exclusion. The present study attempts to analyse the perception of the DCB managers of the selected branches of District Co - operative Banks (DCBs) in Kerala, in terms of three dimensions of self exclusion, access exclusion and credit exclusion. Primary data collected from 75 respondents of three selected districts, through multi stage random sampling method were used for the study and the data were analysed, using SPSS (version 17).

Key Words: *Financial Inclusion, Financial Exclusion, MDS.*

Introduction:

Financial exclusion is deeply interrelated with social exclusion. When social exclusion automatically leads to financial exclusion, financial exclusion is considered as belonging to a process that reinforces the risk of social exclusion. Social exclusion means being unable to access the things in life that most of the society takes for granted. Social exclusion is the process by which certain groups are unable to fully participate in the life of their communities (Vani K. Borooah, 2010). In this context, Levitas (2006) observes that all those who do not participate in the normal activities of citizens' and do so voluntarily are not socially excluded. Clare Louise Chambers (2004) identifies that if people are excluded from using financial products then there is likelihood that these people may become socially excluded as well.

The term 'financial exclusion' was first coined in 1993, by geographers who were concerned about limited physical access to banking services as a result of bank branch closures (Leyshon and Thrift, 1995). It was in 1999, that the term 'financial exclusion' seems first to have been used in a broader sense to refer to people who have constrained access to mainstream financial services (Kempson and Whyley, 1999).

Financial exclusion is both a process and a state which enshrines a lack of integration' (Gloukoviezoff, 2007). Financial exclusion can be described as the inability of individuals, households or groups to access necessary financial services in an appropriate form. A person is considered financially excluded when he has no access to some or all of the services

offered by mainstream financial institutions in his country of residence or do not make use of these services. In the narrow sense financial exclusion refers to the exclusion from certain financial products and services, while more broadly, it describes the processes which have the effect of shutting out the less well off from mainstream money services (Sinclair, 2001). The denial of financial services and the conditions that lead to depriving an individual or a group from the benefits of these services is Financial Exclusion (Carbo et al. 2007). RBI (2006) reports that India in the last 15 years has witnessed unprecedented growth in financial services, unfolded by liberalisation and globalisation. But alongside this positive development, there are evidences that the formal financial sector still excludes a large section of population.

Clark et al. (2005) find that while the Government seems to have been successful in promoting basic banking services, a bigger issue was that of dormant accounts and the limited use of automated banking. Many, were not able to take advantage of the benefits mainstream banking could offer, which is described in the literature as a case of 'exclusion within inclusion'. 'Banking exclusion' is more dynamic with households suspending or closing down accounts when circumstances change particularly in case of unemployment. Even where bank accounts are claimed to have been opened, verification has shown that these accounts are dormant. Few conduct any banking transactions and even fewer receive any credit (Subha Rao, 2010). At one extreme, there are customers who have wide range of financial products and services at their disposal, who are served well by the financial service providers. At the other extreme, there are people who are financially excluded, having no access to even the basic banking services. Another segment of population in between the two extremes exists having limited access to financial services (Chandrasekhar 2007). There is ample evidence that financial exclusion is both a dynamic and multidimensional concept.

Dimensions of Financial Exclusion:

Self Exclusion / Use Exclusion and Mistrust of Banks

People with basic bank account may be reluctant to use their account. Mistrust of banks is one of the factors which explain why individuals might not want to access or use mainstream financial products. This puts exclusion from the financial system into a different light since it suggests that some consumers prefer not to be included for one reason or another. Feeling of mistrust may be based on actual individual experience or by the experience of friends, family or neighbours or negative media coverage of mainstream financial service provision. Choice or personal preferences also play a role in explaining (non-) access to other types of financial services. Some people choose to remain without these services like insurance because they feel they do not need it or have a greater readiness to assume risk. A degree of choice exists in deciding which type of transaction services people want to use (ranging from very basic services to more sophisticated banking products) and how they want to use available products (e.g. use of automated banking). Sometimes, people may feel that financial services are not for them and that banks are reluctant to do business with them (Kempson and Whyley, 1999). These feelings of mistrust of mainstream financial institutions are widespread among people who are largely excluded from the financial system.

The question remains, whether, those who freely decide not to engage with the financial system in some way or another, should be included in the definition of financial exclusion. In

this case, people's choice needs to be accepted as genuine and hence, not as an act of financial exclusion (Devlin, 2005). People may simply have no need for, say, a personal loan and cannot be considered as excluded from such a market, if not using that product. However, it is not known, if people would be denied access should they approach a bank for credit or other financial services. In practical terms, however, financial exclusion is generally discussed in the context of imposed exclusion rather than 'self exclusion' by choice. Although, there is the possibility of voluntary financial exclusion, most people will in fact experience barriers to inclusion rather than making an unconstrained choice of self - exclusion.

Access Exclusion / Banking Exclusion.

The access to a bank account is seen as a universal need in most of the developed as well as developing nations. Access to a bank account facilitates - storing money safely until it needs to be withdrawn; availing of credit; converting cheques into cash; receiving payments of funds such as salaries, pensions or social assistance (electronically); paying for goods and services other than in cash; paying bills electronically; making remittances etc. Though, it is not enough to have access to a bank account to be qualified as financially included, the lack of access to banking may impair social inclusion due to the following factors:

- It is the basic and generalised financial provision.
- It is a key to access other financial services (credit/ savings).
- Lack of a bank account may give an opportunity to unfair provisions to grow and may consequently increase risk of poverty.
- It becomes more difficult and expensive for people who can pay only in cash, with more risk of being stolen.

Credit Exclusion

The concern for the credit aspect of financial exclusion stems mainly from the apparent exclusion of low - income households from affordable sources of credit. Credit is a major financial tool to enable access to goods or expenditures that oversize the monthly budgets. It may play a significant role to smooth consumption and to protect against income shocks. Lack of access or use of this financial provision may impact social inclusion in many ways (European Commission, 2008). Without access to mainstream credit or alternative (affordable) credit options, people may resort to borrow from lenders that operate at the lower end of the credit market or illegal moneylenders. Lack of access to affordable credit options is identified as a contributory factor to debt problems. It is not only the costs of illegal credit that causes concern but also the lending practices of some of these lenders which lead clients into more debt thereby creating and perpetuating a cycle of borrowing and indebtedness. Consequently, low - income consumers seek access to an appropriate source of borrowing to prevent future financial difficulties.

Objectives:

The present study is undertaken with the following objectives.

1) To identify the basic factors to be blamed for financial exclusion.
2) To analyse the perception of District Co - operative Bank (DCB) managers in Kerala, with regard to the basic factors to be blamed for Financial Exclusion.

3) To examine whether there exists any demographic variation in the insight of DCB managers in Kerala with regard to the factors to be blamed for exclusion.

Methodology:

This study is based on primary data collected from 75 Branch managers of District Co - operative Banks (DCBs) in three selected districts of Kerala state. The districts selected at random were: Thiruvananthapuram, Ernakulam and Kannur. The study is descriptive in nature. The collected data was edited, tabulated and analysed, using SPSS (version 17). Statistical tools such as mean, standard deviation, Factor Analysis, Two - way ANOVA, Friedman's test and MDS - ALSCAL technique were used for analysing the data.

Results and Discussion:

Underlying factors to be blamed for financial exclusion, identified from the literature were: (i) Self exclusion; (ii) Access exclusion and (iii) Credit exclusion. Therefore, the views of the sample respondents were analysed in terms of three dimensions as discussed below.

(A) Factors to be blamed for Self Exclusion

The reasons for the people to abstain from opening accounts with formal banks are many. Keeping this in view, an attempt is made here to observe the opinion of bank managers in this respect. To evaluate the agreement of the respondents to the identified factors, responses were collected on a five point Likert scale with 5 for 'strongly agree' and 1 for 'strongly disagree'. The details are given in the table below.

Table 1: Descriptive Statistics Associated with the Factors to be Blamed for Self Exclusion

Reason for access exclusion	N	Min	Max	Mean	Std. Deviation
No money to save	75	1.00	5.00	2.6800	1.58677
No bank in the area	75	1.00	5.00	2.2267	1.41013
Too many bank charges	75	1.00	5.00	1.7733	1.02104
Refusal by the bank	75	1.00	5.00	1.7733	1.22555
Lengthy process	75	1.00	5.00	1.6933	1.11468
No help from banks	75	1.00	5.00	1.7333	1.11904
Lack of awareness	75	1.00	5.00	3.3067	1.41396
Presence of moneylenders	75	1.00	5.00	2.5867	1.34660
Problem of minimum balance	75	1.00	5.00	2.1733	1.56286

Source: *Survey Data*

From the Table, it can be observed that all the variables except 'lack of awareness' possess a mean score below the neutral value 3, which indicates the lack of agreement of the bank managers to the relevance of various factors identified. They opine that the only reason for people not opening a bank account is lack of awareness on the part of the people. Now, it is

hypothesised that the factors considered for analysing the reasons to be blamed for self exclusion by the customers by not opening a bank account, are multidimensional and is not explainable by the independent variables selected for the study. Thus, Hypotheses may be stated as:

H_0: The independent variables selected for analysing the factors to be blamed for self exclusion by the customers, are not multidimensional and are explainable.

H_1: The independent variables selected for analysing the factors to be blamed for self exclusion by the customers, are multidimensional and are not explainable.

For further analysis and validation, the data reduction technique called, Factor Analysis was carried out. The output of factor analysis is examined after validating the variables using the communalities. Communalities represent the proportion of the variance in the original variables that is accounted for by the factor solution. The following table provides the communalities extracted for the factors which prevent the people from opening bank accounts.

Table 2: Communalities Extracted for the Factors Preventing People from Opening Accounts

Reasons for not opening accounts	Initial	Extraction
No money to save	1.000	.725
No bank in the area	1.000	.615
Too many bank charges	1.000	.567
Refusal by the bank	1.000	.598
Lengthy process	1.000	.704
No help from banks	1.000	.754
Presence of moneylenders	1.000	.660
Minimum balance	1.000	.524
Extraction Method: Principal Component Analysis.		

Source: *Survey Data*

It can be seen that the communalities show sufficiently large values suggesting that the variables are equally important for the contemplated problem. (Communalities with values more than 0.3 may be taken as important as a thumb rule when the sample size is sufficiently large). Since the lowest communality is 0.524 and all other communalities are fairly large (> 0.524), it is supposed to be a good set of variables for further analysis. The factors extracted and the related results are given below.

Table 3: Total Variance Explained on the factors to be blamed for Not Opening Accounts

Factor	Initial Eigen values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.498	31.230	31.230	2.498	31.230	31.230
2	1.385	17.317	48.547	1.385	17.317	48.547
3	1.263	15.792	64.339	1.263	15.792	64.339

Extraction Method: *Principal Component Analysis*

Source: *Survey Data*

From Table - 3, it is clear that three factors are extracted with Eigen values greater than 1, which is the usual procedure in factor analysis to identify the factors. It may be seen that, a total of 64.339 per cent of the total variation is explained by these three factors. The associated rotated component matrix is given below.

Table 4 : Rotated Component Matrixes

Reasons for not opening accounts	Component		
	1	2	3
No money to save	-.166	-.024	.835
No bank in the area	.054	.660	.421
Too many bank charges	.557	.503	.062
Refusal by the bank	.630	.423	-.146
Lengthy process	.788	-.282	.053
No help from banks	.850	.123	.130
Presence of moneylenders	-.007	.804	-.116
Minimum balance	.301	.057	.656
Extraction Method: Principal Component Analysis.			
Rotation Method: Varimax with Kaiser Normalization.			

Source: *Survey Data*

From the above matrix using the factor loadings, three factors with factor loading more than 0.50 are identified (the thumb rule is, to select the variables whose factor loadings is more than 0.50).

Factor 1 - The first factor has relatively higher loadings for responses to the following variables viz. 1) Too many bank charges, 2) Refusal by the bank, 3) Lengthy process, 4) No help from banks. These four variables indicate the constriction on the part of the banks and

therefore identified as ***'Lack of assistance'.***

Factor 2 - The second factor has relatively higher loadings for responses to the following variables viz. 1) No bank in the area, 2) Presence of money lenders. These two variables together indicate ***'lack of accesses'*** as the second factor.

Factor 3 - The third factor has relatively higher loadings for responses to the variables: 1) No savings, 2) Minimum balance not affordable. These two variables taken together indicate ***'lack of affordability'*** as the third factor.

From Table 4 we identify three factors which have very high loadings. Among three, the most important factor is lack of assistance and it consists of four variables. These variables together make 31.23 per cent of variance. Lack of access is the second important factor in the group, which consists of two variables. These two variables make 17.32 per cent of variance. Third factor is lack of affordability consisting of two other variables which make 15.79 per cent variance.

From the analysis conducted above and the observations cited above, it is clear that, the factors selected are good fit for the identification and analysis of the major factors to be blamed for self exclusion by the customers, for the three factors together are capable of explaining 64.339 per cent variance. Therefore, we may conclude that the independent variables selected for identifying and selecting the factors to be blamed for self exclusion are multidimensional and is not explainable by the independent variables and hence the null hypothesis stands rejected.

Now it is proposed to make an enquiry into the level of perception of the DCB managers on above three factors to see whether there is any significant variation in their outlook. Since the respondents are grouped under three districts, Trivandrum, Ernakulam and Kannur and under two areas, viz., rural and urban, a Two- way ANOVA is undertaken to examine district wise and area wise variation.

Perception on Lack of Assistance - District wise and Area wise :

Table below provides the average for the two - way classified scores on lack of assistance as revealed from the opinion of DCB managers.

Table 5 : Average for Two-way Classified Data on Scores of Lack of Assistance

District	Mean	Std. Error
Trivandrum	6.959	.609
Ernakulam	7.011	.706
Kannur	7.082	.750
Area		
Urban	7.264	.608
Rural	6.771	.519

Source: *Survey Data*

The mean scores associated with 'lack of assistance' across the sample districts and areas are observed to have modest variation. The significance of the variation is examined by the ANOVA output, given below.

Table 6 : Tests of Between Subjects Effects on Lack of Assistance

Source	Sum of Squares	df	Mean Square	F	Sig.
District	.076	2	.038	.003	.997
Area	4.383	1	4.383	.383	.538
Error	813.487	71	11.458		
Total	4465.000	75			

Source: *Survey Data*

ANOVA output shows that, variation in the mean scores among districts and area are not significant because the p value associated with F is more than 0.05 (P > 0.05) at 5 per cent level. Thus, DCB managers across three districts and areas under study do not differ significantly in their perception on lack of assistance. It is therefore inferred that lack of assistance on the part of bank personnel can be construed as one of the factors preventing the people from opening accounts with formal banks including DCBs.

Perception on Lack of Access - District wise and Area wise :

Table below provides the average for the Two-way classified scores on lack of access across the districts and area under survey.

Table 7 : Average for the Two-way Classified Scores on Lack of Access

District	Mean	Std. Error
Trivandrum	5.164	.402
Ernakulam	4.755	.465
Kannur	4.549	.495
Area		
Urban	5.184	.401
Rural	4.461	.342

Source: *Survey Data*

The mean scores among the sample districts and urban and rural areas under study, seems to have a variation. This can be validated by the ANOVA output provided below.

Table 8 : Tests of between Subjects Effects on Lack of Access

Source	Sum of Squares	df	Mean Square	F	Sig.
District	6.325	2	3.163	.635	.533
Area	9.437	1	9.437	1.895	.173
Error	353.625	71	4.981		
Total	2107.000	75			

Source: *Survey Data*

The district wise as well as area wise mean scores variation are not significant as per the ANOVA output, which shows that district wise, F = 0.635 and p=0.533 > 0.05 and area wise F = 1.895 and p=0.173 > 0.05. Thus, it is observed that there is no difference in the perception of DCB managers on 'lack of access' of various products and services being offered by the banks. Thus lack of access may be considered as another reason for the people for not opening accounts with formal banks.

Perception on Lack of Affordability - District Wise and Area Wise :

The mean scores for the Two - way classified scores on the factor - lack of affordability -is furnished in the Table below.

Table 9 : Mean Scores for the Two-way Classified Scores on Lack of Affordability

District	Mean	Std. Error
Trivandrum	4.957	.452
Ernakulam	4.662	.524
Kannur	5.027	.557
Area		
Urban	5.105	.451
Rural	4.659	.385

Source: *Survey Data*

Observing the mean values, it is found that the mean scores of the sample districts and areas under study have a modest variation. To test for the difference, ANOVA output was obtained and reported.

Table 10 : Tests of between Subjects Effects on Lack of Affordability

Source	Sum of Squares	df	Mean Square	F	Sig.
District	1.346	2	.673	.107	.899
Area	3.595	1	3.595	.569	.453
Error	448.446	71	6.316		
Total	2220.000	75			

Source: *Survey Data*

With district wise F = 0.107 and p=0.899 > 0.05 and area wise F = 0.569 and p=0.453 > 0.05, ANOVA output signifies that the mean variations in both the cases are not significant. Since, no significant variation among the DCB managers may be observed in their views with regard to 'lack of affordability' of various products and services being offered by the banks, it is considered as the third factor along with lack of assistance and lack of access, to be blamed for thwarting people from opening accounts with formal banks including DCBs.

(B) Factors to be Blamed for Access Exclusion by Refusal of Account

At times, the banks may refuse to open basic savings banks accounts on account of various reasons. The reasons identified include, lack of identity documents, previous bad credit history, unemployment, huge debts and lack of credit history. To evaluate the experience of DCB managers in this regard, it is proposed to gather their views. To assess the degree of agreement on the five components which were identified, the respondents were asked to prioritise their views based on ranking of the five factors. The results obtained are furnished in the Table below.

Table 11 : Frequency Distribution of Reasons for Refusal of Accounts

	Reasons for refusal of accounts				
Ranks	Lack of documents	Bad credit history	Unemployment	Huge debt	No credit history
Rank 1	60(80)	4(5.3)	5(6.6)	2(2.6)	4(5.4)
Rank 2	0(0)	29(38.7)	17(22.7)	9(12)	21(28)
Rank 3	1(1.3)	20(26.7)	8(10.7)	29(38.7)	16(21.3)
Rank 4	1(1.3)	14(18.7)	18(24)	26(34.7)	16(21.3)
Rank 5	13(17.4)	8(10.6)	27(36)	9(12)	18(24)
Total	75(100)	75(100)	75(100)	759(100)	75(100)

Source: *Primary Data*

Note: *Figures in parenthesis represent percentage to respective columns total.*

From Table 11, it can be inferred that the highest number of first ranks was assigned to the variable- *'lack of documents'*. So, the managers under study rank this as the major reason for refusal of accounts. In the order of ranking, the largest number of the second ranks is being given by the managers to *'bad credit history'*; the third and the fourth ranks are given to 'huge debts' followed by *'no credit history'*.

To test, whether the respondents associate different levels of preferences, for the reasons for account refusal, Friedman's test, which is a non parametric test for testing several related samples is used. The hypotheses may be stated as:

H_0: There is no difference among the preferences of bank managers associated with the reasons for account refusal

H_1: There is difference among the preferences of bank managers associated with the reasons for account refusal.

The result obtained from the test is presented in the following Table.

Table 12 : Mean Ranks obtained for the reasons for refusal of account

Reasons for refusing account	Mean Rank
Lack of identity documents	1.76
Bad credit history	2.91
Unemployment	3.60
Huge debts	3.42
No credit history	3.31

Source: *Survey data*

The mean ranks obtained for the five factors are stated above. ***The lower the ranks, the higher will be the preference.*** Thus from Table -12, it is clear that the highest preference is given to lack of identity documents and the least preference is given to unemployment. The test statistic is reported in Table - 13 below.

Table 13 : Test Statistics (Friedman Test)

N	75
Chi-Square	65.310
Df	4
Asymp. Sig.	.000

Source: *Primary Data*

The χ^2 statistic provides a value of 65.310 which is significant at 1 per cent level. It may be concluded that there is significant difference among the preferences associated with the reasons of account refusal and the null hypothesis stands rejected.

(C) Factors to be Blamed for Credit Exclusion by Refusal of Loan

From the previous discussions, it was observed that at times, the banks may refuse to open accounts for various reasons. Now, it is considered relevant to examine the factors the bank managers reckon for refusing various loans to the customers. Six factors were identified as the reasons for refusal of loans on the part of the bank personnel. They include: i) Insufficient security, ii) Lack of regular income, iii) Previous loan, iv) Purpose of the loan, v) Insufficient documents and vi) Bad credit history. The respondents were asked to give their opinion on a five point Likert scale and the Table given below provides the results obtained.

Table 14 : Descriptive Statistics for Factors Refusing Loan

Factors refusing a loan	N	Min	Max	Mean	Std. Deviation
Insufficient security	75	1.00	5.00	4.7600	.56569
Lack of regular income	75	1.00	5.00	4.5200	.77738
Previous loan	75	1.00	5.00	2.9067	1.47202
Purpose of the loan	75	1.00	5.00	3.3067	1.51545
Insufficient documents	75	1.00	5.00	4.8000	.56949
Bad credit history	75	1.00	5.00	4.3333	.90544

Source: *Survey Data*

Table 14 reveals that all the variables except 'previous loan' hold mean score above the neutral value of 3, which indicates the respondents' agreement to the factors responsible for refusal of loans. Since the mean score of 'previous loan' is below 3, it may mean that it is not a factor to blame for. To identify the most dominant factor among the above six factors, a Multi Dimensional Scaling (MDS) - ALSCAL technique was used.

The steps involved in the procedure of MDS are - *try to reduce a measure of stress as low as possible, while the R Square (RSQ) increases to a maximum.* The identified factors are presented in a form of two dimensional graph and the results are reported as under.

Table 15 : Stimulus Co - ordinates for Factors Refusing Loans

Stimulus Number	Stimulus Name	Dimensions	
		1	2
1	Insufficient security	1.0140	-.0005
2	Lack of regular income	.7718	.1684
3	Previous loan	-2.0816	.9140
4	Purpose of the loan	-1.4010	-1.2319
5	Insufficient documents	1.2007	.0782
6	Bad credit history	.4961	.0717

For matrix Stress = .12085 RSQ = .96937. Configuration derived in 2 dimensions

Source: *Survey Data*

From Table 15, it can be seen that the model explains 96 per cent of the variability (RSQ = 0.96937) and the stress is also small (0.12085) and this model reveals the actual facts about the factors to be blamed for credit exclusion by refusal of credit by banks. It can be concluded that:

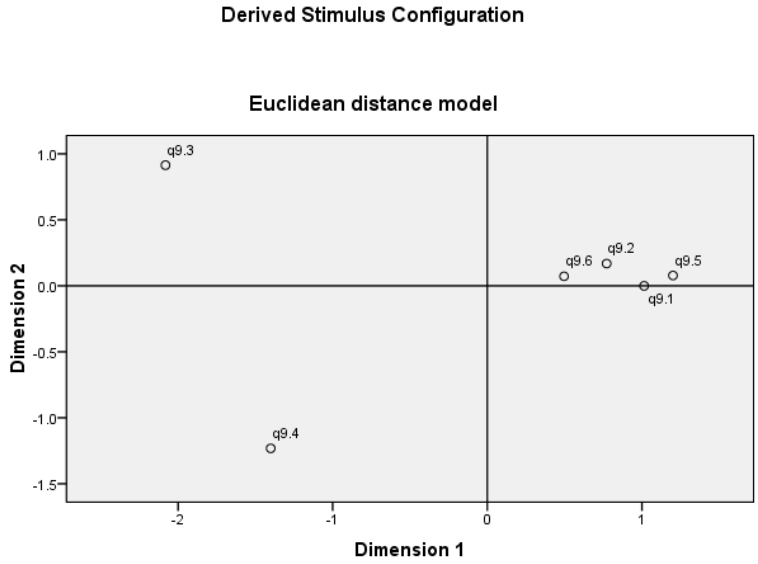
i) *'Insufficient documents'* (stimulus No.5), *'lack of regular income'* (stimulus No.2) and *'bad credit history'* (stimulus No.6) are the main contributing factors responsible for refusing loans in both dimensions (with positive coefficient values in both dimensions).

ii) *'Insufficient security'* and *'previous loan'* are loaded in one dimension only.

iii) *'Purpose of the loan'* does not contribute to the problem under study (with negative coefficient values in both dimensions).

It can also be verified by the MDS plot provided below. The plot has six points, one for each variable. In the map, those variables sharing a high degree of similarity with many other variables are placed near the centre of the map and others not sharing a high degree of similarity are placed near the edges of the map and represent more peripheral specialties.

Figure 1 : MDS Plot for factors for refusing loans by the banks



Source: *Survey data*

Concluding Observations :

The basic factors responsible to be blamed for financial exclusion were identified from the

existing literature as self exclusion, access exclusion and credit exclusion and the perception of the DCB managers of the selected branches of District Co-operative Banks (DCBs) were analysed in the present study. Descriptive statistics associated with the reason for self exclusion on the part of the people by not opening an account with a formal bank suggested that the sole reason was lack of awareness of the people. Hence, it is hypothesised that the factors considered for analysing the reasons to be blamed for self exclusion by the people by not opening a bank account, are multidimensional and is not explainable by the independent variables selected for the study and for this reason, the 'Factor Analysis' technique was used and three factors were emerged to be the reasons for self exclusion - lack of assistance , lack of access and lack of affordability .These factors were further analysed to examine the district - wise and area - wise difference and found that no significant demographic variation does exist among the respondents with regard to lack of assistance , lack of access and lack of affordability. To identify the variables responsible for access exclusion on account of account refusal on the part of the bank personnel, a Friedman's test, which is a non parametric test for testing several related samples, was used. Lack of identity documents was observed to be the dominant factor responsible for access exclusion. To determine the variables to be blamed for credit exclusion, Multi Dimensional Scaling (MDS) - ALSCAL technique was used which revealed that insufficient documents, lack of regular income and bad credit history are the main contributing factors responsible for credit exclusion by refusing loans.

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The Behaviour of Spot and Forward Prices: Evidences from Hessian and Sacking Markets in West Bengal

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Abstract:

An attempt has been made in this paper to draw inferences on the efficiency of the hessian and sacking markets by analyzing the behaviour of spot and forward prices. The study is based on available secondary data sources from the Annual Reports of the East India Jute and Hessian Exchange Ltd. (EIJHE). To test the Efficient Market Hypothesis in weak sense, the study carried out two tests: autocorrelation test and run test. Empirical results of both the test procedures establish significant statistical evidences of interdependence of successive individual series on spot and forward prices at different periods of time in the hessian and sacking markets. Thus the results lead to rejection of Efficient Market Hypothesis in weak sense in the hessian and sacking markets. The inefficiency in the market is mainly attributable to the thin trade volume and infrequent trading of hessian and sacking in EIJHE, which ultimately resulted in declining liquidity of the market. The study, therefore, recommends implementing several innovative steps in the operation of this regional exchange so as to regain the glory of the oldest derivative exchange in India. To exploit the location advantage of EIJHE in trading raw jute and jute products, a well developed jute spot market in West Bengal is considered as the pre-requisite.

Key Words: *East India Jute and Hessian Commodity Exchange, Hessian, Sacking, Spot market, Forward market, Efficient Market Hypothesis, Autocorrelation test, Run test.*

JEL classification: *C58, G13, G14, P22.*

Introduction:

A commodity derivative is a financial contract whose price depends on, or is derived from, the price of underlying commodity. A relatively simple of derivative is a forward contract. It is an arrangement to buy or sell a commodity at a certain future time for a certain agreed price (Hull and Basu, 2012). In India, organized commodity derivatives started as early as 1875, when the Bombay Cotton Trade Association established cotton contracts. However, formal commodity trading starts with the operation of futures trading of raw jute in the East India Jute and Hessian Commodity Exchange (EIJHE)[1] in 1919. It can be considered as the oldest commodity regional exchange ever operating in India. After independence, futures trading of raw jute and hessian in this regional exchange were gone in a topsy-turvy manner, as trading activity was banned in the 1964 and resumed in 1992. Over this period, the exchange thrived on forward trading contracts. In 1997, hedging in jute sacking helped the exchange boom. However, problems surfaced in 1999 and the recognition of the EIJHE was come to a halt in

[1] *Presently, there is a two-tier structure for commodity exchanges in India: 13 commodity specific regional and 6 country-wise national commodity exchanges (MCX, NCDEX, NMCE, ICX, ACE, and UCX).*

the year 2012. No transferable specific delivery (TSD)[2] or hedging contract was taken place after January 2012.

It is expected that trading of raw jute and related jute products (i.e., hessian and sacking) in derivative market would play a pivotal role in bridging the gap between jute farmers and industry and thereby meeting both of their ends. However, the success of the derivative market in performing the stabilizing function critically depends on whether they are "efficient"[3] (Fama, 1970). For the storable commodity like hessian, existing empirical evidences suggest that futures market has reduced the price volatility in the hessian market during 1992-97 (Singh, 2004). It was observed that futures market facilitates storage of jute to produce hessian, which has a significant impact on spot market of hessian. It was possible as hessian futures market was observed to be efficient in performing stabilization function (Singh, 2004). In contrary, Naik and Jain (2002) argued that hessian futures market in Kolkata was not able to develop efficient mechanisms of risk management and price discovery even after resumption of hessian trading in EIJHE since 1992. In this context, one pertinent question that largely remains unsettled in academic and policy discussions is: whether the transactions of hessian and sacking in the regional market are efficient or not? Under this backdrop, an attempt has been made in this paper to examine the behaviour of spot and forward prices of hessian and sacking commodities. A probable inference on the efficiency of the market is another particular interest in this paper. However, this paper is organized as follows. The next section analysed the trend of spot and forward prices of hessian and sacking in West Bengal. Section 3 considers the data sources and methodology of the study. Section 4 presents the empirical evidences on the randomness of spot and forward price behavior in hessian and sacking markets. The concluding remarks and policy implications are presented in the last section.

Trends of Spot and Forward Prices of Hessian and Sacking in West Bengal:

A trend of spot prices of hessian and sacking by using daily data over a period of last three years (2008-09 to 2011-12) is presented in Table 1. The spot price of hessian cloth (101.5 cm X 213 gm/m2)[4], which was quoted at Rs. 815.95 per 100 meters in July 2008, rose to Rs. 1284.39 in December 2011, registering an upward trend in general over the period. The coefficient of variation around the annual mean price of hessian cloth is relatively higher (lower) in the month of August and September (April and May). Over the whole period (2008-09 to 2011-12), there is a wide variation in the spot prices of hessian cloth and the coefficient of variation is found to be around 19.28. The variability in the spot prices of hessian cloth is, in fact, higher in comparison to sacking bag. This can be inferred from a significant low coefficient of variation (17.40) in spot prices of sacking bags. The relatively

[2] *These are contracts which, though freely transferable from one party to another, are concerned with a specific and pre-determined consignment or variety of the commodity. Delivery, of the agreed variety, is mandatory (Somanathan, 1999, pp.12).*

[3] *An efficient market is one in which the spot market "fully reflects" the available information and no one can consistently make profits and futures eliminate the possibility of guaranteed profits (Sahi & Raizada, 2006). An efficient market would provide reliable forecasts of spot prices in future.*

[4] *This particular specification of hessian cloth (101.5 cm X 213 gm/m2) is chosen as the benchmark in the annual report of the EIJHE. Similarly for sacking bag, B-twill 907 grams bag is considered as the benchmark criteria.*

lower variability in the prices of sacking bag is supplemented by a steady upward movement of prices of sacking bag from a level of Rs. 3173.81 (per 100 bags) in July 2008 to Rs. 5473.86 in December 2011.

Table 1-Trend of Spot Prices of Hessian and Sacking

Month	Measurement	Hessian				Sacking			
		2008-09	2009-10	2010-11	2011-12	2008-09	2009-10	2010-11	2011-12
April	Mean	----	935.62	1392.58	1421.74	----	4146.66	5400.83	5999.86
	CV	----	2.89	1.73	3.15	----	3.06	3.49	2.06
May	Mean	----	948.07	1381.82	1418.58	----	4215.65	5388.23	5949.89
	CV	----	3.40	1.98	2.89	----	3.95	3.09	2.57
June	Mean	----	977.14	1363.82	1409.72	----	4304.4	5389.86	5913.01
	CV	----	6.97	3.65	3.14	----	5.37	2.84	2.85
July	Mean	815.95	1079.16	1260.42	1342.70	3173.81	4676.38	5333.21	5601.01
	CV	2.23	5.83	7.70	4.37	1.47	1.23	2.08	3.25
Aug.	Mean	822.20	1029.83	1253.80	1324.84	3236.62	4612.71	5363.28	5566.75
	CV	2.30	7.73	7.17	4.62	4.07	2.75	2.37	3.10
Sep	Mean	829.10	1029.37	1283.31	1319.75	3337.94	4611.25	5426.26	5553.07
	CV	2.51	6.79	7.97	4.20	6.59	2.78	3.26	2.81
Oct	Mean	852.8	1013.44	1376.40	----	3709	4649.35	5642.18	----
	CV	0.71	4.93	7.29	----	2.33	3.53	2.65	----
Nov	Mean	849.4	1063.6	1402.18	1278.87	3753.37	4750.5	5715.80	5441.87
	CV	0.88	9.90	6.91	0.99	2.85	5.02	3.48	1.10
Dec	Mean	853.88	1092.74	1418.48	1284.39	3792.94	4802.25	5803.79	5473.86
	CV	1.55	12.22	6.42	1.05	3.83	5.74	4.15	1.18
Jan	Mean	872.31	1237.61	1464.71	----	3992.53	5094.04	5981.53	----
	CV	3.33	8.08	1.78	----	4.97	3.02	2.64	----
Feb	Mean	882.36	1264.81	1460.95	----	4015.65	5212.26	6001.59	----
	CV	3.44	8.28	1.73	----	4.63	5.21	2.46	----
Mar	Mean	893.86	1313.43	1446.69	----	4029.78	5293.12	5999.15	----
	CV	3.97	8.33	2.77	----	4.21	4.86	2.36	----

Source: *Author's calculation based on Annual Reports of EIJHE*

A trend of forward prices of hessian and sacking by using daily data over a period of last three years (2008-09 to 2011-12) is presented in table 2. The forward prices of 100 meters hessian cloth, which are quoted at Rs. 819.68 in July 2008, rose to Rs. 1285.45 in December 2011, registering an upward trend of prices in the period. However, the average price of hessian cloth in 2011-12 is observed to be relatively lowered in compared to the prices quoted for the year 2008-2010. The coefficient of variation around the annual mean price of hessian cloth is relatively higher (lower) in the month of January to March (April to June). Unlike hessian cloth, forward prices of sacking bag exhibits a consistently upward movement of prices from a level of Rs. 3217.86 per 100 bags in July 2008 to Rs. 5479.17 in December 2011. The upward trend of sacking prices is also associated with lower variation of prices (c.v. is 16.81)

in compared to hessian cloth (c.v. is 19.16) during 2008-09 to 2011-12. An overall comparison of spot and forward prices suggests that the variability of forward prices is lowered in compared to spot prices of such commodities.

Table 2-Trend of Forward Prices of Hessian and Sacking

Month	Measures	Hessian				Sacking			
		2008-09	2009-10	2010-11	2011-12	2008-09	2009-10	2010-11	2011-12
April	Mean	----	935.08	1384.83	1426.74	----	4146.67	5324.17	6009.24
	CV	----	2.97	2.52	3.71	----	3.06	2.15	2.27
May	Mean	----	947.66	1375.76	1422.64	----	4215.66	5331.18	5957.50
	CV	----	3.47	2.43	3.41	----	3.95	2.05	2.75
June	Mean	----	976.86	1358.83	1413.14	----	4304.40	5343.92	5931.31
	CV	----	7.02	3.77	3.60	----	5.37	2.08	2.91
July	Mean	819.68	1079.17	1259.00	1341.49	3217.86	4676.39	5333.21	5627.36
	CV	1.84	5.84	7.69	4.34	1.42	1.24	2.09	3.78
Aug.	Mean	826.86	1020.76	1251.61	1316.19	3304.65	4598.31	5363.28	5586.86
	CV	1.86	6.83	7.15	4.43	3.26	2.51	2.37	3.61
Sep	Mean	835.71	1013.69	1281.39	1305.86	3446.65	4593.75	5427.52	5569.06
	CV	2.07	5.74	8.00	3.97	5.53	2.52	3.28	3.28
Oct	Mean	856.60	1005.91	1376.41	----	3785.00	4642.21	5651.56	----
	CV	0.79	5.77	7.30	----	1.49	3.76	2.57	----
Nov	Mean	853.80	1057.70	1402.18	1280.63	3849.32	4741.50	5731.32	5450.63
	CV	1.43	10.52	6.91	1.16	1.59	5.34	3.32	1.32
Dec	Mean	866.12	1084.41	1420.09	1285.45	3915.88	4792.79	5826.56	5479.17
	CV	1.75	12.27	6.52	1.12	1.99	5.97	4.14	1.27
Jan	Mean	877.01	1222.86	1467.33	----	4048.51	5088.10	6004.26	----
	CV	2.91	6.68	2.02	----	3.30	2.84	3.00	----
Feb	Mean	885.82	1253.11	1463.05	----	4058.52	5206.60	6022.05	----
	CV	3.01	7.59	1.95	----	3.31	5.15	2.79	----
Mar	Mean	896.26	1302.94	1448.38	----	4063.70	5253.75	6015.70	----
	CV	3.58	8.13	2.93	----	3.02	4.07	2.65	----

Source: *Author's calculation based on Annual Reports of EIJHE*

Spot and forward prices of hessian and sacking are observed to be closely interrelated with each other. A diagrammatic representation of movement of spot and forward prices in a single diagram suggest that spot and forward prices are overlapping to each other and it is not possible to disintegrable the movement of one price from other (Figure 1 and 2).

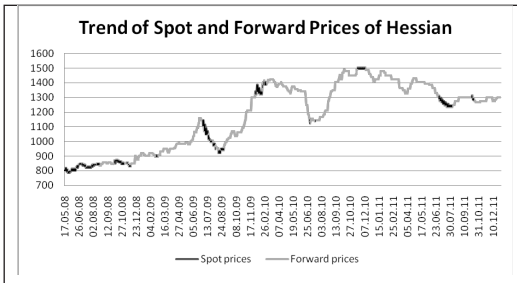

Figure 1: Price movement in Hessian cloth

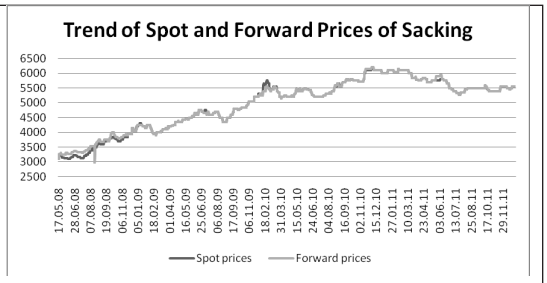

Figure 2: Price movement in Sacking Bag

Data Source and Methodology of the Study :

The study is mainly based on available secondary data source obtained from the Annual Report of the EIJHE covering a period of 2008-09 to 2012-13. The reports provide information on the daily closing quotations for TSD contract in hessian and sacking products. During the period, 41 forward contracts each for hessian and sacking products are considered in the study. On the basis of available data, an attempt has been made in the study to examine the behaviour of spot and forward prices in hessian and sacking markets. The behaviour of prices would guide us to draw inferences on the efficiency of the market. Among the three variant forms of market efficiency[5], weak form of market efficiency relies on the historical sequence of prices and is the most commonly used efficiency test in the literature (Chowdhury, 1991). The weak form of Efficient Market Hypothesis involves two separate hypotheses: successive price changes are independent of one another, and the price changes are identically distributed random variables. If these two hypotheses are valid, then historical price changes cannot be used to predict future price movements in any meaningful way (Ahmed et al, 2006). Empirical tests of weak form efficiency aimed at testing whether successive or lagged price changes are independent. The possibility of independence in a particular series is examined in the study by using autocorrelation test and run test.

Autocorrelation function at lag k measures the amount of linear dependence between observations in a time series that are separated by lag k and is defined as the proportion of covariance at lag k and variance, i.e. $\rho_k = \frac{\sum (p_t - \bar{p})(p_{t+k} - \bar{p})}{\sum (p_t - \bar{p})^2}$ It is expected that the empirical autocorrelation function of a stationary autoregressive series to damp toward zero, and the partial autocorrelation function to be approximately zero beyond the order of the process (Johnston and Dinardo, 1997). In order to test joint hypothesis that all the ρ_k autocorrelation coefficients are simultaneously equal to zero, Box-Pierce-Ljung Q statistic

[5] *Fama (1991) classified market efficiency into three variant forms-weak, semi-strong and strong. Weak form says that the current prices of stocks already fully reflect all the information that is contained in the historical sequence of prices. The semi-strong form of the efficient market hypothesis says that current prices of stocks not only reflect all informational content of historical prices but also reflect all publicly available knowledge. The strong form of the efficient market hypothesis maintains that not only is publicly available information useless to the investor but all information is useless (Fisher and Jordon, 2008).*

is used. It is computed as $Q_{LB} = n(n+2)\sum_{k=1}^{m}\left(\frac{\hat{\rho}_k^{\,2}}{n-k}\right) \sim \chi_m^2$. In large sample, Q statistic is approximately distributed as the chi-square distribution with m degrees of freedom. If the computed Q exceeds the critical Q value from the chi-square table at the chosen level of significance, one can reject the null hypothesis that all ρ_k are all zero; at least some of them must be non-zero.

One of the important problems of autocorrelation test arises when correlation coefficients are dominated by extreme values. To overcome the problem, some researchers have employed run test. This non-parametric test ignores the absolute values of the numbers in the series and observes only their sign. The number of runs is counted depending on the consecutive sequences of signs in the same direction. Then the actual number of runs observed is compared with the expected number of runs computed form a series of randomly generated price changes (Fisher and Jordon, 2008). When the expected number of runs is significantly different from the observed number of runs, the test rejects the null hypothesis of randomness of the price series. In the test procedure, the null hypothesis is tested by using the Z-test, i.e.,

$Z = \frac{r - E(r)}{SD(r)}$ where Mean= $E(r) = \frac{2n_1n_2}{n_1+n_2} + 1$,

Standard deviation= $SD(r) = \sqrt{\frac{2n_1n_2(2n_1n_2 - n_1 - n_2)}{(n_1+n_2)^2(n_1+n_2-1)}}$ Here the total sample of size n contains n_1 elements of one kind and n_2 elements of the other kind. The number of runs is denoted by r. For large samples, the Z statistic gives the probability of difference between the actual and expected number of runs. If the Z value is greater than or equal to 1.96, the null hypothesis is rejected at 5 percent level of significance, and thereby establishes the inefficiency of the market in weak sense.

Empirical Results and Discussion:

Autocorrelation Test:

The diagrammatic representation of autocorrelation function (i.e., correlogram) along with their Q statistic for spot and forward prices of hessian and sacking products are presented in appendix tables A1and A2. It is evident that the estimated Q statistic is statistically significant for all the contracts, and thereby Box-Pierce-Ljung test rejects the joint null hypothesis of zero autocorrelation at 1 percent level[6]. One of the general trends of both the spot and forward prices of hessian and sacking commodities is that the coefficients are high at lags in the beginning and the values continue to fall as the lags increase from 1 to 5. In other words, ACF (k) are very high and decline slowly as the lag value (k) increases. However, the fall in the value of autocorrelation is not much significant in any of the price series. This may

[6] *Only one exception is observed in the July 2009 forward contract of sacking bag. No large departure from zero is found in these particular autocorrelation coefficients in daily prices of the forward contract. Thus the contract is found to be efficient in weak form.*

suggest that information embedded in longer period of lags would be as influential in determining forward (spot) price as that of information embedded in short lag periods. Specifically, information embedded in five periods of lags would be as influential in determining forward (spot) price as that of information embedded in one lag periods. The results show significant evidence of inefficiency in both spot and forward markets in hessian and sacking products during the period of the study.

Run Test:

Empirical result of Run Test is presented in table 3. In the test procedure, median is used as the measure of test statistic. It is evident that the values of Z test statistic are negative and statistically significant at 1 percent level. The significant negative Z value for spot and forward prices indicate that the actual number of runs fall short of the expected number of runs. Thus the results reject the null hypothesis of random walk at 1 percent level. The negative Z values for prices are also indicative of positive autocorrelation. Thus the result is found consistent with the results obtained from the earlier parametric test (i.e., autocorrelation test) and reestablished our earlier conclusion that individual series of spot and forward prices are non-random and thereby, spot and forward markets in hessian cloth and sacking bag are inefficient in weak sense. It implies that the information regarding the yesterday prices are not effectively absorbed in today's price.

Table 3-Results of the Run Test for Hessian and Sacking

Contract	F/S	Runs	Z [a]	Contract	Runs	Z [a]	Contract	Runs	Z [a]
Hessian									
July	F	4	-7.19	Sep	3	-8.55	Nov	4	-8.73
2008	S	2	-7.74	2009	3	-8.55	2010	4	-8.73
Aug	F	4	-8.68	Oct	2	-8.6	Dec	5	-9.83
2008	S	4	-8.68	2009	2	-8.6	2010	5	-9.83
Sep	F	6	-9.68	Nov	4	-9.45	Jan	5	-8.58
2008	S	4	-10.06	2009	4	-9.45	2011	5	-8.58
Oct	F	5	-5.88	Dec	4	-10.01	Feb	4	-9.71
2008	S	7	-5.42	2009	4	-10.01	2011	4	-9.71
Nov	F	3	-8.19	Jan	2	-6.05	Mar	4	-11.15
2008	S	8	-6.67	2010	2	-6.05	2011	4	-11.15
Dec	F	4	-8.62	Feb	2	-7.07	Apr	5	-9.77
2008	S	8	-7.25	2010	2	-7.07	2011	5	-9.77
Jan	F	3	-7.75	Mar	2	-8.75	May	6	-10.92
2009	S	3	-7.75	2010	2	-8.77	2011	6	-10.92
Feb	F	8	-8.11	Apr	9	-5.73	June	6	-12.06
2009	S	8	-8.11	2010	5	-6.73	2011	6	-12.06
Mar	F	6	-9.81	May	11	-6.98	July	2	-8.43
2009	S	8	-9.38	2010	5	-8.4	2011	2	-8.43
Apr	F	4	-7.95	June	7	-9.43	Aug	3	-9.49
2009	S	4	-7.95	2010	7	-9.44	2011	2	-9.7

Contract	F/S	Runs	Z [a]	Contract	Runs	Z [a]	Contract	Runs	Z [a]
Hessian									
May	F	4	-9.33	July	2	-8.19	Sep	3	-10.71
2009	S	4	-9.33	2010	2	-8.19	2011	3	-10.7
June	F	4	-10.64	Aug	3	-9.44	Nov	3	-5.39
2009	S	4	-10.64	2010	3	-9.44	2011	3	-5.39
July	F	2	-5.58	Sep	3	-10.59	Dec	5	-7.19
2009	S	2	-5.58	2010	5	-10.22	2011	5	-7.19
Aug	F	2	-7.48	Oct	2	-7.81			
2009	S	2	-7.48	2010	2	-7.81			
Sacking									
July	F	6	-6.72	Sep	3	-8.47	Nov	2	-9.16
2008	S	5	-6.96	2009	3	-8.47	2010	2	-9.16
Aug	F	10	-7.32	Oct	4	-8.14	Dec	6	-9.64
2008	S	7	-8.01	2009	4	-8.14	2010	4	-10.04
Sep	F	6	-9.68	Nov	2	-9.84	Jan	4	-8.78
2008	S	7	-9.4	2009	2	-9.84	2011	4	-8.78
Oct	F	7	-5.42	Dec	4	-10.01	Feb	6	-9.56
2008	S	2	-6.83	2009	4	-10.01	2011	6	-9.57
Nov	F	8	-6.99	Jan	2	-5.99	Mar	7	-10.66
2008	S	6	-7.47	2010	2	-5.99	2011	7	-10.67
Dec	F	6	-7.95	Feb	2	-7.07	Apr	4	-10.05
2008	S	4	-8.62	2010	2	-7.07	2011	4	-10.05
Jan	F	4	-7.51	Mar	3	-8.55	May	2	-11.61
2009	S	2	-7.99	2010	5	-8.10	2011	2	-11.61
Feb	F	5	-8.74	Apr	2	-7.54	June	4	-12.37
2009	S	4	-8.95	2010	2	-7.55	2011	4	-12.37
Mar	F	6	-9.82	May	5	-8.39	July	2	-8.42
2009	S	4	-10.20	2010	3	-8.83	2011	2	-8.42
Apr	F	5	-7.77	June	6	-9.60	Aug	3	-9.46
2009	S	5	-7.77	2010	4	-10.00	2011	3	-9.46
May	F	6	-8.97	July	3	-7.94	Sep	3	-10.66
2009	S	6	-8.97	2010	3	-7.94	2011	3	-10.66
June	F	4	-10.67	Aug	4	-9.23	Nov	1[c]	-----
2009	S	4	-10.67	2010	4	-9.23	2011	1[c]	-----
July	F	5	-4.54	Sep	4	-10.38	Dec	5	-7.18
2009	S	5	-4.54	2010	4	-10.38	2011	5	-7.19
Aug	F	4	-6.95	Oct	2	-7.81			
2009	S	4	-6.95	2010	2	-7.81			

Source: *Authors' calculation based on Annual reports of EIJHE (Various years)*

Note: (1) a. Median

(2) b. All values are greater than or less than the cutoff. Runs Test cannot be performed.

(3) c. Only one run occurs. Runs Test cannot be performed.

Conclusions and Policy Implications:

This paper attempts to analyse the dynamics of spot and forward price movement in hessian and sacking markets in West Bengal. It has been seen that there is an upward movement of spot and forward prices in both hessian and sacking markets overtime. Spot and forward prices of hessian cloth and sacking bag are observed to be closely interrelated with each other and it is not possible to disintegrable the movement of one price from other. The behaviour of prices has guided us to draw inferences on the efficiency of the market. To test the weak form of market efficiency, the study carried out two econometric tests: autocorrelation test and run test. Empirical evidences of significant interdependence of successive individual spot and forward price series at different periods of time rejects Efficient Market Hypothesis in weak sense in the hessian and sacking markets. This result is rather expected given the fact that thin trade volume and infrequent trading of hessian and sacking in EIJHE, which ultimately resulted in declining liquidity of the market. Distribution of handout quotations in the working day as the medium of information dissemination of the hessian and sacking contracts do not attract the influential jute mill owners, shippers and dealers to the trading platform of the exchange. Inefficiency in the forward market may also be due to the underdeveloped nature of jute spot market.

To regain the glory of the oldest derivative exchange in India, EIJHE needs to implement several innovative steps in keeping pace with other sophisticated nationalized exchanges. The location advantage of EIJHE[7] in trading raw jute and jute products became nullified by the opening of nationalized exchanges like MCX and NCDEX in 2002. In this context, an effort to establish linkages with sophisticated nationalized exchanges is expected to sort out the liquidity problem of the exchange[8]. The revenue generated form renting out the empty ring hall of the exchange for the business purpose needs to be properly utilized for the installation of online trading system. A drive of modernization of the exchange in this regard will replace the traditional method of supplying handouts to the member participants, and thereby make the trading activity transparent. The exchange should ask for the permission of the FMC to reintroduce hedging contract, which will provide a platform to the common hedgers to hedge their products against the variations in spot prices.

[7] *Some of the futures exchanges have the location disadvantages as they are not located in the area where very developed spot market exists.*

[8] *An initiative of Calcutta stock exchange (CSE) to maintain linkage with other nationalized stock exchanges, BSE and NSE, has given an opportunity to the investor to trade on BSE and NSE platforms through CSE. However, the Calcutta stock exchange followed the familiar outcry system for stock trading up until 1997, when it was replaced by an electronic (e-Trading) system known as C-STAR (CSE Screen Based Trading and Reporting). Bombay Stock Exchange (BSE) has made a strategic investment in Calcutta Stock Exchange, acquiring 5% of its shares. This modernization programme has attracted small companies of other regional exchanges to get listed in it as a cost effective solution compared to other national exchanges (The Economic Times, November 4, 2013).*

Appendix

Table A1-Results of Autocorrelation for Hessian Cloth

Cont.	Lag	Autocorrelation	Q-Stat	Cont.	Autocorrelation	Q-Stat	Cont.	Autocorrelation	Q-Stat
July 08 (F)	1 2 3 4 5	. |*******| . |****** | . |****** | . |***** |	55.771 102.89 144.53 180.95 213.12	Aug 09 (S)	. |*******| . |*******| . |*******| . |*******| . |****** |	58.883 115.17 167.64 215.65 259.45	Oct 10 (F)	. |*******| . |*******| . |*******| . |****** | . |****** |	60.771 116.76 167.68 213.75 255.62
July 08 (S)	1 2 3 4 5	. |*******| . |*******| . |*******| . |****** | . |****** |	60.898 117.32 168.50 214.14 254.87	Sept 09 (F)	. |*******| . |*******| . |*******| . |****** | . |****** |	76.578 148.12 214.31 274.82 329.43	Oct 10 (S)	. |*******| . |*******| . |*******| . |****** | . |****** |	60.771 116.76 167.68 213.75 255.62
Aug 08 (F)	1 2 3 4 5	. |*******| . |*******| . |****** | . |****** | . |***** |	75.997 141.51 199.79 251.18 297.06	Sept 09 (S)	. |*******| . |*******| . |*******| . |*******| . |****** |	78.852 154.52 225.07 289.67 348.46	Nov 10 (F)	. |*******| . |*******| . |*******| . |****** | . |****** |	81.730 156.80 224.89 286.33 341.93
Aug 08 (S)	1 2 3 4 5	. |*******| . |*******| . |*******| . |****** | . |****** |	81.547 157.23 226.22 287.90 343.68	Oct 09 (F)	. |*******| . |*******| . |*******| . |****** | . |****** |	73.387 141.27 204.66 263.31 317.22	Nov 10 (S)	. |*******| . |*******| . |*******| . |****** | . |****** |	81.730 156.80 224.89 286.33 341.93
Sep 08 (F)	1 2 3 4 5	. |*******| . |*******| . |*******| . |****** | . |****** |	102.67 194.19 278.73 357.09 428.76	Oct 09 (S)	. |*******| . |*******| . |*******| . |****** | . |****** |	73.120 140.40 202.84 260.31 312.55	Dec 10 (F)	. |*******| . |*******| . |*******| . |****** | . |****** |	105.79 204.06 294.37 376.97 452.77
Sep 08 (S)	1 2 3 4 5	. |*******| . |*******| . |*******|	107.91 210.19 306.32 395.70 478.31	Nov 09 (F)	. |*******| . |*******| . |*******|	95.983 186.07 270.08 347.76 419.38	Dec 10 (S)	. |*******| . |*******| . |*******| . |****** | . |****** |	105.65 203.66 293.64 375.87 451.27

		. |*******| . |****** |			. |*******| . |****** |			
Oct 08 (F)	1 2 3 4 5	. |****** | . |**** | . |** | . | . | .*| . |	32.220 49.115 54.629 54.846 55.111	Nov 09 (S)	. |*******| . |*******| . |*******| . |*******| . |****** |	95.863 185.70 269.27 346.34 417.00	Jan 11 (F)	. |*******| . |*******| . |*******| . |****** | . |****** |	82.544 157.88 224.70 282.93 331.78
Oct 08 (S)	1 2 3 4 5	. |****** | . |***** | . |*** | . |*. | . | . |	33.995 53.550 61.853 63.304 63.431	Dec 09 (F)	. |******** . |*******| . |*******| . |*******| . |*******|	108.68 213.08 313.03 408.26 498.72	Jan 11 (S)	. |*******| . |*******| . |****** | . |****** | . |***** |	81.621 155.19 219.86 275.50 321.30
Nov 08 (F)	1 2 3 4 5	. |*******| . |*******| . |****** | . |***** | . |**** |	66.709 123.39 169.05 204.02 231.61	Dec 09 (S)	. |*******| . |*******| . |*******| . |*******| . |*******|	108.05 211.19 309.28 402.01 488.89	Feb 11 (F)	. |*******| . |*******| . |****** | . |****** | . |***** |	100.88 191.13 269.64 336.24 390.50
Nov 08 (S)	1 2 3 4 5	. |*******| . |****** | . |**** | . |*** | . |** |	58.713 99.414 122.56 132.58 136.34	Jan 10 (F)	. |*******| . |*******| . |****** | . |***** | . |***** |	38.106 71.523 100.23 124.11 143.49	Feb 11 (S)	. |*******| . |*******| . |****** | . |****** | . |***** |	99.573 187.35 262.78 325.59 375.48
Dec 08 (F)	1 2 3 4 5	. |*******| . |****** | . |***** | . |**** | . |**** |	67.796 119.57 156.31 186.79 212.84	Jan 10 (S)	. |*******| . |*******| . |****** | . |***** | . |***** |	38.207 71.588 100.20 124.05 143.07	Mar 11 (F)	.|*******| .|*******| .|*******| .|****** | .|****** |	123.60 236.16 337.38 427.37 506.07

Dec	1	. |****** |	59.203	Feb	.	47.043	Mar	.|*******|	122.72
08	2	. |***** |	97.364	10	|*******|	87.534	11	.|*******|	233.86
(S)	3	. |**** |	118.17	(F)	. |****** |	121.70	(S)	.|******* |	333.41
	4	. |*** |	132.02		. |****** |	149.68		.|******* |	421.48
	5	. |** |	141.19		. |***** |	172.45		.|******* |	498.09
					. |***** |				
Jan	1	.	61.878	Feb	.	48.030	Apr	. |*******|	100.35
09	2	|*******|	116.49	10	|*******|	90.253	11	. |*******|	190.42
(F)	3	.	163.93	(S)	.	126.79	(F)	. |****** |	270.68
	4	|*******|	207.58		|*******|	157.74		. |****** |	340.66
	5	. |****** |	247.67		. |****** |	183.75		. |****** |	404.81
		. |****** |			. |****** |				
		. |****** |			. |***** |				
Jan	1	.	63.151	Mar	.	75.415	Apr	. |*******|	107.17
09	2	|*******|	120.06	10	|*******|	145.19	11	. |*******|	207.17
(S)	3	.	170.77	(F)	.	209.35	(S)	. |*******|	300.20
	4	|*******|	217.92		|*******|	267.49		. |*******|	385.15
	5	. |****** |	261.81		.	319.85		. |****** |	461.83
		. |****** |			|*******|				
		. |****** |			. |****** |				
					. |****** |				
Feb	1	.	85.192	Mar	.	75.294	May	.|*******|	122.78
09	2	|*******|	162.71	10	|*******|	144.76	11	.|*******|	232.44
(F)	3	.	232.76	(S)	.	208.39	(F)	.|******* |	329.64
	4	|*******|	298.62		|*******|	265.98		.|******* |	413.90
	5	.	361.25		.	317.66		.|******* |	490.54
		|*******|			|*******|				
		. |****** |			. |****** |				
		. |****** |			. |****** |				
Feb	1	.	86.339	Apr	. |****** |	44.667	May	.|*******|	130.74
09	2	|*******|	165.89	10	. |***** |	76.668	11	.|*******|	251.92
(S)	3	.	238.83	(F)	. |**** |	98.235	(S)	.|*******|	363.82
	4	|*******|	307.73		. |*** |	109.32		.|******* |	465.24
	5	.	373.54		. |** |	114.70		.|******* |	556.04
		|*******|							
		. |****** |							
		. |****** |							
Mar	1	.|*******|	107.95	Apr	.	49.432	June	.|*******|	145.34
09	2	.|*******|	208.05	10	|*******|	84.593	11	.|*******|	274.05
(F)	3	.|*******|	299.08	(S)	. |****** |	107.45	(F)	.|******* |	387.05
	4	.|******* |	385.29		. |***** |	119.65		.|******* |	485.53
	5	.|******* |	466.74		. |*** |	124.36		.|******* |	574.39
					. |** |				
Mar	1	.|*******|	108.59	May	.	65.281	June	.|*******|	151.82
09	2	.|*******|	209.88	10	|*******|	113.80	11	.|*******|	289.55
(S)	3	.|*******|	302.91	(F)	. |****** |	147.36	(S)	.|*******|	413.78
	4	.|*******|	391.43		. |***** |	167.15		.|******* |	525.62
	5	.|******* |	475.67		. |**** |	178.90		.|******* |	625.16
					. |*** |				

Apr 09 (F)	1 2 3 4 5	. |*******| . |*******| . |******* | . |******* | . |****** |	68.334 129.35 182.08 226.09 264.15	May 10 (S)	. |*******| . |******* | . |******* | . |***** | . |**** |	75.934 138.51 187.34 223.22 247.91	July 11 (F)	. |*******| . |*******| . |*******| . |*******| . |******* |	72.277 140.82 205.67 266.81 324.55
Apr 09 (S)	1 2 3 4 5	. |*******| . |*******| . |******* | . |******* | . |****** |	67.638 127.72 179.37 222.39 259.85	June 10 (F)	. |*******| . |******* | . |***** | . |**** | . |*** |	87.573 155.96 206.54 239.65 264.17	July 11 (S)	. |*******| . |*******| . |*******| . |*******| . |******* |	72.135 140.46 205.02 265.80 323.22
May 09 (F)	1 2 3 4 5	. |*******| . |*******| . |*******| . |*******| . |******* |	93.128 179.59 260.41 335.84 407.36	June 10 (S)	. |*******| . |******* | . |******* | . |***** | . |**** |	92.984 169.56 229.55 272.41 306.03	Aug 11 (F)	. |******** . |*******| . |*******| . |*******| . |*******|	96.335 190.02 281.07 369.43 454.58
May 09 (S)	1 2 3 4 5	. |*******| . |*******| . |*******| . |*******| . |******* |	92.646 178.45 258.57 333.42 404.71	July 10 (F)	. |******** . |*******| . |*******| . |*******| . |*******|	70.154 138.61 204.59 267.02 325.42	Aug 11 (S)	. |******** . |*******| . |*******| . |*******| . |*******|	96.943 191.84 284.67 375.37 463.45
June 09 (F)	1 2 3 4 5	.|*******| .|*******| .|*******| .|******* | .|******* |	117.89 227.76 329.08 421.57 505.23	July 10 (S)	. |******** . |*******| . |*******| . |*******| . |*******|	70.080 138.36 204.07 266.01 323.75	Sep 11 (F)	.|*******| .|*******| .|*******| .|*******| .|*******|	118.94 232.90 341.93 446.05 545.08
June 09 (S)	1 2 3 4 5	.|*******| .|*******| .|*******| .|******* | .|******* |	117.82 227.56 328.72 421.02 504.55	Aug 10 (F)	. |******** . |*******| . |*******| .	94.819 186.48 273.81 356.20 433.36	Sep 11 (S)	.|******** .|*******| .|*******| .|*******| .|*******|	121.09 239.28 354.57 466.89 576.05

					|*******| . |*******|				
July 09 (F)	1 2 3 4 5	|*******| |*******| . |****** | . |****** | . |***** |	34.697 66.090 93.215 116.09 135.19	Aug 10 (S)	. |******** . |*******| . |*******| . |*******| . |*******|	94.890 186.71 274.19 356.36 433.14	Nov 11 (F)	. |****** | . |***** | . |**** | . |*** | . |** |	29.169 47.605 60.289 67.524 70.382
July 09 (S)	1 2 3 4 5	|*******| |*******| . |****** | . |****** | . |***** |	34.697 66.090 93.215 116.09 135.19	Sep 10 (F)	.|*******| .|*******| .|*******| .|*******| .|*******|	115.87 228.21 336.14 439.48 536.68	Nov 11 (S)	. |****** | . |***** | . |**** | . |*** | . |** |	30.483 51.073 65.221 73.691 77.975
Aug 09 (F)	1 2 3 4 5	. |*******| . |*******| . |*******| . |*******| . |****** |	58.211 113.24 165.12 213.37 257.95	Sep 10 (S)	.|*******| .|*******| .|*******| .|*******| .|*******|	115.88 228.23 336.07 438.91 535.42	Dec 11 (F)	. |*******| . |****** | . |***** | . |**** | . |*** |	52.694 91.844 122.09 142.72 154.77
							Dec 11 (S)	. |*******| . |****** | . |***** | . |***** | . |**** |	55.657 100.05 135.43 161.23 178.86

Source: *Authors' calculation based on Annual reports of EIJHE (Various years)*

Table A2 : Results of Autocorrelation for Sacking Bag

Cont.	Lag	Autocorrelation	Q-Stat	Cont.	Autocorrelation	Q-Stat	Cont.	Autocorrelation	Q-Stat
July 08 (F)	1	. |****** |	37.045	Aug	. |*******|	52.047	Oct	. |*******|	59.176
	2								
	3	. |**** |	54.335	09	. |****** |	95.443	10	. |*******|	109.35
	4	. |*** |	66.143	(S)	. |****** |	131.61	(F)	. |****** |	151.14
	5	. |** |	72.114		. |***** |	160.64		. |***** |	185.38
		. |** |	75.652		. |**** |	182.80		. |***** |	214.52
July 08 (S)	1	. |*******|	52.108	Sept	. |*******|	70.766	Oct	. |*******|	60.025
	2								
	3	. |****** |	91.623	09	. |****** |	130.67	10	. |*******|	111.75
	4	. |***** |	116.56	(F)	. |****** |	180.19	(S)	. |****** |	155.28
	5	. |**** |	131.89		. |***** |	219.92		. |****** |	191.38
		. |*** |	139.82		. |***** |	250.60		. |***** |	222.35
Aug 08 (F)	1	. |***** |	36.120	Sept	. |*******|	72.093	Nov	. |*******|	79.084
	2								
	3	. |**** |	61.462	09	. |*******|	134.53	10	. |*******|	146.88
	4								
	5	. |**** |	82.924	(S)	. |****** |	187.64	(F)	. |****** |	202.38
		. |*** |	98.406		. |****** |	231.60		. |***** |	246.80
		. |*** |	110.97		. |***** |	266.74		. |***** |	281.91
Aug 08 (S)	1	. |****** |	52.809	Oct	. |*******|	72.395	Nov	. |*******|	80.019
	2								
	3	. |***** |	98.167	09	. |*******|	138.40	10	. |*******|	149.88
	4								
	5	. |***** |	137.70	(F)	. |*******|	198.51	(F)	. |****** |	208.52
		. |***** |	171.18		. |****** |	252.35		. |****** |	256.90
		. |**** |	199.53		. |****** |	300.46		. |***** |	296.60
Sep 08 (F)	1	. |*******|	87.541	Oct	. |*******|	73.351	Dec	. |*******|	107.18
	2								
	3	. |****** |	167.57	09	. |*******|	141.20	10	. |*******|	206.39
	4								
	5	. |****** |	244.69	(F)	. |*******|	203.87	(F)	. |*******|	296.12
		. |****** |	317.21		. |****** |	260.83		. |****** |	376.54
		. |****** |	386.88		. |****** |	312.30		. |****** |	448.79
Sep 08 (S)	1	. |*******|	98.485	Nov	. |*******|	95.496	Dec	. |*******|	107.85
	2								
	3	. |*******|	191.90	09	. |*******|	184.65	10	. |*******|	208.40
	4								
	5	. |*******|	282.04	(F)	. |*******|	267.36	(S)	. |*******|	300.62
		. |*******|	368.66		. |*******|	343.40		. |****** |	384.87
		. |****** |	451.56		. |****** |	413.25		. |****** |	462.17
Oct 08 (F)	1	. |****** |	36.412	Nov	. |*******|	96.402	Jan	. |*******|	84.587
	2								
	3	. |***** |	59.777	09	.	187.31	11	. |*******|	163.87

	4				|*******|			
	5	. |**** |	73.190	(S)	. |*******|	272.43	(F)	. |*******|	234.45
		. |** |	78.410		. |*******|	351.40		. |****** |	296.72
		. |** |	81.169		. |****** |	424.55		. |****** |	350.63
Oct 08 (S)	1 2 3 4	. |*******|	43.872	Dec 09 (F)	. |*******|	107.70	Jan 11 (S)	. |*******|	85.553
		. |****** |	80.169		. |*******|	210.20		. |*******|	166.73
		. |****** |	111.11		. |*******|	307.49		. |*******|	240.52
		. |***** |	136.50		. |*******|	399.33		. |****** |	307.19
		. |***** |	159.87		. |*******|	485.59		. |****** |	366.35
Nov 08 (F)	1 2 3 4 5	. |*******|	55.780	Dec 09 (S)	. |********	108.66	Feb 11 (F)	. |*******|	104.07
		. |***** |	94.251		. |*******|	213.02		. |*******|	200.44
		. |**** |	119.25		. |*******|	312.82		. |*******|	285.68
		. |*** |	132.32		. |*******|	407.74		. |****** |	360.39
		. |** |	139.87		. |*******|	497.51		. |****** |	424.61
Nov 08 (S)	1 2 3 4 5	. |*******|	64.353	Jan 10 (F)	. |*******|	39.253	Feb 11 (S)	. |*******|	105.89
		. |****** |	117.89		. |*******|	73.058		. |*******|	205.81
		. |****** |	162.84		. |****** |	101.49		. |*******|	296.77
		. |***** |	199.52		. |***** |	124.91		. |****** |	379.13
		. |***** |	230.77		. |***** |	143.11		. |****** |	452.47
Dec 08 (F)	1 2 3 4 5	. |*******|	67.229	Jan 10 (S)	. |*******|	39.073	Mar 11 (F)	.|*******|	127.42
		. |****** |	117.04		. |*******|	73.411		.|*******|	244.12
		. |***** |	153.18		. |****** |	103.03		.|*******|	346.53
		. |**** |	181.04		. |****** |	127.82		.|****** |	435.34
		. |**** |	203.50		. |***** |	147.59		.|****** |	510.83
Dec 08 (S)	1 2 3 4 5	. |*******|	76.616	Feb 10 (F)	. |*******|	48.441	Mar 11 (S)	.|*******|	129.43
		. |*******|	143.40		. |*******|	89.460		.|*******|	249.96
		. |****** |	201.86		. |****** |	123.49		.|*******|	358.58
		. |****** |	253.81		. |***** |	151.13		.|****** |	455.62
		. |****** |	301.01		. |***** |	173.86		.|****** |	540.85
Jan 09	1 2	. |*******|	62.799	Feb	. |*******|	48.168	Apr	. |*******|	104.92

(F)	3	. |******* |	119.61	10	. |****** |	88.726	11	. |******* |	201.25
	4	. |****** |	170.65	(S)	. |****** |	122.55	(F)	. |******* |	289.77
	5	. |****** |	218.64		. |***** |	150.09		. |****** |	370.32
		. |****** |	262.66		. |***** |	172.87		. |****** |	443.19
Jan	1	. |******* |	65.469	Mar	.	76.866	Apr	. |******* |	105.87
09	2				|******* |				
(S)	3	. |******* |	127.20	10	.	147.73	11	. |******* |	205.74
	4				|******* |				
	5	. |******* |	184.86	(F)	.	212.57	(S)	. |******* |	300.33
					|******* |				
		. |******* |	239.32		. |****** |	271.40		. |******* |	389.18
		. |****** |	290.14		. |****** |	325.12		. |****** |	472.42
Feb	1	. |******* |	84.033	Mar	.	75.730	May	.|******* |	133.10
09	2				|******* |				
(F)	3	. |******* |	159.79	10	.	144.57	11	.|******* |	258.25
	4				|******* |				
	5	. |****** |	226.75	(S)	.	206.71	(F)	.|******* |	375.99
					|******* |				
		. |****** |	287.02		. |****** |	262.18		.|******* |	485.83
		. |****** |	340.12		. |****** |	311.97		.|****** |	587.99
Feb	1	. |******* |	87.945	Apr	.	57.188	May	.|******* |	133.93
09	2				|******* |				
(S)	3	. |******* |	170.82	10	.	108.57	11	.|******* |	262.31
	4				|******* |				
	5	. |******* |	247.91	(F)	. |****** |	154.36	(S)	.|******* |	385.62
		. |******* |	319.56		. |****** |	192.50		.|******* |	503.16
		. |****** |	385.84		. |***** |	223.56		.|******* |	615.01
Mar	1	.|******* |	103.48	Apr	.	57.612	June	.|******* |	152.08
09	2				|******* |				
(F)	3	.|******* |	196.29	10	.	109.83	11	.|******* |	289.49
	4				|******* |				
	5	.|****** |	276.84	(S)	.	156.57	(F)	.|******* |	413.20
					|******* |				
		.|****** |	349.53		. |****** |	196.81		.|****** |	526.99
		.|****** |	414.17		. |****** |	231.40		.|****** |	631.20
Mar	1	.|******* |	108.68	May	.	76.749	June	.|******* |	154.83
09	2				|******* |				
(S)	3	.|******* |	210.24	10	.	144.17	11	.|******* |	299.15
	4				|******* |				
	5	.|******* |	303.16	(F)	. |****** |	202.04	(S)	.|******* |	433.59
		.|****** |	389.20		. |****** |	249.02		.|******* |	561.77
		.|****** |	468.43		. |***** |	286.70		.|****** |	683.78
Apr	1	. |******* |	69.830	May	.	80.307	July	. |******* |	72.768
09	2				|******* |				
(F)	3	. |******* |	134.32	10	.	153.56	11	. |******* |	142.34
	4				|******* |				
	5	. |******* |	192.61	(S)	.	219.39	(F)	. |******* |	208.74
					|******* |				
		. |****** |	242.69		. |****** |	276.86		. |******* |	272.02

		. |****** |	285.56		. |****** |	327.32		. |*******|	331.39
Apr	1	. |*******|	69.830	June	.	98.459	July	. |*******|	72.915
09	2				|*******|					
(S)	3	. |*******|	134.32	10	.	183.26	11	. |*******|	142.77
	4				|*******|					
	5	. |*******|	192.61	(F)	. |****** |	254.44	(S)	. |*******|	209.61
		. |****** |	242.69		. |***** |	310.66		. |*******|	273.45
		. |****** |	285.56		. |***** |	354.34		. |*******|	333.32
May	1	. |*******|	95.211	June	.	102.47	Aug	.	96.557
09	2				|*******|			|********	
(F)	3	. |*******|	185.68	10	.	194.20	11	. |*******|	190.68
	4				|*******|					
	5	. |*******|	271.01	(S)	. |****** |	275.04	(F)	. |*******|	282.39
		. |*******|	350.59		. |****** |	344.01		. |*******|	371.68
		. |****** |	424.66		. |***** |	403.16		. |*******|	458.64
May	1	. |*******|	95.211	July	.	66.298	Aug	.	96.801
09	2				|*******|			|********	
(S)	3	. |*******|	185.68	10	.	129.43	11	. |*******|	191.41
	4				|*******|					
	5	. |*******|	271.01	(F)	.	187.56	(S)	. |*******|	283.84
					|*******|					
		. |*******|	350.59		. |****** |	240.95		. |*******|	374.09
		. |****** |	424.66		. |****** |	291.73		. |*******|	462.25
June	1	.|********	121.92	July	.	66.298	Sep	.|********	120.79
09	2				|*******|					
(F)	3	.|*******|	239.31	10	.	129.43	11	.|*******|	238.40
	4				|*******|					
	5	.|*******|	351.97	(S)	.	187.56	(F)	.|*******|	352.85
					|*******|					
		.|*******|	459.59		. |****** |	240.95		.|*******|	464.15
		.|*******|	562.10		. |****** |	291.73		.|*******|	572.40
June	1	.|********	121.92	Aug	.	87.013	Sep	.|********	121.02
09	2				|*******|					
(S)	3	.|*******|	239.31	10	.	164.45	11	.|*******|	239.07
	4				|*******|					
	5	.|*******|	351.97	(F)	. |****** |	231.63	(S)	.|*******|	354.16
		.|*******|	459.59		. |****** |	289.70		.|*******|	466.33
		.|*******|	562.10		. |****** |	342.31		.|*******|	575.68
July	1	. |* . |	0.3782	Aug	.	87.013	Nov	. |******* |	30.155
09	2				|*******|					
(F)	3	. |* . |	0.6498	10	.	164.45	11	. |***** |	50.200
	4				|*******|					
	5	. |* . |	1.1720	(S)	. |****** |	231.63	(F)	. |**** |	62.292
		. |* . |	1.6531		. |****** |	289.70		. |*** |	67.991
		. | . |	1.7898		. |****** |	342.31		. |** |	69.937
July	1	|*******|	28.738	Sep	.|*******|	113.49	Nov	. |*******|	31.339
09	2	. |****** |	48.661	10	.|*******|	220.10	11	. |***** |	53.367
(S)	3	. |****** |	64.279	(F)	.|*******|	319.42	(S)	. |**** |	67.098
	4	. |**** |	77.997		.|*******|	411.50		. |*** |	74.018

	5	. |**** |	88.019		.|****** |	497.77		. |** |	76.569
Aug	1	. |*******|	51.383	Sep	.|*******|	113.69	Dec	. |*******|	55.884
09	2	. |****** |	93.835	10	.|*******|	220.39	11	. |****** |	100.68
(F)	3	. |****** |	128.69	(S)	.|*******|	319.68	(F)	. |***** |	135.42
	4	. |***** |	156.03		.|*******|	412.06		. |***** |	160.73
	5	. |**** |	176.42		.|****** |	498.79		. |**** |	178.52
							Dec	. |*******|	58.754
							11	. |*******|	108.82
							(S)	. |****** |	150.27
								. |***** |	183.37
								. |***** |	209.16

Source: *Authors' calculation based on Annual reports of EIJHE (Various years)*

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Green Profit-A Case of WIPRO Initiatives

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Ashish B. Gorvadiya

Abstract:

Increasing pollution has resulted into various problems for the people living in this world. The problems like GHG, Ozone layer depletion, Global warming etc. have resulted into the problems for the mankind. In most of the cases, this pollution is the result of operations of business organizations. The business organizations use, rather exploit, the natural resources and create dangerous environmental problems. It can be concluded that the business organizations are responsible for the environmental degradation. Over the last few years, the business organizations have created such a large damage to the environment which is not easily recoverable. All the governments, businesses, academia and NGOs all over the world are seriously thinking over this problem and trying to find out some agreeable solutions. But it seems very difficult to recover the environmental damage easily. In this situation, there are some organizations like Wipro that are undertaking some voluntary steps to recover the environmental damage. Though the government has not made it compulsory for the business organizations to take such steps, Wipro believes it as its voluntary responsibility and fulfills it with due care. Some experts are of the view that such efforts involve a huge cost and as a result the profit of the company goes down. But this is not true. The organizations that take such efforts create positive image in the people's mind and as a result its financial performance improves. A case study of Wipro presented here reveals this fact with proof.

Key Words: *Environmental problems, Environmental degradation, Voluntary responsibility, Huge cost, Positive image.*

Introduction:

Government, businesses and academia all over the world are under increasing pressure of taking measures for controlling pollution. More and more consumers are now making purchasing decisions with the consideration of environment. The world organizations, government and statutory bodies demand that the companies cut the energy consumption, reduce carbon emission, reduce water consumption or make any such efforts that reduce the harm to and create the positive impact on the environment. The companies all over the world are now heading their efforts in this direction.

The company that is focused solely on profit loses its chance for long term survival. The companies that ignore social and environmental costs of their operations lessen the chances of their long run survival. Agreeing with this view, the companies are now addressing ecological and social challenges in order to achieve long term sustainability. Wipro is one of such pioneering companies that have undertaken ecological considerations in their operations. Some critics argue that the organizations that undertake environmental considerations have to bear a lot of cost for such initiatives and ultimately it adversely affects the profit of the firm. In reality, this argument does not seem to work. Actually, the

organization that undertake its operations with environmental considerations can create positive image in the minds of all its stake holders and as a result, it positively affect the profitability of the organization. This article has tried to prove this fact by presenting a case study of Wipro. It is to be noted that Wipro undertakes these efforts voluntarily. There are no such rules prepared by the government or no such act is passed for the companies to follow the practices for the environment protection.

Objectives of the Study:

The presented study is undertaken to achieve the following objectives.

(1) To look into the environmental problems.

(2) To consider Wipro's initiatives for environment protection.

(3) To observe Wipro's financial performance.

(4) To reveal that company's care for the society and environment creates positive image in the people's mind.

(5) To reveal that the positive image about the company in the people's mind can improve its financial performance.

WIPRO Initiatives:

Over the last decade, Wipro has consciously engaged with issues that go beyond economic gain and are out of the standard activities of "Business". Wipro has done this by interaction with several social leaders, NGOs, etc. By this interaction, Wipro has tried to create a just, humane and equitable society. The initiatives of Wipro take the form of Wipro Applying Thought in Schools (WATIS), Mission 10X and Wipro Cares.

- **Wipro Applying Thought in Schools (WATIS):**

  WATIS is focused initiative towards the systematic reform in school education in India, to improve the quality of our education. This initiative involves over 1000 schools across 17 states with a partnership of over 30 organizations.

- **Mission 10X:**

  Mission 10X was launched in 2007. Mission 10X aims at promoting systematic changes to current teaching-learning paradigms in Engineering Education in collaboration with academia. Mission 10X is formed as a not-for-profit trust and its vision is to empower 10,000 faculty members by 2010.

- **Wipro Cares:**

  Wipro Care is a collaborative initiative of Wipro and its employees. In this initiative, they contribute managerial expertise, collective knowledge and money in community development wherever they operate.

Wipro Applying Thought in School, Mission 10X and Wipro Cares are the basic issues of society and community. They have felt the need to add a comprehensive initiative on ecological sustainability. This initiative includes substantial work on water and energy conservation and waste management.

- **Energy Efficiency:**

Wipro has undertaken a range of measures to improve energy efficiency of their buildings

and campuses. This has resulted in a decrease in per employee energy consumption from 338 units per month in 2001-02 to 275 units in 2007-08, an overall decrease of 18.6%. Wipro expects to reduce the energy consumption even more rapidly in the coming years as more number of employees move to the LEED (Leadership in Energy Efficient Design) certified buildings. The following table shows the Energy Efficiency initiatives by Wipro.

Energy Efficiency Area	Implemented Initiatives
Building Design	(a) LEED rated campuses at Gurgaon (Platinum) and Kochi (Gold) help in energy efficiency improvement of nearly 15% (b) Use of Skylighters in basements (c) Double glazed glass reduces cooling demand (d) Greater use of natural ventilation and lighting
Cooling Equipment	(a) Shift from window AC to centralized cooling systems (b) Adopted technologies that enhance cooling efficiency like Variable Frequency Drives, Screw compressors, Autovents, Ambiators which use ambient air in Winter
Computing Equipment	(a) Use of energy star certifies Pcs (b) Use of computing tools to switch off power automatically (c) Increasing use of TFT monitors in lieu of CRT monitors (d) Use of virtualization technologies in data centers
Lighting	(a) Use of occupancy sensors and timers (b) 100% use of CFLs and Hi-lumen tubes
Processes	(a) Regular energy audits (b) Life cycle analysis of equipment like lifts, ACs and right sizing of the same (c) Use of Building Management System (BMS) to optimize energy use
Practices	(a) Switching off all equipments- PCs, Photocopiers, ACs- after office hours (b) Recalibrate temperature settings in conference rooms and laboratories

(***Source:*** *CSR Report of Wipro*)

- **Use of Renewable Energy:**

  Wipro is constantly focused on renewable sources of energy. Wipro has placed Solar Water heaters in a couple of large campus cafeteria as well as to service the water heating requirements for 372 rooms across guesthouse facilities in Bangalore,

Hyderabad, Pune and Kolkata. This has resulted in saving 451,744 units of electricity during the year. Wipro has successfully completed the pilot project using windmills in their electronic city, Bangalore campus to power streetlights.

- **Climate Change and Green House Gas (GHG) Emission:**

  The global GHG emissions are estimated at 35 billion tones. Governments, public bodies, R & D institutions, NGOs all around the world are thinking over this problem. Wipro is one of the initial signatories to the CII Mission on Sustainable Growth, a 10 point code of ecological conduct for organizations to follow.

- **Transportation and Commuting:**

  42% of Wipro's Indian employees use the company operated transport services, 17% use their personal vehicles while the remaining 41% use public transport. The first two categories amount to 46184 tons of GHG impact. Wipro is trying to reduce the GHG impact further by innovative processes and technologies like car pooling and virtual meetings.

- **Water Efficiency:**

  Water conservation continues to become the principal focus area at all the locations of Wipro.

  - Wipro recycled 707492 m3 of water in 19 of their major locations, using state of the art Sewage Treatment Plants.
  - Reverse Osmosis plants in major centers ensure a very high quantity of drinking water (IS 10500 standard), which prevents the need of purchasing bottled water.
  - Use of treated water for gardening, landscaping and toilet-flushing.
  - Use of sprinklers for watering the garden, landscaped area at scheduled intervals.
  - Implementation of rain water harvesting at campus location and reuse of rain water after treatment for gardening, cooling towers, sanitation purpose and recharge to the ground.
  - Use of dish washing machines to clean utensils at kitchen
  - Pre-valves installation.
  - Installation of Auto sensors for Urinals and Wash Basins.
  - Installation of meters to monitor the water usage wherever feasible.
  - Automatic level sensors fixed in main tank and STP water tank.

- **Pollution and Waste Management:**

  Pollution of air and water poses biggest threat to the environment. Wipro is consciously taking efforts for managing this pollution. The main highlights of Wipro's waste management program are given below.

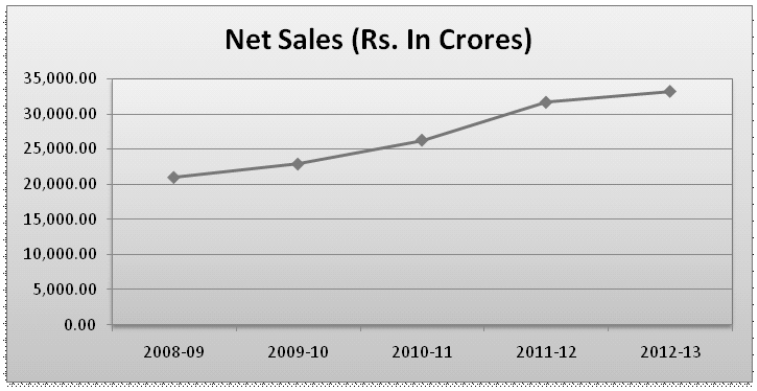
  - Using treated waste water for non-drinking purpose. The waste water is treated in their own STP units and comprises 36% of the total water consumption
  - Recycling of used and waste paper in their paper recycling plants at Electronic city Banglore.

- Recycling of food waste to source calorific heat for cafeteria kitchens. This is done in the Biomass conversion unit at Electronic city, Banglore.
- Safe disposal of their electronic waste through authorized partners in Banglore.
- Safe disposal of hazardous waste such as used oil and batteries through authorized partners.
- Controlled emission of ozone depleting substances and air pollutants like oxides of nitrogen and sulphur.

As mentioned above, Wipro has under taken several measures for maintaining ecological stability. Wipro has taken special care of the environment in all its operations. This care for the environment involves huge cost. Some critics believe that because of such kind of efforts, the profit of the organization reduces. But it is not the reality. Instead, when a company cares for the society and the environment, its image in the eyes of the people improves and the company gets the favor of the stake holders. This improves the financial performance of the company. Wipro is the torch bearer in this direction. Below given statistical data of Wipro, reveals that in spite of incurring huge cost for environmental considerations, its financial performance continuously improves.

Table showing Net Sales (Rs. In Crores)

Year	Net Sales (Rs. In Crores)
2008-09	21,023.10
2009-10	22,922.00
2010-11	26,300.50
2011-12	31,682.90
2012-13	33,226.50

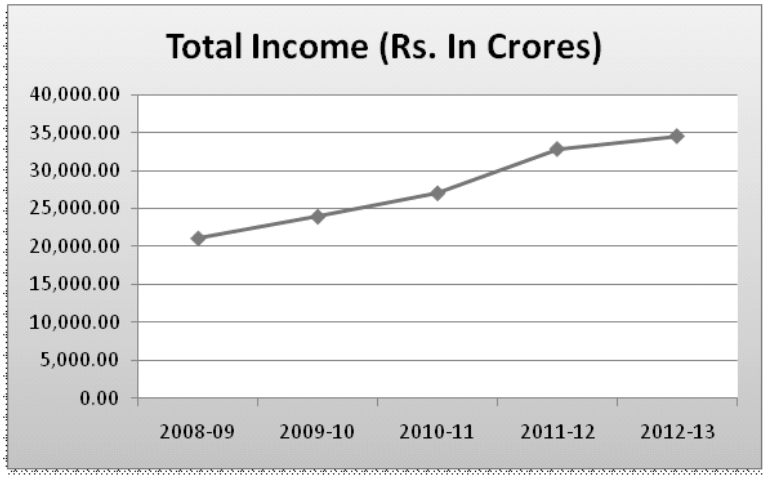


As it can be seen from the above given table and graph the Net Sales of the company is increasing continuously in the last five years. A net sale in the year 2008-09 was 21,023.10 which increased to 33,226.50 in the year 2012-13. We can conclude that the company's

efforts towards ecological balance have created positive impact on the customers and clients which resulted into increased sales.

Table showing Total Income (Rs in Crores)

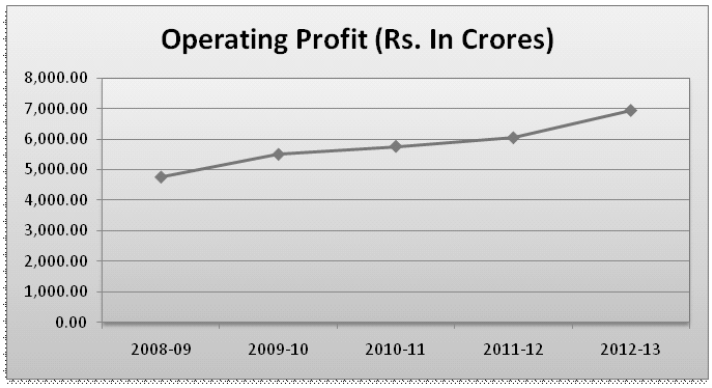
Year	Total Income (Rs. In Crores)
2008-09	21,023.10
2009-10	23,899.70
2010-11	27,012.80
2011-12	32,865.40
2012-13	34.570.00



As given above, the total income of the company is also increasing. Its total income was Rs. 21,023.10 crores in the year 2008-09 which increased to 34,570.00 in the year 2012-13. This also shows the positive impact of the company's efforts.

Table showing Operating Profit (Rs in Crores)

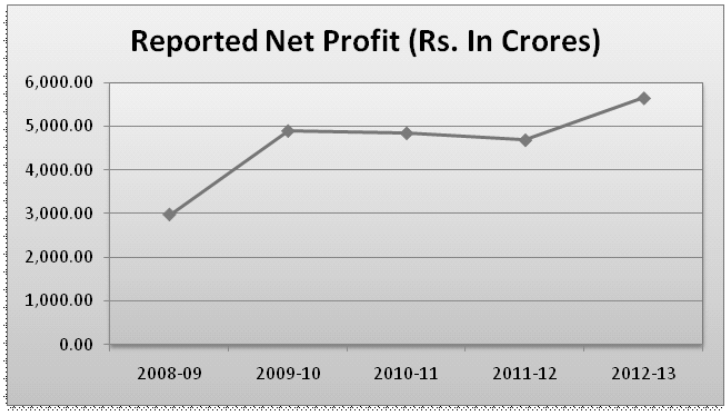
Year	Operating Profit (Rs. In Crores)
2008-09	4,758.70
2009-10	5,501.50
2010-11	5,760.90
2011-12	6,043.00
2012-13	6,933.50



When we look at the operating profit of the company, it also shows the positive trend. In the year 2008-09, the operating profit of the company was Rs. 4,758.70 crores, which increased to Rs. 6,933.50 crores in the year 2012-13. It means that the company is on the path of growth in profit. We can say that the positive approach to the environment has led the company to this growth.

Table showing Reported Net Profit (Rs. In Crores)

Year	Net Profit (Rs. In Crores)
2008-09	2,973.80
2009-10	4,898.00
2010-11	4,843.70
2011-12	4,685.10
2012-13	5,650.20

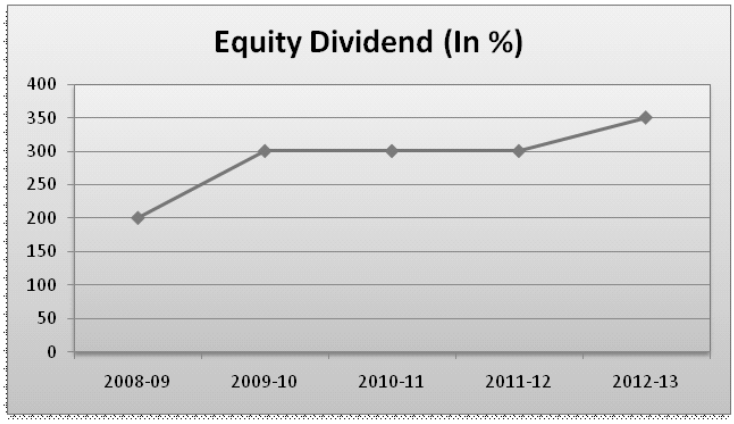


The Reported Net Profit of the company is also showing the similar trend for the study period. In the year 2008-09, the Reported Net Profit was Rs. 2,973.80 crores which increased

to Rs. 5,650.20 crores in 2012-13. The increase in Reported Net Profit may also be the result of positive approach to the environment.

Table showing Equity Dividend (In %)

Year	Equity Dividend (In %)
2008-09	200.00
2009-10	300.00
2010-11	300.00
2011-12	300.00



In case of Equity Dividend, it was 200.00% in the year 2008-09. It increased to 350.00% in the year 2012-13. Thus, there is 175% rise in the equity dividend during time period of last 5 years. The company can pay such a large dividend only because of its good financial health. This may also be the result of company's efforts for the environment protection.

Conclusion:

Thus, above given discussion reveals that the company that undertakes the considerable efforts for the society and environment is viewed as a "good company" by the stake holders. The stake holders have positive image in their minds for such company. The products produced by such company are highly valued by the customers and the demand for such product increases. As a result the company earns good profit from the market. Wipro has undertaken considerable efforts for the environment and the company is leveraging the advantages of these efforts in terms of increased sales, profit and equity dividend. In short, we can say that the profit earned by the company is "Green Profit" because it is earned by the green efforts for the environment protection.

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A Study on Factors that Shapes the Investment criteria of Indian Investors

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Priyanka Sharma

Abstract :

An investor is always a risk-avert. The tendency of an investor would always be to reduce unsystematic risk to the possible margin or to maximize returns at a given level of risk. In order to achieve their desired objectives investor designs investment policies based on the way they perceive the risk factors and rate of return they expect. Perception of risk and expectation of returns are psychological factors and that may vary significantly in a given set of investors. These factors are also the key determinants that shape the investment policy. Thus it is interesting to know the various factors that the investors hold relatively more significant to set their investment criteria. The criterion framed by the investors might diverge from the traditional theoretical connotations as the investors will not always behave rationally. The behavior of investors to a large extent is risk perception and expectation driven. Thus the study will help to reveal the factors that the investors give due weightage to take investment decision.

Key Words: *Investor, Stock Market, Investment Decision, Risk, Capital Formation and Wealth Creation.*

JEL Classification: *E44, G11*

Introduction :

In the era of globalization where the world has become a global village the Indian stock markets are exposed to international influences coupled up with domestic factors. It has enhanced the degree of volatility of stock markets. Thus an early recognition of the risks associated with making investment in stock market has become imperative on the part of the investors. This will enable them to strategize for better monetary yield.

In the recent periods, the Indian household sector has realized the fact that surplus money if kept idle as 'savings', will not result to appreciation of funds. For meeting the purpose they should become a part of wealth creation process. Thus wholly or partially such savings has been channelized to the stock market to invest in various types of securities. Such investment offers lucrative returns; however, there is a presence of risk element to a certain extent which is always borne by investors. Hence, in order to counter such risk investors always tend to adopt customized tactics.

Research Problem in Brief :

An investor is always a risk-avert. The tendency of an investor would always be to reduce unsystematic risk to the possible margin or to maximize returns at a given level of risk. In order to achieve their desired objectives investor designs investment policies based on the way they perceive the risk factors and rate of return they expect. Perception of risk and

expectation of returns are psychological factors and that may vary significantly in a given set of investors. These factors are also the key determinants that shape the investment policy. Thus it is interesting to know the various factors that the investors hold relatively more significant to set their investment criteria. The criterion framed by the investors might diverge from the traditional theoretical connotations as the investors will not always behave rationally. The behavior of investors to a large extent is risk perception and expectation driven. Thus the study will help to reveal the factors that the investors give due weightage to take investment decision.

Objectives of the Study :

The following are the objectives of the study:

- ❒ To study the percentage of savings that is invested in securities.
- ❒ To study the key motivating factor behind investing in securities.
- ❒ To study the determinants that serve as decisive factors for taking investment decision by the investors.
- ❒ To study the type of shares that the investors prefer to invest in.
- ❒ To verify whether there is any relationship between experience of investors in stock market operations and type of shares that the investors prefer to invest in.

Review of Literature :

A number of researchers have already conducted studies on the diversified aspects of the issue. A summary of findings of such studies are reviewed below:

Charls Schwab (2000)[3] revealed very practical, authoritative and easy-to-follow tips and suggestions for good investment in the stock market. According to him growth is the heart of successful investment. He suggested that before investing, one should be clear about the goal. He opined that the biggest risk is not in investing but in doing nothing and watching inflation eating away the savings. A very useful suggestion of the author is not to draw upon the income from investment but to reinvest it. A low risk approach will yield low return. So the author urged the investor to be aggressive, subject to his personal limits.

Nabhi Kumar Jain (1992)[7] specified certain tips for buying shares for holding and also for selling shares. He advised the investors to buy shares of a growing company of a growing industry. Buy shares by diversifying in a number of growth companies operating in a different but equally fast growing sector of the economy.

He suggested selling the shares the moment company has or almost reached the peak of its growth. Also, sell the shares the moment you realize you have made a mistake in the initial selection of the shares. The only option to decide when to buy and sell high priced shares is to identify the individual merit or demerit of each of the shares in the portfolio and arrive at a decision.

Preeti Singh (1986)[8] disclosed the basic rules for selecting the company to invest in. she opined that understanding and measuring return and risk is fundamental to the investment process. According to her most of the investor is risk avert. To have higher returns the investors has to face greater degree of risk. She concluded that the investors should be aware of pitfalls of investment. The investors should carefully analyze the financial statements of

the company with special emphasis on solvency, profitability, EPS and efficiency of the company.

Research Methodology :

The data required for the purpose of study has been collected from both primary and secondary sources. The primary data has been collected through a structured questionnaire concerning various factors that determines their investment policy. For the purpose of data collection the questionnaire framed was sent to 250 respondents. Out of that, around 81 were either remained non-responded or filled in ambiguously. Thus those cannot be used for the analysis and interpretation of results. Finally, the study was performed with a sample size of 169 investors. For the purpose of collection of secondary data various published sources such as magazines, journals, e-resources and dailies like Economic Times has been used.

Analysis and Interpretation of Data :

The data so collected were edited, coded and synchronized keeping in mind the need of the study. For analysis of the data statistical tool mainly correlation coefficients has been employed to derive out results. The statistical analysis has been done using MS-Excel and Statistical Package for Social Sciences (SPSS) version 20 software.

Limitations of the Study :

The study is suffered from the following limitations:

- The sample size is not large enough to make generalized conclusions.
- The study is dependent on a primary survey thus the personal bias of the respondents might have crept in.
- It is a micro-level study and thus all the causal factors could not be duly considered.

Findings and Analysis of Data Collected :

Percentage of savings that is invested in securities.

Table 1 -% Investment in Shares out of Total Savings

% Investment in Shares out of Total Savings	No. of Respondents	Percentage
0-25	71	42.01
26-50	62	36.69
51-75	28	16.57
76-100	8	4.73
Total	**169**	**100**

Source: *Primary Survey*

As exhibited by table 1 above that approximately 79% of the investors have invested less than 50% of their savings in shares. Only 21% has invested over a margin of 50% of savings. Thus it reflects the propensity of investors for a higher retention of funds either for keeping the money idle or for investing in alternative options. If the retained money is kept idle then it signifies a lower degree of participation in the wealth creation process and that may lead to a sluggish economic development. Further it also indicates that the confidence of investors for investing

in the financial securities has diluted due to the amplification of market volatility. There always remains uncertainty in the markets but then initiatives to educate the investors for dealing in stock market should be taken and stringent regulatory framework should be enforced to boost up the confidence of the investors. This will assure capital formation at a considerable pace.

Key motivating factor behind investing in securities

Table 2-Motivating factor behind investing in securities

Factors	No. of Respondents	Percentage
Income from Dividend	13	7.70
Capital Appreciation	132	78.10
Liquidity	18	10.65
Safety	6	3.55
Any Other	-	-
Total	**169**	**100**

Source: *Primary Survey*

It can be easily sorted out from the data table that most of the investors invest with a motive of capital appreciation. Around 78% of the investor expects a higher return on investment by way of capital appreciation than to earning from dividend. Capital appreciation requires sound investment strategy and timely decision making skills. If the investors fail to meet such expectations a dominant segment of investor will fade away.

Liquidity of shares appeal 10.65% of investors to invest in. shares are assumed to be somewhat liquid in nature i.e. readily convertible into cash or equivalent. But there are some exceptions to the myth. If the shares are not actively traded in the market or are not performing well an investor may not get buyers for it. Thus the investors should be cautious keeping in mind the fact that they might fail to divest at will.

Only 7.70% of investors invest for dividend and a meager 3.55% invests for safety. Thus it is quite evident to state that investors are ready to take more risks in order to earn higher rates of return.

Decisive factors for taking investment decision

Table 3- Decisive Factors for Taking Investment Decisions

Factors	No. of Respondents	Percentage
Management of the company	43	25.44
Earnings per share	16	9.47
Dividend	8	4.73
Track record of the company	34	20.12
Comparative price of shares	21	12.43
All of the above	47	27.81
Total	**169**	**100**

Source: *Primary Survey*

The data table above shows that majority of the investor consider all the parameters to adjudge the investment option. This reflects awareness of investors to choose the most efficient opportunities available. The management of the company is also paid considerable attention by the investors while investing as experienced and expertise navigators can sail the company smoothly even at tough times. Other factors such as track record of the company, EPS and comparative prices of shares account for around 42.02% which is justified enough. But it is interesting to observe that dividend stands for only 4.73%.

Type of shares that the investors prefer to invest in

Table 4-Type of Shares that the investors prefer to invest in

Type of Shares	No. of Respondents	Percentage
Highly volatile shares	60	35.50
Growth shares	24	14.20
Less volatile shares	36	21.30
Regular Income shares	32	18.95
Shares of fundamentally strong companies	11	6.50
Shares having high volume of trade	6	3.55
Total	**169**	**100**

Source: *Primary Survey*

The table shows that a major segment of investors (57% approx.) prefer to invest in shares which are volatile in their prices. Of it around 35.50% tend to invest in highly volatile shares. It represents the fact that most of the investors believe the generalized theory that highly volatile shares are vibrant and will yield better rates of return. But it always may not result to be it so. 21.30% investors prefer to invest in low volatile shares the reason being they want to play safe and do not intent to undertake a greater degree of risk. 14.20% of investors tend to invest in growth shares which are related to the growing sectors of the economy. With the emergence of new business arena the shares related to growth sector of an economy has tremendous opportunities ahead. But this fact is not well recognized by majority of the investors. Shares with high volume of trade and strong share fundamentals are found to be account for only 10.05%. Thus it can be said that this two factors do not have sharp influences on preference of the investors.

- **Relationship between experience of investors in stock market operations and type of shares that the investors prefer to invest in**

It is generally held that in the process to avert risk in investing in shares the experienced players stands to gain than to inexperienced ones. Thus they should differ in choices of shares to invest in. In order to verify such generalization an attempt has been made by correlating the experience of investor with type of share they prefer to invest.

Table 5-Experience of Investors in Stock Market Operations and Type of Shares that the Investors prefer to Invest

	Experience Profile of Investors (in years)									
	0-5		6-10		11-15		16-20		21-25	
Type of Shares	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
Highly volatile shares	25	44.64	20	29.41	9	36	3	30	3	30
Growth shares	7	12.50	4	5.88	7	28	4	40	2	20
Less volatile shares	15	26.79	14	20.59	3	12	2	20	2	20
Regular Income shares	9	16.07	19	27.94	4	16	-	-	-	-
Shares of fundamentally strong companies	-	-	8	11.76	2	8	1	10	-	-
Shares having high volume of trade	-	-	3	4.42	-	-	-	-	3	30
Total	**56**	**100**	**68**	**100**	**25**	**100**	**10**	**100**	**10**	**100**

Source: *Primary Survey*

High Volatile Shares

The results show that there is a tendency of all categories of investors to take considerable degree of risk with a hope of higher returns. However, the level of risk diminishes with experience.

Correlation between experience in stock market operations and selection of highly volatile shares:

Correlation Coefficient= -0.6952

A relatively high degree of negative correlation has been found in this case. The underlying reason may be attributed to the fact that with the increase in age of investors they tend to curb the practice to undertake higher risks.

Growth Shares

It was stated earlier that the investor do not recognizes the benefit of investment in growth shares. However the trends reveal that with experiences in stock market operations there is a considerable improvisation in their view.

Correlation between experience in stock market operations and selection of highly growth shares:

Correlation Coefficient= 0.5823

A positive degree of correlation supports the interpretations and comments made above.

Less Volatile Shares

Correlation between experience in stock market operations and selection of less volatile shares:

Correlation Coefficient= -0.4265

A relative low degree of negative correlation is found in this case. The reason may be the tendency of the investor to take moderate risk with increase in age.

Regular Income Shares

Correlation between experience in stock market operations and selection of regular income shares:

Correlation Coefficient= -0.7925

Higher dividends and a low retention ratio might disrupt the long run growth prospects of a company. The correlation results show a high degree of negative correlation. That implies with the increase in the experience index the investors become conscious of the fact. Thus they do not prefer such shares.

Concluding Thoughts :

India is growing at a considerable pace and it is expected that over a passage of time the scenario will be far better than of today's. In a growing economy like India it becomes indispensable that the household sector should channelize their savings to the priority sectors. This will lead to capital formation and a strengthened wealth creation process of the entire nation. Thus more and more investors should step in the stock market with funds to invest with appropriate and scientific strategies. This is where the investment aptitude and awareness of investor's comes into play. The sentiments and expectations of the investors should be appropriately protected and safeguarded in order to boost confidence in them and to stimulate more investment propensity.

Scope for Further Study :

This study suffers from certain limitations that provide a scope for further researches in future. The sample size is not large enough in this study which is question mark on the integrity of the results. Hence a large sample size will ensure better and more approximate results. Other factors such as diversification of portfolios and its periodical revision, risk management measure etc. can also be taken into consideration. This will canvass a more complete picture.

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Analyzing Business Risk through Ginni's Coefficient of Concentration: A Comparative Study of Select Domestic and Multinational Companies in Indian Pharmaceutical Industry

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Abstract:

The paradigm shift of the Indian economy to a market-dominated open economic system in 1991 from a state-dominated subsidized financial system consequent upon the world wide wave in favour of globalization and liberalization gaining momentum in the last quarter of the twentieth century and signing of the Trade Related Intellectual Property Rights System (TRIPS) agreement in 1995 are considered as watershed events for the Indian industries in the recent time. Pharmaceutical industry, one of the promising industries of the country, is not a silent spectator to witness these path breaking events. With the spectacular changes in the business milieu, the earning trends, the cost behavior pattern, capital productivity and liquidity policies in the Indian pharmaceutical industry have also changed radically. Consequently, the pattern of business risk associated with the companies in the Indian pharmaceutical industry has witnessed notable changes. A sizeable number of studies on the analysis of business risk in Indian corporate sector have been made during the last few decades. Study on the same issue, though few in numbers, have also been carried out emphasizing the study in the context of the post-liberalization eon. However, adequate attention has not yet been paid to the Indian pharmaceutical sector in respect of analyzing its business risk in the academic studies in the perspective of post-liberalization era. In this backdrop, the present study seeks to analyze the business risk in the Indian pharmaceutical industry during the period 2001-02 to 2010–11 and also to examine whether its findings are at par with the theoretical arguments as forwarded by the eminent theorists and researchers. The sample size of the study consists of twenty five companies which have been selected from the top thirty pharmaceutical companies in India (based on the sum of total income and total asset) following purposive sampling procedure. While measuring the business risk and its company specific components associated with the selected companies, Ginni's Coefficient of Concentration has been used.

Key Words: *Business Risk, Liquidity Risk, Cost Structure Risk, Capital Productivity Risk, Pharmaceutical Industry.*

Introduction :

In today's challenging and competitive environment, the task of designing appropriate strategies for managing risks in accomplishing the wealth maximization objective of corporates is of utmost importance (Mallik & Sur, 2009). Business risk (BR) is inherent in the business process of a company. It is gleaned from the randomness of the company's

proficiency of generating operating surplus. BR is caused by a number of factors which are commonly categorized as economy- specific, industry-specific and company-specific factors. Economy-specific factors are those that affect all the sectors of the economy, such as fluctuations in foreign exchanges, concentration of revenue, imports, inflation etc. Industry-specific factors relate to the industry to which the company belongs. Special status enjoyed by the industry, growth prospects of the output produced or service rendered by the industry in the market and so on are included in this category. Company-specific factors are explicit to the affairs of the company concerned such as managerial competence, cost structure, asset composition, organizational culture, ethical values and so on. Economy-risk, industry-risk and company-risk – these three components of BR stem from economy-specific factors, industry–specific factors and company-specific factors respectively. The company risk emanates from precariousness in one or more fronts of the company, important of which are instability in cost behavior pattern, dispersion of revenue generating capability using long term funds and variability in short term debt paying capability. These weaknesses lead to cost structure risk, capital productivity risk and liquidity risk (Sur & Mitra, 2011). There is almost no scope to exercise control over the economy risk and industry risk while it is, to some extent, possible to have control over the company risk. Theoretically, it is expected that high risk can be rewarded by higher risk premium i.e. higher return. It will be hard to a company with high risk-low return profile to run its operating wheel in the long run. However, the issue relating to the nature and degree of association between risk and return is a controversial one. The findings of the relevant studies carried out so far are conflicting and inconclusive in nature. One school of thought argues that there is a high degree of positive affiliation between risk and return (Cootner & Hollant, 1970) while the other provides exactly the opposite argument (Bettis & Mahajan, 1985; Singh, 1986; and Mallik & Sur, 2009). However, there exists a third alternative view which suggests that risk and return are influenced by various industry conditions and business strategies, but not by each other (Oriatt and Bauershmidt, 1991)

The paradigm shift of the Indian economy to a market-dominated open economic system in 1991 from a state-dominated subsidized financial system, consequent upon the world wide wave in favour of globalization and liberalization gaining motion in the last quarter of the twentieth century and signing of the Trade Related Intellectual Property Rights System (TRIPS) agreement in 1995 are watershed events for the Indian industries in the recent time. Pharmaceutical industry, one of the promising industries of the country, is not a silent spectator to witness these path breaking events. Due to the changes brought about by these two mega events, a large number of companies in the Indian pharmaceutical sector which had grown exponentially over the years in a virtually non-competitive milieu have started facing stern competition in the domestic front and as well as across the border. As a result, the earnings trends, cost behavior pattern, capital productivity, liquidity policies and other allied issues in this sector have changed extensively. Consequently, the pattern of BR associated the companies in the Indian pharmaceutical industry has witnessed notable changes. These companies have been forced to re-orient their strategies for mitigating the BR associated with them in the post liberalization era. Some of them have fruitfully adapted themselves to the new state of affairs while others have failed to do so. A considerable number of studies have been made to analyze the issue relating to the BR in Indian corporate sector during the

last few decades and also a very few studies on the same issue have been carried out emphasizing the post-liberalization period. But no significant study has so far been made to deal with the same matter associated with the Indian pharmaceutical sector in the post-liberalization era. In this backdrop, the present study seeks to analyze the BR in the Indian pharmaceutical industry during the period 2001-02 to 2010-11.

Objectives of the study :

The objectives of the study are:

- To measure the degree of BR associated with each of the selected pharmaceutical companies and to compare the said attribute of the selected multinational companies with that of the selected domestic companies in Indian pharmaceutical sector.
- To assess the company-specific components of BR associated with each of the companies under study and to compare the said characteristic of the selected multinational companies with that of the selected domestic companies in Indian pharmaceutical sector.
- To ascertain the degree of relationship between BR and its company-specific components of the selected companies and also to compare the said aspect of multinational companies with that of domestic companies under study.
- To analyze the combined effect of the company-specific components of the selected companies on their BR and also to compare the matter of selected multinational companies with that of selected domestic companies.
- To study the relative risk-return status of the selected companies as well as to compare the said status of multinational companies with that of domestic companies under study.
- To evaluate and compare the extent of relationship between risk and return of the selected multinational companies with that of the selected domestic companies.
- To examine the conclusion of the study at the backdrop of its theoretical arguments.

Methodology of the Study :

The study is based on ten multinational and ten domestic companies which were selected from Indian pharmaceutical sector following purposive sampling procedure. While making this selection, net sales revenue was considered as the selection criterion. The selected ten multinational and ten domestic companies are shown in Appendix 1. The data of the selected companies for the period 2001-02 to 2010-11 used in this study were taken from secondary sources i.e. Capitaline Corporate Database of Capital Market Publishers (I) Ltd. Mumbai. For measuring the BR and its company-specific components associated with the selected companies, Ginni's coefficient of concentration (G) was used. At the time of analyzing the computed values of risks, statistical techniques such as Pearson's simple correlation analysis, Spearman's rank correlation analysis, Kendall's correlation analysis, analysis of Kendall's coefficient of concordance, multiple correlation analysis, multiple regression analysis and statistical tests like t test, F test and Chi-square test were applied at appropriate places.

Limitations of the Study :

The present study has the following limitations:

- This study was carried out by using the data collected from the published financial statements of the selected companies.

- This study was confined to the analysis of the company-specific components of BR associated with the selected companies. The economy-specific and industry-specific components of the BR were not analyzed in this study.
- The issue relating to the minimization of cost structure risk through forex management was not taken into consideration in this study.

Empirical Results :

i. In Table 1, an attempt was made to measure the degree of BR associated with the selected multinational and domestic companies in Indian pharmaceutical industry during the period under study. The BR of each of the selected companies was ascertained by using G of its return on capital employed (ROCE). Table 1 shows that the degree of BR was the highest in Fulford and it was followed by Abbott, Glaxosmithkline, Aventis, Ranbaxy, Pfizer, Dr. Reddy's, Wockhardt, Novartis, Sun, Aurobindo, Astrazeneca, Wyeth, Lupin, Organon, Merck, Ipca, Cipla, Piramal and Cadila respectively. Six multinational and four domestic companies were placed in the top-ten category in respect of BR. Another notable outcome of this analysis is that the first four ranks in respect of BR were occupied by four multinational companies, namely Fulford, Abbott, Glaxosmithkline and Aventis.

ii. In Table 2.1, three major components of company-specific BR, namely liquidity risk (LR), cost structure risk (CSR) and capital productivity risk (CPR) of each of the selected multinational and domestic companies were measured by G of working capital ratio (WCR), that of cost to sales ratio (CTSR) and that of capital turnover ratio (CTR) respectively. Table 2.1 discloses that five multinational companies, namely Organon, Aventis, Novartis, Wyeth and Glaxosmithkline and five domestic companies, namely Sun, Dr. Reddy's, Wockhardt, Cadila and Piramal got their place in the first ten positions in respect of risk associated with short term debt paying capability. In respect of CSR, seven multinational companies, namely Astrazeneca, Glaxosmithkline, Fulford, Aventis, Wyeth, Abbott and Merck and three domestic companies, namely Ranbaxy, Wockhardt and Dr. Reddy's were placed in the 'first-ten' category. Fulford maintained the highest level of risk of not getting stable turnover by utilizing average long term funds, followed by Wyeth, Abbott, Aurobindo, Pfizer, Organon, Wockhardt, Ranbaxy, Merck, Novartis, Astrazeneca, Sun, Lupin, Glaxosmithkline, Piramal, Aventis, Cipla, Cadila, Dr. Reddy's and Ipca. So out of the first ten selected companies according to CPR, seven companies were multinational while the remaining three were domestic.

In Table 2.2 an attempt was made to examine whether there was any uniformity among the selected company-specific components of BR associated with the selected multinational companies. The same examination was also carried out in case of the selected domestic companies. While conducting such examinations, Kendall's coefficient of concordance (W) was used and for testing the significance of W values Chi-square test was applied. Table 2.2 shows that among the selected multinational companies Astrazeneca captured the first rank in CSR while it occupied the seventh and eighth ranks in LR and CPR respectively. Similarly, the CPR was the highest in Fulford though the company occupied the eighth and third ranks in LR and CSR

respectively. Again, Organon captured the first rank in LR, fifth rank in CPR and ninth rank in CSR. So, at a glance, lack of uniformity among the selected company-specific components of BR in the multinational companies under study was observed during the study period. The computed value of Kendall's coefficient of concordance among all the selected company-specific components of BR associated with the selected multinational companies (W_M) was 0.1515 which was not found to be statistically significant even at 0.10 level. It also confirms that there was no uniformity among the selected company-specific components of BR in the selected multinational companies during the study period. Table 2.2 also discloses that among the selected domestic companies Cipla occupied the eighth, tenth and seventh ranks in respect of LR, CSR and CPR respectively. Ipca captured the tenth rank in respect of both LR and CPR while it occupied the eighth rank in respect of CSR. Similarly, such uniformity among LR, CSR and CPR was maintained by most of the domestic companies under study. Moreover, the computed value of Kendall's coefficient of concordance among LR, CSR and CPR of the selected domestic companies (W_D) was 0.5529 which was found to be statistically significant at 10 per cent level. It confirms that a considerable degree of uniformity among the selected company-specific components of BR in the domestic companies under study during the study period was noticed.

In Table 3, effort had been made to measure the degree of relationship between BR and each of its company-specific components in both the selected multinational and domestic companies through correlation coefficients taking into account their magnitudes (i.e. by Pearson's simple correlation coefficient), rankings of their magnitudes (i.e. by Spearman's rank correlation coefficient) and the nature of their associated changes (i.e. by Kendall's correlation coefficient). These correlation coefficients were tested by using t test. In theoretical terms, there should be a very high degree of positive association between BR and its components. But Table 3 shows that in case of the selected multinational companies all the three correlation coefficients between BR and LR were negative which were not found to be statistically significant at 5 per cent level whereas in case of domestic companies under study all the three correlation coefficients between BR and LR were positive which were not found to be statistically significant at 5 per cent level. Table 3 also depicts that in case of multinational companies, out of three, two correlation coefficients between BR and CSR were positive but not found to be statistically significant at 5 per cent level whereas in case of domestic companies, all the three correlation coefficients between BR and CSR were positive out of which two coefficients were found to be statistically significant. However, all the correlation coefficients between BR and CPR in both the multinational and domestic companies were positive but none of them was found to be statistically significant. Thus, this study reveals that only in case of the relationship between BR and CSR in the selected domestic companies, strong evidence of positive association was observed.

iii. In Table 4, an effort was made to ascertain the joint effect of the selected components of the company risk associated with the companies under study on their BR by applying multiple correlation analysis and multiple regression analysis. The multiple

correlation coefficients and the partial regression coefficients were tested by F test and t test respectively. The regression equation fitted in this regard is: $BR = b_0 + b_1$. $LR + b_2$. $CSR + b_3$. CPR where b_0 is intercept, b_1, b_2 and b_3 are the partial regression coefficients. Table 4 shows that for one unit increase in CSR, the BR stepped up by 0.02 unit and 0.55 unit in the selected multinational companies and domestic companies respectively. However, the increase in BR as a result of one unit increase in CSR was found to be statistically significant at 0.05 level only in case of the selected domestic companies. For one unit increase in LR, the BR decreased by 0.07 unit in case of the selected multinational companies and improved by 0.007 unit in case of the domestic companies under study which were not found to be statistically significant. With the increase in CPR by one unit, the BR increased by 0.20 unit and .08 unit respectively in case of the selected multinational and domestic companies, and both these movements were not found to be statistically significant. The net outcome obtained from the multiple regression analysis made in this study shows that only in case of the selected domestic companies CSR made a notable contribution towards enhancing the BR associated with them while in both the selected multinational and domestic companies no significant impact of LR and CPR on BR was noticed during the study period. Table 4 also discloses that in case of the selected multinational companies the multiple correlation coefficient of BR on LR, CSR and CPR was 0.548 which was not found to be statistically significant. This table also depicts that only 30.10 percent of the variation in the BR of the selected multinational companies was contributed by their LR, CSR and CPR during the study period. On the other hand, in case of the selected domestic companies the multiple correlation coefficient of BR on LR, CSR and CPR was 0.899 which was found to be statistically significant at 5 per cent level. This Table also depicts that 80.80 per cent of the variation in the BR of the selected domestic companies was contributed by their LR, CSR and CPR during the study period.

iv. In Table 5.1 risk-return status of the selected multinational and domestic companies in Indian pharmaceutical industry was measured with reference to BR and overall profitability. The ROCE was taken as the overall profitability pointer in this analysis. Table 5.1 shows that Abbott and Fulford, both belonging to the multinational category were placed in the most undesirable category i.e. high risk-low return class whereas Pfizer belonging to the same class was the only company among the selected ones which maintained a moderate risk-high return combination. A balance between risk and return was maintained by Aventis, Glaxosmithkline, Novartis (multinational) and Sun (domestic) by capturing moderate risk-moderate return cell. Ranbaxy, Wockhardt and Dr. Reddy's belonging to the domestic category were placed in the moderate risk-low return class while Astrazeneca, Merck, Wyeth belonging to the multinational class maintained low risk-high return combination. A blend of low risk-moderate return was maintained by Organon (multinational) and Cipla (domestic) whereas five domestic companies namely, Aurobindo, Cadila, Ipca, Lupin and Piramal were placed in the low risk-low return cell.

In Table 5.2 risk-return profile of the selected companies was assessed on the basis of LR and ROCE. It was observed from Table 5.2 that Merck (multinational) was placed

in the most desirable class i.e. low risk-high return class. A combination of high risk and high return was maintained by Wyeth (multinational) whereas Aventis, Novartis, Organon (multinational) and Sun (domestic) were in the high risk-moderate return class, while the reverse combination i.e. moderate risk-high return combination was maintained by Astrazeneca and Pfizer (multinational). Three domestic companies, namely Cadila, Dr. Reddy's and Wockhardt were placed in the most undesirable category i.e. high risk-low return class while Lupin, Piramal and Ranbaxy belonging to the same class maintained a blend of moderate risk-low return. Cipla was the only domestic company which maintained a low risk-moderate return combination whereas Glaxosmithkline the only multinational company maintained a balance between risk and return by occupying a moderate risk-moderate return cell. Two multinational companies, namely Abbott and Fulford and two domestic companies, namely Aurobindo and Ipca were placed in low risk-low return cell.

In Table 5.3 risk-return status of the selected companies was ascertained with reference to CSR and ROCE. This table discloses that Pfizer (multinational) was placed in the most desirable class i.e. low risk-high return class. Astrazeneca (multinational) was high risk-high return company. The cell representing a blend of moderate risk-high return was occupied by two multinational companies, namely Merck and Wyeth. Three domestic companies, namely Dr. Reddy's, Ranbaxy and Wockhardt were placed in the high risk-low return cell whereas the moderate risk-low return class was occupied by two multinational companies, namely Abbott and Fulford and one domestic company, namely Piramal. A blend of low risk-low return was adopted by four domestic companies, namely Aurobindo, Cadila, Ipca and Lupin. Organon (multinational) and Cipla (domestic) captured the low risk-moderate return combination whereas three multinational companies, namely Aventis, Glaxosmithkline, Novartis and one domestic company, namely Sun maintained a balance between risk and return by capturing the moderate risk-moderate return cell.

In Table 5.4 an assessment of risk-return status of the selected companies was made by taking into account the combination of CPR and ROCE. This table depicts that two multinational companies, namely Aventis and Glaxosmithkline and one domestic company, namely Cipla were placed in the low risk-moderate return category whereas Lupin (domestic) maintained the reverse combination i.e. moderate risk-low return combination. Novartis (multinational) and Sun (domestic) maintained a balance between risk and return by occupying moderate risk-moderate return cell while two multinational companies, namely Pfizer and Wyeth and four domestic companies, namely Cadila, Dr. Reddy's, Ipca and Piramal adopted the similar policy by capturing high risk-high return and low risk-low return cells respectively. Astrazeneca and Merck belonging to the multinational class maintained a blend of moderate risk-high return class whereas Abbott and Fulford belonging to the multinational category and Aurobindo, Ranbaxy, Wockhardt belonging to the domestic class occupied the most undesirable class i.e. high risk-low return cell. Organon was the only multinational company which captured the high risk-moderate return mix.

v. In Table 6 an attempt was made to examine the nature and extent of relationship

between BR and overall profitability and those between each of the company-specific components of BR and overall profitability of the selected companies by using three correlation measures, namely Pearson's simple correlation coefficient, Spearman's rank correlation coefficient and Kendall's correlation coefficient. In order to test whether these coefficients were statistically significant or not, t test was made. Theoretically it is expected that there should be a high degree of positive association between BR or its company-specific components and overall profitability. However, the study did not satisfy the theoretical argument. Table 6 shows that in case of the selected multinational companies out of twelve correlation coefficients between BR or its company-specific components and overall profitability nine coefficients were negative and only one coefficient out of these negative ones was found to be significant whereas the remaining three coefficients were positive which were not found to be statistically significant. In case of the selected domestic companies out of twelve correlation coefficients between BR or its company-specific components and overall profitability nine coefficients were negative and the remaining three were positive but all these coefficients were not found to be statistically significant at 0.05 level. Thus, these correlation results failed to provide strong evidence of any specific relationship between BR and return.

Concluding Observations :

(i) The first four ranks in respect of BR were captured by four multinational companies while the last four ranks in this respect were occupied by four domestic companies. Out of the first ten positions in respect of BR six were taken by multinational companies. The net outcome derived from this analysis reflects that the selected multinational companies faced more risk in connection with their operating profitability as compared to the domestic ones under study during the study period.

(ii) Out of the first ten positions according to LR, five were captured by multinational companies and five were occupied by domestic ones. However, out of the first ten positions in respect of both CSR and CPR seven were captured by multinational companies while the remaining three were taken up by domestic ones.

(iii) Only among the selected multinational companies, the highest rank was captured by Organon in respect of LR while CSR and CPR of it were ranked ninth and fifth respectively during the study period. Similarly, Astrazeneca faced the maximum risk in cost structure front whereas it occupied the seventh and eighth ranks in respect of LR and CPR respectively during the period under study. Again, Aventis enjoyed the lowest risk in capital productivity front whereas the second highest volatility and fourth highest volatility were found in liquidity front and cost structure front respectively during the study period. This kind of disparity was observed in nine companies out of the ten selected multinational companies (except Wyeth). So, uniformity among LR, CSR and CPR was absent in the selected multinational companies during the study period. The outcome of W derived in this study also confirms the above inference.

However, while considering only domestic companies it was observed that in most of the cases uniformity among LR, CSR and CPR was present during the study period. The net result obtained from the analysis of W also reflects a notable degree of association among LR, CSR and CPR of the selected domestic companies during the

study period.

(iv) In case of the selected domestic companies, among the three selected company-specific components of BR, only CSR proved itself to be a significant contributor of the BR while LR and CPR failed to establish themselves as the same during the period under study whereas in case of the selected multinational companies, LR, CSR and CPR all failed to establish themselves as notable contributors of the BR during the period under study. The analysis of multiple regression of BR on LR, CSR and CPR made in this study provides the similar evidence which confirms the above inference.

(v) The outcome derived from the study of multiple determination of BR on LR, CSR and CPR reflects an insignificant portion of the total variation (30.10 per cent) in the BR associated with the selected multinational companies was due to the variations in its selected company-specific components, during the study period. However, in case of the selected domestic companies the analysis of multiple determination of BR on LR, CSR and CPR indicates a significant portion of the total variation (80.80 per cent) in the BR was due to the variations in its selected company-specific components, during the study period.

(vi) The uniformity in respect of risk-return trade off among the selected multinational and domestic pharmaceutical companies was totally absent during the study period. Rather various peculiar blends of risk and return were observed in many cases. Although the level kept by multinational companies, namely Pfizer, Astrazeneca, Merck and Wyeth in respect of BR and its company-specific components varied widely from low to high, they established themselves as profit hunter during the period under study. The two multinational companies, namely Abbott and Fulford moved from high to low classes in respect of BR and its company-specific components but failed to yield high or moderate return during the study period.

However, all the domestic companies under study failed to establish themselves as profit-hunter although some of them proved themselves as aggressive risk-taker, some of them were very conservative in taking risk and some adopted moderate degree of risk during the study period. Cipla was the only company among the selected domestic ones which was able to maintain moderate return by keeping its BR and company-specific components of BR at low levels. Wockhardt, bearing high LR, CSR and CPR but yielding low return, was placed in the most undesirable category and therefore, should adopt appropriate measures to exercise control over the company-specific components of its BR. Ipca proved itself as a very conservative player as it preferred to retain itself in the low risk-low return cell in all the cases. Moderate volatility in the operating profitability as well as short-term debt paying capability on high instability in cost behavior pattern and capital productivity of Ranbaxy was not at all compensated as the company failed to enter into moderate or high return strata.

(vii) Although a high degree of positive association between BR or its company-specific components and return is theoretically desirable, the analysis of interrelation between them made in this study failed to provide strong evidence of positive association either in case of selected multinational companies or in case of domestic companies under study. It implies that high risk was not at all compensated by high risk premium i.e. high return in the selected pharmaceutical companies during the study period.

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Table 1: Ranks of Business Risk of the Selected Multinational and Domestic Companies in Indian Pharmaceutical Industry

	Company	Business Risk (G of ROCE)	Status Rank
Multinational	Abbott	0.208	2
	Astrazeneca	0.088	12
	Aventis	0.170	4
	Fulford	0.300	1
	Glaxosmithkline	0.175	3
	Merck	0.061	16
	Novartis	0.106	9
	Organon	0.062	15
	Pfizer	0.144	6
	Wyeth	0.083	13
Domestic	Aurobindo	0.096	11
	Cadila	0.052	20
	Cipla	0.059	18
	Dr Reddy's	0.114	7
	Ipca	0.060	17
	Lupin	0.072	14
	Piramal	0.054	19
	Ranbaxy	0.156	5
	Sun	0.103	10
	Wockhardt	0.108	8

Source : *Compiled and computed from 'Capitaline Corporate Database' of Capital Market Publishers (I) Ltd., Mumbai*

Table 2.1: Ranks of Company- specific components of Business Risk of all the Selected Companies (both multinational and domestic) in Indian Pharmaceutical Industry

Sl. No	Company	Liquidity Risk		Cost Structure Risk		Capital Productivity Risk	
		G of wCR	Rank	G of CTSR	Rank	G of CTR	Rank
Multinational	Abbott	0.259	16	0.066	9	0.555	3
	Astrazeneca	0.376	13	0.226	1	0.355	11
	Aventis	0.702	5	0.079	7	0.272	16
	Fulford	0.262	15	0.093	6	0.773	1
	Glaxosmithkline	0.472	10	0.099	5	0.290	14
	Merck	0.196	19	0.061	10	0.396	9
	Novartis	0.513	7	0.052	13	0.384	10
	Organon	1.268	1	0.044	14	0.496	6
	Pfizer	0.382	12	0.041	16	0.504	5
	Wyeth	0.508	8	0.069	8	0.591	2
Domestic	Aurobindo	0.211	18	0.040	17	0.532	4
	Cadila	0.612	6	0.043	15	0.186	18
	Cipla	0.225	17	0.028	20	0.201	17
	Dr Reddy's	1.087	3	0.113	4	0.160	19
	Ipca	0.055	20	0.039	18	0.153	20
	Lupin	0.346	14	0.037	19	0.311	13
	Piramal	0.486	9	0.059	11	0.275	15
	Ranbaxy	0.456	11	0.152	2	0.447	8
	Sun	1.204	2	0.054	12	0.349	12
	Wockhardt	0.908	4	0.119	3	0.490	7

***Source**:Compiled and computed from 'Capitaline Corporate Database' of Capital Market Publishers (I) Ltd. Mumbai*

Table 2.2: Ranks of Company- specific components of Business Risk of the Selected Multinational Companies and that of Domestic Companies(multinational companies and domestic companies ranked separately) in Indian Pharmaceutical Industry

Sl. No	Company	Liquidity Risk		Cost Structure Risk		Capital Productivity Risk	
		G of WCR	Rank	G of CTSR	Rank	G of CTR	Rank
Multinational	Abbott	0.259	9	0.066	6	0.555	3
	Astrazeneca	0.376	7	0.226	1	0.355	8
	Aventis	0.702	2	0.079	4	0.272	10
	Fulford	0.262	8	0.093	3	0.773	1
	Glaxosmithkline	0.472	5	0.099	2	0.290	9
	Merck	0.196	10	0.061	7	0.396	6
	Novartis	0.513	3	0.052	8	0.384	7
	Organon	1.268	1	0.044	9	0.496	5
	Pfizer	0.382	6	0.041	10	0.504	4
	Wyeth	0.508	4	0.069	5	0.591	2
Kendall's coefficient of concordance among the selected company-specific components of business risk (W_M) is 0.1515 and Chi-square value of W is 4.09, being statistically insignificant.							
Domestic	Aurobindo	0.211	9	0.040	7	0.532	1
	Cadila	0.612	4	0.043	6	0.186	8
	Cipla	0.225	8	0.028	10	0.201	7
	Dr Reddy's	1.087	2	0.113	3	0.160	9
	Ipca	0.055	10	0.039	8	0.153	10
	Lupin	0.346	7	0.037	9	0.311	5
	Piramal	0.486	5	0.059	4	0.275	6
	Ranbaxy	0.456	6	0.152	1	0.447	3
	Sun	1.204	1	0.054	5	0.349	4
	Wockhardt	0.908	3	0.119	2	0.490	2
Kendall's coefficient of concordance among the selected company-specific components of business risk (W_D) is 0.5529 and Chi-square value of W is 14.927, being significant at 10% level. Table value of Chi-square with (n-1) d.f. i.e. 9 d.f. at 10 % level = 14.684							

***Source**:Compiled and computed from 'Capitaline Corporate Database' of Capital Market Publishers (I) Ltd. Mumbai*

Table 3: Analysis of Correlation between Business Risk and its Company-specific components of the Selected Companies in Indian Pharmaceutical Industry.

Correlation coefficient between / Correlation Measure	Business Risk and Liquidity Risk		Business Risk and Cost Structure Risk		Business Risk and Capital Productivity Risk	
	Multinati -onal	Domestic	Multinati -onal	Domestic	Multinati -onal	Domestic
Pearson	-0.378	0.407	0	0.847**	0.457	0.574
Spearman	-0.188	0.321	0.370	0.614	0.127	0.430
Kendall	-0.156	0.156	0.244	0.494*	0.111	0.333

**Significant at 0.01 level
* Significant at 0.05 level

Source: *Compiled and computed from 'Capitaline Corporate Database' of Capital Market Publishers (I) Ltd. Mumbai.*

Table 4: Analysis of Multiple Regression and Multiple Correlation of Business Risk on its Company- specific components of the Selected Companies in Indian Pharmaceutical Industry

Multiple Regression Equation of BR on LR, CSR and CPR :
$BR = b_0 + b_1 LR + b_2 CSR + b_3 CPR$

Variable	Partial Regression Coefficient		t value	
	Multinationa l	Domestic	Multinationa l	Domestic
LR	-0.07	0.007	-0.832	0.394
CSR	0.02	0.55	0.049	3.245*
CPR	0.20	0.08	1.129	1.671
Constant	0.08	0.02	0.641	1.312

* Significant at 0.05 Level

Multiple correlation coefficient of BR on LR, CSR and CPR:

	Multinational	Domestic
$R_{B \cdot LSP}$	0.548	0.899
$R^2_{B.LSP}$	0.301	0.808
F	0.861	8.392*

* Significant at 0.05 Level

Source: *Compiled and computed from 'Capitaline Corporate Database' of Capital Market Publishers (I) Ltd. Mumbai*

Table 5.1: Risk-Return Status of the Selected Companies in Indian Pharmaceutical Industry based on combination of Business Risk and Overall profitability

ROCE / BR	High (≥35%)	Moderate (>25% but <35%)	Low (≤25%)
High (≥0.20)			Abbott, Fulford
Moderate (>0.10 but < 0.20)	Pfizer,	Aventis, Glaxosmithkline, Novartis, Sun	Ranbaxy, Wockhardt, Dr. Reddy's
Low (≤0.10)	Astrazeneca, Merck, Wyeth	Organon, Cipla,	Aurobindo, Cadila, Ipca, Lupin, Piramal,

Source: *Compiled and computed from 'Capitaline Corporate Database' of Capital Market Publishers (I) Ltd. Mumbai*

Table 5.2: Risk-Return Status of the Selected Companies in Indian Pharmaceutical Industry based on combination of Liquidity Risk and Overall Profitability

ROCE / LR	High (≥35%)	Moderate (>25% but <35%)	Low (≤25%)
High (≥0.50)	Wyeth	Aventis, Novartis, Organon, Sun	Cadila,Dr. Reddy's, Wockhardt
Moderate (>0.30 but <0.50)	Astrazeneca, Pfizer	Glaxosmithkline	Lupin, Piramal, Ranbaxy,
Low (≤0.30)	Merck	Cipla	Abbott, Fulford, Aurobindo, Ipca

Source: *Compiled and computed from 'Capitaline Corporate Database' of Capital Market Publishers (I) Ltd. Mumbai*

Table 5.3: Risk-Return Status of the Selected Companies in Indian Pharmaceutical Industry based On combination of Cost Structure Risk and Overall Profitability

ROCE / CSR	High (≥35%)	Moderate (>25% but <35%)	Low (≤25%)
High (≥0.10)	Astrazeneca,		Dr. Reddy's, Ranbaxy, Wockhardt
Moderate (> 0.05 but < 0.10)	Merck, Wyeth	Aventis, Glaxosmithkline, Novartis, Sun	Abbott, Fulford, Piramal
Low (≤0.05)	Pfizer,	Organon, Cipla	Aurobindo, Cadila, Ipca, Lupin

Source:*Compiled and computed from 'Capitaline Corporate Database' of Capital Market Publishers (I) Ltd. Mumbai*

Table 5.4: Risk-Return Status of the Selected Companies in Indian Pharmaceutical Industry based on combination of Capital Productivity Risk and Overall Profitability.

ROCE / CPR	High (≥35%)	Moderate (>25% but <35%)	Low (≤25%)
High (≥0.40)	Pfizer, Wyeth	Organon,	Abbott, Fulford, Aurobindo, Ranbaxy, Wockhardt
Moderate (>0.30 but <0.40)	Astrazeneca, Merck,	Novartis, Sun	Lupin
Low (≤0.30)		Aventis, Glaxosmithkline, Cipla	Cadila, Dr. Reddy's, Ipca, Piramal,

Source: *Compiled and computed from 'Capitaline Corporate Database' of Capital Market Publishers (I) Ltd. Mumbai*

Table 6: Analysis of Correlation between Risk and Return of the Selected Companies in Indian Pharmaceutical Industry

Correlation coefficient between / Correlation Measure	Business Risk and Overall Profitability		Liquidity Risk and Overall Profitability		Cost Structure Risk and Overall Profitability		Capital Productivity Risk and Overall Profitability	
	Multinatio-nal	Domestic	Multination-al	Domestic	Multi n-ationa l	Domestic	Multin a-tional	Domestic
Pearson	- 0.685*	- 0.197	0.166	0.083	0.238	-0.277	-0.513	-0.171
Spearman	- 0.552	- 0.116	-0.055	0.097	0.067	-0.058	-0.321	-0.164
Kendall	- 0.422	- 0.135	-0.067	0.090	-0.022	-0.068	-0.244	-0.135

*Significant at 0.05 level

Source: *Compiled and computed from 'Capitaline Corporate Database' of Capital Market Publishers (I) Ltd. Mumbai*

Appendix 1	
List of the Selected Companies	
Multinational Companies	Abbott India Ltd. (Abbott)
	Astrazeneca Pharma India Ltd. (Astrazeneca)
	Aventis Pharma Ltd. (Aventis)
	Fulford (India) Ltd. (Fulford)
	Glaxosmithkline Pharmaceuticals Ltd. (Glaxosmithkline)
	Merck Ltd. (Merck)
	Novartis India Ltd. (Novartis)
	Organon (India) Ltd. (Organon)
	Pfizer Ltd. (Pfizer)
	Wyeth Ltd. (Wyeth)
Domestic Companies	Aurobindo Pharma Ltd. (Aurobindo)
	Cadila Healthcare Ltd. (Cadila)
	Cipla Ltd. (Cipla)
	Dr. Reddy's Laboratories Ltd. (Dr. Reddy)
	Ipca Laboratories Ltd. (Ipca)
	Lupin Ltd. (Lupin)
	Piramal Healthcare Ltd. (Piramal)
	Ranbaxy Laboratories Ltd. (Ranbaxy)
	Sun Pharmaceuticals Industries Ltd. (Sun)
	Wockhardt Ltd. (Wockhardt)

Appendix 2

		G of ROCE (Business Risk)	G of CTR (Capital Productivity Risk)	G of CTSR (Cost Structure Risk)	G of WCR (Liquidity Risk)	ROCE
Multinational Companies	Abbott	0.208	0.555	0.066	0.259	17.36
	Astrazeneca	0.088	0.355	0.226	0.376	40.34
	Aventis	0.170	0.272	0.079	0.702	34.15
	Fulford	0.300	0.773	0.093	0.262	23.31
	Glaxosmithkline	0.175	0.290	0.099	0.472	33.68
	Merck	0.061	0.396	0.061	0.196	37.80
	Novartis	0.106	0.384	0.052	0.513	31.13
	Organon	0.062	0.496	0.043	1.268	33.37
	Pfizer	0.144	0.504	0.041	0.382	39.94
	Wyeth	0.083	0.591	0.069	0.508	35.42
Domestic Companies	Aurobindo	0.096	0.532	0.040	0.211	20.42
	Cadila	0.052	0.186	0.043	0.612	19.19
	Cipla	0.059	0.201	0.028	0.225	33.39
	Dr Reddy's	0.114	0.160	0.113	1.087	20.44
	Ipca	0.060	0.153	0.040	0.055	22.88
	Lupin	0.072	0.311	0.037	0.346	17.32
	Piramal	0.054	0.275	0.059	0.486	24.73
	Ranbaxy	0.156	0.447	0.152	0.456	20.42
	Sun	0.103	0.349	0.054	1.204	29.73
	Wockhardt	0.108	0.490	0.119	0.908	22.52

Source:*Compiled and computed from 'Capitaline Corporate Database' of Capital Market Publishers (I) Ltd. Mumbai*

Role of Public Sector Banks in Financial Inclusion - A case study on West Bengal

Joydeep Chakraborty

Abstract:

The banking industry has shown tremendous growth in volume and complexity during the last few decades, the main concern is that the banks have not been able to reach and bring vast segment of the society into its fold of basic banking sector. Financial inclusion is not a new dispensation. Financial inclusion, of late has become one of the major attentions in academic research, public policy, seminars in view of its important role in aiding economic development of the resource poor developing economies. RBI has also taken up different measures to improve the financial inclusiveness of the economy of the country. Rangarajan Committee (2008) on financial inclusion stated that "Financial inclusion may be defined as the process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups such as weaker sections and low income groups at an affordable cost". West-Bengal is one of the most dispersed state in terms of financial inclusion, where only North 24 Parganas and Kolkata showed high levels of inclusiveness (RBI Working Papers).

This paper puts emphasis on the present scenario of financial inclusion in the state and outreach of public sector banks (members of SLBC, West-Bengal) in reaching out the different excluded section of the society.

Key Words: *Financial Inclusion, FIP, SLBC, Public Sector Banks.*

Introduction:

Reserve Bank of India (RBI) defines Financial Inclusion (FI) "as the process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups such as the weaker sections and low income groups at an affordable cost from mainstream financial institutions". Starting from the Nationalization of Banks (1969), outlining priority sector lending requirement for banks, introduction of lead bank schemes, establishment of Regional Rural Banks (1975-76), Service Area Approach (1989) and Self-Help Group-Bank linkage Programme (1989-90), all these initiatives were taken with an underlying objective of taking banking services to the masses and making them participate in the developmental process of the economy. The financial sector reforms in the 1990s saw the focus shift to strengthening financial institutions and bringing in new players to infuse competitiveness, with the ultimate objective of achieving enhanced financial access, greater efficiency and improved consumer satisfaction. Despite geographical and functional outreach of the commercial banks, small and marginal farmers, women, unorganized sector workers, artisans, self-employed, unemployed, pensioners etc. remained excluded from the opportunities and services provided by the formal financial sector. RBI advised all public and private sector banks to devise Financial Inclusion Plans (FIPs) with their business strategy and to make FIPs an integral part of their corporate plans. These plans were setting up of rural brick and mortar branches, deployment of Business correspondence (BC), coverage of

unbanked villages with population above 2000 and below 2000 through branches/(BCs)/other modes, no frills accounts, including through BC-ICT, Kisan Credit Cards (KCCs) and General Credit Cards (GCCs).

On the basis of the above plans, large number of banking outlets opened in the different areas of the country with a special attention towards unbanked villages and rural areas. But FI does not merely mean opening of savings Bank A/c, rather it includes creation of awareness about financial products and offering of advice on money management and debt counseling. Newly nationally- representative data from the 2012 Global Financial inclusion (FINDEX) data base revealed that only 35% of all adults in India have an account at formal financial institutions (Demirgus-kunt and klapper, 2012).

Report of Crisil inclusix (June, 2013) an Index* to measure India's progress in Financial inclusion also stated that inclusion index of India as a whole is only 40.1, whereas only Southern Region showed high inclusion index at 62.2 followed by western Region (38.2), Northern Region (37.1), Eastern Region (28.6) and North-Eastern Region (28.5). Southern Region also has a better credit penetration - the number of loan accounts in the southern region is nearly twice of the all India average.

Now the question arises that why the level of inclusiveness is so low irrespective of all such policy initiatives by RBI and Central Government. According to K.C. Chakraborty (Ex-Deputy Governor, RBI) "Financial Inclusion (Exclusion) is the lack of access by certain consumers to appropriate, low-cost, fair and safe financial products and services from main stream provides". There are three types of exclusions - (a) people who do not have any access to a regulated financial system (b) people who have limited access to banks and other financial services and (c) individuals who have unsuitable products. The reason for such exclusion is due to problems from both the demand and the supply side. Lack of awareness, low incomes, poverty and illiteracy are the factors that lead to low demand for financial services. On the other hand distance from branch, branch timings, complexities in documentation and procedure, language barriers and staff attitudes are the problems from the supply side, resulting into flourishing of so called 'Un-Organized Financial Institutions" in the society.

With this background the major objective of this paper is to examine the extent of financial inclusion in the state of West Bengal. Concentrating only on the role of selected public sector Banks [United bank of India (UBI), Central bank of India (CBI), Allahabad Bank, United Commercial Bank (UCO), State Bank of India (SBI)], the members of State Level Bankers Committee (SLBC), West Bengal. Now question arises - (a) Why is the state of West Bengal chosen for the study? (b) All the Public Sector Banks operate in West Bengal, but why only five Public Sector Banks (PSBs) are taken into account? (c) What is State Level Bankers Committee (SLBC)? All these questions are answered below -

*	*Crisil Inclusix score*	*Level of Financial Inclusion*
	>55	*High*
	40.1-55.0	*Above average*
	25.0-40.0	*Below Average*
	<25	*Low*

a) Why West Bengal?

- West Bengal demonstrates the highest disparity among the large states. (CRISIL Inclusix, June 2013)
- Among 19 districts of West Bengal, only Kolkata and North 24 Parganas scored high in financial index. (Sadhan Kumar Chattopadhyay, RBI Working Papers, 2011).
- Among the large states, West Bengal is one of the bottom scoring states (CRISIL inclusix, June 2013)
- West Bengal remains at below average in branch penetration and deposit penetration and low in credit penetration* (CRISIL inclusix, June 2013)
- West Bengal CRISIL inclusix score is 28.8 in 2011, which indicates Below Average as per CRISIL Index, and this state is ranked 29th among the 35 states of the country. (CRISIL inclusix, June 2013).

b) Why only Five Public Sector Banks?

- UBI, CBI, UCO, Allahabad Bank and SBI are the lead banks of the 19 districts of West Bengal.
- UBI is the lead bank of 10 districts viz. Bankura, Purulia, South 24 Parganas, Purba Medinipur, Paschim Medinipur, Murshidabad, Malda, Dakshin & Uttar Dinajpur. CBI is the lead bank of 3 districts viz. Darjeeling, Jalpaiguri & Coochbehar. UCO bank is the lead bank of Howrah, Hooghly, Burdwan & Birbhum. Allahabad bank and SBI is the lead bank of North 24 Parganas and Kolkata district respectively.

c) What is SLBC?

- There are 16 SLBC convenor banks in India. United bank of India is the convenor bank of SLBC in West Bengal.
- Formed by the representative of SLBC Convenor bank of the state, Representatives of NABARD, SIDBI, RRBs, Co-operative Banks, MD-SFC, Regional Director-RBI, and representatives of Govt. Authorities of secretaries of Planning, Finance, Agriculture, and Rural Development.
- To take up the impediments of development of banking system in the state with the State Govt. authorities.
- To discuss issues, problems & arrive at solutions in the field of agricultural, rural development, financial inclusion and evolve consensus for action.
- To undertake, critical analysis of the progress of the implementation of Annual Credit Plans (ACPs), Credit Linked programmes/ Schemes of Govt. and other agencies in various districts.

Objective of the study:

a) To list the various policy initiatives of RBI with respect to financial inclusion.

b) To study the outreach of selected public sector banks in financial inclusion plans in W.B.

Research Methodology:

Research methodology is partly descriptive, partly exploratory and partly casual. For this study data and information has been collected with the help of books, magazines,

newspapers, research journals, e-journals, report of RBI, SLBC reports and reports of National and international institutions. All the data used in this paper is from April 2013 to December 2013, since the data has been collected in the month of March 2014, so the last quarter data from January 2014 to March 2014 is unavailable.

Presentation of facts:

a) **RBI Policy Initiatives:-**

RBI has adopted bank-led model for achieving financial inclusion. The initiatives are as follows:

- RBI advised all banks to open **Basic Savings Bank Deposit (BSBD)** accounts with minimum common facilities such as no minimum balance, deposit and withdrawal of cash at bank branches and ATMs, receipt/credit of money through electronic payment channels, facility of providing ATM Cards.
- **Relaxed and Simplified KYC norms** to facilitate easy opening of bank accounts especially for small accounts with balances not exceeding Rs. 50,000/- and aggregate credits in accounts not exceeding Rs. 1,00,000 in a year. In addition banks are allowed to use AADHAR card** as a proof of both identity and address.
- Compulsory requirement of **Opening Branches in Unbanked Villages.** Banks are directed to allocate at least 25% of the total no of branches to be opened during the year in unbanked rural centers.
- **Simplified Branch Authorization Policy** to address the issue of uneven spread bank branches, domestic scheduled Commercial banks (SCBs) are permitted to freely open branches where population is less than 1,00,000 under general permission. In North-Eastern states and Sikkim domestic SCBs can open branches without any permission from RBI.
- **Opening of intermediate brick and mortar structure for** effective cash management, documentation, close supervision of BC operation. Banks have been advised to open intermediate structure between the present base branch and BC locations. These branches would be in the form of low-cost simple brick and mortar structure consisting of minimum infrastructure.
- Public & Private sector banks have been advised to submit board approved 3 year **Financial Inclusion Plan (FIPs)** starting in April'2010. These policies aim at keeping self set targets in respect of rural brick and mortar branches opened, BCs deployed, coverage of unbanked villages with population above 2,000 and as well as below 2,000, BSBD accounts opened, KCCs, GCCs issued and others.
- Bank have been advised that there FIPs should be **disaggregated and percolated down up to the branch level.** This would ensure the involvement of all stakeholders in the financial inclusion efforts.

** Branch penetration, Deposit Penetration and Credit Penetration are the three indicators used in the formula for calculating financial inclusion index by CRISIL and RBI. The Supreme Court of India has ignored the importance of Aadhar Card and gave the judgment that it is not the ultimate proof of both identity and address.*

- RBI advised that **Financial Literacy Centers (FLCs)** and all the rural branches of SCBs should scale up financial literacy efforts through conduct of outdoor literacy camps at least once a month, to facilitate financial inclusion through provision of two essentials, i.e. 'Financial Literacy' and easy 'Financial Access'.
- The Present round of **licensing new banks** is essentially aimed at giving further fillip to financial inclusion efforts in the country. FIP would be an important criterion for procuring the bank licenses (Dr. D. Subbarao)*.

b) **Outreach of Public Sector Banks :**

Progress of financial inclusion since the launch of financial inclusion plans clearly indicates that banks are progressing in areas like opening of banking outlets, deploying BCs, and opening of Basic Savings Bank Deposit Account (BSBDA), grant of credit through KCCs, GCCs and other schemes. Detailed information is furnished in the following points and tables.

- **Total no of branches in Rural and unbanked villages :**

A target was set by SLBC, West Bengal, of opening rural branches and opening branches in unbanked villages to all the member banks up to March, 2014. All the five banks that are taken for this study showed very positive results in opening of bank branches in the rural areas but UBI and UCO bank remains behind in opening of branches in unbanked villages than the other three banks with a quarter remaining.

Fig.-1: Total no of branches in Rural and unbanked villages:

Financial Inclusion Plan	Allahabad Bank		United bank of India		Central Bank of India		SBI		UCO Bank	
Particulars	**Target upto March' 14**	**Month ended Dec'13**	**Target upto March' 14**	**Month ended Dec'13**	**Target upto March' 14**	**Month ended Dec'13**	**Target upto March' 14**	**Month ended Dec'13**	**Target upto March' 14**	**Month ended Dec'13**
Total No. of Branches	573	512	842	855	344	330	1200	1105	420	365
Out of 1 above, No. of Rural Branches	270	255	392	426	151	156	600	513	160	137
No. of Branches in unbanked villages	32	22	120	39	41	52	30	12	79	17
Total No. of CSPs* deployed	**971**	**699**	**3483**	**2390**	**888**	**461**	**3504**	**2936**	**795**	**441**

Source: *SLBC, West Bengal.*

**** CSP - Customer Service Point is the place where urban poor including petty businessman can open a bank account with low as one rupee.***

** D. Subbarao is the Ex-Governor of RBI.*

➢ **Banking outlet in villages with population above 2,000 as well as population below 2000:**

This scheme named 'Swabhiman' was taken by the banks, and they decided to open banking outlets in the villages having population above 2000 and below 2000 not only through branches but also through BCs and other modes. Every bank performed exceptionally well in opening of banking outlets in the villages with population above 2000. But the scenario is opposite in case of opening outlets in the villages below 2000. Only UBI exceeded its target, but the rest four banks failed to do so. **(Fig-2)**

Fig-2: Banking outlet in villages with population above 2,000 as well as population below 2000:

Financial Inclusion Plan Disaggregation	**Allahabad Bank**		**United bank of India**		**Central Bank of India**		**SBI**		**UCO Bank**	
Particulars	**Target up to March' 14**	**Month ended Dec'13**	**Target up to March' 14**	**Month ended Dec'13**	**Target up to March' 14**	**Month ended Dec'13**	**Target up to March' 14**	**Month ended Dec'13**	**Target up to March' 14**	**Month ended Dec'13**
No.of Banking outlets in villages with population >2000										
---- **Through Branches**	166	255	392	426	145	35	580	490	152	137
----Through BCs	686	699	1083	1083	437	437	1452	1455	300	302
-----Through other modes	1	0	0	0	0	0	2	1	56	56
Sub Total >2000	853	954	1475	1509	582	472	2034	1946	508	495
No.of Banking outlets in villages with population < 2000										
---- **Through Branches**	104	0	0	0	6	15	20	95	8	0
----Through BCs	1585	275	2400	3137	445	92	2095	716	910	360
-----Through other modes	0	0	0	0	0	0	0	0	0	0
Sub Total < 2000	1689	275	2400	3137	451	107	2072	811	918	360
Total banking outlets in all villages	2542	1229	3875	4646	1033	579	4106	2757	1426	855
No. of BC outlets in Urban location	0	0	41	7	0	0	65	33	78	7

Source: *SLBC, West-Bengal.*

- **Basic Savings Bank Deposit Account (BSBDA):**

  RBI has advised all banks to open BSBDA and to provide overdraft (OD) on such accounts through branches and BCs. A target was set up to April,2014 by SLBC both on the opening of A/c's (in lacs) and also on the amount of deposit (in cores). All the fine public sector banks viz. UBI, UCO, CBI, Allahabad Bank, SBI provides favorable figures in opening BSBD a/c both through branches and BCs. All these banks also extended overdraft facility to its customer as per the target set by SLBC. **(Fig-3)**

Fig-3: Basic Savings Bank Deposit Account (BSBDA):

Financial Inclusion Plan Disaggregation	**Allahabad Bank**		**United bank of India**		**Central Bank of India**		**SBI**		**UCO Bank**	
Particulars	**Target up to March' 14**	**Month ended Dec'13**	**Target up to March' 14**	**Month ended Dec'13**	**Target up to March' 14**	**Month ended Dec'13**	**Target up to March' 14**	**Month ended Dec'13**	**Targe t up to Marc h'14**	**Month ended Dec'13**
Basic Savings Bank Deposit Account (BSBDA) [Through Branches]										
.... No. in Lac	6.18	5.42	9.01	9.45	25.8	23.48	1.85	1.60	3.14	3
....Amount in Crore	1.02	2.34	9.01	9.49	4294.6	4030.6	12.00	15.72	104.8	122.00
Basic Savings Bank Deposit Account (BSBDA) [Through BCs]										
.... No. in Lac	2.06	2.57	14.65	13.48	1.53	2.43	9.00	18.41	2.02	2
....Amount in Crore	2.03	1.63	37.59	8.49	3.2	2.82	60.00	110.56	4.00	0.63
Basic Savings Bank Deposit Account (BSBDA) [Bank as a whole]										
.... No. in Lac	8.24	7.99	23.65	23.43	27.33	25.91	10.85	20.01	5.16	5.00
....Amount in Crore	3.05	3.97	46.59	17.98	4297.8	4033.4	72.00	126.28	108.8	122.63
OD facilities availed in BSBDAs										
.... No. in Lac	1.11	0.77	14.11	5.89	0.98	0.09	0	.00053	0.36	0.2074
….Amount in Crore	1.87	1.01	104.71	24.66	4.92	0.28	0.02	0.01	1.38	1.00

Source: *SLBC, West-Bengal.*

➢ **Kisan Credit Cards (KCCs) issued :**

Banks have been advised to issue KCCs to small farmers for meeting their credit requirement. From the below table, it is quiet clear that against a target of 2.41 lacs up to March,2014, Allahabad Bank has just managed to issue KCC to only 0.93091 lacs person, though a quarter is yet to end. CBI has reached the target of 0.56 lacs issue of KCC within December, 2013. The progress of the other three banks also seems satisfactory. **(Fig.-4)**

Fig-4: Kisan Credit Cards (KCCs) issued:

Financial Inclusion Plan Disaggregation	**Allahabad Bank**		**United bank of India**		**Central Bank of India**		**SBI**		**UCO Bank**	
Particulars	**Target up to March '14**	**Month ended Dec'13**	**Target up to March' 14**	**Month ended Dec'13**	**Target up to March' 14**	**Month ended Dec'13**	**Target up to March' 14**	**Month ended Dec'13**	**Target up to March' 14**	**Month ended Dec'13**
KCCs outstanding through branches										
…No in Lacs	2.39	0.93	2.73	2.81	0.56	0.56	2.7	2.45	0.85	0.47
...Amount in Crore	1887.7	460.21	1524.3	962.28	197.3	201.3	1000	948.18	551.3	145.46
KCCs outstanding through BCs										
…No in Lacs	0.02	.00031	0.41	0.23	0	0	0.01	0	0.01	0.0046
...Amount in Crore	4.58	0.004	228.64	88.88	0	0	0.75	0	0.08	0.0463
KCCs total (Bank as a whole)										
….No in Lacs	2.41	.93031	3.14	3.04	0.56	0.56	2.71	2.45	0.86	0.4746
…Amount in Crore	1892.3	460.21	1753	1051.2	197.3	201.3	1000.8	948.18	551.4	145.51

Source: *SLBC, West-Bengal.*

➢ **General Credit Cards (GCCs) issued :**

Banks have been advised to issue GCC facility up to Rs.25000/- at their rural and semi-Urban branches, UBI and CBI have achieved the target of 4.7 lacs and 1.12 lacs within December, 2013. Allahabad Bank remains a distant short of its target but still a quarter is left. SBI and UCO banks are slowly and steadily inching towards its target. **(Fig 5)**

Fig. 5: General Credit Cards (GCCs) issued:

Financial Inclusion Plan Disaggregation	Allahabad Bank		United bank of India		Central Bank of India		SBI		UCO Bank	
Particulars	**Target up to March' 14**	**Month ended Dec'13**	**Target up to March' 14**	**Month ended Dec'13**	**Target up to March' 14**	**Month ended Dec'13**	**Target up to March' 14**	**Month ended Dec'13**	**Target up to March' 14**	**Month ended Dec'13**
GCCs outstanding through branches										
…No in Lacs	0.08	0.188	0.05	0.36	0.14	0.14	0.42	0.401	0.23	0.22
...Amount in Crore	18.3	15.28	13.51	1.79	0.20	0.2	37.5	35.84	13.98	9.00
GCCs outstanding through BCs										
…No in Lacs	0	0	4.65	4.79	0.98	1.32	0	0	0	0
...Amount in Crore	0.12	0	22.09	20.62	4.92	6.58	0.14	0	0.06	0
GCCs total (Bank as a whole)										
….No in Lacs	0.08	0.188	4.7	5.15	1.12	1.46	0.42	0.401	0.24	0.22
…Amount in Crore	18.42	15.28	35.6	22.41	5.12	6.78	37.64	35.84	14.05	9.00

Source: *SLBC, West-Bengal.*

- **ICT based accounts through BCs* :**

  In order to provide efficient and cost effective banking services in the unbanked and remote comes of the country. RBI directed commercial banks to provide ICT enable banking services having CBS** connectivity to provide all banking serviced including deposit and withdrawal of money in the financially excludes regions.

  All the five banks that were taken for study showed very favorable figures according to the target, many of such targets set on them were either achieved or were on the verge of achieving the target. But this trend does not continue in ICT based Accounts through BCs. Transactions in BC-ICT Accounts includes savings deposit, Credit / OD, Term Deposit, EBT/Remittance and others. Except SBI & UCO Bank, none of the other banks even achieved 10% mark. **(Fig 6)**

* Information and Communication Technology (ICT) provide doorstep banking services through BC model where accounts can be opened by illiterate customers, thus providing security and confidence in banking system.

*** Core Banking System (CBS) is a banking services provided by a group of networked bank branches where a customer may access bank account and perform basic transactions from any of the member bank branches.*

Fig. 6: ICT Based Accounts through Bcs:

Financial Inclusion Plan Disaggregation	Allahabad Bank		United bank of India		Central Bank of India		SBI		UCO Bank	
Particulars	**Target up to March' 14**	**Month ended Dec'13**	**Target up to March' 14**	**Month ended Dec'13**	**Target up to March' 14**	**Month ended Dec'13**	**Target up to March' 14**	**Month ended Dec'13**	**Targe t up to Marc h'14**	**Month ended Dec'13**
Savings Deposits										
...No. in Lakhs	2.64	0.36	2.1	1.35	0	0.19	20.00	18.39	0.28	0.4536
...Amount in Crore	5.27	0.89	14.17	9.96	0	0.34	470.00	512.01	1.00	1.018
Credit/OD										
…No. in Lakhs	0.74	0	21.17	1.78	0	0.11	0	.00032	0.12	0.002
…Amount in Crore	1.54	0	355.14	3.86	0	1.17	0.02	0.0049	0.37	0.012
Term Deposits										
…No. in Lakhs	0.51	0	0	0	0	0	0.06	0.235	0	0
…Amount in Crore	0.51	0	0	0	0	0	0.12	2.497	0.03	0
EBT/Remittance										
…No. in Lakhs	8.24	0	4.91	0	0	0	1.50	0.10	0.30	0.0007
…Amount in Crore	20.6		491.37	0	0	0	90	52.34	1.8	0.0003
Others										
…No. in Lakhs	0	0	0	0	0	0	0	0	0	0
…Amount in Crore	0	0	0	0	0	0	0	0	0	0
Total of transactions in BC-ICT A/cs										
…No in Lakhs										
…Amount in Crores	12.13	0.36	28.18	3.13	0.00	0.30	21.56	18.725	0.71	0.46
	27.92	0.89	860.98	13.82	0.00	1.51	560.14	566.85	3.2	1.03

Source: *SLBC, West-Bengal.*

Conclusions & Recommendations:

From the above analysis it is clearly evident that the public sector banks that were taken for the study showed positive attitude in devising Financial Inclusion Plans (FIPs) with their business strategy and have made FIPs an integral part of their corporate plans. It is also observed that large no. of accounts are opened in the rural areas and unbanked villages, large number of CSPs have also been deployed **(Fig: 1)** then also majority of these accounts remain without minimum required operations **[as observed in ICT based accounts through BCs (fig: 6) in terms of Credit/OD, Term deposits, EBT/Remittance, etc].** The probable reasons of such inoperative accounts are the BCs operating in village and unbanked areas are corporate in nature and they receive commission for opening of bank accounts and not for operation of those opened accounts. Moreover the cash holding capacity and

payment capacity of one BC is restricted to Rs 10,000 only and thus unable to meet up the demand of the customers. The remuneration of the CSPs are also not regularly paid by these corporate BCs and thus restricting the movement of CSPs in villages, though the corporate BCs receive the payments from the respective banks in due time. Infrastructural drawback has also somewhat hindered the progress of financial inclusion. CSPs are provided with machineries like laptop and other electronic devices in order to transact in real time with the nearest located bank branch. If such machineries go out of order then it takes long time for repairing and thus hindering the so called door step banking. The figures of SBI and Allahabad Bank showed positive results overall, but it should be kept in mind that these two banks are the lead banks of Kolkata and North 24 Parganas(whose scores are highest among all the districts of the state). Lastly, it can be concluded that BC model adopted by the banks are not working properly and are unable to contribute to enhance the FIPs adopted by the banks to a great extent.

RBI has taken up several measures to bring the excluded masses of the society into the basic fold of its banking sector. Achievements cannot be ignored - Nearly 117 Lacs No Frills Accounts (NFAs) have been opened by banks so far in this state. When FI process started, we were all saying people have no bank accounts, now with bank accounts being opened we are complaining that there are no transactions in these accounts. Banks need to be given time for making these NFAs active. Banks must be able to see Financial Inclusion as a business opportunity. The Technology is critical for this as brick and mortar branches would not be cost effective and that is why BC- ICT model is the key. Electronic Benefit Transfer (EBT)*, Remittances and credit products will play a key role in making this experiment a commercial success. Banks must be allowed to discover business and delivery model. If the EBT scheme succeeds and if Banks are allowed to develop the business and delivery models, operations through BCs would become viable and the number of transactions in these accounts will increase. Apart from these recommendations, relaxation in documentation and banking norms, reduction of high usage of technology in banking matters in the rural areas, improvement of technology to stabilize ICT based BC model, reduction of transaction cost in access to savings and credit, creating awareness through financial literacy camps in the regional languages, introducing financial inclusion in the curriculum in schools at national level, to bring all stakeholders like Non Government Organizations (NGOs) and civil societies to work for a sound and purposeful collaboration is needed to make the financial inclusion a grand success.

** Banks have been advised to implement EBT by leveraging ICT-based banking through BCs to transfer social benefits electronically to the bank account of the beneficiary and deliver government benefits to the doorstep of the beneficiary, thus reducing dependence on cash and lowering transaction costs.*

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Commercial Bank Finance and Sickness: A study of Micro and Small Engineering Enterprises in the district of Howrah, West Bengal

Manidipa Das Gupta

Abstract:

In any developing country like India, ***Micro and Small Enterprises (MSEs)*** *can be considered as the most strengthening source in socio-economic development. But distressingly enough, the very sector cannot get itself protected from sickness which spreads its wings in every state of India. In this regard, West Bengal (WB) is specially mentionable mainly due to the moribund condition of* ***Micro and Small Engineering Enterprises of Howrah,*** *the former Birmingham/Sheffield of the East. As per the All India Fourth Census Report (2006-2007),* ***Shortage of Working Capital*** *is the most severe cause of sickness of MSEs. Among different sources of finance of MSEs,* ***Commercial Banks*** *are the main ones. But sometimes, their unfriendly attitude to the concerned sector forces the same to face financial deficiencies which pull the enterprises to become sick. The present paper aims at identifying how much and to what extent the finance related causes in association with the Commercial Banks are responsible in bringing about sickness in Micro and Small Engineering Enterprises in Howrah and recommending some remedial measures following descriptive research methodology.*

Key Words: *Micro and Small Enterprises, Sickness, Micro and Small Engineering Enterprises, Commercial Banks, Finance, Howrah.*

Introduction :

In any developing country like India, Micro and Small Enterprises (MSEs) [formerly tiny and Small Scale Industries (SSIs)] can be recognized as the most energizing fuel in the socio-economic development. As per the All India Fourth Census Report, 2006-2007, the sector has explored remarkable performance in production (₹ 608152.14 crore), export promotion (₹56031.07 crore), employment generation (8758242) and gross value addition (₹100605.25 crore). Besides, the sector is well capable to redress off the concomitant social hazards of our nation like unemployment and its resultant issues.

But distressingly enough, the very sector is rigorously being arrested by sickness which spreads its roots in every state of India amongst which West Bengal (WB) is specially mentionable mainly due to the moribund condition of Micro and Small Engineering Enterprises of the district of Howrah, the former Birmingham/Sheffield of the East.

Howrah has contained the maximum number of Incipient Sick SSIs (20.17 percent*) and second maximum number of Sick SSIs (15.62 percent*) in WB just after South 24 parganas. As per the Fourth All India Census Report (2006-2007), Shortage of Working Capital can be detected as one of the severe cause of sickness of MSEs. In India, among all the sources of

**As the state-wise Fourth Census Report of India (2006-2007) has not yet been released, the data of the Third Census Report, Directorate of Cottage and Small Scale Industries, WB (2001-2002) on sickness have been used. It may be mentioned in this connection that SEs were recognised as SSIs, including tiny (now Micro) also, at that time.*

finance of MSEs, Commercial Banks are the most important ones (₹ 485943 crore in 2011, MSME Annual Report 2011-12), ensuring the assistance as per the RBI's Guidelines. But the financial policies in paper sometimes do not support the actual picture in respect of the performance of Commercial Banks to MSEs which gifts insufficient financial base of the very sector and resultantly huge number of sick units. The concerned sector of Howrah is not an exceptional one in this regard.

Researchers, authoritative institutions, in this respect, have focused on this problematic issue and its probable solution in their different reports, books, articles and policies some of which can be reflected as under:

- The RBI in its different Committee Reports like *Chakraborty Committee Report (2007), Kohli Committee Report (2002)* has focused on the definitional criteria of sick, incipient sick and sick viable MSEs in India. Besides, it has also mentioned different modes of Commercial Bank Finance to MSEs in various reports like RPCD.MSME&NFS.BC.No.5/06.02.31/2013-14 date, July 1, 2013 etc.
- *Desai (2006)* in his book *Small Scale Industries and Entrepreneurship in the 21st Century: Spirit of Enterprise and Mathur (1999)* in his study *Sickness in Small Scale Sector* have reflected sickness in Small Enterprises (SEs) in India and its respective causes.
- *Ministry of MSME* in its *Annual Report (2011-2012)* has showed the empirical report on the loaned amount given to MSEs from different sources. Besides it has mentioned the present position of MSMEs in India in its *Micro, Small and Medium Enterprises Development Act, 2006.*
- *Bose (2013)* in his article Financing of *Micro, medium and small scale enterprises in India Key Challenges, DasGupta (2010)* in her paper *Commercial Bank Finance in Small Enterprises in India* and *Ganguli (2009)* in his study *Credit Flows thrive to MSME in West Bengal* have focused on the practical horrible picture of MSEs in India specially in WB due to paucity of need based finance.
- *The Office of the Development Commissioner (2006-2007)* in the *All India Fourth Census Report and Directorate of Cottage and Small Sale Industries (2001-2002)* in the All India Third Census Report exhibited the composition of MSEs and sick MSEs in different states of India.

The literature, in this context, though focused on the different dimensions related to MSEs and their sickness, did not highlight on the sickness in MSEs in the engineering sector of Howrah, WB and its related issues.

This paper aims at *detecting how far and to what extent the major responsible causes of sickness in finance related area in association with Commercial Bank, are liable in bringing about sickness in Micro and Small Engineering Enterprises in the district of Howrah and recommending some remedial measures to get rid of the prevailing situation.*

But the present study suffers from some *limitations* like (i) only registered and urban MSEs belonging to the light engineering sector in the district of Howrah of WB have been selected for primary survey, keeping in mind the time and resource constraints, (ii) information necessary for the primary survey have been collected administering questionnaire among the

entrepreneurs of the sample units. The authenticity of such information cannot be verified due to non-availability of any written documents relating to such information, (iii) like many other studies in social science, the subjectivity in structuring the research problem could not be avoided in the present research work also.

Keeping in mind the aforementioned objective, the remainder parts of the present paper can be designated as under:

Section 2: Sickness in MSEs in India - An Overview

Section 3: Commercial Bank Finance in MSEs in India

Section 4: Methodology, Analysis and Findings of the Study

Section 5: Conclusion and Recommendation

Sickness in MSEs in India-An Overview :

With the introduction of *Micro, Small and Medium Enterprises Development (MSMED)* Act, 2006, a modified definitional criteria of MSMEs, based on the operational activities like *manufacturing and rendering of services* has been introduced. As per the new enactment, manufacturing MSEs should have investment in plant and machineries to the extent of ₹ 25 lakh and within ₹ 25 lakh and ₹ 5 crore respectively, while the service rendering MSEs should have the maximum limit of investment in equipment of ₹ 10 lakh and within ₹ 10 lakh and ₹ 2 crore respectively (MSMED Act, 2006).

In this context, to find out the viability status of MSEs in India, the RBI has time-to-time formed different Committees to define the *Sick, Incipient Sick and Sick Viable MSEs*. As per the latest report of its *Chakraborty Committee Report (2007), a unit may be said to have become sick, if any of its borrowal accounts remains under Non Performing Asset (NPA) for atleast 3 months or if there is erosion in the net worth due to accumulated losses to the extent of 50 percent of its net worth, excepting the condition of willful mismanagement.*

A unit may be treated to have reached the stage of *incipient sickness,* if (i) there is delay in *commencement of commercial production* by more than *six months* for reasons beyond the control of the promotion which entails *cost overrun* or (ii) the unit *incurs losses for two years or cash loss for one year* or (iii) the *capacity utilisation is less than 50 percent* of the projected level in terms of quantity or the *sales are less than 50 percent* of the projected level in terms of value during a year.

As per the RBI's *Kohli Committee Report (2002)* which has also been supported by the *Chakraborty Committee Report (2007)*, a unit may be regarded as *potentially viable* if it would be in a position to pay back the relief package as provided by concerned authorities (Banks, FIs, Government etc.), *within 7 years from the implementation of the said package without any concession.*

In India, as per the All India Fourth Census Report (2006-2007), the maximum number of sick MSEs has been found in Tamilnadu (7374 units), while in Kerala, the maximum number of incipient sick MSEs (18401 units) have been detected. WB, in all these respects has been found within the first 8 states in India. But the rigorous deteriorating condition of it has made the state the most sickness-prone one in India (The Statesman, 17.11.2010). WB now has been identified within the first 5 states in India so far as the number of units having outstanding loan and their defaults are concerned.

Commercial Bank Finance in MSEs in India :

As per the latest RBI's Guidelines, Commercial Banks should grant advances to MSEs under the Overall Priority Sector target of *40 percent (32 percent for Foreign Banks operating in India with less than 20 Branches) of Adjusted Net Bank Credit (ANBC) or credit equivalent amount of Off Balance Sheet Exposure, whichever is higher.* In this context, *60 percent of MSEs advances should go to the MEs* (RPCD.MSME&NFS.BC.No.5/06.02.31/2013-14 date, July 1, 2013).

As per the latest RBI's Guidelines, Commercial Banks have to enhance the credit facility to MSEs through different policies like - *Composite Loan, Collateral-free Security, Credit Guarantee Trust for Micro and Small Enterprise (CGTMSE), Credit Linked Capital Subsidy Scheme (CLSS)* at soften interest rates. Besides, Commercial Banks ensure specialized MSME Branches in identified clusters/centre to enable the entrepreneurs to have easy access to Bank credit and also counseling services.

Commercial Banks should consider the sick viable MSEs, detected according to RBI's Guidelines, for ensuring rehabilitation support. The decision on viability of the units should be taken at the earliest but not later than three months of becoming sick under any circumstance. In this context, the rehabilitation package for sick viable units should be in force within *six months* from the date of the identification of sickness. However, to avoid the unnecessary increase in paper work of some MEs having investment in Plant and Machineries up to ₹ 5 lakh and in equipment up to ₹ 2 lakh, the Branch Manager may decide on viability. The Rehabilitation Scheme as implemented by Commercial Banks are *Waving and Funding of Penal Interest; Unadjusted Interest Rate; Reduction of Rate of Interest on Additional Term Loan and Working Capital; Working Capital Term Loan (WCTL), Financing of Future Cash Losses and Pressing Liabilities* etc.. In the rehabilitation package policy, the Banks are to put in place a Right to Recompense Clause.

Commercial Banks have increased their financial support service to the very sector from *19.9 percent in 2009 to 33.5 percent in 2011 (Bose, 2013)* and established 2032 *specialised MSME branches up to March 2013* (www.rbi.org.in). As per the recent recommendation of Task Force (2010), all the scheduled Commercial banks should maintain the provisions like achievement of 20 percent year-on-year growth in credit to MSES, acquiring a 10 percent annual growth in the number of MEs accounts etc. But unfortunately, it has been detected by RBI that more than *90 percent of MSMEs* have been under the *financial exclusion* due to several inefficient financial performances of MSEs. In this respect, Commercial Banks, have detected the main finance-related responsible causes of sickness of MSEs based on the Guidelines of the RBI's Committees like (i) Inadequate need based finance, (ii) Wrong estimation of financial requirement, (iii) Poor utilisation of current assets and under utilisation of installed capacity, (iv) Inadequate mobilisation of finance, (v) Poor debt collection management, (vi) Block of fund due to over stock, (vii) Deficiency in formulating budget and budgetary control, (viii) Unplanned payment to creditors (ix) Credit restraint policy, (x) Inflation etc. [Mathur, S.B. (1999); Desai, V (2006)].

Methodology, Analysis and Findings of the Study :

This section highlights on the methodology of the present paper, the profile of the units

surveyed, the analysis of the study based on different statistical techniques and the findings.

Methodology :

- The present study is predominantly a *Descriptive* one with an *intensive investigation and careful analysis.*
- Beside the secondary sources, data of the present paper have also been collected through *primary survey* (January 2011 to September 2012) among 232 (93 MEs and 139 SEs) registered (DIC, Howrah, 2000-2001 to 2008-2009) *urban light engineering MSEs.* The units have been detected as sick running units as per the RBI's Guidelines (p 4). The units have been selected randomly through *simple random sampling method* from 290 total population of units.
- The sample units have been visited personally and information have been collected through *interview and questionnaire* where the surveyed sample units were asked to respond on the finance related causes of sickness of their units, caused mainly due to the unfriendly attitude of Commercial Banks. The responsible causes of sickness in MSEs were detected through *pilot survey (December, 2010) for 30 units (12.93 percent of 232 units)* and also from the causes as detected by Commercial Banks.

  In questionnaire, a *5 point Rating Scale* (1 = not responsible at all, 2 = not very responsible, 3 = somewhat responsible, 4 = responsible and 5 = highly responsible) has been used to detect the *degree of responsibility of the finance related causes of sickness* associated with Commercial Banks' finance in bringing about sickness in the concerned units. In this respect, different dimensions (Figure - 1) have been used to confirm an in-depth analysis. Here, the responses of the surveyed sample units on the 5 point rating scale have been summarised in *three categories* to detect the said finance related causes of sickness of the concerned units more firmly like (i) Not Responsible (1) (ii) Not Fully Responsible {Not Very Responsible (2) + Somewhat Responsible (3)} and (iii) Fully Responsible {Responsible (4) + Highly Responsible (5)}.
- The data obtained through primary survey have been tabulated and analysed using *non-parametric Chi-Square (χ^2) test* by applying *Snedecor and Irwin Formula.*

  The formula used in the present study, with the change of notations, stands as follows.

  $$\chi^2 = T^2 / T_A T_B [\{\sum (a_i^2 / T_i) - T_A^2 / T\}]$$ {Goulden, (Second Ed.)}

  Here, T (in place of G) = Total surveyed sample units, T_A (in place of C_1) = Total of Group A, T_B (in place of C_2) = Total of Group B, T_i (in place of R_i) = Total number of sample units in specific rank, a_i / T_i = Number of surveyed sample units in the specific ranking / corresponding total number of sample units.

  This formula has been used to test the hypothesis for degree of freedom (d.f.) 3 that is (no. of rows - 1).

Profile of the surveyed sample units :

- *Viability Status of the surveyed sample units:* As per Table - 1, 54.74 percent (127 units) and 45.26 percent (105 units) of the total surveyed sample units have been identified as Non-Viable and Viable ones respectively by Bank and/or DIC. Here, viability status of the units has been judged on the basis of the RBI's Guidelines.

- *Assistance received by the surveyed sample units in the field of Finance: 120 of the total surveyed sample units* have taken financial assistance from Commercial Banks in different modes of *working capital* (Composite Loan, Collateral free security etc.) and of *rehabilitation purpose* (WCTL, Waiving and funding interest dues on cash credit and term loan etc.). Here, only the sick viable units could have the said rehabilitation assistance. The rest of the surveyed sample units that is *122 units* did not take the financial assistance from Commercial Banks either due to their preference to arrange the need-based finance from their own source considering the high interest burden of bank finance and banking hazards (90 units) or due to the unfriendly and partial attitude of the Commercial Banks in offering loan finance to units (20 units) or both (12 units). As per Table - 2, out of total assisted units (120 units), *39.16 percent* has responded the financial assistance provided by the Commercial Banks as *totally insufficient* to support their requirement. The Degree of Sufficiency of the respective assistance here has been judged on the basis of the responses of the units surveyed and then plotted on the 5 point rating scale accordingly.

Analysis of the Study :

In the finance-related area as identified by the Pilot Survey and Guidelines of Commercial Banks, ***3 causes*** like *(a) Inadequate Need Based Finance, (b) Poor Debt Collection Management and (c) Unplanned Payment to Creditors* which have also been related to the Commercial Banks finance, have been detected as the ***major responsible*** ones in respect of which at least ***51 percent, i.e., majority*** of the concerned units have responded to *fully responsible category i.e. 4 (responsible) and/or 5 (highly responsible*) of the five-point rating scale. Among the three finance-related causes of sickness, ***Inadequate Need Based Finance*** has been found as the most responsible cause of sickness containing ***66.38 percent*** *responses of the total surveyed sample units* in the fully responsible category (Table - 3).

Dimensions of the Inferential Study :

The study firstly has considered *only one dimension - Financial Assistance to Entrepreneurs of the units* which has contained two specific groups - *Units having entrepreneurs not getting Financial Assistance and Units having entrepreneurs getting Financial Assistance.* Further, for in-depth analysis, the *Units having entrepreneurs getting Financial Assistance* are sub-divided into two specific sub-dimensions - *Nature of Entrepreneurship of Financially Assisted Units and Technical Qualification of the personnel of Financially Assisted Units.* Each of the sub dimensions has two sub-groups based on the ownership patterns (Sole Proprietorship and Other than Sole Proprietorship mainly Partnership and Private Ltd. Company) and technical qualification of the entrepreneurs of the units (Units having personnel without technically qualification and with technical qualification). The sub dimension technical qualification of the entrepreneurs of the units signifies the surveyed sample units where at least one managerial personnel has been with technical knowledge which can be arrived from (i) Technical Degree/Diploma or (ii) Training in Technical Field or (iii) Experience or (iv) All. The dimensions (Figure - 1) are used for framing out the hypotheses.

Hypotheses Framing, Testing, Interpretation and Remarks :

H_0: There is *no significant association* between the *Financial Assistance to Entrepreneurs* and the degree of responsibility of the *major responsible Finance-related causes* in bringing about sickness in the Micro and Small Sick Engineering units.

As per the responses of the surveyed sample units (Table - 4), *H0 has been rejected for Inadequate Need Based Finance and Unplanned Payment to Creditors.* But for *Inadequate Need Based Finance* the Units having Entrepreneurs getting Financial Assistance (Group B) have suffered more than the other group of units. Therefore, further two sub-hypotheses (H_{01}, H_{02}) have been framed based on the two sub dimensions to continue the study intensively in association with the cause *Inadequate Need Based Finance.*

H_{01}: There is *no significant association* between *Nature of Entrepreneurship of Financially Assisted Units and degree of responsibility of Inadequate Need-based Finance* in bringing about sickness in the Micro and Small Sick Engineering units.

H_{02}: There is no significant association between Technical Qualification of the personnel of the Financially Assisted Units and degree of responsibility of Inadequate Need-based Finance in bringing about sickness in the Micro and Small Sick Engineering units.

Findings of the Study :

Dimension (D): *Units having Entrepreneurs not getting Financial Assistance (Group-A)* have suffered more than the other group of units due to *Unplanned Payment to Creditors* mainly for lack of required financial base. The units of Group - A might not be able to sketch proper planning to meet the dues of creditors as per priority or they might be interested to meet their current urgency in production and marketing related area which hindered their prompt payment to creditors as per the requirement. On the other hand, strangely enough, **2-Units having Entrepreneurs getting Financial Assistance (Group -B)** have suffered more than the other group of units due to *Inadequate Need-based Finance.* The units of Group - B might not be able to assess their financial requirement based on which they could arrange fund from Banks or they might not utilize the arranged Bank finance, if there be any, properly in practice as per priority and urgency. Moreover, they might chalk out their expenditure in anticipation of getting financial assistance from Commercial Banks but in practice when they could not avail of the estimated required amount from Banks they had to suffer a lot. The other group of units, on the other hand had sufficient knowledge about their pocket which helped them to take practical decision on expenditure.

Sub-Dimension (Sd_1): As per the responses of the surveyed sample units as reflected in Table - 5, it has been identified that *Financially Assisted Sole Proprietorship (SP) Units (Sub-Group - A)* have suffered more than the other group of units. In this context, SP units due to their lack of manpower might not be able to maintain papers required presenting before Banks for availing of the need-based finance. They could not preserve accounting records and thus were not be able to convince the Banks about their creditworthiness.

The responses of the surveyed sample units have exhibited the fact (Table - 6) that *Financially Assisted Units having personnel without technical qualification (Sub-Group - A)* have suffered more than the other group of units due to *Inadequate Need Based Finance.* Commercial Banks used to prefer the feasibility report of the units having technically

qualified personnels than the other group of units while providing financial assistance.

Conclusion and Recommendations:

The credit flow from commercial banks to MSEs whose total requirement of credit is more than ₹ 10,000 crore (www.dcmsme.gov.in) as conventional estimate puts, remains a cause of worry. Commercial banks in support of their dissatisfactory performance to MSEs have blamed the *extreme risk generation in getting back the principal and interest amount of the loaned capital from concerned MSEs and the possible tremendous loss,* connected therewith and incidental thereto (Das Gupta, 2010). As per Government latest financial report (2011-12), in banking system credit the share of MSEs was 9.8 percent whereas the share of this sector in banking system NPA was as high as 17.9 percent (Bose, 2013). Moreover, the difficult and costly accessible credit information, lack of transparency and reliable financial track record of MSEs pull Commercial Banks in trouble to distinguish between bankable projects and doubtful projects. In addition thereto, the lesser interest rate and the relaxed terms for repayment of loaned amount from MSEs, as per the RBI's norm, make financing to the very sector unattractive from commercial aspect for Banks. Resultantly, the loaned amount to the priority sector is found to be flown to Medium-sized units and only nominal percent is provided to MSEs (Ganguli, 2009). On the other hand, MSEs now prefer to have financial support from different informal sources rather than from Commercial Banks due to their timeliness, convenience and simpler process of financial assistance. Now, somehow to resolve the prevailing situation, some recommendations may be offered to the connected parties as follows.

The Government may (i) organise *Seminar, Workshop and Conferences* both for Banks and MSEs exhibiting the current financial policies, (ii) empower the MSEs *Facilitation Council* and organise *special district-level committees* to identify different stages of sickness in MSEs, (iii) monitor the financial performance of Commercial Banks in respect of credit financing to the neediest sector MSEs and call for clarification if they deviate from the stipulated level of financial assistance to MSEs (iv) introduce sector-specific financial policy and credit policy on the basis of financial requirement in different functional areas of the sector.

The Financial Institutions may (i) introduce the modernized way of *venture capital financing* and factoring service in MSE financing (ii) tone-up the risk assessment based on the *SEs rating services of Credit Rating Information Service India Limited (CRISIL)* to undertake better decisions and to reduce the NPA in MSEs, (iii) build up a strict *monitoring cell* in MSEs financing as made by different branches of Banks and *set up a grievance redressal cell* in connection therewith and incidental thereto, (iv) train up the entrepreneurs in maintaining records easily to get loan advance and also help them to assess the financial requirement.

The Entrepreneurs/Owners of the units should (i) be aware of the *basic principles of financial management* with a view to assessing financial need of their units, identify the sources of finance and manage their debtors and creditors properly as per urgency, (ii) maintain papers as per requirement of Commercial Banks to get financial assistance.

Keeping in mind the keen importance of MSEs in socio-economic advancement of our

nation and the present financial crisis of the very sector, different promotional schemes have been implemented by different authorities in India like (i) setting up of stock exchange/platform for Small and Medium Enterprises (Prime Minister's Task Force in 2010), (ii) establishment of *Credit Information Bureau India Limited (CIBIL)* to strengthen the credit information infrastructure, (iii) disclosure of *K.R. Kamath Committee Report (2013)* for monitoring of the credit related issues etc. Presently, in 2014, the *State Government of WB* has announced to open *a special Branch of State Bank of India (SBI)* for its *export-import activities* and has proposed to increase the bank finance to MSEs to the extent of *150 percent* from the earlier limit. In this context, all the connected parties should ensure special attention to Micro and Small Engineering Enterprises of Howrah, the then most promising engineering sector of WB as well as India, to achieve their past glory, *Birmingham/Sheffield of the East* once again which has somehow been lost mainly due to the shortage of need-based finance.

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Table - 1 : Viability Status of the Surveyed Sample Units (no. of units)

Ownership Patterns	Viable Units			Non-viable units	Total number of units surveyed
	By Bank	By DIC	By both Bank and DIC		
38		36 6	93		**173**
19		- -	24		**43**
-		6 -	10		**16**
Total 57		**42 6**	**127**		**232**

Source: *Primary Survey (January 2011 to September 2012) , Note: SP = Sole Proprietorship, Pt. = Partnership, Pvt. Ltd. = Private Limited Co.*

Table - 2 : Financial Assistance of Commercial Banks to Surveyed Sample Units and its assessment (no. of units)

Ownership Pattern		Units taking assistance	Assessment of the assistance by the Units				
			5	4	3	2	1
SP	61		**-**	**-**	4	20	37
Pt.	42		**-**	**-**	7	29	6
Pvt.	17		**-**	**-**	2	11	4
Total	**120**		**-**	**-**	**13**	**60**	**47**

Source: *Primary Survey (January 2011-September 2012)*
5 = More than sufficient, 4 = Sufficient, 3 = About to be sufficient, 2 = Little bit insufficient, 1 = Totally Insufficient.

Table - 3 : Finance-related Causes of Sickness in Surveyed Sample Units of Howrah

Causes of Sickness	1 %	Not Fully Responsible			Fully Responsible		
		2 (%)	(3) (%)	Total (2+3) (%)	(4) (%)	(5) (%)	Total (4+5) (%)
Inadequate Need Based Finance	0	46 (19.83)	32 (13.79)	78 (33.62)	21 (9.05)	133 (57.33)	154 (66.38)
Poor Debt Collection Management	0	0	79 (34.05)	79 (34.05)	119 (51.29)	34 (14.66)	153 (65.94)
Unplanned Payment to Creditors	0	16 (6.90)	70 (30.17)	86 (37.07)	94 (40.52)	52 (22.41)	146 (62.93)

Source: *Primary Survey (January 2011-September 2012)*
Note: *Figures in parenthesis specify the percentage of responding units (232) `responded against the particular causes in the specific point of 5 point rating scale.*

Figure - 1 : Dimensions of the Study

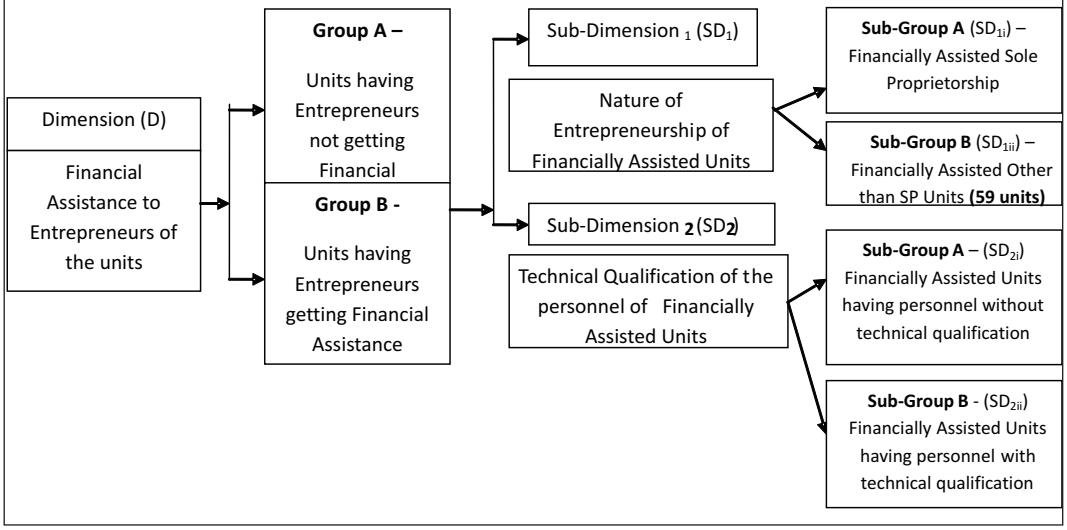

Table - 4 : Responses of the Surveyed Sample Units on rejected H_0

Areas	Causes	Not Fully Responsible						Fully Responsible						Result of χ^2
		$D_{(i)}$			$D_{(ii)}$			$D_{(i)}$			$D_{(ii)}$			
		2	3	Total	2	3	Total	4	5	Total	4	5	Total	
Finance	Inadequate Need Based Finance	29.46	8.93	38.39	10.83	18.33	29.16	3.57	58.04	61.61	14.17	56.67	70.84#	21.07*
	Unplanned Payment to Creditors	4.46	18.75	23.21	9.17	40.83	50.00	50.00	26.79	76.79#	31.67	18.33	50.00	17.86*

Note: [1] *P value for 3 d.f. at 5 % level of significance is 7.81 and at 1 % level of significance is 11.34.*
$D_{(i)}$ = Units having Entrepreneurs not getting Financial Assistance , $D_{(ii)}$ = Units having Entrepreneurs getting Financial Assistance , R = Rejected, A = Accepted

Table -5 : Responses of the Surveyed Sample Units on H_{01}

Areas	Causes	Not Fully Responsible						Fully Responsible						Result of χ^2
		$SD_{1\,(i)}$			$SD_{1\,(ii)}$			$SD_{1\,(i)}$			$SD_{1\,(ii)}$			
		2	3	Total	2	3	Total	4	5	Total	4	5	Total	
Finance	Inadequate Need Based Finance	4.92	4.75	19.67	18.64	45.76	64.41	27.87	52.46	80.33	22.03	13.56	35.59	28.48*

Note: ** P value for 3 d.f. at 5 % level of significance is 7.81 and at 1 % level of significance is 11.34.*
$SD_{1\,(i)}$ = Financially Assisted Sole Proprietorship (SP) units, $SD_{1(ii)}$ = Financially Assisted Other than SP units

Table - 6 : Responses of the Surveyed Sample Units on H_{02}

Areas	Causes	Not Fully Responsible						Fully Responsible						Result of χ^2
		$SD_{2\,(i)}$			$SD_{2(ii)}$			$SD_{2\,(i)}$			$SD_{2\,(ii)}$			
		2	3	Total	2	3	Total	4	5	Total	4	5	Total	
Finance	Inadequate Need Based Finance	6.25	18.75	25.00	37.50	25.00	62.50	31.25	43.75	75.00	12.50	25.00	37.50	22.41*

Note: ** P value for 3 d.f. at 5 % level of significance is 7.81 and at 1 % level of significance is 11.34.*
$SD_{2\,(i)}$ = Financially Assisted Units having personnel without technical qualification, $SD_{2(ii)}$ = Financially Assisted Units having personnel with technical qualification

Social Audit as a Means to Curb Corruption: The NREGA Experience

Mausumi Bhattacharyya

Abstract :

The National Rural Employment Guarantee Act (NREGA), 2005 is an important step towards realization of the right to work. It aims at arresting out-migration of rural households in search of employment, simultaneously enhancing people's livelihood on a sustained basis by developing economic and social infrastructure in rural areas. This Act mandates 100 days manual work for every rural unskilled and unemployed men and women of India. To keep the NREGA activities under scrutiny a system of mandatory social audit has been put in place. Unfortunately, social audits have largely been reduced to a mere compliance mechanism with too scant reporting of malpractices and misappropriations. Media and various survey reports abound with the unfathomable corruption around NREGA activities. But they hardly find any mention in the social audit reports. Thus, the basic purpose of having public scrutiny over the public works gets defeated. The present paper attempts to highlight the efficacy of social audit system in the context of NREGA, the largest ever social security measure.

Key Words: *NREGA Act, Social Audit, Public scrutiny, Public work, Unemployment.*

Introduction:

The National Rural Employment Guarantee Act (NREGA) has been enacted in the year 2005 as a flagship programme for ensuring social security of the unemployed people of rural India. This Act mandates 100 days manual work for every listed unemployed with no eligibility criteria other than being an adult willing to work. This is a part of the agenda of inclusive development by the Indian government. NREGA is the world's largest social security programme targeting 4.5 crore people (Ramachandran, 2010). The Act is later renamed as Mahatma Gandhi National Rural Employment Guarantee Act in 2009. This change of nomenclature is very significant in that it incorporates the symbol of candor and veracity into its architecture. The spirit of transparency is intended to be imbibed into the essence of the largest ever social welfare scheme in India. The basic objective of the government is to provide employment opportunities to the rural unskilled and unemployed population which in effect would help forming social assets through their labour. The Act is an important step towards realization of the right to work and aims at arresting out-migration of rural households in search of employment, simultaneously enhancing people's livelihood on a sustained basis by developing economic and social infrastructure in rural areas (All-India Report on Evaluation of NREGA: a Survey of Twenty Districts, 2008). Construction of roads, digging of ponds, water conservation and harvesting, drought proofing and land development are some of the examples of the works targeted in NREG schemes. It is, no doubt, a noble proposition so far as it builds up social infrastructure while providing social security to the unskilled. It is the largest workfare programme dwarfing the similar endeavours of any other country of the world. It is the scheme which got the biggest amount of fund that had ever flowed to the rural India and is designed to be implemented by the State

machinery. However promising this project may sound, like any other schemes meant for the poor, this optimistic mission too witnessed severe anomalies in its delivery mechanism. Crores of public money loses their way in transit before reaching the poor. Corruption has become an organic part of the NREG programmes. To bring about transparency in the operation of the scheme, the scheme clearly keeps a provision of social audit by the concerned stakeholders. But the entire exercise ultimately gets reduced to a mere compliance mechanism. Therefore, the annoying question is, can the system of social audit really curb the insatiable greed of the public representatives, elected or otherwise? Can the public scrutiny ever plug the unscrupulous black holes of corruption and smoothen the drive towards achieving the noble mission? The present paper aims to delve into the down sides of the NREGA experience and understand the efficacy and effectiveness of social audit in respect of this ambitious social security scheme.

Literature Survey:

The fundamental question whether the money meant for the poor under the NREGA scheme really reach the poor is the central concern across the board. The same is echoed in the words of Dreze, Khera and Siddhartha (2008). They underlined a severe concern that the draft CAG Report does not present much evidence of the large scale embezzlement of funds. Their worries are justified as the Reports merely points to the procedural lapses ignoring the issue of vanishing money. They conducted a muster roll verification survey with help of G P Pant Social Science Institute, Allahabad which noted a horrifying degree of misappropriation in some districts of Jharkhand and Chhattisgarh.

NREGA has addressed an unresolved debate about the feasibility of having a national minimum wage. Sankaran (2011) stressed that the NREGA wages must be a need-based national minimum wage under the Minimum wages Act. This will allow the regional or geographical flexibility in the wage rates. Although, the Act, with immense potential, has changed the face of many a village and prevented the out-migration of villagers as a consequence (Roy Chowdhury, 2010), the highly ambitious scheme of NREGA has continuously been in the news for not meeting its objectives. The statistics reveal a bleak picture and it has been observed that the money have continually been siphoned off from the scheme. Shankar and Gaiha (2013) applied both qualitative and quantitative analysis to measure the effectiveness of formal and informal mechanisms in reducing corrupt practices.

Burra (2008) explored the possibility of a new paradigm for the relationship between state agencies and Civil Society Organisations (CSOs). She presented the two extremes of the State- CSO relationships. At the one end of the spectrum is a model of conflict between CSOs and the State and at the other end is the cooperation where CSOs act closely in concert with State agencies. She pointed out the uniqueness of the Andhra Pradesh model where the State itself commissioned CSOs to ensure transparency and accountability. Capturing the nuances of this partnership is somewhat difficult as the CSOs are to unearth the corruption of the State machinery itself. This model has immense potential for both the extremes; fuelling the unscrupulous nexus and bringing about the transparency. The choice, however, lies with the State functionaries (Akella and Kidambi, 2007).

Essence of NREGA:

The enactment of NREGA in 2005 symbolizes the achievement of a very long civil society movement towards ensuring the right to food through ensuring right to work. It provides a minimum 100 days work to every rural household within 15 days of a person making application for the job within a radius of 5 kms from the applicants' residence, failing which, the government would pay him an unemployment allowance. Another interesting dimension of this Act is that it pays equal wages to men and women, a practice rural India had hardly seen before. The Act is built up on three pillars: decentralized planning and organization, pro-active disclosure and social audits. The scheme is based on participatory planning approach where people at the grass-root level are expected to take part in the planning and implementation process. It is the beneficiaries who identify the work and are consulted for the proper execution of the same. It is, indeed, a democratic process in which the ordinary beneficiaries, Gram Sabha, various NGOs and self-help groups and different civil society organs ideally play an active role. Although the job scheme was planned as a bottom-up programme where the work should be demand-driven and be decided by the needs of the local community, it finally ended up in a top-down approach with decisions imposed on the beneficiaries (Ramachandran, 2010). Maintenance of transparency in all its affairs is at the core of the scheme and for that matter, a mandatory system of surveillance has been put in place. The multi-layered social audit system was initially introduced in 200 villages and later it was spread over the entire rural India.

NREGA aims at providing people's livelihood on a sustained basis by developing the economic and social infrastructure. Construction of ponds, drainage system and plantation are some of the most commonly practiced areas of work. The choice of works seeks to address the causes of chronic poverty such as drought, deforestation or soil erosion besides the infrastructural lacunae such as lack of roads and supply of water. Activities like the development of roads, land and water bodies have a long-term impact on the economic growth complimenting village development.

Public scrutiny of public work:

A social audit is a process by which the people, the ultimate beneficiaries of any scheme, both present and potential, are empowered to audit such schemes, programmes and policies. In other words, social audit entails a verification of the project scheme, its implementation and evaluation of its results by the community with the active involvement of various stakeholders. It is conducted in addition to statutory audits for certain type of schemes and activities especially those involving huge and disaggregated expenditure. The idea of social audit is textured on the principles of transparency, accountability and ensuring democratic participation by the beneficiaries. In the context of NREGA, transparency demands full disclosure of the details of planning, process and financial affairs. Accountability implies holding the elected representatives and government functionaries responsible for the entire activity or inactions, success or failure, to all the concerned people. The third pillar of NREGA, namely, the social audit process involves a cross verification of government records by the most disempowered and marginalized section thereby creating a scope for their participation in governance. It is carried out by the community of stakeholders and includes beneficiaries, funding agencies, Gram Sabha, NGOs, self-help groups, village-

level organizations, minority representatives and so on. There is a stipulated format for the presentation of social audit report which is an elaborate one and demands extensive details about the compliance status. As per Section 17 (read with para 13 of schedule-1of the NREG Act, all the states are bound to organize social audit of their respective schemes in the prescribed manner. The Ministry of Rural Development, Government of India, mandated the conduct of social audits by an order (NO. J-16012/1/09-NREGA, dated 19th June, 2009). The District Programme Coordinators were instructed to complete the social audit and entry of the information in the prescribed format in a time-bound manner. It identified 11 stages of the programme where the beneficiaries of the scheme can intervene and ask for explanations (Aiyar & Samji, 2009). For the effective conduct of the social audit, the identification of the steps involved in the NREG process is essential as each step may give way to corruption. Therefore, social audit protocol must be designed to keep vigilance over all the potential problem areas right from job card distribution to disbursement of wages. The Ministry has, thus, accorded highest priority to 'increasing transparency and public accountability of NREGA by enforcing social audit'.

The State Government shall facilitate conduct of social audit of the works in every Gram Panchayat at least once in six months. A summary of such findings of such social audits shall be submitted by the State Government to the Comptroller and Auditor General of India. Under the Act, the State Government shall identify or establish an independent organization called Social Audit Units to facilitate the conduct of the audit by Gram Sabha. These units are responsible for the capacity building of Gram Sabha for conducting social audits in term of training of and deployment of resource persons at village, block or district level, drawing primary stakeholders and other civil society organizations, preparation of social audit reporting formats, creating awareness among the labourers about their entitlements and rights and so on. To minimize the chances of developing vested interests, the resource persons deployed for facilitating social audits in a Panchayat shall not be residents of the same Panchayat.

The process for conducting social audit involves the preparation of an annual calendar at the beginning of the year for conducting at least one audit in each Gram Panchayat in six months. A copy of the calendar must be submitted to the District Programme Coordinators. The Gram Sabha along with the primary stakeholders shall verify the muster rolls, entry and payments made in the specific period by contacting the wage seekers whose names are entered in such muster rolls, the cash book, bank statement, invoices, bills vouchers and related records for procurement of materials to testify whether such procurement was as per the estimate and was economical. The audit also requires the Gram Sabha and the relevant stakeholders to visit the work sites and assess the volume of work done with reference to the records and judge the quality of work as well. All elected members of Panchayats and staff involved in implementing the scheme shall be present at the Gram Sabha and respond to the queries. The Gram Sabha shall provide a platform to all villagers to seek and obtain further information and responses from all involved in the implementation. Every district Programme Coordinator is responsible for taking steps to recover the amount embezzled and to take appropriate action against the individuals who misutilised or embezzled the funds.

NREGA and Social audit experiences :

The Mahatma Gandhi National Rural Employment Guarantee Act has two challenges before it; one, the capacity of the central government to meet the financial obligations that the law demands and, two, an honest delivery of the scheme. Even if the first one is ensured, the second challenge is really a difficult proposition. Opportunities are galore for the middlemen to siphon out money depriving the poor. Thus, NREGA, the biggest ever social security measure, has faced with several controversies at different points in time, thanks to the all pervasive corruption in India. According to Mihir Shah, a member of Planning Commission, NREGA has a revolutionary architecture but is performing way below potential (Ramachandran, 2010). Swaminathan Iyar (2004), a noted economist, once said that "likelihood of money reaching the poor would be higher if we simply drop the money by helicopter or gas balloon into rural areas, than the route through employment programmes". In the face of these grim predictions, social audit seemed to be a reason for hope (Aakella & Kidambi, 2007). But the ground reality is quite contrary to what had been ideally contemplated. Some instances would suffice to understand the efficacy of the social audit system of NREGA.

The government ordered an inquiry into the alleged irregularities in wage payment in Kotda village in Gujarat's Kotiyana district, for which a probe had been ordered by the then Rural Development Minister. Interestingly, the irregularities or misappropriations have been reported by an e-literate panwala (The Economic Times, Nov 19, 2010). Alleging misuse of the wages, hundreds of NREGA workers in Ganderbal district, Srinagar, staged demonstrations for the immediate release of their wages. They further alleged that the poor workers are being cheated by the big politicians of the district and are being threatened by the sarpanchs in case they raise their voices against the anomalies (Kapra, 2012). The corruption around NREG scheme has been so rampant that there is hardly any district that may escape such charges. Kendrapara Block, West Bengal, is a token example where the released fund of about 62 lakh has been allegedly misappropriated by the unscrupulous officials and there has been no trace of physical work done. The execution of the entire work is "on paper only" (Kar, 2011). The fund-misuse relates to the financial year 2009-10 although the social audit report of the same period remained silent about any such misappropriation. In terms of NREGA scams, Uttar Pradesh has perhaps outweighed all other states. According to Mr. Sanjay Dixit, a member of the Central Employment Guarantee Council, "the size of NREGA scam in UP is worth 10,000 crore". He claims that only 40 percent of the sanctioned fund of Rs. 20000 crore in the past four years has reached the target beneficiaries (Srivastava, 2011). So far as the state of Jharkhand is concerned, the CAG Report (2010) revealed that only 47 percent of the schemes taken up under the MG-NREGA Scheme were completed in 2009-10. Out of a total of 160813 schemes only 75767 schemes were completed at the end of 2009-10 (The Economic Times, Sept 12, 2011). The CAG report (2011) observed several lapses and irregularities such as non-preparation of the district perspective plan, execution of works not recommended by gram sabhas, non-conduct of social audit and so on. Deficient enumeration procedure coupled with fake job cards, fictitious labour budgets, gross anomalies in utilization of funds and non-maintenance of statutory control registers and hoarding of job cards facilitated the misappropriation of funds by the unscrupulous officials and political

musclemen. The report further pointed out that the inordinate delays in execution of the scheme and consequent delay in providing employment in majority of the households have defeated the spirit of the scheme (The Economic Times, July 28, 2012). All these anomalies and many more took place despite having the system of social audit in place.

A scrutiny of the state-wise social audit reports (see Annexure 1 and 2) revealed that a sizable number of social audits have been conducted in every state. The recurrence of social audit process may be viewed more as a regulatory compliance than as a transparency drive. This argument gains ground in the fact that more than 50% of the social audit reports recorded no grievance. For example, out of 16475 social audits conducted in the State of Bihar in 2013-14, 7778 issues were raised and actions were taken. Similar was the trend in 2012-13 when out of 11705 social audits, 5101 issues were raised and redressed in Bihar. Given the track record of Bihar, it is hard to believe that there are so few issues to be raised and redressed in respect of NREGA in rural Bihar. In this context, it may be referred that the Union Rural Development Minister, C P Joshi stated in a press conference that "Bihar has failed to utilize the funds allocated under National Rural Employment Guarantee Act (NREGA)." He further added that the state government was arranging jobs for 35 days on an average against the target of 100 days and that the state government must look into the charges of corruption in implementing the NREGA (Outlook, Aug 3, 2012). The silence of the social audit report about the grievance of the beneficiaries makes one apprehend an anomalous social audit report. While in the state of Madhya Pradesh, charges of misappropriation of NREGA funds amounting to Rs 9 crore has been reported, allegations have been leveled against the BDO and the sarpanch of Gandarbal district of Srinagar for embezzlement of public money. Surprisingly, during the conduct of 1968 social audits in Jammu and Kashmir in 2012-13 only 921 issues were raised while in 2013-14, only 542 issues were raised and addressed out of 1392 social audits. Madhya Pradesh too is no exception to this eyewash. During 41931 social audits conducted across the state of Madhya Pradesh, merely 14659 issues were raised and taken care in 2012-13. These figures hint at almost no-grievance among the two-thirds of the NREGA beneficiaries of the state. Despite so much of allegations, the social audit reports of Srinagar and Madhya Pradesh came unscathed by belittling the grievance submitted. There could be plethora of similar instances pointing to the unidimensional conclusion that large scale irregularities, whether financial or otherwise, have become an integral part of the NREGA schemes and social audits have failed to track them.

In various districts of Orissa, such as Boalingir, Boudh and Kalahandi, corruption reigns at its classical form. The infamous 'fixed percentage of schemes fund' whereby the functionaries demand a fixed percentage of the funds continued and it seemed to absorb about 22 percent of the funds. Community monitoring has not been able to bring about much change. An activist who showed up fraud in NREGA was murdered in Jharkhand (Vinaik, 2008). Bihar and Maharashtra have also seen cases where whistle blowers in road construction and the targeted public distribution system have been murdered. Moreover, a powerful lobby of Rajasthan ganged up against monitoring in terms of filing a case against social audits being run by NGOs. Despite all these open secrets there has been no mention of the same in the social audit reports of the states concerned.

Bureaucracy and political nexus is said to have cheated the poor of their legitimate claims by

privatization of public money in their favour and robbed the poor of their voice. A gross understatement of malpractices prevalent in various states is defeating the basic tenet of social audit. A look into the social audit reports reveals that the majority of the social audit reports have reported either a single issue to be redressed or no issue at all. They seem to be reflecting the state's view and are largely manipulated. It may also be apprehended that the social audit is not being taken seriously and therefore, it is deviating from the away from its designated goal.

Gandhian optimism :

Social audit reports of NREGA are a saga of a gross understatement of the unthinkable degree of misappropriation and manipulations. Even the blocks, which stole the headlines as being discredited with the charges of manipulations and fraud, have their social audit reports clean without any mention of the irregularities. The ambitious idea of inviting public scrutiny of the public work has largely got reduced to a mere ritual of filling out a stipulated printed form. There has been no dearth of initiatives on the part of the policy makers for ensuring transparency in the social audit process but the problem lies in its implementation. Rajiv Gandhi once remarked that only 15 paise of every rupee allocated to the poor really reaches the poor. Ironically, this seems to be true in case of rural employment guarantee scheme. Time changes, habits don't. Social audit of NREGA has hardly improved the situation than what Rajiv Gandhi lamented for about two decades back.

But amidst all the disappointments, Andhra Pradesh stands as a lighthouse showing the right path to those deviating away. Andhra has become a model which started social audit in February, 2006 even before it was mandated. The state has set an example by providing a well-designed delivery system supported by end-to-end information technology application which ensured speed and transparency (Aakella & Kidambi, 2007). The state government initiated the social audit process, teaming up with various civil society groups. However, the actual audit is done by the literate villagers who have been trained up in the social audit process. Although, Andhra- model is not beyond question as it has lead to several controversies, the outcomes of the scheme are quite tangible here. Will the other states ever try to arouse its villagers out of their slumber and train them up to raise voice against all sorts of corruption that bereft them of their right to livelihood? Following the social audit route, can the public representatives be ever held accountable to the people for what they did? An honest endeavour to give the scheme its true shape may really yield wonders. We will be hoping against hope for the NREGA to offer us an improved, enriched and incredible rural India. But, despite our Gandhian optimism the question remained: can the social audit ever curb the menace of corruption!

Suggestions for improvement and Conclusion:

The participatory surveillance mechanism as contemplated in the NREGA Act is, no doubt, a democratic privilege. But its limited success led us to speculate the presence of some organizational lapses besides political nexus and vested interests. For the improvement of the social audit practices the following suggestions may be made:

Randomization of the audit: The ideal design for identifying the casual effects of social audit would be to randomize the social audit programmes. The schedule of social audits should not

be fixed at the beginning of the year. Rather, audit programmes should be conducted impromptu or with a short notice so that chances of manipulations can be minimized. Comparing NREGA outcome between early and late social audit recipients cannot therefore distort estimates of social audit impacts.

Institutionalization of the social audit process: Without sufficient institutional support, the expectation that beneficiary-led audit should spontaneously arise is unsustainable.

Computerization of the records: Andhra Pradesh reaped the benefits of IT revolution and channeled the same in materializing the NREGA schemes. For the effective documentation of the work computerization has no parallel. Retrieval of necessary data at any point of time can be a matter of a mouse click. Of course, it should be complemented by an extensive e-literacy programme across the rural India. However, infrastructural support may pose a hindrance to its success.

Wage payments through banks: One of the major issues that crops up in social audit reports and floods the media is delayed, non-payment or underpayment of wages. Wage payments through direct transfer to the workers' bank account may eliminate this unscrupulous practice.

Periodic training of Gram Sabha members and village youth: This may help them acquire skill and acumen in conducting the social audit effectively. Otherwise, things may appear to them incomprehensible and they may just succumb to some pressure. Proper training is particularly important for the measurement of the efficacy of social audit lies in its proper documentation.

The social audit model of Andhra Pradesh is successful both beyond within and borders. Adopting this model in other Indian states may not be altogether difficult. A scrutiny of the NREGA social audit reports of the last few years reveals no significant effect of repeated social audit process on reducing the aggregate number of complaints. The participatory audit programme like this obviously puts some amount of moral pressure on the public officials. A decline in theft and misappropriation has declined in many panchayats owing to the villagers seeking accountability. But, community-based monitoring may not yield any magical outcome as long as the central vigilance system remains a dormant instrument. Therefore, greater vigilance on the NREGA activities as well as in the documentation of social audit evidence, which could be critical for assessing the impact of these audits, is essential.

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Annexure : 1 - MGNREG Social Audit Report 2013-14

S.No.	State name	Total District	No. of District Started Social Audit	Total GP	No. of Panchayat Covered	No. of Social Audit	Issue Raised and action taken
1	ANDHRA PRADESH	22	0	21863	0	0	0
2	ARUNACHAL PRADESH	16	5	1832	85	104	49
3	ASSAM	27	27	2644	2546	5379	3458
4	BIHAR	38	38	8529	8386	16475	7778
5	CHHATTISGARH	27	27	9924	9367	9381	7412
6	GOA	2	2	190	95	95	75
7	GUJARAT	26	26	14318	13922	26227	18278
8	HARYANA	21	21	6207	4110	4983	2766
9	HIMACHAL PRADESH	12	11	3243	2462	3236	2174
10	JAMMU AND KASHMIR	22	15	4148	1289	1392	541
11	JHARKHAND	24	22	4578	2981	3709	1050
12	KARNATAKA	30	30	5632	5628	11266	7399
13	KERALA	14	14	978	862	14423	11314
14	MADHYA PRADESH	51	27	23311	3167	3357	1564
15	MAHARASHTRA	33	27	28621	12385	13352	3629
16	MANIPUR	9	4	3050	178	184	174
17	MEGHALAYA	7	7	1823	1593	2591	1172
18	MIZORAM	8	3	850	143	162	81
19	NAGALAND	11	0	1164	0	0	0
20	ODISHA	30	30	6236	6196	11742	7988
21	PUNJAB	22	22	13153	12751	21798	13289
22	RAJASTHAN	33	33	9196	7639	7781	6230
23	SIKKIM	4	4	180	85	85	11
24	TAMIL NADU	31	3	12620	479	1337	0
25	TRIPURA	8	8	1140	578	811	511
26	UTTAR PRADESH	75	67	52108	12553	12834	10355
27	UTTARAKHAND	13	11	7577	5247	6117	1616
28	WEST BENGAL	19	19	3354	2944	5559	2468
29	ANDAMAN AND NICOBAR	3	1	77	22	42	0
30	CHANDIGARH	1	0	1	0	0	0
31	DADRA & NAGAR HAVELI	1	0	11	0	0	0
32	DAMAN & DIU	2	0	10	0	0	0
33	LAKSHADWEEP	1	0	10	0	0	0
34	PUDUCHERRY	2	1	14	5	5	3
Total		645	505	248592	117698	184427	111385

Annexure : 2 - MGNREGA Social Audit Report 2012-13

S.No.	State name	Total District	No. of District Started Social Audit	Total GP	No. of Panchayat Covered	No. of Social Audit	Issue Raised and action taken
1	ANDHRA PRADESH	22	0	21863	0	0	0
2	ARUNACHAL PRADESH	16	6	1832	161	209	100
3	ASSAM	27	27	2644	2594	5661	3573
4	BIHAR	38	38	8529	7873	11705	5101
5	CHHATTISGARH	27	27	9924	9619	11879	6010
6	GOA	2	1	190	21	21	17
7	GUJARAT	26	26	14318	13754	26676	16322
8	HARYANA	21	21	6207	4200	6988	3685
9	HIMACHAL PRADESH	12	10	3243	2218	2662	1713
10	JAMMU AND KASHMIR	22	15	4148	1393	1968	921
11	JHARKHAND	24	23	4578	3967	6282	2471
12	KARNATAKA	30	29	5632	5309	8915	4345
13	KERALA	14	14	978	963	17816	11616
14	MADHYA PRADESH	51	50	23311	21794	41931	14659
15	MAHARASHTRA	33	28	28621	14862	19643	6743
16	MANIPUR	9	9	3050	1922	2113	1092
17	MEGHALAYA	7	7	1823	1618	2563	1538
18	MIZORAM	8	4	850	170	195	106
19	NAGALAND	11	3	1164	126	158	76
20	ODISHA	30	30	6236	6234	11841	8858
21	PUNJAB	22	22	13153	12670	23484	8678
22	RAJASTHAN	33	29	9196	6206	6347	770
23	SIKKIM	4	2	180	7	6	6
24	TAMIL NADU	31	15	12620	3450	7047	641
25	TRIPURA	8	7	1140	581	487	177
26	UTTAR PRADESH	75	74	52108	44721	73966	27920
27	UTTARAKHAND	13	13	7577	6018	7720	3682
28	WEST BENGAL	19	19	3354	3142	29408	21860
29	ANDAMAN AND NICOBAR	3	2	77	24	45	18
30	CHANDIGARH	1	0	1	0	0	0
31	DADRA & NAGAR HAVELI	1	1	11	1	1	0
32	DAMAN & DIU	2	0	10	0	0	0
33	LAKSHADWEEP	1	1	10	1	1	1
34	PUDUCHERRY	2	2	14	7	38	36
Total		645	555	248592	175626	327776	152735

Source : *Ministry of Rural Development, Govt. of India*

Indian Pharmaceutical sector and Investments in Research and Development, Pre and Post Trips: A comparative study

Madhuvanti Sathe

S U Gawade

Abstract:

The paper attempts to understand the effect of Trade Related aspects of Intellectual Property rights (TRIPS) regime on the investments in research and development made by Indian pharmaceutical sector. It is revealed that the Indian pharmaceutical industry has positively reacted to TRIPS reforms by emphasizing on the investments in research. Size really doesn't seem to be stopping Indian companies from investing in research and large as well as small companies have shown a significant increase in investments in research. The companies under domestic control have remarkably increased their investments in research but the ones under foreign control seem to be behind in the race. The firms exploring the global market have started investing more in research after TRIPS regime. However the firms operating only in the domestic market have depicted their reluctance towards research and development. The Indian pharmaceutical industry is certainly changing its focus but will have to continue with its research and innovation in order to grow and face the global competition.

Key words: *TRIPS, Research and Development Indian Pharmaceutical Industry.*

Introduction :

Indian Pharmaceutical Sector scenario

India's pharmaceutical sector will touch US$ 45 billion by 2020, according to a major study by global management and consulting firm, McKinsey & Company. India's pharmaceutical market has experienced a boom by reaching US$ 18 billion in 2012 from US$6 billion in 2005. The report further states that the Indian pharmaceutical market will be the sixth largest in the world by 2020.

According to IBEF[1] report, December, 2013, the domestic pharmaceutical market has reported total sales of Rs. 6,883 crores in the month of July 2013, a growth of 13.5 per cent. The major factors responsible for this growth are increasing sales of generic medicines, continued growth in chronic therapies and greater penetration in rural markets.

India currently exports drug intermediates, Active Pharmaceutical Ingredients (APIs), Finished Dosage Formulations (FDFs), Bio-Pharmaceuticals, and Clinical Services across the globe. The exports of pharmaceuticals from India grew to US$ 14.6 billion in 2012-13 from US$ 6.23 billion in 2006-07, registering a compound annual growth rate (CAGR) of around 15.2 per cent. The Ministry of Commerce has set a target for Indian pharmaceutical sector exports of US$ 25 billion by 2014 at an annual growth rate of 25 per cent.

[1] *India Brand Equity Foundation*

Indian pharmaceutical sector and TRIPS

As part of globalization programme, India has become a signatory of the GATT (known as World Trade Organization (WTO) since 1995) and hence a signatory to the TRIPS (Trade Related aspects of Intellectual Property Rights). The Uruguay round (1994) of WTO had laid stress on Intellectual Property Rights, which gave rise to the 'Trade Related aspects of Intellectual Property Rights' (TRIPS) framework. India, a member country of WTO made amendments in Patents Act 1970, in 2005 and switched over from process to product patents, which were made effective from 1.1.2005. Patents give exclusive right to the innovator to commercially use the innovation for a period of 20 years.

To get the patents, pharmaceutical companies have to develop a new drug for which they have to invest in research and development (R&D). After the amendments made to Patents Act in 2005, and with the advent of Pharmaceutical Policy, 2002, it has, now, become inevitable for the companies to spend more on R&D. In the words of Anji Reddy, Chairman of DRL, "Excelling in the basic business operations will be necessary, but not sufficient. To maintain a long-term presence in the global pharmaceuticals market and to grow profitably will require companies to be even more focused on R&D and creation of successful IPR's - (intellectual property rights)." This shows the changing mindset of Indian Pharmaceutical Industry with respect to their outlook towards R&D. India armed with superior R&D infrastructure, low cost skilled human capital and cost effective technology can make a global impact. Indian companies, before TRIPS framework heavily relied on process patents. With advent of TRIPS, it became inevitable for the Indian Pharmaceutical Companies to shift their focus from process to product patents.

In spite of such pace, the Indian companies are still coming to terms with the investment in R&D. While R&D activities have diversified, Indian Pharmaceutical firms have yet to prove their competence in innovating new product. (Chaudhuri, 2007). As correctly stated in FICCI report, India is lacking investment in innovative R&D and lacks resources to compete with MNCs for new drug discovery research and to commercialize molecules on worldwide basis.(FICCI, 2005)

Review of Literature :

The term Research and Development (R&D) is used to reflect the activity carried out by the firm to expand its scope and to further its own interests. It can be done with an intention to gain an edge over its competitors. R&D is considered a non- rivalrous good from the "endogenous growth" model. (Lall & Szenberg, 2006). As defined by OECD, R&D is a, "Creative work undertaken on a systematic basis in order to increase the stock of knowledge including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications."

The R& D costs of pharmaceutical companies are associated with developing formulations and process modifications. In excess of 40 per cent of the industry's R&D is aimed at producing minor variations of existing drugs, not at turning out new ones. (Corbey). Two-thirds of the drugs approved from 1989 to 2000 were modified versions of existing drugs or even identical to those already on the market, rather than truly new medicines.(New York Times, 2002)

Investing in R&D may also enlarge the firm's ability to absorb knowledge over larger distances. This further enhances profit-earning opportunities for such firms. Because they invest in R&D, they become technically and product wise more superior as compared to the companies from developing countries. The technological level of these firms provides them with a competitive advantage, which gives good reason to enter new market. (Grünfeld, 2006). The relation between patent applications and corporate profitability appears to be more of a complementary nature, especially in the long run (Verbeek & Debackere, 2006).

Traditionally, the spending on research by Indian pharmaceutical industry was mainly based on reverse engineering and adaption of the patented foreign drugs to the Indian market. Very little portion of R& D was spent on innovative research and companies spent most of their research costs on improving the established processes. However, considerable improvement has been observed in investments in research and development after TRIPS. (Bedi, Bedi, & Sooch, 2013)

As process patent became passé, in order to survive the competition and have a sustainable advantage, Indian pharmaceutical industry was compelled to invest in R&D. While in the past the companies were primarily engaged with development of new processes for manufacturing drugs, now they are also involved in R&D for modifications of existing drugs to develop new formulations and compositions.(Chaudhuri, 2007)

According to N Lalitha, various options are possible for Indian pharmaceutical industry in the TRIPS regime, such as,manufacture off patented generic drugs, produce patented drugs under compulsory licensing or cross licensing,invest in R&D to engage in new product development, produce patented and other drugs on contract basis, explore the possibilities of new drug delivery mechanisms and alternative use of existing drugs, and collaborate with multinationals to engage in R&D, clinical trials, product development or marketing the patented product on a contract basis and so on. India's expertise in process development skills if utilised within the WTO framework with emphasis on quality standards will provide India a competitive advantage over other Asian countries. (Lalitha)

A report by United Nations Development Programme examines India's response to product patent regime. In the post-TRIPS situation, Indian generic companies have the following basic options,

- For non-patented or patent-expired drugs:To continue to cater to domestic and export markets
- For patented drugs
- Undertake R&D for development of new drugs
- Collaborate with innovator companies for manufacturing, marketing and R&D
- Manufacture patented drugs through compulsory or voluntary licensing(Choudhari, 2010).

During the TRIPS negotiations, it was specifically claimed that TRIPS-compliant patent protection will promptdeveloping country companies to conduct more R&D for the development of new drugs more suited to localneeds.(Choudhari, 2010)

The introduction of TRIPS and government regulations had an impact on R&D investment

strategies of Indian companies. Normally, favorable government regulations help to improve the profitability of companies. Reforms increase a firm's independence to react to other firms as well as increase the extent of competition faced by these firms(Kambhampati & Parikh, 2005). Tax credits may offer a more economic means of providing ongoing support to indigenous biotech enterprises by actively encouraging and rewarding R&D (Johnson, Colette, & Simon, 2006).

Indian Government's role in promoting pharmaceutical R&D has been two-fold. One, providing incentives to the pharmaceutical industry for increasing R&D spending, and, two, facilitating collaboration between the private sector and the large network of publicly funded research institutions, in particular, those functioning under the Council for Scientific and Industrial Research (CSIR). (Dhar & Gopakumar, 2006). The R& D efforts of companies have thus fond to receive support from the government of India.

Purpose and Objective of the Study :

The pharmaceutical companies were expected to invest more in research and development with the advent of TRIPs regime from the year 2005. The investments in research and development have a longer gestation period and the performance is far reaching.

With the advent of TRIPs regime it became inevitable for Indian pharmaceutical companies to invest in research and development. The objective of this study is to understand whether Indian pharmaceutical companies reacted to TRIPs regime by investing in research and development.

Target Population :

The target population for this study was limited to the pharmaceutical companies listed on two major stock exchanges in India viz. Bombay Stock Exchange (BSE) and/or National Stock Exchange (NSE) and did not cover any pharmaceutical company that is not listed. Availability and accuracy of data was a key concern and the researcher believed that the probability of collection of such data was very low in case of companies that are not listed.

To further explain the target population, and to understand the impact of TRIPS regime on investment in research and development, the companies were divided in to various sub-groups as follows,

1. Large companies and small companies
2. Companies under domestic control and companies under foreign control
3. Companies exploring the global market and not exploring the global market

Reference period :

The agreement on TRIPS came in to being from the year 1995. The transition period of five years was available for all developing countries to give effect to the provisions of the TRIPS agreement. This period ended on 1.1.2000. This period was further extended till 1.1.2005. India made amendment in Patents Act, 1970 and switched from process patents to product patents in 2005. Financial Year 2000-2001 was thus taken as the starting year for the current study. The reference period was further classified in to two sub periods viz pre TRIPs regime and post TRIPs regime. It was thus decided to have the reference period from the financial year 2000-2001 up to 2004-2005 as pre TRIPS period and from 2005-2006 till 2011-2012 as

post TRIPS period.

Source of Data and sampling technique :

The data of Indian Pharmaceutical companies were obtained from the Prowess database[2] developed by CMIE[3]. The financial data of 192 Indian pharmaceutical companies from financial year 2000-01 to 2011-12, listed either on BSE or NSC or both are used in our study. Total of net sales for the period under study was used as selection criteria. Out of the 192 companies, 176 companies showed total of net sales for the period under study greater than 0. These companies were included in sample. Other 16 companies were excluded from the sample.

These 176 companies were further divided in to 3 sub-groups for better understanding of the impact of TRIPS regime on investments in research and development. The bases used for subgrouping are as follows,

1. **Size of the company**

   The size of the company was determined using the value of total assets held by the companies. The average of total assets was found using the number of years for which the asset values were observed in the database. This number was less than 12 years for some companies due to the limitation of the database or due to having less number of operating years than that of study period. The companies possessing total assets more than or equal to the mean of 'average total assets' were considered as large companies. Other companies were taken as small companies.

2. **Control perspective**

   The control of the companies can be determined using the parameter of the ownership (whether domestic or foreign) and using the percentage of shares held by foreign and Indian promoters. If a company is having more than 50 percent of its shares held by foreign promoters and also if the company is owned by the foreign owners, it was taken as the company under foreign control. The other companies were considered as companies under domestic control. Ranbaxy, an Indian company was acquired by Daiichi, a foreign multinational, in November 2008. Out of the study period of 12 years, only for 3 years 4 months it was under foreign control. The researchers thought it relevant to include this company in the group 'companies under domestic control. The recent acquisition of Ranbaxy by Sun Pharma in the year 2014 has confirmed that the company is under domestic control. Out of 176 companies, 167 companies were included in the group 'companies under domestic control and remaining 9 companies were considered to be under foreign control.

3. **Export Sales**

   The companies having presence in the international market suggest their ability to grow and expand. If the companies want to survive in the global market, investing in research becomes inevitable to them. The companies were divided in to three sub-groups using

[2] *Prowess is a database of large and medium Indian firms. It contains detailed information on over 27,000 firms.*

[3] *The Centre for Monitoring Indian Economy (CMIE) is an independent economic think-tank headquartered in Mumbai, India. It provides information solutions in the form of databases and research reports. CMIE has built the largest database on the Indian economy and companies.*

export sales as a criterion. 74 companies were observed to be exporting for the entire period under study, whereas 93 companies did not show any exports during this period of twelve years. 35 companies did not have any exports in the period of pre TRIPS regime but showed some exports during the post TRIPS regime. Remaining 52 companies that showed the exports for a period of less than 12 years were included in the fourth sub-group named 'other companies.'

The following table will clarify the grouping and the sub-grouping of the pharmaceutical companies.

Table 1: Pharmaceutical companies investing in research (Number of companies)

Sub-groups	**Investing in Research All years**	**Not at all investing in Research**	**Not investing in Research in the pre TRIPS but investing in post TRIPS regime**	**Investing in Intermittent Years**	**Total**
Size of the companies					
Large companies	17	3	3	16	39
Small companies	8	90	13	26	137
Total	**25**	**93**	**16**	**42**	**176**
Control perspective					
Under domestic control	25	93	14	35	167
Under foreign control	0	0	2	7	9
Total	**25**	**93**	**16**	**42**	**176**
Export Sales					
Exporting all years	23	14	8	29	74
Not exporting at all	0	34	1	0	35
Not exporting in pre but in post TRIPS regime	0	12	2	1	15
Other companies	2	33	5	12	52
Total	**25**	**93**	**16**	**42**	**176**

Our study is a descriptive study in which an attempt has been made to understand whether the Indian pharmaceutical companies have invested more in research and development in the period of post TRIPS reforms.

Variable :

Research and Development (R&D)

Research and Development reflects the willingness of the firm to forego its current profits for improving its future performance. R&D may help the firm to get strategic advantage over its competitors thereby allowing the firm to get above average returns on the same. R&D therefore, should be taken as a strategic asset. In the paper, R&D is taken as an investment ignoring the accounting aspect of the same. The capitalized value of R& D has been used in the study.

Proposition :

We argue that the Indian pharmaceutical companies reacted to the advent of TRIPS regime by focusing on research and development. This made them to divert their attention from imitation to original research. The firms anticipated changes that might arise in future when India became member of World Trade Organization.(Mazumdar & Rajeev, Comparing the Efficiency of the Indian Pharmaceutical frims: A metafrontier approach, 2010).

Our proposition led use to the following hypothesis.

H0: There is no significant difference in the investments made in research and development during the period of pre and post TRIPS regime.

H1: There is significant difference in the investments made in research and development during the period of pre and post TRIPS regime.

Empirical Findings:

Before turning to more elaborate discussions and findings, we first present an overview of the descriptive statistics of the variable under study, Research and Development.

Table 2: Descriptive Statistics

Sub-Groups	**Pre TRIPS**				**Post TRIPS**			
(Number of companies)	**Min**	**Max**	**Mean**	**S.D.**	**Min**	**Max**	**Mean**	**S.D.**
Size								
Large companies (39)	5.41	16.20	9.37	4.46	12.96	20.47	18.27	2.52
Small companies (137)	0.67	2.04	1.19	0.56	2.01	4.44	3.03	0.76
Control Perspective								
Under domestic control(167)	4.36	11.06	6.42	2.84	8.30	13.42	11.96	1.75
Under foreign control (9)	0.26	1.42	0.72	0.43	0.45	2.01	0.91	0.62
Export Sales								
Exporting all years (74)	4.27	12.82	7.07	3.55	8.93	15.00	13.20	2.06

Not exporting at all (35)	Not a single company was found				Only one company with Rs. 0.01 crore			
Not exporting in pre but in post TRIPS regime (15)	0.96	1.65	1.31	0.49	0.05	2.14	0.86	0.68
Other companies (52)	0.34	1.03	0.63	0.25	1.60	5.98	3.63	1.45
For all companies together								
All companies (176)	3.87	10.42	5.90	2.77	7.67	12.44	10.92	1.61

Statistical Test :

The hypothesis was tested for the group and not for an individual company. The focus of researchers is on the approach of Indian pharmaceutical sector in totality and not on a specific company's lookout. The researchers used student's t test for testing the equality of average investments in research and development during pre and post TRIPS regime. The test was carried out for the entire sample as well as for the above specified sub-groups. The categories within each sub-group were mutually exclusive. This classification fostered the under standing of attitude of Indian pharmaceutical companies towards TRIPS regime and need for investing in research. We used the software, 'IBM SPSS Statistics 20' to analyse the data. The results of student's t test for entire sample and sub-groups are discussed below.

1. For the entire sample (176 companies)

The calculated value of test statistic 't'	-3.996
'P' value	0.003

Interpretation: Using two tailed test, at significance level $\alpha = 0.05$, the null hypothesis is rejected. The test reveals reliable difference between means of research and development in pre and post TRIPS regime. The Indian pharmaceutical sector has certainly exhibited the positive approach towards investment in research and development.

2. For sub- group based on size

a. Large companies (39 companies)

The calculated value of test statistic 't'	-4.43
'P' value	0.001

b. Small companies (139 companies)

The calculated value of test statistic 't'	-4.599
'P' value	0.001

Interpretation: Using two tailed test, at significance level $\alpha = 0.05$, the null hypothesis is rejected for the group of large as well as small companies. Both the groups have shown a significant increase in average investments during the post TRIPS period. The average R&D

investments of large companies were Rs. 9.37 crores per year and went up to as high as Rs. 18.27 crores. The group of small companies also revealed a remarkable increase though the magnitude of these investments was on lower side.

3. For sub-group based on control perspective

a. Domestic control (167 companies)

The calculated value of test statistic 't'	-4.21
'P' value	0.002

b. Foreign control (9 companies)

The calculated value of test statistic 't'	-0.585
'P' value	0.571

Interpretation: Using two tailed test, at significance level $\alpha = 0.05$, the null hypothesis is rejected for the companies under domestic control. However the null hypothesis is accepted for the companies under foreign control. This means that the companies under domestic control have shown the significant change in the average investments in research during the period of post TRIPS reforms. The average investments of this group were Rs. 6.42 crores before TRIPS and have raised up to Rs. 11.96 crores in the post TRIPS period. On the other hand the average investments of companies under foreign control have not shown any significant change. The group could show a marginal increase in average investments from Rs. 0.72 crores to Rs. 0.91 crores.

4. For sub group based on export sales

a. Companies exporting in all years (74 companies)

The calculated value of test statistic 't'	-3.797
'P' value	0.004

b. Companies not exporting at all (35 companies)

The companies that did not export at all during the entire study period were studied separately for their investments in R& D. Out of such 35 companies, only one company invested in research during the period of post TRIPS regime. Remaining companies were reluctant and did not invest in research at all.

c. Companies not exporting in pre TRIPS regime but showed exports for some years in the post TRIPS regime (15 companies)

The calculated value of test statistic 't'	0.85
'P' value	0.423

d. Other companies (52 companies)

The calculated value of test statistic 't'	-4.538
'P' value	0.001

Interpretation: Using two tailed test, at significance level $\alpha = 0.05$, the null hypothesis is rejected for the companies that exported in all years (category 'a'). This describes the notable difference between R&D investments during the pre and post TRIPS regime. The 'other companies' (category 'd') exporting for the period of less than 12 years also depicted a remarkable increase in average investments in R& D. The hypothesis was rejected for this sub-group as well.

However, the companies that did not have any exports in the pre TRIPS period but showed exports for some years in the post TRIPS period (category 'c') were observed to be unwilling to invest in R& D. The hypothesis was accepted showing no significant difference in the average investments in R& D.

Conclusion :

The study reveals that Indian pharmaceutical sector has reacted positively to the reforms under TRIPS and has started investing more in research and development. The sector has realized the need for magnifying their investments in research when the focus is shifting from process patents to product patents. Indian pharmaceutical industry has been doing well since the introduction of Patents Act, 1970. Indian pharmaceutical industry has been known for its low cost production. With the advent of TRIPS, the focus shifted but the sector has continued to contribute in terms of investments in research and development. The size of these companies has not really affected this positive contribution. The large companies can afford to invest more as they enjoy economies of large scale and hence more profits which can be diverted towards research. The researchers found large as well as small companies showing remarkable increase in investments in research and development in the period of post TRIPS reforms.

The companies under domestic control have shown a spectacular increase in their R& D. This shows that they have positively reacted to TRIPS and to the amendments in Pharmaceutical Policy, 2002. TRIPS compliant patent regime does not appear to have dampened the innovative capability of domestic pharmaceutical industry, and on the contrary they have both increased their research budgets and patenting (Mani, 2006). The companies under foreign control however failed to show the significant increase in their R& D. They are found to be behind in the race than their domestically controlled counterparts. This may be because the companies under foreign control have had product patents in place for long. Their scale of operations and reserves give them an edge over their Indian counterparts and that might be one of the reasons of their low investments in research during the period under study.

The export sales based classification was observed to be significant. The companies that exported for all 12 years of study period and the companies that exported for less than 12 years period (other companies) have remarkably increased their investments in research. This may be due to the fact that the firms exploring the global market produce their product keeping in view the differences in the disease pattern, population structure, and regulatory norms in the global context.(Mazumdar & Rajeev, 2010) This argument gets furthered when the companies concentrating only on domestic sales failed to show any investments in research and development.

It can thus be concluded that the Indian companies are trying to change their focus by investing more in research and development. However, they still have a long way to go. In spite of Government creating supportive environment by way of FDI policy and giving tax exemptions to pharmaceutical sector, Indian companies are still lagging behind as compared to companies of the developed economies. This can be highlighted from the fact that out of 176 companies from sample, 93 companies had not invested in R&D at all. The Indian pharmaceutical industry will have to stay focused on research and innovation in order to grow and face the global competition.

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Performance Evaluation of Regional Rural Banks of West Bengal in the Post-Reorganization Period- A Study

Paromita Dutta

Abstract:

India is an agrarian economy with two-third of its population living in rural areas and most of them dependent on agriculture. Agriculture employs large section of the society which is semi-skilled and semi-literate and most of them are unskilled and illiterate. In India rural people have been exploited in the name of credit facility by informal sector such as moneylenders and indigenous bankers. To protect rural section of society, Regional Rural Banks (RRBs) were established to cater the needs of rural and semi-urban people by granting loans and advances to small and marginal farmers, agricultural labourers and rural artisans. These banks are penetrating every corner of the country and are providing a helping hand for development of the economy. The success of every business depends on its effective and efficient performance. To ensure this the Advisory Committee on Flow of Credit to Agriculture and Related Activities under the Chairmanship of Shri V.S. Vyas, recommended restructuring of Regional Rural Banks (RRBs) in 2004. It was suggested to improve the operational viability, financial soundness and enhancing the economies of scale. Since 2005 the process of amalgamation starts, the number of Regional Rural Banks that stood at 196 became 82 operating all over the country. In January 2013, 25 RRBs have been amalgamated into 10. At present there are 61 RRBs in India. This structural consolidation has resulted in formation of new RRBs which are financially stronger and bigger in size in terms of business volume and outreach which would enable them to take advantage of economies of scale and helps in reducing the operational costs. However, this process also helps the sponsor banks in managing the affairs of RRBs more effectively.

Key Words: *Capital Adequacy Ratio (CAR), Non-Performing Assets (NPA), Average Working Funds (AWF), Paschim Banga Gramin Bank (PBGB) and Bangiya Gramin Vikash Bank (BGVB).*

Introduction:

The Reserve Bank of India has a mandate to be closely involved in matters relating to rural credit and banking by virtue of the provisions of Section 54 of the RBI Act. The major initiative in pursuance of this mandate was taken with sponsoring of All India Rural Credit Survey in 1951-52. This was the origin of the policy of extending formal credit through institutions. In the first stage, efforts were concentrated in developing and strengthening co-operative credit structures. The Reserve Bank of India has also been making financial contributions to the cooperative institutions through evolving institutional arrangements, especially for refinancing of credit to agriculture.

While enacting the State Bank of India Act in 1955, the objective was stated to be the extension of banking facilities on a large scale more particularly to rural and semi-urban areas. Therefore, SBI became an important instrument of extending rural credit to

supplement the efforts of cooperative institutions. In 1969, 14 major commercial banks were nationalized which became important instruments for advancement of rural banking in addition to cooperatives and State Bank of India. But the actual picture was that the nationalization of major commercial banks did not improve the situation to greater extent. Less than 1 per cent villages availed the financial facilities from commercial banks. Primary Agricultural Cooperative Societies also suffered from overdue, limited coverage of rural areas, low mobility of resources, improper management and inadequate coverage to small and marginal farmers and limited access to weaker sections of rural and remote areas.

On this backdrop, the Narasimham Committee conceptualized the foundation of Regional Rural Banks in India. It was set up under the Regional Rural Banks Act, 1976. Five Regional Rural Banks were set up under the sponsorship of five commercial banks Punjab National Bank, State Bank of India, Syndicate Bank, United Bank of India and United Commercial Bank. The equities of RRBs are divided in a proportion of 50:35:15 among the Central Bank, the Sponsor Bank and the concerned State Government.

Literature review:

Kalkundrikar (1990) ***(Regional Rural banks and Economic Development)*** focuses on the RRBs which are playing an active role in financing the weaker sections of the society in the rural areas and inculcating banking habit among the rural masses. The book aims at analyzing the present role and identifying the future role of the RRBs in the economic development of India in the light of the case study of the Grameena Banks in Karnataka.

Agarwal (1991) ***(Evaluation of the working of Regional Rural Banks)*** explores the operations of Prathma bank the first regional bank of India which was set up in Moradabad district of Uttar Pradesh in 2nd October, 1975. Syndicate bank was called upon to set up this bank. The book examines the management pattern, the branch expansion, the deposit pattern, the advances made by the Prathma bank and the impact of Prathma Bank on the rural economy of Moradabad district i.e., the problems faced by the rural people and necessary suggestions to come out of those problems.

Sinha Roy (1994) ***(Regional Rural Banks in West Bengal)*** examines the role of regional rural banks in playing an indispensable part which ensures the movement of resources to the rural section of the society in order to fulfill the social and economic needs. The case study is based on three RRB's of West Bengal which are Mayurakshi Gramin Bank, Gaur Gramin Bank and Uttarbanga Kshetriya Gramin Bank regarding how they are granting the loans and advances to the agricultural and non-agricultural sectors and the recovery process of such loans and advances.

Ahmad (1998) ***(Rural Banking and Economic Development)*** focuses on the background for setting up the regional rural banks, evaluate the business performance and the economic viability and profitability of RRBs, reviewing the problems and challenges of RRBs, analyzing various problems and causes for poor recovery of loans and to give concrete suggestions to make the RRBs economically viable, profitable and efficient. Aligarh gramin bank has been taken as the case study.10 selected branches of Aligarh Gramin Bank has been taken from the point of view of the economic viability.

Narasaiah and Udayasree (1999) ***(Financing of Weaker Sections Regional Rural Banks)***

elaborates the growth of regional rural banks in India as well as in Andhra Pradesh. It focuses on the effective functioning and overall performance of Sree Anantha Grameen Bank in Anantapur District of Andhra Pradesh in terms of mobilization of loans, deposits, advances to the weaker sections and recovery of loans.

Pati (2005) ***(Regional Rural Banks in Liberalized Environment)*** explains that prior to the independence there was no system of regular banking in India. There were no questions of commercial banking coming forward to fulfill the social needs. The entire banking industry was in a state of confusion, dislocation, stagnation and failures. It is only after the nationalization of the banks in 1969 the focus of commercial banks were shifted to rural areas with the priority sector lending target. Thus the book brings out the strength and weaknesses of Subansiri Gaonlia Bank and its branches in North Lakhimpur district of Assam.

Sreeramulu (2006) ***(Empowerment of women through self-help group)*** intends to analyze the enacted legislations and exclusive programmes for women in India specially in Andhra Pradesh.An attempt is made to explain the necessity and requirement of the schemes of the economic programme for women. The government of India started various economic programmes. One of these programme is a self-help programme which is designed in tune with the directives of the World bank and IMF. Regional Rural Banks plays a very important role in connection with proposal and implementation of various self-help group programmes. They have a major share of 66 per cent in 1997 followed by commercial banks with 24 per cent in 1997 regarding chalking out various programmes.

Chaudhuri (2007) ***(Financial Sector Reforms: An Indian Perspective)*** deals with various institutions involved in the development of rural financial sector and their performance. It also deals with various strategies that can be adopted for improving credit delivery in the rural sector as this sector is now viewed as continuous source of saving and an opportunity for profitable deployment of funds. Commercial banks, NABARD, co-operative banks and regional rural banks has come up with innovative schemes, focused approach, dedicated manpower and training and educational programmes.

Thorat, U. (2007) ***(Issues and Challenges in Regulating, Supervising and Providing Deposit Insurance to Rural Banks and Cooperatives in India)*** explains the rising strength of regional rural banks and the challenges, opportunities and problems faced by them.

Ibrahim (2010) ***(Performance Evaluation of Regional Rural Banks in India)*** analyses the performance evaluation of five regional rural banks operating in different states of India. This paper is confined to performance evaluation of five RRBs in specific areas such as number of branches, districts coverage, disbursement of loans and advances, growth of investments for eight years period from 2001-02 to 2008-09 i.e. the pre-merger and post-merger period.

Reddy and Prasad (2011) ***(Evaluating Performance of Regional rural Banks: An Application of Camel Model)*** explores the performance evaluation of two RRBs by using CAMEL approach. Twenty variables are being selected to justify the ratios constituting CAMEL model i.e. capital adequacy ratio, aseet management ratio, management efficiency ratio, earning ratio and liquidity ratio.

Thakur and Nigam (2013) ***(A Study of the Status and Prospects of Financial Inclusion in Madhya Pradesh)*** studies the historical background of financial inclusion efforts. The paper examines the recent policy response of the Government of India and the Reserve Bank of India for achieving financial inclusion in Madhya Pradesh and the initiatives taken for achieving total financial inclusion in general and in the state of Madhya Pradesh.

Research methodology:

Paschim Banga Gramin Bank (PBGB) and Bangiya Gramin Vikash Bank (BGVB) of West Bengal are selected as a sample for evaluating the post reorganization relative performance on the basis of CAMEL Model. Paschim Banga Gramin Bank was formed by the amalgamation of Howrah Gramin Bank, Bardhaman Gramin Bank and Mayurakshi Gramin Bank whereas Bangiya Gramin Vikash Bank was formed by the amalgamation of Mallabhum Gramin Bank, Gaur Gramin Bank, Murshidabad Gramin Bank, Nadia Gramin Bank and Sagar Gramin Bank. Amalgamation of both the banks took place in 2007. The period for evaluating the relative performance ranging from 2008-09 to 2012-13 i.e., the post reorganization period. The data is collected from annual reports published by the RRBs. This model measures the Capital Adequacy, Asset Quality, Management Efficiency, Earning Quality and Liquidity of RRBs. It is an analytical and descriptive research design. Twenty variables are used in this study. While interpreting the results the statistical tools like arithmetic mean and t-test are used by applying SPSS 17.

Analysis:

Various ratios like Capital Adequacy, Asset Quality, Management Efficiency, Earning Quality and Liquidity are used in this hypothesis.

H0: There is no significant difference between Paschim Banga Gramin Bank (PBGB) and Bangiya Gramin Vikash Bank (BGVB).

H1: There is a significant difference between Paschim Banga Gramin Bank (PBGB) and Bangiya Gramin Vikash Bank (BGVB).

Capital adequacy:

Capital adequacy helps to maintain depositor's confidence and prevents a bank from going bankrupt. It forecast the ability of a bank to meet the need of additional capital and reflects the overall financial condition of the bank. The variables used to measure capital adequacy are:

Capital adequacy ratio: It has been developed to ensure that bank can absorb a reasonable level of losses arises due to operational reasons and the bank should have enough capital to absorb unexpected losses. The banks are expected to maintain the Capital Adequacy Ratio as prescribed by RBI from time to time. As per the latest RBI norms, the banks in India should have a CAR of 9 per cent but it is not mandatory for the RRBs. Higher the CAR, the stronger would be the RRB as it ensures higher safety against bankruptcy.

Debt-equity ratio: This ratio indicates the degree of leverage of a bank. It indicates how much the total business of a bank is financed by debt and equity. Higher the ratio higher would be the financial obligations of the equity shareholders, lesser would be the protection for creditors and depositors which in turn increases the equity capitalization rate.

Advances to assets: This ratio ensures the aggressiveness of a bank's lending that ultimately results in better profitability. Higher ratio is preferred than a lower one.

Government Securities to Total Investments: Government securities are considered as the safest debt instrument that carries a low return. It a risk free investment for a bank. Higher the ratio lower the risk involved in a bank's investment.

Table-1: Capital Adequacy Ratios for the period 2008-09 to 2012-13

Ratio	Bank Name	Mean	S.D.	Mean Difference	T-Value	Sig. Value
CAR	PBGB	1.686	10.41339	-2.02	-0.599	0.581
	BGVB	3.706	3.32738			
Debt-Equity (times)	PBGB	39.108	16.88169	23.752	3.501	0.025
	BGVB	15.356	2.93434			
Adv to Assts	PBGB	29.242	1.1998	-9.812	-5.11	0.007
	BGVB	39.054	4.01223			
G-sec to Inv.	PBGB	90.296	5.66456	31.212	7.547	0.002
	BGVB	59.084	8.80673			

Observations:

- The mean value of BGVB in case of CAR is 3.706 which are more than PBGB. The mean difference is -2.02 with a t-value of -0.599 and p value of 0.581. It shows that there are no significant differences between BGVB and PBGB.
- The debt-equity ratio of PBGB is 39.108, higher than BGVB. It indicates that the financial risk obligations of the equity shareholders are more due to over inclusion of debt capital in the capital structure of PBGB. The mean differences are 23.752 with a t value of 3.501 and a p value of 0.025. The p value is less than 0.05, the null hypothesis of equality would be rejected at 5 per cent level of significance i.e., there is a significant difference between PBGB and BGVB.
- The Advances to assets ratio shows that BGVB has generated more advances by proper utilizing its available resources. The mean differences are -9.812 with at value of -5.11 and p value of 0.007. It indicates that BGVB has outperformed PBGB and there exist significant differences between the two.
- G-Sec to Total Investment ratio is 90.296 in case of PBGB with a mean difference of 31.212, t value of 7.547 and p value of 0.002. It defines that PBGB are investing more on Gov. Sec for enjoying a risk free rate of return. There exist a significant difference between PBGB and BGVB.

Asset quality

The quality of asset is an important parameter to measure the strength of a bank. The main objective of measuring the asset quality is to ascertain the component of Non-Performing Assets (NPA) as a percentage of total assets. It indicates the type of depositors a bank is having.

Gross NPA to Net Advances: It measures the quality of asset where the management has not provided for loss on NPAs. Net Advances is the Gross advances minus provisions against NPA. Lower the ratios better the quality of advances.

Net NPA to Net Advances: Net NPA are the Gross NPA minus provisions against NPA and interest in suspense account.

Total Investments to Total Assets: It measures the percentage of total assets locked up in investments. Higher ratio means bank has conservatively kept a high cushion of investment to guard against NPAs that affects its profit adversely.

Net NPAs to Total Assets: This ratio indicates the efficiency of the bank in assessing the credit risk and indicates to what extent it can recover its debt. Lower ratio is desirable because it indicates better performance of a bank.

Table 2: Asset Quality Ratios for the period 2008-09 to 2012-13

Ratio	Bank Name	Mean	S.D.	Mean Difference	T-Value	Sig. Value
Gross NPA to Net Adv.	PBGB	11.642	1.69205	4.282	3.787	0.019
	BGVB	7.36	1.88445			
Net NPA to Net Adv.	PBGB	7.866	2.02964	4.1	3.888	0.018
	BGVB	3.766	1.02734			
Tot Inv to Tot Assts	PBGB	42.32	11.24614	3.098	0.62	0.569
	BGVB	39.222	1.32728			
Net NPA to Tot Assts	PBGB	2.134	0.35097	0.68	2.71	0.054
	BGVB	1.454	0.36712			

Observations:

- In case of Gross NPA to Net Advances BGVB outperformed PBGB which indicates that the percentage of NPAs in advances is more for PBGB. The mean differences between the two banks are 4.282 with a t value of 3.787 and p value of 0.019.
- For Net NPA to Net Advances the p value is 0.018 which rejects the null hypothesis of equality. BGVB has outperformed PBGB with a lower percentage of NPAs in advances.
- Tot Inv to Tot Assets ratio is more for PBGB which shows that bank has purposely gone for more investment out of total assets employed that affects its profitability adversely.

The mean difference is 3.098 with a t value of 0.62 and p value of 0.569 which shows there is no significant difference between the two banks.

- Net NPAS to Tot Assets ratio shows that the mean value of PBGB is slightly more than BGVB that indicates PBGB has higher percentage of NPAs in their total assets. The mean difference is 0.68 with a t value of 2.71 and p value of 0.054. It rejects the null hypotheses by concluding that BGVB has outperformed PBGB.

Management efficiency:

This ratio measures the efficiency and effectiveness of management. This parameter is used to evaluate the management efficiency as to assign premium to better quality banks and discount poorly managed banks. The variables used to define this parameter are given below:

Total Advances to Total Deposits: It measures the ability and efficiency of a bank in converting the deposits into high earning advances.

Business per employee: It measures the efficiency of an employee in generating business for the bank. Business means a sum of total deposits and total advances. Higher the ratio better is the position of the bank.

Profit per employee: It measures the surplus earned per employee. It is arrived by dividing the Profit after tax (PAT) by the total number of employees. Higher the ratio higher would be the efficiency of the management.

Table 3: Management Efficiency Ratios for the period 2008-09 to 2012-13

Ratio	Bank Name	Mean	S.D.	Mean Difference	T-Value	Sig. Value
Tot Adv to Tot Deposits	PBGB	33.21	1.84468	-12.482	-5.285	0.006
	BGVB	45.692	4.92164			
Bus per employee	PBGB	291.536	56.01892	-8.97	-0.642	0.556
	BGVB	300.506	86.47897			
Profit per employee	PBGB	-0.92	1.63825	-1.624	-2.252	0.087
	BGVB	0.704	0.26539			

Observations:

- In case of Tot Adv to Tot Deposits ratio, the mean value of BGVB is more than PBGB which explains the capability of the bank in converting its deposits into high earning advances. The mean difference is -12.482 with t value of -5.285 and p value of 0.006. It indicates that BGVB has outperformed PBGB.
- BGVB shows a higher mean which indicates that BGVB is giving higher business per employee in comparison to PBGB. The p value is 0.556 which defines that there is no significant difference between the two banks.
- For profit per employee PBGB has a negative mean value of -0.92 whereas BGVB has positive mean of 0.704. The mean difference between the two banks is -1.624 with t value of -2.252 and p value of 0.087 which shows there is no significant difference between the two banks.

Earning quality:

This ratio is an important element of the CAMEL model as it measures the profitability of the banks. It shows the sustainability and growth in earnings in the future. The following variables explain the quality of income generation

Operating Profits to Average Working Funds (AWF) Ratio: It determines the operating profits generated out of working funds employed. Better utilization of this fund will result in higher operating profits. It is arrived by dividing the operating profits by average working funds. Average working funds are the total resources employed by a bank. It is the daily average of total assets or liabilities during a year. Higher the ratio better will be the position of the bank.

Spread to Total Assets: It shows the ability to keep the interest on deposits low and interest on advances high. Spread is the difference between the interest income and interest expended as a percentage of total assets. A higher spread indicates better earnings given the total assets.

Net Profit to Average Assets: It measures the return on assets employed. It is calculated by dividing the net profit by average assets, which is the average of total assets in the current and in the previous year. It shows the efficiency of the bank in utilizing its assets for generating profits. A higher ratio indicates higher income generating capacity of the assets and higher efficiency of the management.

Interest Income to Total Income: Interest Income shows the ability of the banks in generating interest out of its lending operations. Interest Income includes income on advances, interest on deposits with RBI and dividend income.

Non-Interest Income to Total Income: It measures the income from operations other than lending function as a percentage of total income. These are mainly fee based income generated through innovative products and adaption of technology through sustained service levels.

Table 4: Earning Quality Ratios for the period 2008-09 to 2012-13

Ratio	Bank Name	Mean	S.D.	Mean Difference	T-Value	Sig. Value
Operating profits to AWF	PBGB	-0.122	0.6467	-1.044	-4.871	0.008
	BGVB	0.922	0.22231			
Spread to Tot Assts	PBGB	1.858	0.15531	-0.432	-3.018	0.039
	BGVB	2.29	0.31922			
Net Profit to Avg. Assts	PBGB	-37.696	70.01342	-69.276	-2.295	0.083
	BGVB	31.58	5.35574			
Interest Inc to Tot Inc.	PBGB	92.378	2.13798	5.72	7.439	0.002
	BGVB	86.658	3.82323			
Non Interest Inc to Tot Inc.	PBGB	7.622	2.13798	-5.716	-7.431	0.002
	BGVB	13.338	3.82369			

Observations:

- Operating Profit to AWF ratio shows a negative mean for PBGB which explains that PBGB could not utilized its available resources properly for generating operating profits. The mean difference is -1.044 with a t value of -4.871 and p value of 0.008. The relative performance between the two banks is differed significantly.
- For Spread to Total Assets ratio, BGVB has increased its net margin or spread given the total assets. The mean difference is -0.432 with t value of -3.018 and p value of 0.039. The difference between the two banks in terms of performance differed significantly.
- Net Profit to Avg. Assets ratio gives negative mean of -37.696 for PBGB which defines that net loss has been evolved out of the average assets employed in PBGB. The mean difference is -69.276 with t value of -2.295 and p value of 0.083. The relative performance of the two banks does not differ significantly.
- Interest Income to Total Income is more for PBGB with a mean value of 92.378 which states that it has generated more income from its lending operations. The mean difference is 5.72 with a t value of 7.439 and p value of 0.002. The difference between the two banks is significant.
- For Non-Interest Income to Total Income, BGVB has outperformed PBGB as it has generated more non-interest income out of other operations rather than lending. The mean difference is -5.716 with t value of 7.431 and p value of 0.002 therefore the null hypothesis is rejected at 5 per cent significant level.

Liquidity:

Liquidity is very important for a bank as it has to take proper care for hedging liquidity risk, at the same time it has to ensure that a higher return can be generated by investing good percentage of funds elsewhere so that the bank can generate profit and can also provide liquidity to the depositors.

Liquid Assets to Total Assets: Liquid assets include cash in hand, balance with RBI, balance with the other banks, money at call and short notice. This ratio indicates the overall liquidity position of the bank.

G-Secs to Total Assets: Government securities are the most liquid and safe investments. It measures the risk involved in the assets held by a bank.

Liquid Assets to Demand Deposits: Demand deposits offer high liquidity to the depositor and hence banks have to invest these assets in a highly liquid form. It measures the ability of a bank to meet the demand from deposits in a particular year.

Liquid Assets to Total Deposits: Total deposits include demand deposits, savings deposits, term deposits and deposits of other financial institutions.

Table 5: Liquidity Ratios for the period 2008-09 to 2012-13

Ratio	Bank Name	Mean	S.D.	Mean Difference	T-Value	Sig. Value
Liq. Assts to Tot Assts	PBGB	22.586	9.93952	9.478	2.651	0.057
	BGVB	13.108	3.08705			
G-Secs to Tot Assts	PBGB	38.586	11.50854	15.41	3.827	0.019
	BGVB	23.176	3.58238			
Liq. Assts to Demand Deposits	PBGB	29.038	35.4244	19.572	1.379	0.24
	BGVB	9.466	6.85954			
Liq. Assts to Tot Deposits	PBGB	25.81	11.80379	10.48	2.502	0.067
	BGVB	15.33	3.60849			

Observations:

- For liquid Assets to Tot Assets ratio, the percentage of liquid assets in total assets is more for PBGB. The mean difference is 9.478 with t value of 2.651 and p value of 0.057. Hence the performance of two sample banks does not differ significantly.
- G-Secs to Tot Assets ratio states that the risk involved in PBGB is less in comparison to BGVB as PBGB has invested more on Gov-Secs with a mean value of 38.586. The mean difference is 15.41 with a t value of 3.827 and p value of 0.019. Therefore, the relative performance of the two banks differs significantly.
- Liquid assets to Demand Deposits ratio show that PBGB has converted its deposits into liquid assets in greater proportion to meet the demand in comparison to BGVB. The mean difference is 19.572 with t value of 1.379 and p value of 0.24. The p value indicates that there is no significant difference between the two banks.
- Liquid Assets to Total Deposits ratio show that PBGB has kept its total deposits in a highly liquid form with a mean value of 25.81. The mean differences between the two banks are 10.48 with a t value of 2.502 and p value of 0.067. It indicates that two banks do not differ significantly.

Findings from the analysis:

1. BGVB has outperformed PBGB in terms of **Capital Adequacy ratio** by protecting the confidence of the creditors and depositors. It shows that in term of forecasting financial health, BGVB is in an advantageous position in comparison to PBGB.
2. In connection with **Asset Quality ratio,** BGVB is good in asset quality perspective as its NPA position is better in comparison with PBGB.
3. For judging **Management Efficiency** of both the banks, BGVB has generated more business and more profit per employee, whereas it's a loss per employee for PBGB. In converting the deposits into advances BGVB is in a good position with a higher mean.

BGVB is proved to be good.

4. In terms of **Earning Quality,** PBGB showed a loss out of its average working fund and average assets employed in the bank. Though PBGB has generated more interest income but its earning position is poor in comparison to BGVB.
5. For **Liquidity ratio,** PBGB has generated more liquid assets out of its total assets and total deposits which it can employ elsewhere for hedging liquidity risk and for earning high revenues. Therefore, PBGB has outperformed BGVB in respect of liquidity position.
6. Considering all the five ratios, it can be concluded that **BGVB rated good in terms of overall performance in comparison to PBGB.**

Road ahead:

Reserve Bank of India (RBI) has issued guidelines on new banking licences on February, 2013 for entities which are severely trusted by the Indian public. The plan to license new banks was announced by then Finance Minister and our President Mr. Pranab Mukherjee in 2010 budget. RBI has given in-principle approval to two companies to start-up new banks. This approval will be valid for 18 months during which these two companies will have to abide by all the rules and regulations stipulated by RBI. The details of the companies are given below:

- IDFC(Infrastructure Development Finance Company) an infrastructure finance company which has a loan book of Rs. 54,552 crore and a net woth of 15,250 at the end of December,2013 and
- BANDHAN which is the largest micro-lender in India in terms of its assets. It has a loan book of Rs. 6200 crore with 5.4 million borrowers, 13000 employees and 2016 branches in 22 states.

The new license are being issued to broaden the reach of almost Rs. 84 trillion banking industry in an economy where only 35% adults have access to formal banking services, according to 2012 World Bank Document. A total of 25 other companies are also in the race of new banking licences which includes Reliance Capital Ltd., Aditya Birla Financial Services Group, L&T Finance Holdings Ltd., LIC Housing Finance Ltd., Muthoot Finance Ltd. and India Post.

RBI guidelines require new banks to hold minimum capital of Rs. 500 crore and it is mandatory for the new banks to open at least 25% of branches in rural areas. Not only that they also have to comply the priority sector lending norms under which 40% of the money loaned by the banks will go to the segments like agriculture, small businesses, retail traders, professionals and self-employed individuals.

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Economic Value Added (EVA) - An Empirical Examination of New Approach for Wealth Creation by Indian Corporates

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Abstract:

EVA, an acronym for economic value added, is Stern Stewart & Company's version of a popular and significant concept called residual income. EVA or Economic Value Added is a concept, which emphasis that companies do not earn a true profit until all costs, including opportunity costs and cost of capital, have been recovered. Simply earning a profit or EPS is not sufficient for the value creation. If a firm is generating earning higher than cost of capital, then it is a wealth creator otherwise a wealth destroyer.This concept focuses on the creation of Economic value added and suggests how to minimize the uneconomical activities to increases the returns. However, some activities that do not increase shareholders value might be critical for customer's satisfaction or social responsibility. Focusing solely on shareholder's wealth might jeopardize a firm's reputation and profitability in the long run. Present research paper is a modest attempt to evaluate the shareholders value creation through EVA, discloser and reporting practices followed by larger India companies in different business segment' e. g. Infosys (IT), Hero Honda (Automobile), BHEL(Capital Goods), HUL, MARICO(FMCG) and Dr Reddy's (Pharma) are leading corporate in India.

Key Words: *EVA, Capital Employed, EPS, DPS, Market Capitalization, Shareholders' Value Creation*

Part-I

Introduction:

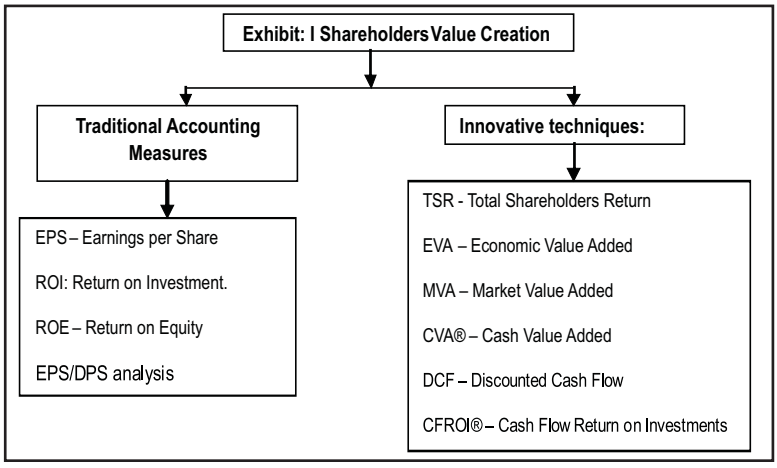
Shareholders' value creation means creation of values in the form of profits for the shareholders through better management e.g. adoption of strategic cost management techniques, brand images etc. Normally, shareholders' value creation is the difference of current year shareholders' value minus previous year shareholders' value. The capital contribution by shareholders is reflected by the book value of firm's share. In terms of market and book value of shareholder investment, shareholders' value creation may be defined as the excess of market value over book value per share. The shareholders' value creation is based on the notion of the present value of future cash flows using the cost of capital as the discount rate. Scott[1] wrote that shareholder value is another term for the total value of equity of a firm or its "market capitalisation".

Rationale of the study:

The goal of financial decision is to maximize shareholders value, therefore creation of other stockholders interest will automatically become a sub goal and achieving these sub goals become the crucial to the achievement of the overall goal. Economic Value Added is an

[1] *Scott, Mark C. (1998): Value drivers: the managers' guide to driving corporate value creation. John Wiley.*

innovative corporate performance measuring techniques, which deals with the benchmark of cost of capital of the firm during the financial years. Since ordinary returns on capital invested is not appropriate in the competitive era. Investors now have a better way to measure the true performance of a company and managers have a better ways on how to create value for their shareholders. According to the Stern Stewart, EVA helps managers incorporate two basic principles of finance into their decision making. The primary financial objective of any company should be to maximize the wealth of their shareholders and two that the value of the company depends on the extent to which investors expect future profits to exceed or fall short of the cost of capital. The capital charge forces managers to use assets more meticulously and eliminates accounting distortions which are exists in the contemporary environment.



As we know that there are various ways to create the shareholder value (refer exhibit I) traditional (EPS, ROI, EPS/DPS analysis) as well as innovative techniques (TSR, EVA, MVA, CVA etc), but EVA is one of the important tools to measure shareholder value creation with the benchmark of the cost of capital. It is equally important for the valuation and reporting for intangible assets during the global era of enhanced reporting framework. Keeping this background in view an attempt has been made by researcher to evaluate the EVA generation, discloser and reporting practices followed by large companies' e. g. Infosys, Hero Honda, BHEL, HUL, MARICO and Dr Reddy's are leading corporate in India.

This research paper is divided into IV sections. First Section deals with introduction of topic, rationale of study, National and international status and review of literature. Second section deals with research methodology of the study including introduction of sample selection, objectives of the study, hypothesis and limitations of the study. Third section deals with data analysis including various ratios, coefficient of correlation and students T-test and finally the Fourth section is for findings, suggestions and conclusion of the study.

Economic Value Added (EVA) ® - A New tool in Competitive Era:

The techniques of economic value added have acquired acceptance as a tool for assessing the existing financial status and predicating the future performance of a company. EVA, an

acronym for economic value added, is the registered trade name of Stern Stewart & Company for their version of a popular and significant concept called residual income. EVA or economic value added is the concept, which emphasis that companies do not earn a true profit until all costs, including items such as opportunity costs and cost of capital, have been covered. In other words, showing a profit on the income statement is not enough. The amount of earnings must also cover opportunity costs[2]. But more importantly earnings must cover cost of capital. Only the earnings left, if any, after subtracting the firm's physical costs and intangible costs, can be considered profits. When a company earns more than its total costs, then it has made a true profit or economic profit[3]. And, if their earning are not sufficient to cover up this capital cost, treated as value destroyer.

EVA= NOPAT - (WACC* CE) Here, **NOPAT**= Net operating profit after tax, **WACC**= Weighted average cost of capital, **CE**= Capital employed

While calculation of NOPAT, the non-operating items like dividend/interest on securities invested outside the business, non-operating expenses etc. will not be considered. The total capital employed is the sum of shareholders funds as well as loan funds. But this does not include investments outside the business. In determining the WACC, cost of debt is taken as after tax cost and cost of equity is measured on the basis of capital asset pricing method.

International Experience:

At international level, EVA reporting and discloser is very popular from the last two decades (refer exhibit III). **Cola-Cola** is one among many companies that adopted EVA for measuring its performance. **AT&T Corp** used EVA as the lead indicator of a performance measurement system that included people value added and customer value added. **IBM** conducted a study with Stern Stewart that indicated that outsourcing IT often led to short-term increases in EVA. Data and philosophy of EVA have also been significantly promoted in the UK, Australia, Canada, Brazil, Germany, Mexico, Turkey and France, amongst others, used to provide published rankings of managerial performance, and several international companies have adopted EVA for performance measurement and/or incentive compensation packages. For example, in Australia the ANZ Banking Group, Fletcher Challenge Limited, James Hardie Industries and the Wrightson Group, have implemented EVA financial management systems in recent years.

Exhibit III: EVA Reporting Practices at National & International level

Company	Year	Usage of EVA
Coca-Cola Co.	Early 1980s	Focused business managers on increasing shareholder value.
AT&T Corp.	1994	Used EVA as the lead indicator of a performance measurement system that included people value added and customer value added.

[2] *Opportunity cost means the benefit foregone by using resources in a particular manner.*
[3] *The term "economic profit" was first developed by British Economist Alfred Marshall.*

IBM	1999	Conducted a study with Stern Stewart it indicated that outsourcing IT often led to short-term increases in EVA.
Herman Miller Inc.	Late 1990s	Tied EVA measure to senior managers' bonus and compensation system.
INFOSYS	1996	EVA is used as a tool to tell its clients that the value delivered by Infosys is greater than what the client pays for.
MARICO	1993	As a signaling device to tell its employees that capital is important.
Dr. REDDY'S LAB	1999	As a qualifying criterion to grant rewards such a variable pay, stock options and performance bonus.
TCS	1999	Here EVA is linked to compensation and has been implemented in great detail.
BHEL	2003	EVA linked with the company's business strategy and value along with discharge of economic & social responsibility.
HERO HONDA	1999	EVA linked with the performance appraisal and reward to the employees and analyze value creation process.
HUL	1993	Used EVA as a basis to measure the performance of each of its division. EVA locates performance on the basis of operating profit after charging the cost of capital.
GODREJ	2002	EVA is used not only as financial, but also as a way of structuring performance linked variable remuneration. EVA has been a tool to measure, motivate, manage and finally, overhaul the mindsets of people.

Source: *Compiled from annual reports of the sample companies.*

There are many **Indian companies** are also focusing on EVA for the different managerial aspect. For instance Infosys using EVA for the better corporate information system, Marico industries they using it as singling device that capital is important and better utilization, Dr Reddy's EVA is criterion for various rewards, such as pay hike, stock options and performance bonus. Tata Consultancy Services explains the part EVA plays in transforming TCS from an Indian enterprise with a global reach to a truly global organization. Their first hand experience of the tool was a revelation of the fact that EVA results in an enlarged pie

which benefits both the individual and the organization. For the Godrej Group, EVA has been a tool to measure, motivate, manage and finally, overhaul the mindsets of people.

Review of Literature:

The idea of measuring value creation is not new. Most attempts to measure value creation have been based on numbers derived from historical performance.There are lots of works done by the various authors at international level regarding the EVA. **Fredrik Weissenrieder (1998)** explains the relation between EVA and Cash value added (CVA) for the batter corporate management. His paper deals with EVA and CVA, the two most frequent concepts in Sweden. A correctly focused Value Based Management concept has the organization focusing on the relevant issues. It will be based on the four factors that determine value; Strategic Investments (tangibles or intangibles), the operating cash flow they generate, the Strategic Investments' economic lives, and their capital cost. And finally he found that cash value added is more important then EVA. **Gary C. Biddle and at el (1997)** explain a relationship between stock returns and firm value with EVA. The evidence indicates that EVA does not dominate net income in associations with stock returns and firm values. They had also explained compensation plans based on residual income motivate managers to take actions consistent with increasing shareholder value. Independent evidence suggests that managers do respond to residual income-based incentives. They discuss how a metric such as EVA can be useful for internal incentive purposes even if it conveys little news to market participants regarding the firm's valuation. **Brewer et al (1999)** recommend using other performance measures along with EVA and suggest the balanced scorecard system. Other researchers have noted that EVA does not correlate as strongly with stock returns as its proponents claim. **Chen & Dodd (1997)** found that, while EVA provides significant information value, other accounting profit measures also provide significant information and should not be discarded in favor of EVA alone. **Biddle, Brown & Wallace (1997)** found only marginal information content beyond earnings and suggest a greater association of earnings with returns and firm values than EVA, residual income, or cash flow from operations. **Rogerson (1997)** investigated the moral hazard that exists with managers to increase shareholder wealth and to thereby increase the firm's cash flows so as to increase managerial compensation. They concluded that residual income (or EVA®) as a performance measure will ensure that managers will always make efficient investment decisions. **Wallace (1996)** also tested the ability of residual income plans to align managers actions with increasing shareholder wealth. He did this by selecting a sample of firms that began using a residual income performance measure in their compensation plans, and comparing their performance to a control sample of firms that continued to use traditional earnings-based incentives.

At National level only few studies were conducted by researchers related with EVA. **Banerjee A. (1999)** conducted a study on nine selected industries in India for a period of 1992-93 to 1997- 98. Using the multiple regression model he studied the relationship that exist between MVA and five chosen impendent variables EPS, EVA, Return on net worth, capital productivity and labour productivity. He made a cross sectional and industrial analysis He found that EVA and MVA positively correlated during the study period. **Debdas Rakshit (2006)** conducted a research related with the EVA reporting of Dabur India ltd. for

the period of 1998-99 to 2002-03. He stated that for evaluation of the efficiency of any decision, value creation or value addition aspect is utmost importance in the present era of good and transparent corporate governance. He made a comparative study of ROI and EVA and he concluded that EVA reporting is very essential for the various stakeholders because ROI does not reflect the real value addition to shareholders' wealth and it is not possible to judge the efficiency of any decision, therefore value creation or value addition aspect is of utmost importance. **Ghanbari Ali M. & Sarlak Narges (2006)** stated that Maximizing shareholders' value becoming the new corporate standard in India. EVA is a tool for identifying whether the management of the company has created wealth or destroyed it. They empirically review the trend of EVA of Indian automobile companies. The results indicate that there is a significant increasing trend in EVA during the period of study and the firms in the automobile industry are moving towards the improvement of their firms' value. **Ramana D V (2007)** examined the relationship between economic profit, cash profit, & accounting profit and also tests the relevance of these earnings. By using the 12 years data of the companies forming a part of Nifty of the National Stock Exchange (NSE) of India, the study provides answers to some of the questions like Is there a meaningful correlation between the economic profit, cash profit, and accounting profit. Can economic profit, cash profit, and accounting profit act as the proxy for the market value added. **Mittal R.K et al (2008)** examined relation between economic value added and corporate social responsibility. Research findings indicate that there is positive relationship between corporate social responsibility (CSR) and company's reputation but relationship between CSR and company's profitability has not been explored in the Indian context. CSR level of business firms in India is increasing in terms of both amount of the disclosure and the number of participating firms. They studied of few Indian companies who have successfully implemented CSR initiatives have also been analyzed to investigate the level and nature of engagement of Indian companies in social responsibility initiatives. **Kumar Ashok & Pal Karam (2008)** examined whether the concept of economic value added (EVA) is well understood by corporate managers and they compared it to the other traditional financial performance indicators. For the purpose of analysis, this study relies on the information gathered through a primary survey in 18 out of 30 companies included in the BSE Sensex. According to this study, EVA is ranked as the best indicator of performance, followed by Return on Capital Employed (ROCE), Rate of Return, Profit Margin, and Residual Income. While some companies have already adopted the EVA technique to measure the shareholder value, a majority of the companies are aware of it, but yet to adopt this model.

Part-II

Research Design & Methodology:

This research paper is based on the leading Indian companies i.e. Infosys, Hero Honda, HUL, Marico BHEL and Dr. Reddy's which are taken as sample companies. The data of selected companies for the year (2002-03 to 2011-12) 10 years used in this study, had been taken from secondary sources (e.g. published annual reports of the company) by the application of **stratified random sampling method.** This research study is basically descriptive and analytical nature of study and researcher is trying to explain the creation of EVA and performance of the sample companies based on application of the some parameters

such as ROCE, EPS, DPS and Market Capitalization. The collected data have been analyzed in following ways: *EVA as percentage of Capital Employed, EVA with Market Capitalization, EVA as percentage with NOPAT, Impact of EVA on EPS and DPS, Analysis of coefficient of correlation between EVA and EPS and EVA and DPS. For assessing the behavior of data, statistical techniques such as Growth Rate, Rank Correlation, T-test have been also used in this study.*

Objectives of the study:

The purpose of the study is to conduct an analytical study of different methods used by different companies to measure shareholder value creation. The study also aims to give a specific picture of how shareholder value is created as a background to measuring shareholder value. The following are the main objectives of the research paper.

1. To understand the concept and methodology of EVA and to examine whether the sample companies have been able to generate value for their shareholders.
2. To understand the contribution of EVA in shareholders' value creation and study the impact of EVA on EPS and DPS during the study period.
3. To analyze EVA reporting and discloser practices of selected sample companies in India.

Hypothesis of the study: On the basis of above objectives the following hypothesis were formulated for the research work:

- NH (I): EVA does not affect shareholders value creation.
- AH (I): EVA does affect shareholders value creation.
- NH (II): EVA does not affect EPS and DPS of the sample companies.
- AH (II): EVA does affect EPS and DPS of the sample companies.
- NH (III): Reporting and disclosure of EVA is not popular among the sample companies.
- AH (III): Reporting and disclosure EVA is popular among the sample companies.

Limitations of the study:

The following are the main limitations of the research paper.

1. This study is limited to 10 years (2002-03 to 2011-12) performance of the selected sample companies.
2. In this study, data's have been taken from published annual reports and official website of the sample companies. As per the requirement and necessity of the study, the data is grouped and sub-grouped.
3. In this study the data is related to IT industry, Pharma industry, FMCG industry, Automobiles industry and Capital goods Industry, since they are the leading wealth creators during the study period.

Companies' profile:

This research paper is based on the six leading Indian companies i.e. Infosys, Hero Honda, HUL, BHEL, and Dr. Reddy's Lab which are taken as sample for the present study.

INFOSYS is one of the leading companies in the area of Information technology and

software. More than 86000 professional are working with this company and more then 92% their revenue came from abroad. They are working with human capital and human values with the motto of "Power of Talent". Their market capitalization is ₹ 164592 crores in the year 2011-12 with the EVA of ₹ 2906 crores. It is one of the largest IT Company they are reporting about the intangible assets in way of human resource accounting, EVA reporting, intangible assets score sheet, and value reporting for the benefit of various stakeholders.

HUL was incorporated 77 years ago, in 1933. At present, Hindustan Unilever Limited is a pre-eminent corporation and its brands are household names across the country. There brands and people have been unparalleled strengths and they have delivered growth not only for company, but also for all stakeholders. They are dealing with all the segments of home care, health, oral care, cosmetics soap and tooth past and beverage etc. Hindustan Unilever Limited is a part of the $ 40 billion Unilever Group. The Group has more than 400 brands spanning 14 categories of home, personal care and food products. It has presence in over 100 countries and employs more than 174,000 people worldwide.

MARICO is another leading FMCG company in India focusing on value creation perspective for the shareholders. They are focusing on main segment and sub segment of skin care and cosmetic area. In the year 2011-12 their market capitalization is ₹ 7256crores with EVA of ₹198.6crores. They also believe in the full disclosers of the EVA in their annual reporting system.

HERO HONDA (Now a day's **Hero Motor Crop**) is one of the leading automobile company in India, their products, two wheelers and four wheeler's are very popular in India as well as in other countries. There motto is "Driven by Passion" and Desh Ki Dhadkan. In the year 2011-12 their market capitalization is ₹ 41011crores with EVA of ₹1677crores. They also believe in the full disclosers of the EVA in their annual reporting system.

BHEL is the largest engineering and manufacturing enterprise in India in the energy related/infrastructure sector. BHEL was established more than 40 years ago, ushering in the indigenous Heavy Electrical Equipment industry in India, a dream which has been more than realized with a well-recognized track record of performance. The wide network of BHEL's 14 manufacturing divisions, 4 power sector regional centres, 8 service centres, 15 regional offices and a large number of Project Sites spread all over India and abroad enables the Company to promptly serve its customers and provide them with suitable products, systems and services-efficiently and at competitive prices. It is one of the major Nav Ratan Company with the vision of "A world class engineering enterprises committed to enhance stakeholder's value".

Dr REDDY'S lab was stated 25 year back in the year 1984. It is one of the leading pharma companies in India with global presence. During the year 2011-12 their market capitalization is ₹ 28832crores with EVA of ₹ 863crores. Their global clients are in America Canada Europe and other Asian countries. Their total employee's strength is more then 9500 with the 40 different countries all over the world. They are treated as best 10 employers in India related with working by the Business today survey.

Part-III

Data analysis and findings:

For the purpose of analysis, Economic Value Added (EVA), Capital Employed (CE), Market Capitalization (MC), Net Operating Profit after Tax (NOPAT) Earning per Share (EPS) and Dividend per Share (DPS) are taken as variables for the period of last ten years. EVA/CE relationship explains the wealth creation against the capital invested by company. It refers to the productivity of the capital employed. It is significant to explain the relationship for the earning and investment. EVA/MC indicates relationship with earnings and Market sentiments. Market capitalization is a supplementary technique used to evaluate a company's performance in stakeholder value creation. Some companies are focusing on net market value added (s the excess of the market value of the company over the value of investors' capital). In contrast to the economic profit, which is the value added by the company over a given period, the MVA is a measure of the investor's perception of value added. Net market capilization is considered as a measure of shareholder wealth. It denotes the extent to which the market has added/eroded value to/from the net worth of the company.

EPS or earning per share is one of the important tests of profitability related to shareholders. Present and potential investors, shareholders always check out EPS of company before their investment. Every company wants to increase their profit as well as wealth, in this regards EPS is very significant to company's earning. The earning per share is a good measure of profitability and when compared with EPS of similar company, it gives a view of the comparative earning or earning power of company. EPS calculated for a number of years indicates whether or not earning power of the company has increased. It is one of the most important detriments of dividend policy. **DPS** is the dividend paid to the equity shareholders on a per share basis. It is calculated by dividend paid by the company in a particular financial year and divided by number of equity shares outstanding at the end of the year. It indicates dividend paying capacity of the company in a specific financial year.

Consolidated view of EVA:

A consolidated view is presented by the researcher to find out the exact trend and growth posting of the EVA. Similarly an effort is made by the researcher to give the individual as well as consolidated rank based on the various parameters. Initially a raking a given on the basis of consistency of the EVA. According this parameter BHEL secured I position, Marico II, Infosys III, and IV, and Vth places were secured by Hero Motor, HUL and Dr Reddy's.

Another ranking is given by the researcher on the basis of higher average of EVA during the study period. based on this parameter highest rank secured by Infosys, II rank BHEL , III rank HUL, IV rank Hero motor and V and VI rank secured by Dr Reddy's and Marico respectively. To evaluate the growth position another rank is given on the basis of higher growth rate during the study period. Based on this parameter, first place secured by BHEL, second goes to Dr Reddy's, third to Marico and 4th , 5th and 6th place secured by Infosys , Hero Motors and HUL respectively.

After these three individual ranking a final ranking is given by the researcher to know the overall ranking position among the sample companies A total ranking is also given by the researcher based on the different individual ranking. Least total will be ranked a one and so

on After taking the total of different ranking secured by an individual company first place secure by BHEL, second Infosys, third Marico and 4th 5th and 6th place secured by Dr Reddy's, HUL and Hero Motors respectively.

When we analyze the EVA and growth during the last ten year we found that Infosys is the leader among the sample companies with a value of ₹ 2018 crores. But on the basis of parameters like growth and consistent development of EVA, we find that BHEL is the leading company with a growth of 3532% and the growth was positive in all the ten years.

Exhibit IV: EVA and Growth for various sample companies during 2002-03 to 2011-12. (Amount in crores ₹)

Year	**Infosys**	**Hero Honda**	**HUL**	**Marico**	**Dr Reddy's**	**BHEL**
2002-03	455	481	1236	31	131	111
2003-04	689	569	1429	38	8	366
2004-05	1132	564	887	46	(240)	504
2005-06	1540	641	1014	51	(123)	1079
2006-07	2122	485	1125	79	257	1657
2007-08	2286	575	1340	132	(137)	1810
2008-09	3379	835	2097	144	281	2008
2009-10	2936	1723	1791	196	401	2670
2010-11	2732	1376	1750	175	489	3793
2011-12	2906	1677	2250	199	863	4032
X	**2018**	**893**	**1492**	**109**	**193**	**1803**
G.R.	**539%**	**249%**	**82%**	**542%**	**559%**	**3532%**
S.D.	**1016**	**501**	**461.68**	**67.67**	**337.63**	**1369.63**
C.V.	**50.35**	**56.10**	**30.94**	**62.03**	**174.94**	**75.96**
Rank (based on consistency)	**III**	**IV**	**IV**	**II**	**V**	**I**
Rank (based on Higher average)	**I**	**IV**	**III**	**VI**	**V**	**II**
Rank (based on Higher GR)	**IV**	**V**	**VI**	**III**	**II**	**I**
Total Rank	**8**	**13**	**13**	**11**	**12**	**4**
Final Rank	**II**	**VI**	**V**	**III**	**IV**	**I**

Source: *Calculated and complied from annual reports of samples companies from 2002-03 to 2011-12.*

All the figures in brackets show negative value in the related year.

EVA and other variable at Infosys:

In case of Infosys EVA is consistently an increase from ₹ 455 crore to ₹ 32906 crores between 2002-03 to 2011-12, that show positive wealth creation for the shareholder and various stakeholders of the firm. When we are comparing EVA with CE it is always between 18.32% to 28.40 % during the study period which is very positive for utilization of capital. When we are establishing the relationship between EVA and MC we find that, out of 10 year 03 year MVA is in negative even in that years EVA is positive reason is lot of fluctuation in stock market during the 2000-01 and 2001-02 due to various scams & frauds in Indian capital market and failure of confidence of the domestic investors. EVA with MC steadily increases from 1.69 % to 1.77% but then after decreases to 6.43% due to the significant increases in the MVA as compare to EVA in the year 2006-07. When we are comparing EVA with NOPAT it is

also between 50% to 60% of NOPAT. Comparison of EVA with EPS is significant for the value creation point of view. During the study period EVA and EPS gone in to same direction it has also been supported by coefficient of correlation between EVA and EPS (0.99) that indicate higher degree positive correlation between these two variables. Over all we can say in case of Infosys EVA is very significant and constant during the study period as compare to other sample companies.

Table VIII: EVA and various variables of Infosys. (Amount in crores ₹)

Year	EVA	CE	MC	NOPAT	EPS	DPS	EVA with CE (%)	EVA with MC (%)	EVA with NOPAT (%)
02-03	455	2494	26847	878	18.09	3.38	18.32	1.69	51.82
03-04	689	3125	32909	1129	23.43	3.69	22.05	2.09	61.03
04-05	1132	4331	61073	2012	34.63	5.75	26.14	1.85	56.56
05-06	1540	6177	82154	2341	44.34	7.50	24.93	1.87	65.78
06-07	2122	9147	115307	3491	67.82	11.50	23.20	1.84	53.65
07-08	2286	12527	82362	3955	78.24	13.25	18.25	2.78	57.80
08-09	3379	17431	75837	6434	101.65	23.50	34.30	4.46	55.38
09-10	2936	21634	150110	5755	100.37	25.00	28.70	1.96	51.02
10-11	2732	25688	186100	6443	112.26	60.00	26.60	1.47	42.41
11-12	2906	30382	164592	7986	139.07	47.00	27.40	1.77	36.39
X	2018	13294	97729	4042	72.00	20.06	25.00	2.18	53.19
G.R.	539	1118	513	810	298	493	37	29	3

Source: *Calculated and complied from annual reports of Infosys ltd from 2002-03 to 2011-12.*

Another important relationship is between EVA and DPS which indicate the impact of EVA on dividend paying decisions of the company. In case of Infosys Coefficient of Correlation between EVA and DPS is 0.99 which strongly indicates that dividend per share is fully depends on the size and trend of EVA which is very positive for the shareholders. Over all we can say that in case of Infosys EVA is very important segment for the value creation for the shareholders and it also directly affected dividend decision & policy of the company.

EVA and other variable at Hero Honda:

Hero Honda is one of the leading automobile company in India. When we were analyzing their EVA we found that it constantly increases from ₹ 481 crores to ₹ 1677 crores between 2002-03 to 2011-12. When we were comparing EVA with CE ratio decreases from 53.86% to 19.98% and then increase up to 34.50% in the year 2011-12. Over all it is always between 20% to 30% during the study period.

Table IX: EVA and various variables of Hero Honda (Amount in crores ₹)

Year	EVA	CE	MC	NOPAT	EPS	DPS	EVA with CE(%)	EVA with MC (%)	EVA with NOPAT(%)
02-03	481	893	3758	582	29.1	18.00	53.86	12.80	82.64
03-04	569	1154	9797	729	36.5	20.00	49.31	5.80	78.05
04-05	564	1504	10943	811	40.6	20.00	37.50	5.15	69.54
05-06	641	1945	17781	973	48.6	20.00	32.96	3.61	65.88
06-07	485	2415	13753	859	43	17.00	20.08	3.53	56.46
07-08	575	2877	13869	969	48.5	19.00	19.98	4.14	59.34
08-09	835	3499	21390	1282	64.19	20.00	23.90	3.91	65.13
09-10	1723	3705	38827	2232	111.8	110.00	46.50	4.44	77.20
10-11	1376	3989	31739	1928	96.5	105.00	34.50	4.34	71.37
11-12	1677	4866	41041	2378	119.1	45.00	34.50	4.09	70.52
X	893	2685	20290	1274	63.79	39.4	35.31	5.18	69.61
G.R.	249	445	992	309	119	150	-35	-68	-15

Source: *Calculated and complied from annual reports of Hero Honda from 2002-03 to 2011-12.*

When we were establishing relationship between EVA and MC, percentage of EVA with MC showed a fluctuating trend during the study period from 12.80% to 4.09% due to the regular fluctuation in the share prices in BSE. Out of the 10 years MVA is three year in negative. Comparison of EVA with EPS is significant for the value creation point of view. In case of Hero Honda EVA and EPS both are always gone in the same direction, EVA is increases from ₹ 481 crores to ₹ 1677 crores, and similarly EPS also increases from 29.10 to 119.1 during the study period which is very significant for wealth creation point of view. When we were calculating the coefficient of correlation between EVA and EPS, it was 0.95 which indicates higher degree positive correlation between two variables, which strongly supported that EPS depends upon the size and trend of EVA. Similarly when we analyzed the coefficient of correlation between EVA and DPS it was 0.96 and it again strongly supported that dividend policy depends upon the size of EVA. Over all EVA of Hero Honda was consistently and positively contributed in wealth creation for shareholders during last one decade.

EVA and other variable at HUL:

In case of HUL when we analyzed EVA, we found different trends during the study period of 2002-03 to 2011-12. During this phase EVA increases from ₹ 1236 crores to Rs. 2250 crores with fluctuating trend. One of the reasons for the decreases of the amount of EVA in the years 2003-04 due to increases for their debt burden from ₹ 881 crores to ₹ 1588 and they has to pay more interest as compare to last year. When we are comparing EVA with CE it is between 36.4 to 64.05% during the study period, it indicates that as compare to their investment every year they are creating more and more wealth. When we were establishing relationship between EVA and MC it shows a fluctuating trend because out of the 10 years MVA is negative in the four years due to decreases in the market value of the share.

Table X: EVA and various variables of HUL (Amount in crores ₹)

Year	EVA	CE	MC	NOPAT	EPS	DPS	EVA with CE(%)	EVA with MC (%)	EVA with NOPAT (%)
02-03	1236	3396	40008	1722	8.04	5.16	36.4	3.09	71.78
03-04	1429	3780	45059	1847	8.05	5.50	37.8	3.17	77.37
04-05	887	3704	31587	1282	5.44	5.00	23.95	2.81	69.19
05-06	1014	2560	43419	1367	6.4	5.00	39.61	2.34	74.18
06-07	1126	2677	47788	1547	8.41	6.00	42.02	2.36	72.72
07-08	1314	2785	46575	1786	8.73	9.00	48.12	2.82	75.03
08-09	2154	2270	51770	3025	11.46	7.50	92.38	4.16	69.32
09-10	1791	2584	52077	2103	10.10	6.50	69.31	3.44	85.16
10-11	1750	2660	61459	2153	10.58	6.50	65.79	2.85	81.28
11-12	2250	3513	88600	2599	12.46	7.50	64.05	2.54	86.57
X	1497	2993	50334	1943	8.97	6.37	51.94	2.96	76.26
G.R.	82	3	121	51	55	45	76	-22	21

Source: *Calculated and complied from annual reports of HUL from 2002-03 to 2011-12*

When EVA compared with the NOPAT both are gone in the same direction and show a perfect positive trend during the study period. Similarly EVA and EPS both also gone into same direction its also supported by coefficient correlation (0.96) between these two variables it clearly indicate that EPS is fully depends upon the level of EVA and it is very positive for the shareholder for value creation point of view. Another important analysis is relationship between EVA and DPS which indicate earning and dividend policy of the company. Coefficient of correlation between these two variables is 0.75 which indicated higher degree positive correlation and proved our philosophy that dividend policy depends upon the size and trend of EVA.

EVA and other variable at Dr Reddy's:

In case of Dr Reddy's EVA is fluctuating during the study period on both the direction positively and negatively from ₹ 131 crores to ₹ 863 crores between 2002 to 2012. Out of 10 years 3 years it is negative Rs. -240 (04-05), Rs. -123 (2005-06) and Rs. -137 (2007-08) that means in these three years they are not creating wealth for the shareholder, simply they are destroying the precious wealth of owners, which is not favorable for the various stakeholders. When we are comparing EVA with capital employed again ratio are fluctuating year by year from 6.94% to 13.80%. When we are comparing EVA with MC we find a unique observation that out of 10 years, 03 years EVA is in negative and absolute MVA is also negative for the year ₹ -2389 crore in the year 2004-05 and ₹ -3051 crore in the year 2007-08 its clearly indicate that market value of a companies fully depends upon the wealth creation for the shareholders that EVA.

Table XI: EVA and various variables of Dr Reddys Lab. (Amount in crores ₹)

Year	EVA	CE	MC	NOPAT	EPS	DPS	EVA with CE (%)	EVA with MC (%)	EVA with NOPAT (%)
02-03	131	1887	5099	355	51.24	5.00	6.94	2.57	36.9
03-04	8	2122	6609	235	37.01	5.00	0.38	0.12	3.4
04-05	-240	2094	4235	17	1	5.00	-11.46	(5.67)	-1411.76
05-06	-123	2230	5894	182	11	5.00	-5.52	(2.09)	-67.58
06-07	257	6312	11283	905	59	3.75	4.07	2.89	28.39
07-08	-137	6411	9352	494	28	3.75	-2.14	(1.46)	27.73
08-09	281	5876	7174	732	(31)	6.25	4.78	3.92	38.39
09-10	401	5384	20678	909	6	11.25	7.44	1.94	44.11
10-11	489	5164	26801	1062	65	11.25	9.47	1.82	46.05
11-12	863	6254	28832	1499	84	13.75	13.80	3.00	57.57
X	193	4373	12596	639	31.13	7.00	2.78	0.704	-119.68
G.R.	559	231	465	322	64	175	99	17	56

Source: *Calculated and complied from annual reports of Dr Reddy's lab from 2002-03 to 2011-12.*

Another major observation is related with relationship between EVA and EPS. When we are establishing a relation between EVA and EPS, we find that years in which EVA is higher correspondingly EPS is also higher, similarly year in which EVS is lower or negative automatically EPS will also be lower that indicate positive relationship between EVA and EPS it is also supported by Correlation between EVA and EPS is 0.52. Another important relationship is between EVA and DPS which indicate the impact of EVA on dividend paying decision of the company. In case of Dr. Reddy's Coefficient of Correlation between EVA and DPS is 0.85 which indicate higher degree association between these two variables. That means dividend decision is fully depends upon the size and value of EVA. Over all we can say EVA is not constant during the study period due to significant changes in the cost structure of the company.

EVA and other variable at BHEL:

In case of BHEL EVA is consistently and positively an increase from ₹ 111 crores to ₹ 4032 crores. When EVA compared with CE it's also positively increases from 3.04% to 22.65% during the study period. When we are comparing EVA with MC it shows a fluctuating trend. It is fluctuating between 2.03% to 6.41%.

Table XII: EVA and various variables of BHEL (Amount in crores ₹)

Year	EVA	CE	MC	NOPAT	EPS	DPS	EVA/ CE (%)	EVA/MC(%)	EVA/ NOPAT (%)
02-03	111	3652	5462	575	1.81	4.00	3.04	2.03	19.3
03-04	366	3706	14792	819	2.69	6.00	9.87	2.47	44.69
04-05	504	4557	18758	986	3.90	8.00	11.06	2.69	51.12
05-06	1079	5517	54874	1660	6.86	14.49	19.56	1.97	65
06-07	1657	5571	55349	2454	9.86	24.49	29.74	3.00	67.52
07-08	1810	7362	100907	2739	11.68	15.22	24.59	1.79	66.08
08-09	2008	7751	73944	3047	12.82	16.98	25.91	2.72	65.90
09-10	2670	11540	117027	4206	17.61	23.31	23.14	2.28	63.48
10-11	3793	14680	100971	5867	24.56	31.15	25.84	3.76	64.65
11-12	4032	19521	62940	6953	28.76	**32.10***	20.65	6.41	57.98
X	1803	8386	60502	2931	12.06	**17.58**	19.34	2.91	56.57
G.R.	3532	435	1052	1109	1489	**703**	579	216	200

Source: *Calculated and complied from annual reports of BHEL from 2002-03 to 2011-12. * converted value on the basis on ₹ 10 each*

When EVA compared with NOPAT both is always gone on to same direction. When EVA compared with EPS it indicates a constant, positive trend during the study period. EPS consistently increases from ₹ 1.81 to ₹ 28.76 from 2002-03 to 2011-12, on the other hand EVA is also on same direction. When we are calculating coefficient of correlation between EVA and EPS it is 0.99 that indicate higher degree positive correlation. Similarly coefficient of correlation between EVA and DPS is 0.95 it also indicates higher degree positive correlation, which is also indicate that dividend policy and dividend payout trends depends upon the level and size of EVA. This relationship is very significant for the wealth creation point of view.

EVA and other variable at Marico:

Marico is another leading FMCG company whose EVA is also consistently increases from 31.30 crore to 198.60 during the study period. When EVA compared with CE its shows fluctuating trend from 14.63% to 12.40% during the study period. When we are comparing EVA with MC again it shows a fluctuating trend. It is fluctuating between 6.53% to 2.74%.

Table XII : EVA and various variables of Marico (Amount in crores Rs.)

Year	EVA	CE	MC	NOPAT	EPS	DPS	EVA/ CE (%)	EVA/MC (%)	EVA/NOPAT (%)
02-03	31.3	214	479	56.2	1.9	0.5	14.63	6.53	55.63
03-04	38.2	204	782	59.0	2.0	0.4	18.73	4.88	64.75
04-05	46.0	289	1015	70.1	1.2	0.5	15.92	4.53	65.62
05-06	50.7	509	928	86.9	1.5	0.6	9.96	5.46	58.34
06-07	79.3	443	3654	112.9	1.9	0.7	17.30	2.17	70.24
07-08	131.5	673	3905	169.1	2.8	0.7	19.54	3.37	77.76
08-09	144.4	829	5176	188.7	3.1	0.7	17.42	2.79	76.52
09-10	196.0	1112	10358	231.7	3.8	0.7	17.63	1.89	84.53
10-11	174.7	1364	6269	286.4	4.7	0.7	12.81	2.79	60.39
11-12	198.6	1601	7256	317.1	5.2	0.7	12.40	2.74	62.63
X	109	724	3982	158	2.81	0.62	15.64	3.72	67.64
G.R.	535	648	1415	464	174	40	-15	-58	12.58

Source: *Calculated and complied from annual reports of MARICO from 2002-03 to 2011-12.*

When EVA was compared with NOPAT we found that both were in same direction, it was always between 55.63% to 84.53%. When EVA was compared with EPS it indicated a constant positive trend during the study period. EPS consistently increases from Rs. 1.91 to Rs. 5.2 from 2002-03 to 2011-12. When we were calculating coefficient of correlation between EVA and EPS it was 0.92, which indicates higher degree positive correlation. Similarly coefficient of correlation between EVA and DPS was 0.80; it again indicates higher degree positive correlation, which also indicates that dividend policy and dividend payout trends depend upon the level and size of EVA. This relationship is very significant from wealth creation point of view.

Reporting and disclosure of EVA:

As we know reporting and disclosers of EVA is in voluntary in nature but due to transparent reporting and full disclosure point of view, many companies are reporting and disclosing EVA as separate section in the annual report of the company . After the analysis of contents of balance sheet to find out what method of reporting and discloser practices followed by the sample companies during the last one decade related to the EVA. Director's Report, Management Discussion, Separate Section, Corporate Governance Report Additional Information to Shareholders, Financial Highlights, Others like Notes to Accounts, Financials statements, in compliance with Indian GAAP are most popular way of reporting and disclosure for EVA.

Most of the Indian companies are using EVA as a means of Business/Financial Performance Measurement, Shareholder Value Enhancement, and Incentive Payments/Equitable Reward System. After the analysis of the content of the annual reports of the selected sample companies summaries information present by the exhibit.

Exhibit-XIII EVA Reporting Companies and Their Respective Industry Affiliation, Residential Status, Medium of EVA Disclosure and EVA Applications

Company Name	Industry	Residential Status	Medium/Source of Disclosure	EVA Applications
Infosys Technologies	Computer software	Private (Indian)	Additional Information to Shareholders	Shareholder Value Enhancement
Hindustan Unilever Ltd	Cosmetics, toiletries and soaps	Uni Lever (F) Group	Financials-Additional Information, Director's Report, Performance Trends	To evaluate Business Performance and Setting targets
Hero Honda Motors Ltd	Two and three wheelers	Hero (Munjals) Group	Separate Section and Financial Highlights	Measure to evaluate Financial Performance and Shareholder value enhancement
Dr Reddy's Laboratories	Drugs and pharmaceuticals	Dr. Reddy's Group	Additional Information (Intangibles Valuation)	Shareholder Value Enhancement
Marico Ltd	Vegetable oils	Private (Indian)	Performance at a glance and 10-year Highlights	To evaluate financial performance
BHEL	Electrical and capital goods	PSU Indian	Additional Information (Intangibles Valuation)	Shareholder Value Enhancement

Source: *Compiled from the annual reports of the sample companies.*

Areas of EVA-Application in Indian Companies :

Most important areas of application of EVA by Indian companies are; Business/Financial Performance Measurement, Shareholder Value Enhancement, Incentive Payments/ Equitable Reward System, Setting targets etc.

After the analysis of various annual reports and other additional information's related to Indian companies some important facts observed regarding the disclosure and reporting of EVA by the Indian companies as follows;

- EVA is primarily used for two purposes by the Indian companies: measurement of financial performance and shareholder value enhancement.
- EVA reporting in Indian companies is found to be irregular and inconsistent within a company over number of years, among intra as well as inter companies.
- Almost all the EVA reporting companies failed to provide for the economic adjustments required to fix the GAAP-based accounting anomalies from a menu of up to 164 adjustments given by the proponents of the concept.
- The EVA usage and disclosure choice in Indian companies is influenced by company's size, profitability, leverage, sales efficiency and residential status.
- The age and earnings' potential of a company do not have a significant impact on EVA disclosures choice of a company.

Testing of hypothesis:

In this research paper, we have tested some hypothesis. Our first basic hypothesis, that EVA positively affected shareholders' value creation is proved, because in most of the sample companies their EVA increases with corresponding increase in their Market Value added (MVA) during the study period. Similarly EPS and DPS also follow the same pattern, which strongly supports that EVA significantly affects shareholders' value creation.

Second hypothesis that EVA positively affected EPS and DPS of the sample companies also proved. Because when we calculated correlation between EVA with EPS and EVA with DPS both indicated high degree positive correlation and t-test also proved significance of correlation between their two variables. This indicates that the sample companies are generating EVA during the study period. EPS and DPS also increases that again indicates that now a day's dividend policy is also determined by the EVA and specially in the era of liberalization. EVA is one of the important factor which affected liberal dividend policy.

Another hypothesis that EVA reporting and disclosure is popular among the sample companies in India is also proved. The sample companies are fully disclosing information about the EVA Philosophy, calculations methodology and reporting in annual reports. When we are ranking based on EVA discloser and reporting, Infosys is the leader because their reporting and discloser practices are far better than others, then second place goes to hero Honda and is followed by Dr. Reddy's, HUL,BHEL and Marico.

Table XIII : Analysis of correlation and Students T- test (between EVA and EPS)

Companies	Correlation between EVA and EPS	t-value	Table value	Level of significance	Significant
Dr Reddy's Lab.	0.52	1.73	2.31	5%	NO
Infosys.	0.99	14.29	2.31	5%	YES
Hero Honda	0.95	9.57	2.31	5%	YES
HUL	0.96	9.86	2.31	5%	YES
MARICO	0.92	9.57	2.31	5%	YES
BHEL	0.99	14.29	2.31	5%	YES

Source: *Authors' own calculation based on the data from annual report of the sample companies.*

Table XIV : Analysis of correlation and Students T- test (between EVA and DPS)

Companies	Correlation between EVA and DPS	t-value	Table value	Level of significance	Significant
Dr Reddy's Lab.	0.85	4.54	2.31	5%	YES
Infosys.	0.99	14.29	2.31	5%	YES
Hero Honda	0.96	9.86	2.37	5%	YES
HUL	0.75	3.21	2.31	5%	YES
MARICO	0.80	3.77	2.31	5%	YES
BHEL	0.95	9.57	2.31	5%	YES

Source: *Authors' own calculation based on the data from annual report of the sample companies.*

Part-IV

Findings and suggestions:

The following are the main findings of the present study:

1. In case of Infosys the EVA consistently increases from ₹ 455 cores to ₹ 2906 crores during the study period and it is a positive indication for the shareholders' value creation. Similarly, Net MVA and EPS (From 18.09 to 139.07) and DPS (from 3.38 to 47.00) also increases significantly. It is proved by the correlation results and through t-test also. We can conclude that EVA is a factor which affects EPS as well as dividend policy of the company.
2. In case of Hero Honda, the EVA is increasing significantly from ₹ 481 crores to ₹ 1677 crores during the study period and again it is a positive indication for the shareholders' value creation. Similarly, Net MVA and EPS (From 29.10 to 119.10) and DPS (18 to 105) also increase significantly. It is also proved by the correlation results and also through t test. Finally we can say that Hero Honda is consistently creating and managing value for the shareholders.
3. In case of HUL the EVA shows two different trends. In the first trend, EVA increases from ₹ 1236 crores to ₹ 2250 crores during study period. One of the reasons for the

decrease of EVA in the years 2003-04 was due to increase of debt burden from ₹ 881 crores to ₹ 1588. During the same period MVA, EPS and DPS also shows very positive sign for the shareholders' value creation.

4. In case of Dr Reddy's EVA shows a very fluctuating trend. During the study period it varies between ₹ 1312 crores to ₹ 8 crores, then decreasing up to negative value -240 (04-05), -123 (2005-06) and -137 (2007-08), that means in these three years they were not creating wealth for the shareholders instead they are destroying the precious wealth of the owners. Similarly, correlation between EA and DPS is 0.52 which indicates lower degree positive correlation.
5. In case of BHEL, EVA consistently and positively increases from ₹ 111 crores to ₹ 4032 crores during the study period. Similarly, Net MVA and EPS (From 1.81 to 28.76) and DPS (4.00 to 32.10) also increase significantly and it is proved by the correlation analysis result and also through t- test.
6. In case of Marico, EVA consistently and positively increases from ₹ 31.3 crores to ₹ 198.6 crores during the study period. Similarly, Net MVA and EPS (From 1.9 to 5.2) and DPS (0.5 to 0.7) also increase significantly and it is proved by the correlation results and also through t- test.
7. Coefficient of correlation between EVA and EPS of all the sample companies shows higher degree positive correlation (except Dr Reddy's 0.52) and it is also proved by the students T- test (except Dr Reddy's). Similarly, coefficient of correlation between EVA and DPS of all the sample companies is higher and is proved by the student T- test also.
8. One important observation is that only BHEL is always having a positive growth in the EVA.
9. Director's Report, Management Discussion, Separate Section, Corporate Governance Report, Additional Information to Shareholders, Financial Highlights, Notes to Accounts, Financials statements in compliance with Indian GAAP are the most popular ways of reporting and disclosure for EVA.
10. Most of the Indian companies are using EVA for Business/Financial Performance Measurement, Shareholder Value Enhancement, and Incentive Payments/Equitable Reward System.

Conclusion:

EVA is a new tool to measure companies' true earning capacity in the modern competitive era. EVA approach helps corporate entities to increase the profitability with the help of minimization of the wasteful activities. It also enhances the good governance, reporting and disclosure practices of the corporate. By increasing EVA, a company can improve its efficiency, reduce its cost of capital and increase its capital. It's an issue of both quality and quantity. Over the last one decade, companies in India have paid a great deal of attention for improving their EVA. Many companies are reorganizing Capital employed, their capital structure and sound working capital management. From the shareholders' point of view the EVA is a new tool to measure their real wealth creation. Reporting and disclosure practices adopted by Indian companies will create a right environment for much awaited transparent working.

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Further Evidence on Pricing Indian Stock Call Options Using Black-Scholes Option Pricing Model

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Abstract:

Derivatives' trading was introduced in India during 2001, and the trade value of derivatives is almost three times that of cash market trade values. However, only about 20 percent of the options offered by the National Stock Exchange (NSE) are traded on an active basis. This is perhaps due to the lack of investor education about options and its pricing methodology. It is hoped that research on option pricing in India will enable investors to understand the mechanism of option pricing and its use as a tool to hedge risks. This empirical paper uses more than 95,000 call options to test the validity of the Black-Scholes (BS)model in pricing Indian Stock Options. The results show the robustness of the Black-Scholes model in pricing stock options in India and that pricing is further improved by incorporating implied volatility into the model.

Key Words: *Option pricing, Pricing call options in India, Black-Scholes model.*

Introduction:

In the year 2001, derivatives' trading was first introduced in India. Thin trading characterizes the vast majority of the options offered by the National Stock Exchange (NSE).In part, this is due to the lack of investor education about options and its pricing methodology. It is hoped that as sophisticated investors enter into the market, and more research is available on option pricing in India, the option market will become more active and vibrant. This paper attempts to provide additional data points in understanding the pricing of stock options in India using the Black-Scholes model (BS). The results provide evidence on the robustness of the BS model in pricing stock options in India.

Literature Review:

As can be expected, extant literature on option pricing in India is scant due to thin trading and gaps in option pricing data. Also, the option pricing data has to be hand gathered for analysis and research and thereby poses a daunting challenge for researchers.

Rao, Yadav, Bansal and Jain (2004) compared pricing efficiency of Black-Scholes, GARCH, and Closed-form GARCH Models in the case of S&P CNX Nifty Options. They found that there is error in the option prices predicted by all the three models. But the GARCH models considerably outperformed the BS model in their study. Kakati (2006) studied the BS model in pricing option contracts for ten Indian stocks. The study found that the BS model mispriced the option contracts considerably and underpriced the options in many cases. However, the study was limited in scope due to the sample size and thereby one cannot draw generalized conclusions from the study. Saxena (2008) used a hybrid model for option pricing developed by combining the BS model and Artificial Neural Networks (ANNs). The

relative pricing accuracy of hybrid model and BS model was examined for the options traded at National Stock Exchange (NSE) of India Ltd., a leading stock exchange in India. It was found that the hybrid model provide better estimates of fair value of options than the BS model.Khan, Gupta, and Siraj (2013) found improvement in pricing of NSE derivatives by using alternative proxies for the risk free rate in the BS model. Panduranga (2013) found the BS model effective in pricing Cement stock options in India. However, there has been no large scale study on the pricing of Indian stock options and it is expected that the current large scale study, both in terms of sample size and time period under consideration, will be a valuable addition to the option literature on Indian option markets.

Sample Selection :

Data are taken from National Stock Exchange (NSE) for the time period1/1/2002 - 10/31/2007. According to NSE data, 52 companies traded in the derivative segment in 2003, 116 companies traded in 2005,and 223 companies traded in this segment in 2007. The stock call options related to these companies for the aforementioned time period were considered. A random sample of 28 companies was selected for the time period under consideration. The selected sample represents a wide spectrum of important industries such as Automobiles, Banks, Cement, Engineering, Information Technology, Petroleum, Pharmaceuticals, Telecom, Textile, and Steel. The selected 28 sample companies are listed in Table 1.

Table 1: Sample Call Option Data

S. No.	Company	From	To	Offered	Traded	Non- Dividend Paying
1	2	3	4	5	6	7
1	Tata Steel	1/1/2002	10/31/07	59,912	18,462	16,100
2	Reliance Ind.	1/1/2002	10/31/07	53,118	16,271	14,145
3	Infosys Technologies	1/31/2003	10/31/07	60,653	18,046	12,559
4	ACC	1/1/2002	10/31/07	56,006	11,577	9,334
5	MTNL	1/1/2002	10/31/07	49,049	13,085	9,298
6	Satyam	1/1/2002	10/31/07	53,376	16,122	8,673
7	HUL	1/1/2002	10/31/07	49,742	12,444	7,776
8	Ranbaxy	1/1/2002	10/31/07	57,502	9,975	7,481
9	ITC	1/1/2002	10/31/07	50,349	8,864	7,264
10	M & M	1/1/2002	10/31/07	56,020	8,739	7,232
11	Ambuja Cements	1/1/2002	10/31/07	47,152	7,643	6,793
12	ICICI	1/31/03	10/31/07	47,754	7,989	6,475
13	ONGC	1/31/03	10/31/07	48,223	9,567	5,978
14	SCI	1/31/03	10/31/07	45,178	6,962	5,574
15	BPCL	1/1/2002	10/31/07	53,954	7,780	5,347
16	Cipla	1/1/2002	10/31/07	56,632	5,665	4,833
17	Dr. Reddy'S	1/1/2002	10/31/07	55,490	5,805	4,721
18	Bank Of India	8/29/03	10/31/07	40,364	6,203	4,660
19	Andhra Bank	8/29/03	10/31/07	33,559	5,896	4,518
20	Wipro Ltd.	1/31/03	10/31/07	47,780	6,417	4,505
21	Syndicate Bank	9/26/03	10/31/07	32,941	5,759	4,389
22	UBI	8/29/03	10/31/07	36,327	5,166	4,122

23	BHEL	1/1/2002	10/31/07	65,471	6,051	4,083
24	PNB	8/29/03	10/31/07	49,229	4,661	3,870
25	Bank Of Baroda	8/29/03	10/31/07	49,764	4,457	3,589
26	Canara Bank	8/29/03	10/31/07	46,500	4,676	3,262
27	Bajaj Auto	1/1/2002	10/31/07	63,292	2,331	1,790
28	Grasim	1/1/2002	10/31/07	64,195	2,086	1,761
Total				**1,429,537**	**238,705**	**180,139**

Source: *Column 1 to 6 from www.nseindia.com*

The initial data size for the sample companies were 1,429,537 call options. Options that were not traded, had missing price data, and related to dividend paying stocks were eliminated. The BS model is designed for European type options which can be exercised only on the expiration date. But, the Indian stock options, which are of the American type, can be exercised any time on or prior to the expiration date. If we eliminate all risk free arbitrage opportunities of American options, one will not exercise the options early and therefore can be treated like European options. In view of the above, all risk-free arbitrage opportunities were eliminated from the sample in order to make use of the BS model for pricing call options. However, it should be noted that this is a limiting assumption of the study.

Box-plot analysis was done to find outliers in the sample and they were eliminated. This led to the final sample size of 95,956 call options. To estimate the volatility of returns of the stock prices, stock prices of the 28 sample companies were downloaded at least from 120 days prior to the first date of the option data. For the 28 sample companies almost 48,000 stock price data were collected.

Methodology :

Black-Scholes Model

The Black-Scholes call option pricing model used in our study is given as:

$C_0 = S_0 N(d_1) - X e^{-rT} N(d_2)$

where:

$$d_1 = \frac{\ln(S_0 / X) + (r + \sigma^2/2)T}{\sigma\sqrt{T}}$$

$$d2 = \frac{\ln(S_0 / X) + (r - \sigma^2/2)T}{\sigma\sqrt{T}}$$

and the variables are defined as:

C_0 = Current call option value

S_0 = Current stock price

N (d) = The probability that a random draw from a standard normal distribution will be less than d. This equals the area under the normal curve up to d.

X = Exercise price / Strike Price

e = 2.71828(base of natural log function)

r = Risk free interest rate (the annualized continuously compounded rate on a safe asset with the same maturity as the expiration of the option).

T = Time to maturity of option in years

ln = Natural Logarithm function.

σ = Standard deviation of the annualized continuously compounded rate of return of the stock.

Moneyness Measure

Moneyness is a basic term describing whether an investor would make money if the option is exercised at the current time. There are three different outcomes for the moneyness measure: in, out, or at the money. In-the-money (ITM) means one would make a profit at this moment, out-of-the-money (OTM) means one would lose a portion of his initial investment if he exercises the option right now, and at-the-money (ATM) means one would break even.In our paper, the moneyness measure is calculated as S_0 / X where S is the spot price and the X is the strike price.

Results :

Mean Absolute Errors

The options are classified on the basis of various outcomes of moneyness measure and the option prices are calculated using BS model. The actual markets prices of call options taken from the NSE website are then compared with the respective predicted prices by the BS model and the Mean Absolute Errors are calculated as below.

$$\text{Mean Absolute Error} = \frac{\sum |P_O - P_T|}{\sum P_O}$$

where PT is the call option price theoretically calculated using BS model, and PO is the observed call option price in the market. The Mean Absolute Errors are summarized and shown in the Table 2.

It may be observed from the table that the Mean Absolute Errors are as high as 0.53 for the deep out-of-the-money options having moneyness between 0.80-0.92. Then it starts to decrease at a faster rate. For moneyness between of 0.93-0.95, it decreases by about 17% to 0.43, and for the next classification of 0.96-0.98, it further falls by 23% to 0.33. Then, Mean Absolute Errors reduce by 24%, 32%, 23% and 7% for next four moneyness classifications. At the end, it is almost flat.

Table2: Mean Absolute Errors of Options with Various Moneyness Measures

Moneyness S_o / X	No. of data	Total Observed Price	Total Absolute Error	Mean Absolute Error
< 0.83	187	4,130	1,635	0.40
0.84-0.86	370	7,265	3,720	0.51
0.87-0.89	1,005	17,501	9,349	0.53
0.90-0.92	3,163	54,356	28,077	0.52
0.93-0.95	8,671	155,569	66,442	0.43
0.96-0.98	17,112	383,157	127,623	0.33
0.99-1.01	21,984	624,996	154,049	0.25
1.02-1.04	17,643	660,766	114,602	0.17
1.05-1.07	11,191	542,341	70,111	0.13
1.08-1.10	6,550	378,344	45,151	0.12
1.11-1.13	3,854	251,920	26,870	0.11
1.14-1.16	2,328	164,207	16,709	0.10
1.17-1.19	1,383	101,157	11,043	0.11
> 1.20	515	62,963	7,688	0.12

The time to expiration was then divided into three categories; life less than or equal to 30 days, life between 31 days to 60 days, and life greater than 61 days. The respective mean absolute errors for the three categories are given in Table 3. Around 78.01% of options had life less than or equal to 30 days, options with life between 31 days to 60 days were 21.77 %, and options with life more than 61 days were 0.22%.

Table3: Mean Absolute Errors for Various Lives of Options

Moneyness S_o / X	All Data	⩽30 Days	31 - 60 Days	> 61 Days
0.84 -0.86	0.51	0.61	0.44	0.54
0.87 -0.89	0.53	0.63	0.43	0.28
0.90 -0.92	0.52	0.58	0.44	0.76
0.93 -0.95	0.43	0.46	0.38	0.42
0.96 -0.98	0.33	0.35	0.30	0.47
0.99 -1.01	0.25	0.25	0.24	0.28
1.02 -1.04	0.17	0.17	0.20	0.18
1.05 -1.07	0.13	0.12	0.16	0.11
1.08 -1.10	0.12	0.12	0.13	0.10
1.11 -1.13	0.11	0.10	0.13	0.06
1.14 -1.16	0.10	0.10	0.10	0.18
1.17 -1.19	0.11	0.11	0.12	Nil

Results Incorporating Mean Implied Volatility :

Implied volatility may be defined as the volatility for which the BS model price and the actual market price of the option are equal while all the other four variables are kept constant. In other words, implied volatility is the volatility calculated using the actual call option price and other variables such as Risk-free-interest rate, Stock Price, Strike Price and life of the option in the BS formula. Implied volatility is calculated using a trial and error approach. One has to apply an approximate value for volatility, keeping other variables constant, and then calculate the theoretical call option price using BS formula. Then, compare the same with the corresponding actual observed call option price in the market. If the values are not equal, then change the value of volatility and re-calculate the theoretical call option price and compare it again with actual call option price. The process has to be repeated till the calculated price is equal to the actual market price. Using these iterations, implied volatility of options with different strike prices for every day was calculated. There are as many implied volatilities as the number of strikes traded per day for each stock, and for every expiration date. In some cases, it was impossible to find the implied volatility. In those circumstances, the corresponding options were eliminated from the sample.

In our study, the option prices were obtained for 1716 working days for the 28 sample companies, and for each working day there were many options with different strikes and different expirations. More than 500,000 implied volatilities were then calculated. Again, for each day, the averages of the above implied volatilities, ranging from 0.80 to 1.20, were calculated for 28 companies totaling 48,048 averages; which are called the Mean Implied Volatilities (MIV).Then, these MIV values for each company, and for each day, are fed into the actual BS formula along with respective risk-free interest rate, life of option, stock price, and corresponding strike price, to find the next day call option prices. Then, new mean absolute errors were calculated as below.

$$\text{Mean Absolute Error} = \frac{\sum |P_O - P_T|}{\sum P_O}$$

where P_T is the call option price theoretically calculated using BS model that incorporates MIV, and P_O is the observed call option price in the market.

The new mean absolute errors were then compared with the errors of actual BS call option prices using Historical Volatility as advocated by the original BS model. If the absolute values of the new errors were less than the corresponding original errors, then it was concluded that MIV improved the predictive ability of the model.

The MIV were calculated and used in the BS model to predict the new call option prices for all moneyness measures. The total observed call option prices in the market for each moneyness measure, and the corresponding mean absolute errors, the ratios for the improved method and old method are given in the Table 4. The results above are exemplary; out of 95,956 options, the errors were reduced in 61,635 of options. The improvement percentage is 64.23%. The errors were reduced as much as 73.24% for options with moneyness measure of

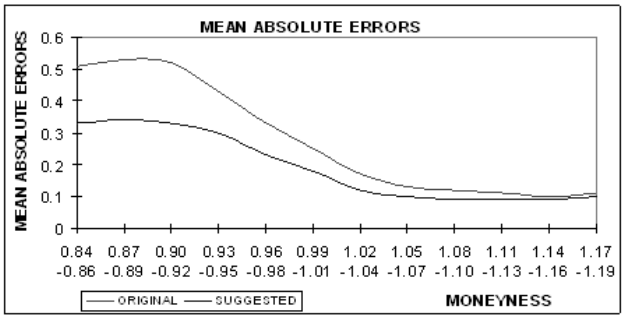
0.84-0.86. The minimum improvement was 62.92% for moneyness measure of 1.02-1.04. The average improvement was 66.59%. Improvements were noticed in all moneyness measure including deep ITM and deep OTM options.

Table4: Results Incorporating Mean Implied Volatility

Moneyness S_0 / X		Total Actual Price	Absolute Errors				Improvement	
			Historical Volatility		Mean Implied Volatility			
			No.	Ratio	No.	Ratio	No.	%
Deep OTM	0.84 - 0.86	7,265	3,720	0.51	2,375	0.33	271	73.24
Deep OTM	0.87 - 0.89	17,501	9,349	0.53	5,954	0.34	732	72.84
Deep OTM	0.90 - 0.92	54,356	28,077	0.52	17,879	0.33	2,238	70.76
OTM	0.93 - 0.95	155,569	66,442	0.43	45,901	0.30	5,911	68.17
OTM	0.96 - 0.98	383,157	127,623	0.33	87,893	0.23	11,192	65.40
ATM	0.99 - 1.01	624,996	154,049	0.25	109,584	0.18	14,022	63.78
ITM	1.02 - 1.04	660,766	114,602	0.17	82,269	0.12	11,101	62.92
ITM	1.05 - 1.07	542,341	70,111	0.13	53,595	0.10	7,076	63.23
Deep ITM	1.08 - 1.10	378,344	45,151	0.12	33,641	0.09	4,201	64.14
Deep ITM	1.11 - 1.13	251,920	26,870	0.11	22,652	0.09	2,489	64.58
Deep ITM	1.14 - 1.16	164,207	16,709	0.10	15,154	0.09	1,486	63.83
Deep ITM	1.17 - 1.19	101,157	11,043	0.11	10,619	0.10	916	66.23

Figure 1 provides a visual picture of the improvement in the predictive ability of the improved model.

Figure1: Comparison of Mean Absolute Errors using Original BS Model using Historical Volatility with Improved Model using Mean Implied Volatility



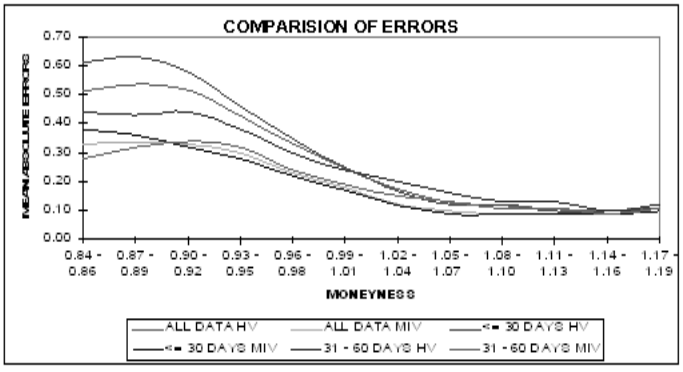
The improvement for different categories of lives of options is enumerated in the Table 5and Figure 2.

Table5: Improvement in Mean Absolute Errors for Different Lives of Options

S_o / X	All data			⩽30 DAYS			31 - 60 DAYS		
	HV	I V	Imp	HV	I V	Imp	HV	I V	Imp
0.84 -0.86	0.51	0.33	0.18	0.61	0.38	0.23	0.44	0.28	0.16
0.87 -0.89	0.53	0.34	0.19	0.63	0.36	0.27	0.43	0.32	0.11
0.90 -0.92	0.52	0.33	0.19	0.58	0.32	0.26	0.44	0.34	0.10
0.93 -0.95	0.43	0.3	0.13	0.46	0.28	0.18	0.38	0.32	0.06
0.96 -0.98	0.33	0.23	0.10	0.35	0.22	0.13	0.30	0.24	0.06
0.99 -1.01	0.25	0.18	0.07	0.25	0.17	0.08	0.24	0.19	0.05
1.02 -1.04	0.17	0.12	0.05	0.17	0.12	0.05	0.20	0.15	0.05
1.05 -1.07	0.13	0.10	0.03	0.12	0.09	0.03	0.16	0.13	0.03
1.08 -1.10	0.12	0.09	0.03	0.12	0.09	0.03	0.13	0.11	0.02
1.11 -1.13	0.11	0.09	0.02	0.10	0.09	0.01	0.13	0.11	0.02
1.14 -1.16	0.10	0.09	0.01	0.10	0.09	0.01	0.10	0.09	0.01
1.17 -1.19	0.11	0.1	0.01	0.11	0.10	0.01	0.12	0.11	0.01
	AVERAGE		0.08	AVERAGE		0.11	AVERAGE		0.06

HV - Historical Volatility IV - Implied Volatility Imp - Improved

Figure 2: Comparison of Mean Absolute Errors using Historical and Mean Implied Volatility for Various Lives of Options



The improvement is higher for the options with lives less than 30 days when compared to lives between 31 to 60 days. The percentage improvement in deep out-of-the-money options

is also very high when compared to options that are deep in-the-money. Let us now examine more closely on the quantum of improvement in predictive ability of each option. The options were divided into groups having various percentages of improvement like 0 to 5%, 5 to 10 %, 10 to 20 %, etc., till 100%.

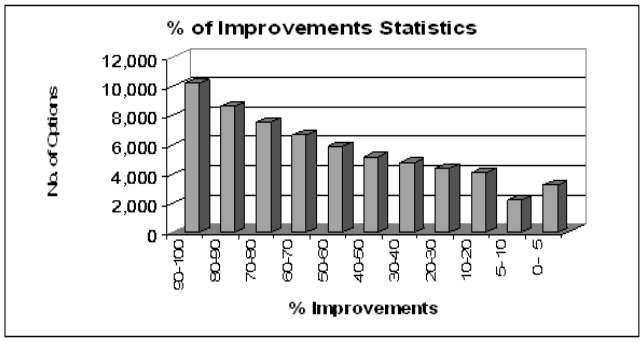
Table6: Percentage Improvement in Predictive Ability of Call Option Prices using Mean Implied Volatility

Percentage Improvement	No. of Improvements	Cumulative Improvements	Percentage Improvements	Cumulative Percentage Improvements
90-100	10154	10,154	10.55	10.55
80-90	8576	18,730	8.91	19.46
70-80	7498	26,228	7.79	27.24
60-70	6629	32,857	6.89	34.13
50-60	5883	38,740	6.11	40.24
40-50	5158	43,898	5.36	45.60
30-40	4745	48,643	4.93	50.53
20-30	4375	53,019	4.55	55.07
10-20	4057	57,076	4.21	59.29
5 to10	2169	59,245	2.25	61.54
0 to 5	3205	62,450	3.33	64.87

The number of improvements, cumulative number of improvements, percentage of improvements in each group, and cumulative percentage of improvements in each group, are given in the Table 6.

It is important to note that the quantum of improvement is not only on the higher side but also the quantity is high for the high quantum improvement. For example, 90-100% of improvement occurs for more than 10,154 options (10.55%), and 80-90% improvement occurs in 8,576 options. The percentage increase is far less at 0-5 % for only 3,205 options (3.33%). In 38,740 options out of the total sample size of 95,956 options, the percentage improvement is more than 50 %. In 26,228 cases, the improvement is more than 70%.The histogram in Figure3 summarizes the extent of improvement using the improved model.

Figure3: Percentage Improvement in Predictive Ability of the Improved Model



Conclusion :

The BS model is robust in pricing Indian stock call options. However, the residual analysis indicated there may be some misspecification and possibilities for improvement in the predictive ability of the model. A correlation analysis suggested that the misspecification may lie with the volatility variable. The implied volatility was then incorporated into the BS model to see if there was an improvement in the predictive ability of the model. The newly constituted model improved the predictive ability for 64.23% of the call option prices. The improvements were broad based across all moneyness measures and lives of options.

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A Study of Feasibility of Replacement of Individual Income Tax by Carbon Tax

Shurveer S. Bhanawat

'A tax on carbon is an idea whose time has come.'

Mr. A. L. Gore

Abstract:

A carbon tax can be central pillar of tax reform and sound fiscal policy. In India, still no tax is charged on the emission of carbon dioxide. Carbon tax could be used to replace individual tax and tax simplification and less government regulation. A carbon tax is also cheaper and often more efficient way to reduce carbon emission than subsidies for alternative fuels. The main objective of the present research paper is to examine the feasibility of replacement of individual income tax by carbon tax.

Under the present paper null hypothesis i.e. there is no difference between tax collection from individuals and carbon tax, is accepted. It clear indicates that the difference between income tax collected from individuals and carbon tax collected from polluters is not significant. By imposing carbon tax instead of individual income tax, the revenue of government will not be affected and approximately 3.5 crores taxpayers shall be benefitted.

Although our research shows that whole individual income tax can be replaced by carbon tax yet it is not possible than alternatively all the taxpayers having taxable income less than five lakhs shall be exempted from personal income tax i.e. minimum exemption limit can be increased from 200000 to 500000. Approximately 2.84 crore tax payers whose income is less than five lakhs shall be benefited. They contributed only 10.10% of total personal income tax collected. Such revenue loss can be compensated by imposing carbon tax on polluters. Due to this relief the government will lose only approximately 20% of total tax revenue collected. Such losses can be set off through imposing carbon tax on most polluted industrial units.

Key Words: *Carbon Tax, Income Tax, CO2, Fossil fuel, Carbon emission.*

Introduction :

Global warming has led to season shifting changing landscapes, rising sea levels, increased risk of drought and floods, stronger storms, increase in heat, related illness and diseases all over the world. This has resulted due to emissions of Green House Gases (GHG's) from various anthropogenic activities. There is growing concern around the world about the impact of Green House Gases on the environment and economy. The frequency, intensity and cost of such events are increasing at alarming rate. Most climate experts concur that dangerous climate change is occurring at a more rapid rate than expected. They also agreed that the deterioration in the earths' climate is primarily a result of carbon emissions from fossil fuel consumption by humans.

Economists have long contended that a carbon tax is the most effective and simplest way to reduce carbon emissions. They also pointed out that the right thing in climate policy for all the big countries is a carbon tax, which is simpler and less vulnerable to fluctuations in emissions than cap-and-trade schemes. The economic solution is to tax the externality so that

the social cost of carbon is reflected in the individual consumer's decision. The carbon tax is an elegant solution to a complicated problem, which allows the everyday business of consumer decision making to do the work of emission reduction. A carbon tax is a tax levied on the carbon content of fuels. It is a form of carbon pricing.

A carbon tax can be central pillar of tax reform and sound fiscal policy. In India, still no tax is charged on the emission of carbon dioxide. Carbon tax could be used to replace individual tax and tax simplification and less government regulation. A carbon tax is also cheaper and often more efficient way to reduce carbon emission than subsidies for alternative fuels. Generous bio-fuels have cost billions of rupees by reducing the price of gasoline they may have perversely increased rather than decreased carbon emission. Generally subsidies encourage producers to pollute or deplete natural resources and consumers to under value the resources they use. Such subsidies conflict with both the polluter and user pay principles by sending false price signals. In India, The Income Tax Department is the biggest revenue generator for the Government. The total tax revenues of the Central Government increased from 1392.26 billion in 1997-98 to 5889.09 billion in 2007-08. There is a lot of ambiguity is available in present structure of tax collection system so a laymen is always confused and misguided by experts. If carbon tax were used to replace individual income tax, it would be a major changed in the history of India and a major mass of tax payer shall be benefited. In order to provide relief to small tax payer's carbon tax can be imposed on industry that emit the carbon dioxide in the environment. Here an attempt has been made to explore the possibility of replacement of carbon tax to individual tax. The present article has been divided into eight parts.

Review of Literature :

Meng, Siriwardana, et al (2013) studied the environmental and economic impact of the carbon tax in Australia. They studied the effects on the environment and on the economy of a carbon tax of A$23 per tonne of carbon dioxide proposed by the government with, and without, a compensation policy. They employ a computable general equilibrium model with an environmentally extended Social accounting matrix. According to the simulation results, the carbon tax can cut emissions effectively, but will cause a mild economic contraction. Because the price signal is intact, the proposed compensation plan has little impact on emission cuts while significantly mitigating the negative effect of a carbon tax on the economy.

Das, Mukhopadhyay, et al (2007) discussed the pattern of energy usage in India and the implications thereof relating to carbon emissions. They examined whether pricing and taxation policies play any role in mitigating carbon emissions from industrial usage in important energy products. They pointed out that the pattern of energy usage exhibits a shift towards non-coal based energy products. It also suggests that the extent of carbon emission reduction is not substantial enough to warrant the use of carbon taxation for mitigating emissions.

Grüner, Salu, et al (2007) discussed ecological tax reforms in Estonia, Sources of tax revenue in state and local budget of Estonia, efficiency of environmental taxes and environmental tax distribution. They pointed out that environmental taxes, environmental protection expenditures, resource and pollution accounts have a definite role for valuing

Estonian natural capital and changes therein and in the development of respective policies.

Research Methodology :

Research Gap: Can individual tax be replaced with carbon tax? What is trend of greenhouse Gas emission in India? All these issues are scratched in mind and not yet discussed with full extent in available literature; in this way the present research problem is originated and fulfils the research gap.

Objectives :

1. To examine the revenue collected from individual income tax payers by government of India
2. To examine the status of CO_2 emissions from different sources of fossil fuels in India
3. To examine the feasibility of replacement of individual income tax by carbon tax

Hypothesis:

H_{01}: There is no significant difference between existing total tax revenue collected from individual income tax payers and estimated carbon tax to be collected from polluters.

Period of study: seven years from 2004 to 2011 have been considered for establishing the trend for both CO_2 emission and personal income tax and both are estimated for 2012 to 2016.

Statistical Techniques: Under present research paper descriptive statistics is being used to describe the basic characteristics of seven years data of CO_2 emission and individual income tax. The trend is also calculated through least square method of time series analysis and finally t test has been administered to test the hypothesis

Critical Analysis of Individual Income Tax Collection in India

In order to examine the structure of individual income tax collection in India, time series data of tax collected from 2004 to 2011have been analyzed. Tax collection from individuals and percentage of tax collection to gross tax revenue are shown in the following table:

Table1: Actual Personal Income Tax Collection (Rs. In Crore)

Year	2004	2005	2006	2007	2008	2009	2010	2011	Average
Personal Income Tax Collected	41387	49268	57308	75079	102644	106046	122475	139069	86659.5
Tax revenue as % of gross tax revenue	NA	NA	NA	NA	17.3	17.5	19.6	17.5	17.97

*(**Sources:** union budget documents and Economic Survey 2012-13, GOI, Ministry of Finance, Department of Economic Affairs, February 2013)*

The above table 1 shows that Share of Tax collection from individuals is less than 20% of gross tax revenue during throughout the study period. Every year on an average tax collection from individuals is Rs. 86659.5 Cr. Although every year tax slabs and basic exemption limit for individual tax payers have been broadened yet gross collection is improved.

Slab wise analysis :

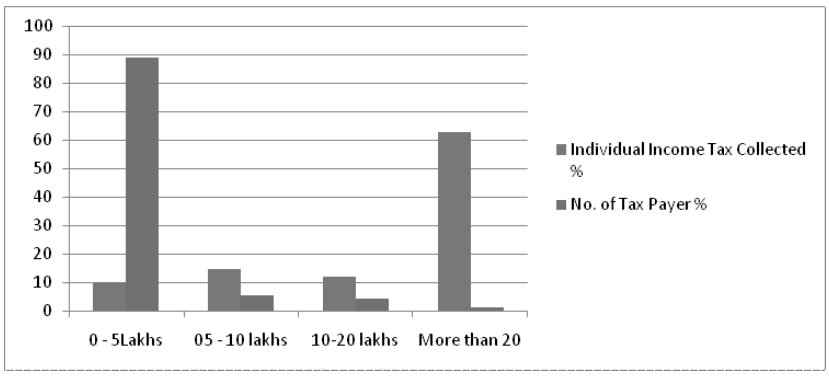
In order to understand the structure of the no. of tax payers and total amount collected in each

slab, data of 2011-12 has been analysed. The other year's slab wise data are neither available on income tax department nor on government of India web sites at my best knowledge, So only one year data which could be collected from Google search have been analysed here. The data relating to 2011-12 have been depicted in tabular format as well as in graphical view in table no.2 and figure 1 respectively. This year data is analysed to understand the structure of tax collections in terms of tax payers and amount of tax.

Table2: Slab wise tax payers and individual income tax collection

Slab	No. of tax payers		Individual Income tax collected	
Rs. In lakhs	Total in crore	Percentage	Amount in crore	Percentage
0-5	2.8444	89%	15010	10.10
5-10	0.1786	5.5%	21976	14.8
10-20	0.1378	4.3%	17858	12.10
More than 20	0.0406	1.3%	93229	63
Total	3.02014	100	148073	100

Figure 1: Income tax payers (no. % to total) and Tax Revenue (Rs. % to total) in each slab



On analysis of above table no. 2 and graph no.1, it is found that high degree of disparity is available among lower income tax payer and high income tax payers. Only 1.3% of all tax payers earn annually more than 20 lakhs in India but they contributed 63% of total taxes collected by Indian government and per capita tax paid by this category is around 23 lakhs. In contrast only 10.10% of total tax revenue is collected from 89% of tax payers whose income is less than five lakhs. 4.3% tax payers whose income is between 10 lakhs to 20 lakhs contributed 12.10% of total tax collected by Government from individually.

More than half of India's total income tax payers (3.02 crore) contribute insignificant amounts as tax, with figures ranging from a paltry Rs 50 to Rs 1,000 in most cases. This reduces the effective tax base to around 1.5 crore tax payers, which includes mainly corporate houses and the salaried class. The cost to the department for maintaining these files would probably exceed the tax collections from this category. A single assessing officer

could be burdened with as many as 10,000 files and it is difficult for him or her to examine all of them in minute detail. (Source: Business India, March10, 2011).

Analysis of Carbon Dioxide (CO2) emissions status in India :

Economic liberalisation has ushered in sustained industrial growth over the last two decades. This growth has been one of the major drivers of rise in demand of energy in the country, in particular led by energy intensive industries such as power, steel, cement, and fertiliser. This energy -intensive industries account for over 45% of commercial energy use in India to deliver 25% of national GDP. The energy demand of these industries is primarily met by fossil fuels such as coal and oil and therefore is highly vulnerable to availability and price volatility of energy resources. India is the fourth-largest energy consumer in the world, trailing only the United States, China, and Russia. (Source: www.eia.gov). Due to use of fossil fuels emission of green house gases are increasing day by day. The component of carbon dioxide is varying high. As per climate policy initiate (CPI) report India is responsible for 8% increase of the global related carbon dioxide emission in 2000-10. (Source: Business standard, May 6, 2013).In order to examine the feasibility of replacement of individual income tax by carbon tax, it would be better to understand the carbon emissions structure in India. The CO2emissions form using various fossil fuels in India from 2004 to 2011 are summarised in the following table no.3.

Table3: Carbon Dioxide Emissions from Consumption of Fossil fuels (Million Metric Tons)

Years	CO_2 Emission from Consumption of			
	Coal	**Petroleum**	**Natural gas**	**Total energy**
2004	752.961	305.97704	61.9382	1120.87657
2005	795.388	314.15478	71.85471	1181.39759
2006	854.305	349.20805	77.13332	1280.64642
2007	930.479	353.562	82.172	1366.213
2008	1014.196	372.403	85.171	1471.77
2009	1078.01	414.144	105.598	1597.752
2010	1046.493	427.416	127.327	1601.236
2011	1149.625	449.816	126.321	1725.762
Average	**952.6821**	**373.33511**	**92.189404**	**1418.206698**
Annual Growth rate				**6.4%**

Source: *www.eia.gov (countries international energy statistics)*

The above table shows that highest CO2 is emitted by using coal during 2004 to 2011 followed by petroleum and natural gas. On an average 67% CO2is emitted by consumption of coal during the study period, it indicates that coal is major source of CO2 emission. The overall annual growth rate in CO2 emission from all sources is observed of 6.4%. Every year CO2 emissions from all three sources viz. coal, petroleum and natural gas are increasing so it is the time to think how to stop it. If preventive measures are not taken into account, the situation will be alarming. The prime objective of present research paper is to examine the feasibility of replacement of individual tax by carbon tax. Before examining it would be better to understand the international scenario of carbon tax. Former vice president of united states Mr. A.L. Gore recently blogged, "A tax on carbon is an idea whose time has come".

Feasibility of Replacement of Individual Income Tax by Carbon Tax :

Carbon Tax

Carbon emissions have an "unpriced" societal cost in terms of their deleterious effects on the earth's climate. A tax on carbon would reflect these costs and send a powerful price signal that would discourage carbon emissions. There is much debate on social cost of carbon but it is true that carbon emissions are seriously underpriced. Any tax on carbon would be an important step.

Environmental pressures have increased with economic growth and in order to reduce negative environmental effect, more attention is paid to market based instruments (environmental taxes, tradable permits, etc.). Similarly to many countries, the implementation of ecological tax reform had started.

As far as carbon tax is concerned, Finland was the first country in the world to introduce a carbon tax @ $6.10 per tonne of carbon on all fossil fuels in 1990 (Gupta 2004). In 1991 Norway was also implemented carbon dioxide tax on mineral oils which was extended to coal and coke. Sweden was also imposed environmental taxes especially on carbon and sulphur in 1991 to offset the reduction in income tax. In Denmark the carbon tax revenues from industry are recycled back to industry through reduced social security contributions and through investment incentives, and in The Netherlands the revenues are recycled back to households and industry through personal and corporate tax relief. Estonia was also increase in environmental tax and decrease in income tax in 1991. In 1999 France, Germany, Italy, Switzerland, UK etc. were also imposed carbon tax.

Estimation of carbon Tax and Individual Income Tax :

In order to examine the feasibility of replacement of individual income tax by carbon tax, time series data of seven years from 2004 to 20011 and next five years data from 2012 to 2016 generated on the basis of trend analysis have been analysed and finally feasibility has been checked from statistical technique i.e. student 't' test.

In order to estimation of carbon emission and collection of personal income tax for incoming years (2012-2016), trend is calculated through least square method of time series analysis. Trend analysis, which is one of the most common and largely used methods, involves a simple extrapolation of past trends. Usually the trend is estimated by a least-squares fit of past data. The major advantage of this method is its simplicity. The disadvantage is that there is no attempt to explain why certain trends were established in the past, so statements on

future structural changes are essentially ad hoc. The assumption that past trends would persist in the future is, in some cases, a limiting assumption. If same trend is maintained then estimated CO_2 emission from total energy consumption for next five years are given in table number4. Simultaneously carbon tax is also estimated for next five years. The rate of carbon tax on per metric ton emission of CO_2 may be fixed by dividing the CO_2 emissions from consumption of energy to total revenue loss by exempting the individual tax payers. National carbon taxes can raise significant revenue to the government to replace the individual income tax. Here, the carbon tax rate is computed on the basis of average revenue of individual income tax and average emission of CO_2 during last seven years from 2004 to 2011.

$$\text{Carbon Tax} = \frac{\text{Average tax collected}}{\text{Average CO2 emission}} = \frac{\text{Rs. 86659.5 cr.}}{\text{141.8206698 cr.}} = \text{Rs. 611.04 per metric ton}$$

Here an assumption is taken into account that carbon tax per metric ton should be increased by 6.4% annually because same growth rate i.e. 6.4% in CO_2 emission is found (table no.3).

Table 4: Estimated CO_2 Emissions and Carbon Tax during next five years (Crores)

Year	2012	2013	2014	2015	2016	Average
Estimated CO_2 emission Metric ton (1)	181.411	190.209	199.007	207.805	216.603	199.007
Estimated Carbon Tax rate On the basis of 6.4% Growth rate (2)	611.04	650.14	691.75	736.02	783.12	694.41
Carbon Tax To be collected Rupees in Cr. (3)=2*3	110849.61	123662.69	137663.3	152948.78	169626	138950.12

Slope: 87.97935 Intercept: - 175200.37

Table 5: Estimated Individual Income Tax during next five Years (Rs. Crores)

Years	2012	2013	2014	2015	2016	Average
Estimated Income Tax to be collected	152208.9	166775.4	181341.9	195908.4	210475	181341.9

Slope: 14566.52 Intercept: -29155637.05

Calculated Student 't' value =0.019997

Table value at 5% level of significance at 8 degree of freedom = 2.306

The above statistical calculation proves that there is no significant revenue loss to the government because calculated value of't' is much less than table value. So income tax relief can be given to individual tax payers and such revenue loss can be compensated by imposing carbon tax on CO_2 emission by the government. Imposing of carbon tax, will lead two benefits: first- a fear will develop among polluters due to financial loss and they will try to reduce CO_2 emissions and second approx. 3.5 crore tax payers of India will be benefited.

Testing the Hypothesis :

Null hypothesis is accepted because calculated value (0.019997) of student t test is very much less than the table value at 5% level of significance (2.306). It clear indicates that the

difference between income tax collected from individuals and carbon tax collected from polluters is not significant. Although difference (Rs.42391.78 crore181341.9-138950.12) is visible yet it is due to sampling fluctuations and not due to any major reasons. In this way by imposing carbon tax instead of individual income tax, the revenue of government will not be affected.

Although our research shows that individual income tax can be replaced with carbon tax yet it is not possible than alternatively all the taxpayers having taxable income less than five lakhs shall be exempted from personal income tax i.e. minimum exemption limit can be increased from 200000 to 500000. Approximately 2.84 crore tax payers whose income is less than five lakhs shall be benefited. They contributed only 10.10% of total personal income tax collected (Rs. 15010 crore out of total 148073 crore in 2011-12). Such revenue loss can be compensated by imposing carbon tax on polluters.

Lesson from Experience with international carbon tax practices :

In some countries, increases in carbon or environmental taxes have been accompanied by reductions in other forms of taxation with the intention of leaving the overall tax take unchanged. This has been driven by the concept of a 'double benefit', which states that a revenue-neutral energy tax reform can improve both environmental and general macroeconomic reform. The most common implementation of revenue recycling is to reduce employer's social security contributions or income taxes in compensation. Reductions in corporation taxes are unusual and there are no examples of reductions in indirect taxation such as Value Added Tax. Both Denmark and the UK chose (to different extents) the same path. They both recycle the revenues from their environmental tax programmes through reduced employers' social security contributions, an approach which is not inflationary and is strongly supported in tax theory (Andersen & Speck, 2009, p 129:30 and Fullerton et al., 2010).

Germany took a mixed approach - revenue recycling was split equally between reductions in employees' and employers' social security contributions (Andersen & Speck, 2009, p 129:30). It also set aside 1 per cent of energy tax revenues to promote renewable. Other countries, such as the Czech Republic, Sweden, British Columbia, and Estonia, have mainly chosen to reduce income or corporate tax rates (Andersen & Speck, 2009, p 129:30). In Sweden, income tax rates were reduced in 1991 to an average of 30 per cent for low income earners and 50 per cent for high income earners. Prior to the environmental tax reform, marginal tax rates were as high as 80 per cent (Blomquist, Ekloef, and Newey, 1997). In British Columbia, the corporate tax rate was reduced to 10 per cent in 2011 from 16.5 per cent in 2001. Summary details of the some of the key examples of environmental tax reform, focussing particularly on those taxing energy and/or carbon emissions, are listed in the following table 6.

Table 6. CARBON TAXES AROUND THE WORLD

Country	Details of carbon-energy taxes
British Columbia	• taxation of all CO2 emissions from the burning of fossil fuels within the province (Ministry of Finance British Columbia, 2008) • Phased implementation from 2008 to 2012 initially set at C$10 per tonne of CO2, increasing by C$5 per year to C$30 in 2012 (id.) • tax benefits to protect working families • from FY09 to FY14, cumulative revenue is estimated at C$4.9bn, and tax relief at C$6bn, with 41% of the relief directed to individuals and 59% to businesses (Ministry of Finance British Columbia, 2011)
Canada (province-based action)	• Canada does not have a federal carbon tax, but two Canadian provinces have existing carbon taxes (Quebec and British Columbia). Alberta implemented emissions trading in 2006 and Quebec's scheme will start in 2013. A further two provinces, British Columbia and Ontario, are considering emissions trading schemes. The Canadian Federal Government has no immediate plans to implement national emissions trading.
Denmark	• long tradition of energy taxes - petrol taxes since 1917, electricity since 1977, coal since 1992; CO2 introduced in 1992 for households and in 1993 extended to businesses (Speck & Jilkova, 2009, p 27:32) • CO2 introduced at a rate of 100DKK (€13.4)/tonne, nominal rate constant till 2005, then reduced to 90DKK (€12.1) per tonne; tax burden of the industry increased gradually during 1996-2000, then remained constant till 2004 (id.) • Phase I (1994-98) aimed at households - tax reduction amounted to c. 2.3% of GDP in 1998, partly offset by increased revenues from ETR of 1.2% and payroll taxes of 1%; additional environmental taxes introduced (id.) • Phase II (1996-2000) aimed at industries - tax shift smaller (0.2% of GDP); contributions to national insurance lowered by 0.11 percentage points in 1997, 0.27 in 1998, 0.32 in 1999 and 0.53 in 2000 (id.) • Phase III (1999-2002) aimed at households - tax shift of 0.3% of GDP in 2002; higher revenues from environmental and corporate taxes used to reduce personal income tax rates and taxes on the yield of pension savings and share

	yields (id.) ● New draft of proposals was adopted by Parliament in 2009 and will come into force between 2010-2019 - increased energy taxes, reduced marginal tax rates on labour income (The Danish Ministry of Taxation, 2010)
Estonia	● 2005: increase in pollution charges and natural resource taxes; income tax reduced from 26 to 24% and tax free allowance raised from 16,800 EEK (€1074) to 20,400 EEK (€1304) (Ministry of Finance of Estonia, 2009) ● 2006-2008: - increases in transport fuel taxes (petrol and diesel) to EU minima, and introduction of tax on electricity; income tax gradually reduced to 21% and tax free allowance gradually increased to 27,000 EEK (€1,726) (id.) ● 2009, 2010: further increases in excise rates, and relevant excise rates now higher than EU minimum rates, and linked to inflation (Schlegelmilch, 2011)
Finland	● Finland introduced the world's first carbon tax in 1990, initially with exemptions for specific sectors. Main changes were later introduced, such as a border tax on imported electricity. Natural gas has a reduced tax rate, while peat was exempted between 2005 and 2010. In 2010, Finland's price on carbon was €20 per tonne of CO2.
Japan	● In April 2012, Japan legislated for a carbon tax of approximately ¥289 per tonne ($A3.30) by increasing existing taxes on fossil fuels (coal and LPG/LNG) with effect from 1 October 2012. Half the revenue will fund low-emissions technologies. Japan has emissions trading schemes operating in the Tokyo and Saitama regions, covering 20 million people.
Norway	● In 1991, Norway introduced a tax on carbon. However its carbon emissions increased by 43 per cent per capita between 1991 and 2008.
South Africa	● South Africa introduced a carbon tax on new vehicle sales in September 2010. South Africa is planning to introduce a carbon tax from 2013, starting at R120 ($A15) per tonne for emissions above a threshold. Each company will have 60 per cent of its emissions tax exempt, with higher exemption thresholds for cement, iron, steel, aluminum, ceramics and fugitive emissions as well as trade exposed industries. Agriculture, forestry, land use and waste will not be taxed.

Sweden	• long tradition of energy taxes - petrol taxes since 1917, diesel since 1937 (Speck & Jilkova, 2009, p 42:6) • SO2 tax (1991); NOX charge (1992) (id.): CO2 tax (1991) - €23/tonne - personal income tax reduced by c. SEK71bn/€9.5bn in 1991 (4.6% of GDP): average tax rates reduced by 30% or more (id.); 2001-2007: shift away from income tax with higher rates on CO2 and energy tax resulted in: €1.34bn reduction in income tax paid by low- and medium-income households; €220m reduction in social security contributions (id.) • 2008: major increase in CO2 tax (in 2010 it stood at €108/tonne); revenue from labour taxes reduced by €7.4bn between 2007-10. (id.) • recent redesign of the carbon-energy tax regime in order to improve coordination with EU ETS (Ekins and Speck 2011, and personal communication from the Ministry of Finance, October 2011)

Source: *Vivid Economics based on sources mentioned in the table*

Carbon tax is not a penal provision but a great contributor to reduce fiscal deficit :

The report titled *"Carbon taxation and fiscal consolidation: the potential of carbon pricing to reduce Europe's fiscal deficits* (report prepared for the European Climate Foundation and Green Budget Europe, May 2012 by Vivid Economics)" Shows that carbon fiscal measures may raise significant revenues while having a less detrimental macro-economic impact than other tax options. This gives them an important potential role in fiscal policy; a role that is currently widely overlooked. This benefit arising from carbon fiscal measures goes beyond the usual arguments in their favour - namely that they are crucial, cost effective instruments to reduce Europe's greenhouse gas emissions. Hence, the above international experience (table 6) shows that carbon tax cannot be treated as penal provision because it can also be used to reduce the fiscal deficit of the country and to improve the social security mechanism in terms of waiving individual income tax. As far as India is concerned 89% tax payers shall be benefitted due to replacement of individual tax by carbon tax. It would be a great contribution of government regarding fulfilment of social obligation of Government. Generally, carbon-energy taxes have generally been considered an instrument of environmental policy rather than fiscal policy, but it is time to reconsider that view.

Concluding Remarks :

It is true that carbon tax will lead to diminish i.e. less emission of CO2 and therefore less tax shall be collected in future. So temporarily relief may be given to individual tax payers until government can bear such loss. On the basis of above analysis it may be concluded that all individual taxpayers should be temporarily exempted from paying income tax. Due to this relief the government will lose only approximately 20% of total tax revenue collected. Such losses can be set off through imposing carbon tax on most polluted industrial units.

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Risk-Return Relationship Reinvestigated

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Abstract:

There is no conclusive evidence on the relationship between risk and return. Therefore we make an attempt to study the time-series relation between risk and return in two parts. One, we examine the link between market return and market risk. Second, we study the relationship between market return and average stock risk. We use the approach suggested by Goyal and Santa Clara (2003) for computing market risk and average stock risk. We use BSE-200 index data as well as BSE-500 companies' price data for the period January 1994 to June 2010. We find that average stock variance is not significant in predicting market returns. Further, we find that market variance has negative and insignificant coefficient in all cases except one where the coefficient is statistically significant at 10% level. Increasing integration of worldwide capital markets could be a possible reason for these insignificant coefficients.

Key Words: *Market risk, Average stock risk, Idiosyncratic risk*

Introduction:

There has been a lot of research on the relationship between risk and return. In most cases, asset pricing models postulate a direct relationship between a portfolio's expected returns and risk. However, there is no consensus on this issue. Some empirical evidence is in favor of a positive relationship between risk and expected return while some other studies found negative or no relationship between the two variables.

Traditionally, total risk has been subdivided into systematic risk and unsystematic risk. As per asset pricing theory an investor should be compensated only for bearing systematic risk and there should be no compensation for unsystematic or idiosyncratic components. This is because systematic risk is non-diversifiable while idiosyncratic part can be diversified away. So a rational investor is expected to hold a well diversified market portfolio with no unsystematic risk. Thus traditionally it is believed that only systematic risk matters in determining expected returns. But the picture looks a little different in real world. Investors, in many cases, face many constraints such as non availability of complete information, liquidity requirements, transaction costs etc. These limitations make it difficult for a typical investor to hold a well diversified market portfolio. As a result real life investment portfolios include systematic as well as unsystematic risk components. Thus, if unsystematic risk is not diversified then investor expects compensation for bearing such risks. Therefore there should be compensation for both systematic as well idiosyncratic risks. Merton (1987) and Malkiel and Xu(2001) take into consideration the idiosyncratic risk component. Their pricing equation relates stock returns to their beta with respect to market as well as their beta with a market wide measure of idiosyncratic risk. But there are studies that do not find any

relation between idiosyncratic risk and expected returns. An important question that still remains unanswered is: 'Do investors expect a higher risk premium when markets become more risky?'.

Goyal and Santa Clara (2003) found that there is a positive relationship between market return and lagged average stock variance. They also found that market variance plays no role in predicting market returns. Their results were robust to controlling for various macroeconomic variables. Wei and Zhang (2005) replicated the results of Goyal and Santa-Clara (2003) and found that Goyal and Santa-Clara's results were primarily driven by data in 1990's. They found an insignificant relationship between return and average stock volatility for their sample period. Bali et al (2005) further re-investigated Goyal and Santa-Clara's results and concluded that the link between average stock variance and portfolio returns disappears if an extended sample period is used. They further reported that Goyal and Santa-Clara's results were impacted by small stocks and liquidity premium.

Our goal is to study the time series relationship between risk and return. We specifically seek answers to the following questions:

1) What is the relationship between market return and market risk?
2) Is there any relation between market return and average stock risk?

This paper is organized into five sections. The first section (i.e., the present one) gives introduction and brief literature review. Section two describes data used and section three explains the methodology employed. Section four gives empirical results and the last section presents summary and conclusions.

Data:

We use daily adjusted share prices (adjusted for stock dividends, stock splits and rights issues) from January 1994 to June 2010 for the companies forming part of BSE-500 index in India. These companies account for around 90% of the total market capitalization and trading activity and therefore our sample companies are a good representative of stock market performance. The daily stock prices have been converted into daily returns for the purpose of computing average stock risk. BSE-200 has been used as proxy for market. Its daily values have been used to compute daily market returns which are then used for market variance computation purpose. Data has been obtained from Bloomberg database. The implicit yield on 91-days Treasury bills has been used to proxy risk free rate of return and its data has been extracted from Reserve Bank of India (RBI) website (www.rbi.org.in).

Methodology:

We use the simple, yet innovative, approach suggested by Goyal and Santa Clara (2003). Let us first describe the risk measures used. In this paper, we use the risk measures adopted by Goyal and Santa Clara. We compute the monthly variance of market portfolio, where market portfolio could be equally weighted (ew) or value weighted (vw) . Monthly variance of market portfolio return is calculated every month using daily return data within that month:

$$MV = \sum_{d=1}^{D} r_{md}^2 + 2\sum_{d=1}^{D-1} r_{md} r_{md+1} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where r_m denotes return on market portfolio on day i and D is the number of days in a

particular month. Market variance (MV) could be equally weighted (MV_{ew}) if calculated using equally weighted market portfolio or it could be value weighted (MV_{vw}) if calculated using market capitalization weighted market portfolio. The second term of (1) is the adjustment made for first order autocorrelation as suggested by French, Schwert and Stambaugh (1987). Daily returns tend to be autocorrelated, particularly at lag one, because of non-synchronous trading of securities. An important point to be aware of is that the variance measure used here is not the usual one as we do not demean daily returns. But, for short holding periods, the impact of demeaning the daily returns is extremely small and therefore does not bring any significant change in the variance calculation.

Similarly, we compute monthly variance of each stock's returns as follows:

$$SV = \sum_{d=1}^{D} r_d^2 + 2\sum_{d=1}^{D-1} r_d r_{d+1} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(2)$$

Where r denotes stock return on day i and D is the number of days in a particular month. Further average stock risk or average stock variance (ASV) is computed as the arithmetic average of the monthly variance of each stock's returns (calculated using (2)) :

$$ASV = \frac{1}{N}\left(\sum_{i=1}^{N} SV_i\right) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3)$$

Where SVi denotes monthly variance of stock i calculated using (2) and N denotes the number stocks traded in a particular month. Note that we use equally weighted average stock variance and do not compute value weighted version of average stock risk.

It is important to note that ASV is a measure of total risk, comprising both systematic as well as unsystematic parts. However, as demonstrated by Goyal and Santa Clara (2003), a major portion of ASV is idiosyncratic. Market variance, on the other hand, constitutes systematic risk. In this paper, we also consider standard deviations corresponding to the variance measures calculated using (1) and (3). As suggested by Goyal and Santa Clara (2003), we also refer to standard deviation as "volatility".

In this paper, we examine the predictive power of our computed measures of risk. In other words, we look at the predictability of market portfolio returns (equally weighted or market capitalization weighted) with variance measures (market variance as well as average stock variance). For this we regress excess returns on lagged risk measures. The study uses the following predictive regressions:

$r_{ew,t+1} = a + b(MV_{ew,t}) + e_{t+1}$ .....(4)

$r_{ew,t+1} = a + b(MV_{vw,t}) + e_{t+1}$ .....(5)

$r_{ew,t+1} = a + b(ASV_t) + e_{t+1}$ .....(6)

$r_{vw,t+1} = a + b(MV_{ew,t}) + e_{t+1}$ .....(7)

$r_{vw,t+1} = a + b(MV_{vw,t}) + e_{t+1}$ .....(8)

$r_{vw,t+1} = a + b(ASV_t) + e_{t+1}$ .....(9)

where r_{ew} and r_{vw} denote equally weighted and value weighted market portfolio return. For r_{vw} we calculate return on BSE-200 index. r_{ew} is computed as the simple arithmetic average of individual stock returns. For this purpose we use data relating to stocks comprising BSE-500

index. We also run above regressions using corresponding standard deviations (where standard deviation= √variance):

$r_{ew,t+1} = a + b(\sqrt{MV_{ew,t}}) + e_{t+1}$ .....(10)

$r_{ew,t+1} = a + b(\sqrt{MV_{vw,t}}) + e_{t+1}$ .....(11)

$r_{ew,t+1} = a + b(\sqrt{ASV_t}) + e_{t+1}$ .....(12)

$r_{vw,t+1} = a + b(\sqrt{MV_{ew,t}}) + e_{t+1}$ .....(13)

$r_{vw,t+1} = a + b(\sqrt{MV_{vw,t}}) + e_{t+1}$ .....(14)

$r_{vw,t+1} = a + b(\sqrt{ASV_t}) + e_{t+1}$ .....(15)

Empirical Analysis and Results :

We compute our variance and standard deviation estimates using the methodology described in the previous section. Let us start with some descriptive statistics on the variance and standard deviation measures. The mean of average stock volatility is 18.19% per month while mean market volatility is 7.44% and 7.31% for value weighted and equally weighted portfolios respectively. Mean of average stock volatility is around 2.5 times the mean of market volatility. This implies that unsystematic volatility constitutes a significant portion of total stock risk.

Correlation between average stock volatility and the equally weighted or value weighted portfolio volatility is quite low at .39 and .43 respectively. Thus periods of high unsystematic volatility are not necessarily the periods of high market risk. The correlation between equally weighted and value weighted portfolio volatilities is high (0.83) and therefore both are good measures of market volatility.

Figure 1, 2 and 3 below plot the time series of average stock volatility and market volatility (equally weighted and value weighted) for our sample period. SQRT(ASV) denotes square root of average stock variance or average standard deviation of stocks. SQRT(MVvw) and SQRT(MVew) represent square root of value weighted or equally weighted market variance or standard deviation of value weighted or equally weighted market portfolio. The graphs do not show any significant upward or downward trend in volatility.

Figure 1

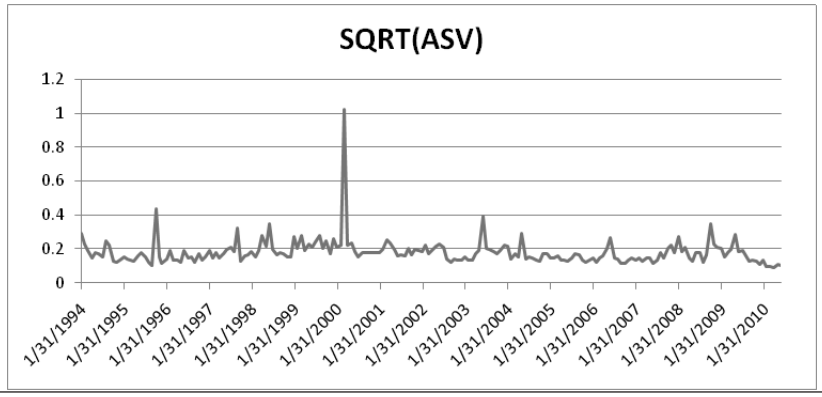


Figure 2

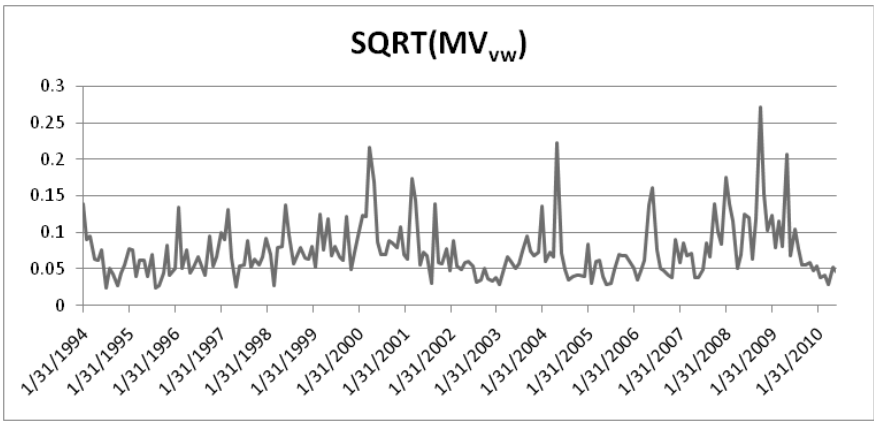
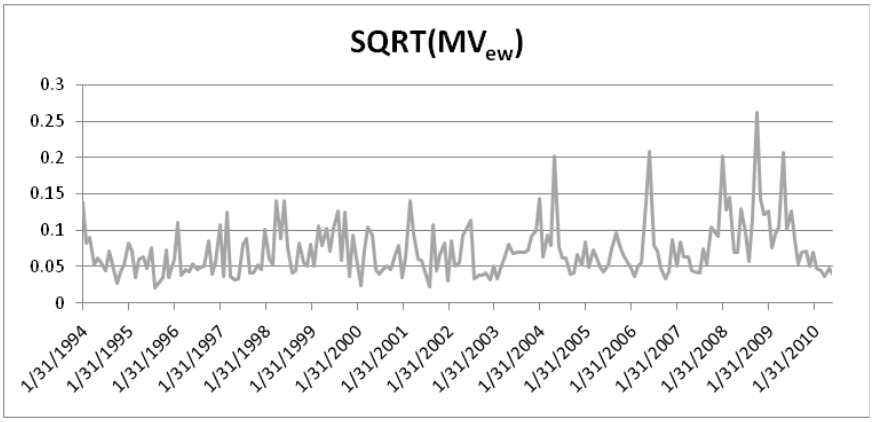


Figure 3



The primary goal of our paper is to check the predictability of market portfolio returns (equally weighted or market capitalization weighted) with variance measures and corresponding standard deviation estimates. For this we run the regressions ((4) to (15)). Table 1 and 2 give the regression results. In table 1, panel A (table 2, panel A) we present the results of one-month ahead predictive regression of the excess value weighted market return (equally weighted market return) on lagged variance estimates. Table 1, panel B (table2, panel B) shows regression results for the corresponding standard deviations.

Table 1 : Predictive Regressions for value-weighted market return

PANEL A				
CONSTANT	***ASV***	***MV_{vw}***	***MV_{ew}***	***Adjusted R^2***
0.005 (0.838)	0.001 (0.034)			-0.512%
0.010 (1.333)		-0.713 (-1.065)		0.069%
0.006 (0.768)			-0.121 (-0.168)	-0.498%
PANEL B				
CONSTANT	***$\sqrt{ASV}$***	***$\sqrt{MV_{vw}}$***	***$\sqrt{MV_{ew}}$***	***Adjusted R^2***
0.009 (1.014)	-0.021 (-0.595)			-0.331%
0.016 (1.194)		-0.139 (-0.900)		-0.097%
0.001 (0.062)			0.059 (0.363)	-0.445%

Table 2: Predictive Regressions for equally-weighted market return

PANEL A				
CONSTANT	***ASV***	***MV_{vw}***	***MV_{ew}***	***Adjusted R^2***
0.021 (2.930)	0.002 (0.135)			-0.503%
0.030 (3.390)		-1.301 (-1.651)		0.873%
0.027 (2.963)			-0.863 (-1.015)	0.012%
PANEL B				
CONSTANT	***$\sqrt{ASV}$***	***$\sqrt{MV_{vw}}$***	***$\sqrt{MV_{ew}}$***	***Adjusted R^2***
0.024 (2.234)	-0.013 (-0.315)			-0.462%
0.043 (2.792)		-0.288 (-1.580)		0.758%
0.028 (1.778)			-0.092 (-0.480)	-0.394%

In existing literature, there is no consensus on the relationship between market return and variance. Some studies (like Glosten et al (1993)) report a negative relation while others (such as French et al (1987) find a positive relation. Our regression results show negative but insignificant relationship between market return (value weighted as well equally weighted market return) and lagged market variance. This result is consistent with Goyal and Santa Clara (2003). In table 1(panel A) and table 2 (panel A), we can see that the coefficients are negative and the t-statistics (shown in the brackets below each coefficient) are also insignificant at 5% level. In table 2, panel A, the coefficient for value weighted market variance is statistically significant at 10% level.

Looking at regression results for average stock variance, we find that the coefficients are positive but statistically insignificant in both the cases. Thus average stock variance has no role in predicting market returns. As explained earlier, a major portion of average stock variance is idiosyncratic. Asset pricing theory suggests that idiosyncratic risk is not relevant in determining expected returns as investors are compensated only for bearing systematic risks which cannot be diversified. Thus idiosyncratic risk, while is diversifiable, becomes irrelevant in asset pricing and plays no role forecasting market returns. Our results appear to be consistent with this argument. Our results are also consistent with those reported by Bali et al (2005) for US market.

Table 1(panel B) and table 2(panel B) report regression results for standard deviation estimates. The results show that the coefficient for average stock risk becomes negative but still remains statistically insignificant. The relation between market return and market risk remains negative in all the cases except one.

On overall basis our results show that average stock risk plays no role in predicting market returns while market risk has a better role in predictability regressions. But even market risk has insignificant coefficient in most cases except one where the coefficient has been found to be significant at 10% level. A possible explanation for our results could be increasing integration of capital markets worldwide (as suggested by Chan et al (1992)). As a result, domestic market returns depend not only on domestic market risk but also on risk from world capital markets.

Summary and Conclusion:

Goyal and Santa Clara (2003) found a positive relation between market return and average stock variance. They further found that market variance has no role in predicting market returns. We use the approach suggested by tem to study the time series relation between return and risk. To be specific, we examine the predictability power of market variance and average stock variance for market returns. We find that average stock variance is not significant in predicting market returns. Further, we find that market variance has negative and insignificant coefficient in all cases except one where the coefficient is statistically significant at 10% level. Increasing integration of worldwide capital markets could be a possible reason for these insignificant coefficients.

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Investors' 'Fear' and 'Greed' Index: A Case India Volatility Index (IVIX)

Imlak Shaikh

Puja Padhi

Abstract:

The aim of the paper is to explore the Indian derivatives market and show that why options are most important for the risk management and volatility estimate. The study demonstrated that investor prefer more options than the futures in hedging strategies. The inverse relation between Nifty index and India VIX occurs due to options trading; during the market weakness when investors are concerned about the moves of Nifty index they seek protection during the market panic. The great concern and nervousness of the investor allows them to buy options aggressively, consequently the aggressive buying result into high implied volatility of the Nifty index options. The empirical result evidences that there is an asymmetric relation between volatility and stock returns.

Key Words: *Implied volatility index; Nifty index; India VIX; Futures and Options*

Introduction :

Financial derivatives are the most elegant part of the stock market. Derivatives have a vital role to play in enhancing shareholders wealth by ensuring access to the cheapest sources of finance. There are different types of derivative instrument popular in Indian stock market as well as rest of the stock market over the globe, which are used for the managing of risk. Derivatives can be defined as a financial instrument whose value depends on (or derives from) the value of other, more basic, underlying variables. Very often the variables underlying derivatives are the prices of traded assets. A stock option, for example is a derivative whose value is dependent on the price of a stock (Hull, 2006).

Over the last 30 years derivatives have become increasingly important in the world of finance. Futures and options are now traded actively on many exchanges throughout the world. Many different types of forward contracts, swaps, options, and other derivatives are regularly traded by financial institutions, fund manager and corporate treasurers in the OTC market. The most common derivative elements are forward, futures and options. Three broad categories of participants are hedgers, speculators and arbitrageurs, trade in the derivatives market. Hedgers, face risk associated with the price of an asset, they use futures or options markets to reduce/eliminate this risk. Speculators, wish to bet on futures movements in the price of an asset. Futures and options contracts can give them an extra leverage, that is, they can increase both the potential gains and potential losses in a speculative venture. Arbitrageurs are in business to take advantage of a discrepancy between prices in two different markets.

Derivatives trading commenced in India from June, 2000 after SEBI granted the final approval to this effect in May, 2001 on the recommendation of L. C Gupta committee. Securities and Exchange Board of India (SEBI) permitted the derivative segments of two stock exchanges, NSE and BSE, and their clearing house/corporation to commence trading

and settlement in approved derivatives contracts. Initially, SEBI approved trading in index futures contracts based on various stock market indices such as, S&P CNX Nifty and SENSEX. Subsequently, index-based trading was permitted in options as well as individual securities. Varma (1998) assess the risk containment and related issues on the Indian securities market by allowing the index futures on equity index. He proposes that there are several issues in the volatility estimation; the volatility in the Indian securities market is higher on the counterpart of developed markets, and volatility remain non-constant over the period. Hence, to control the market volatility, Varma committee has recommended the introduction of derivative products in the Indian securities market.

Table 1: Business growth in futures segment

Year	Index Futures		Stock Futures	
	No. of contracts	Turnover (Rs. cr.)	No. of contracts	Turnover (Rs. cr.)
2013-14	83,256,534	2,413,433	130,728,433	3,633,923
2012-13	96,100,385	2,527,131	147,711,691	4,223,872
2011-12	146,188,740	3,577,998	158,344,617	4,074,671
2010-11	165,023,653	4,356,755	186,041,459	5,495,757
2009-10	178,306,889	3,934,389	145,591,240	5,195,247
2008-09	210,428,103	3,570,111	221,577,980	3,479,642
2007-08	156,598,579	3,820,667	203,587,952	7,548,563
2006-07	81,487,424	2,539,574	104,955,401	3,830,967
2005-06	58,537,886	1,513,755	80,905,493	2,791,697
2004-05	21,635,449	772,147	47,043,066	1,484,056
2003-04	17,191,668	554,446	32,368,842	1,305,939
2002-03	2,126,763	43,952	10,676,843	286,533
2001-02	1,025,588	21,483	1,957,856	51,515
2000-01	90,580	2,365	-	-

Source: *Compilation from NSE website.*

Table 2: Business growth in options segment

Year	Index Options		Stock Options	
	No. of contracts	Notional Turnover (Rs. cr.)	No. of contracts	Notional Turnover (Rs. cr.)
2013-14	726,750,488	21,457,145	61,242,921	1,767,411
2012-13	820,877,149	22,781,574	66,778,193	2,000,427
2011-12	864,017,736	22,720,032	36,494,371	977,031
2010-11	650,638,557	18,365,366	32,508,393	1,030,344
2009-10	341,379,523	8,027,964	14,016,270	506,065
2008-09	212,088,444	3,731,502	13,295,970	229,227
2007-08	55,366,038	1,362,111	9,460,631	359,137
2006-07	25,157,438	791,906	5,283,310	193,795
2005-06	12,935,116	338,469	5,240,776	180,253
2004-05	3,293,558	121,943	5,045,112	168,836
2003-04	1,732,414	52,816	5,583,071	217,207
2002-03	442,241	9,246	3,523,062	100,131
2001-02	175,900	3,765	1,037,529	25,163

Source: *Compilation from NSE website.*

A report on the Indian Securities Market indicates that Indian derivatives market has reached its maturity level. About 1,753 FIIs are trading on the NSE. India stood at the second position after China among the emerging markets with $1,015,370 mn market capitalization. India is one of the most successful developing countries with regard to being a vivacious market for exchange-traded derivatives. India stood at third position among the top five exchanges of various derivative contracts. In addition, NSE holds second rank among the top five exchanges with regard to the number of stock index option contracts traded in 2011.

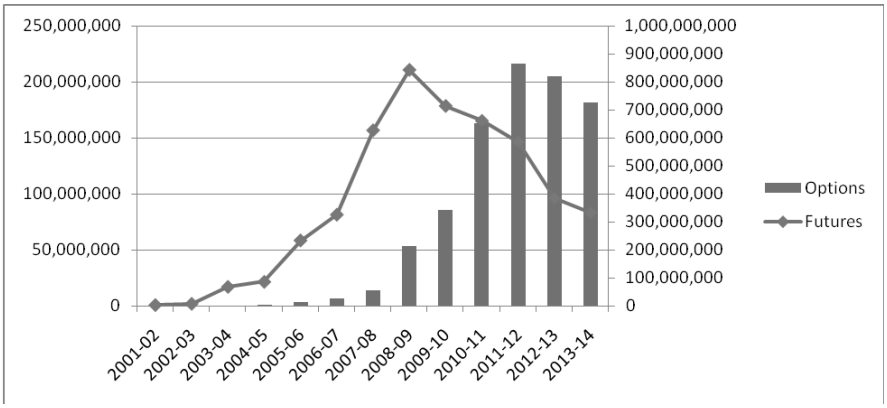
The National Stock Exchange (NSE) of India has introduced a number of derivative products in the F&Os (see Table 1 and 2 for trading volume) segment like currency derivatives, interest rate derivatives, and recently, it also constructed the implied volatility index (India VIX). Further, NSE has proposed to launch some volatility products (i.e. futures and options on India VIX)[1]. This study validates the initiative of NSE. Table 2 clearly explains that investors prefer more options than the futures in hedging the market holdings, and the table also shows an increasing trend over the period in Indian derivatives market. NSE is the main market for the derivatives trading in India, the global rankings of NSE F&Os market is as: Single Stock Futures stood on the 4th, Stock Index Options on the 1st, and Stock Index Futures on 8th, based on the WFE (Rankings done for the period January - June, 2013)[2]. Currently, apart from equity derivatives NSE has started trading of derivatives in currency and interest rates. NSE was the first exchange to have received an in-principle approval from SEBI for setting up currency derivative segment. The exchange launched its currency futures trading platform on 29th August, 2008. Currency futures on USD-INR were introduced for trading and subsequently the Indian rupee was allowed to trade against other currencies such as Euro, Pound sterling and the Japanese yen. A currency option was introduced on 29th October, 2010. NSE launched trading in Interest Rate Futures from 30th August, 2009. The underlying instrument is a Notional 10 year 7% coupon bearing Government of India (GOI) security[3]. Figure 1 shows the time series plot of trading volume in the futures and options market segment on NSE, it is seen clearly that the futures market grown rapidly through 2001 to 2008-09 but after 2009 there is significant fall in the futures market. At the same time one can observe that initially there was less trading volume in the options market but from year 2008-09, and onwards there is an exponential growth in the options market. Figure 1 provides some important insights that investor now prefer more options than the future to protect their market holdings, this also validates the initiative of NSE toward construction of volatility index (India VIX). The volatility products based on option implied volatility provide better information regarding future stock market volatility.

[1] *For more details see Indian Securities Market: A Review (2012), National Stock Exchange of India Limited, Vol. XV. NSE now offers NVIX i.e. futures on its own volatility index India VIX (From 26th, February, 2014).*

[2] *A ranking for single stock futures, stock index options and stock index futures is based on number of contracts traded.*

[3] *For more details see http://www.nseindia.com/products/content/products.htm*

Figure 1: Time series plot of Futures and options market development (number of contracts) (2001-2014)



Source: *Compilation from NSE website.*

The aim of the paper is to discuss some of the generic concepts that are most practical and fundamental in nature in the financial markets. This study is broadly based on the two perspectives: to introduce the latest developments in the Indian derivatives market and provide some insight on the stylized patterns of volatility. Moreover, the paper outlines the volatility index and some facts about India VIX.

The concept of volatility and option's implied volatility :

This section develops the basic concepts that deal with the present study. The variant definition of volatility has been explained based on the most celebrated BS-options pricing model.

Volatility: A measure of uncertainty expressed in the form of simple standard deviation based on the return over a period of time on an asset. Generally speaking volatility is quoted in annualized percentage term, for this purpose trading days or risk days per year is taken in to account (e.g. 250 or 252 trading days). A volatility of an underlying plays a great role in pricing of financial assets (e.g. Black and Scholes, 1973 and Merton, 1973). Volatility of the underlying index is one of the inputs for BS-options pricing model, it is assumed to be constant for any strikes.

Implied volatility: is the forecast of future realized volatility for the remaining life of an option, which is equal to the traded (observed) market price with the theoretical price of an option.

Implied volatility $= f(C, K, S, F, r)$

There is no closed form solution to obtain implied volatility hence implied volatility is obtained numerically using either Newton-Raphson or method of Bisection (e.g. Chriss,1997).

Implied volatility of call and put options: A BS-option pricing model uses the identical volatility input to price the European call and put options, if BS-model good hold in the options market than call/put price can be used to back out implied volatility, but the observed

call and put prices are traded differently in the market. Consequently, call and put based implied volatility appears to be different. If volatility estimate from call and put price are significantly different, this implies incorrect application of BS-model in the options pricing mechanism. Plausible solution may be using the futures price instead of spot price and future is not quite in line with the spot price. When the market is in tranquil condition, the futures are traded at high than the 'fair value' due to this kind of rally in the market underlying value appears to be high, consequently call will be priced higher and call implied volatility will be calculated high and more expensive to the volatility traders. Similarly, put will be less expensive but during the turmoil period it will appear reverse.

Statistical volatility: the historical data is used to calculate/estimate the volatility in the stock market volatility assessment. A statistical volatility is the volatility estimate through statistical model like time series model (e.g. moving average, ARCH/GARCH, RiskMetrics, GJR-GARCH etc.). The statistical volatility models use the historical data and generate the volatility forecasts for the given horizon (e.g. see Shaikh and Padhi, 2014a)

Realized volatility: is the ex-post return volatility based on the historical continuously compounded stock returns, in other words realized volatility is the realization of the process volatility (price movements). For example, a sample standard deviation is based on the constant process volatility but when the process volatility is time-varying, it is estimated through ARCH/GARCH type framework. Realized volatility is more variable than the ex-ante volatility. Alternatively, in options pricing framework, realized volatility is the volatility which is suppose to be realized for the remaining life of the option (e.g. one-month at-the-money option).

Historical volatility: Historical volatility is also to be referred as ex-post volatility, calculated in the same manner like realized volatility, but it is based on the number of days covered by the options.

Volatility smile or skew: the options are priced using the BS-option pricing model under the assumption that markets are complete and efficient. The process volatility is constant and the underlying price S(t) follows Geometric Brownian Motion (GBM) diffusion process:

$$d\,S(t)/S(t) = r\,dt + \sigma\,d\,z\,(t) \qquad (1)$$

Where r = risk-free-rate-of-interest MIBOR

Z= Wiener process

But, hardly these assumptions are realistic in the financial market. The violation of these assumptions gives the birth to some stylized patterns of implied volatility (e.g. see Shaikh and Padhi, 2014c). This occurs due to fat-tailed nature of return distribution and stochastic nature of process volatility. Intuitively, one can say that if the underlying price does not follow GBM process than there may be mispricing of options through BS-model. The volatility smile is observed when the implied volatility is plotted against the strikes/moneyness. The smile effects explain that out-of-the-money puts and calls yield higher volatility than the at-the-money options. The symmetric smiles generally observed in the currency options market, while out-of-the-money call and put options have higher implied volatility than the at-the-money options. However, in the equity market it is not symmetric, the smile has negative skew. The volatility skew occurred due to very small and

high strike options. Alexander (2001) argues that negative skew is often very noticeable in the equity market, where a very large price fall called precipitate 'doom and gloom' for the economy as a whole. The volatility skew was observed during the major stock market crash 1987 in the OEX option market, and another plausible reason for the skew in equity market is the 'leverage effects'.

Terms-structure of implied volatility: the plot of implied volatility against the time-to-expiration of the option yield the term-structure of implied volatility, which speaks the consequences of the mean-reverting behavior of volatility; the volatility appears into 'burst' or 'clusters'. Volatility term structure explain that volatility remain higher for the spot market but in longer-term it converges to the average volatility level.

Implied volatility surfaces: a three-dimensional graph represent the implied volatility surfaces, in which the estimated call and put implied volatility are plotted against the moneyness level and time-to-expiration. The volatility smile and skew occurs in the short-term options market, while for the long-term options (an out-of-the-money options) have a change to be converted in in-the-money option in longer term.

Review of earlier studies :

Arak and Mijid (2006) attempt to analyze the volatility measures (VIX/VXN) to determine whether VIX is the forecast of future stock market volatility or it is the fear of market participants. The nervousness of the investors, raises option premium, hence selling options at the high price becomes profitable at one particular time. But, if expected volatility causes to rise in option premium, in turn the volatility to be high and the same condition will not yield the profit. Arak and Mijid (2006) try to answer whether VIX/VXN is 'fear' or 'forecast' and conclude that implied volatility appear to be partly fear gauge and partly forecast of the future volatility.

Trading on the volatility provide more opportunities for the options seller, a volatile market creates nervousness among the market participants, and fearful investors demand more hedge funds to protect their market positions in short term. The high demand pressure on call and put option ultimately causes high premium for the option seller. Moreover, when market experience spike in the volatility, option holder have more alternative in short term for new strikes, this kind of market conditions also provide potential profit from the fearful investors. More particularly, we can say that worries about the future state of stock market are reflected through volatility index. For example, market participant trade into options to manage their downside risk, similarly for upside risk they buy call options. At one particular point the time due to spike in the VIX encourages the investor to buy options; at that time if options writer sell options at their theoretical price than there will be normal price of the options, and fair market's expected volatility. But, if option seller wants to turn this condition into profit, options writer can sell options at high premium to the fearful investors. Hence, in this work we attempt to establish the asymmetric relation between stock returns and volatility, and show that volatility index is the investor sentiment index that expresses the fear and greed of the investor during market rally.

The important studies of asymmetric relationship between implied volatility and the stock market returns was first put forwarded (e.g. see Fleming et al., 1995 and Schewert,

1989;1990) they find significant negative and asymmetric relation between volatility and returns. The literature in favor of asymmetric relation and volatility index as the investors' fear and greed index (e.g. see Bates, 2000; Bollerslev and Zhou, 2006; Dowly and Muthuswamy, 2005; Dennis et al., 2006; Ederington and Guan 2010; Fleming et al., 1995; Giot, 2005; and Frijns et al., 2010a, 2010b; Poteshman, 2001; Pan, 2002; Schwert, 1989;1990).

Whaley (2000, 2008) points out on the CBOE 'investor fear gauge' index; it is the forward-looking measure of future stock market volatility, and this index is constructed by market participants through observed option prices. The high the level of VIX implies greater fear. Whaley (2000) derive the relation between stock market returns and changes in VIX, the relationship is asymmetric (e.g. Fleming et. al., 1995; Whaley, 2000; Giot, 2005 and Shaikh and Padhi, 2014b). Whaley argues that VIX is more a barometer of invertors' fear (investor sentiment) of the downside risk and it is a barometer of investors' excitement (or greed) in a market rally.

All about India VIX and empirical model :

Implied Volatility Index -India VIX

Implied volatility is the market's expectation of volatility, based on the best bid and ask prices of options written S&P CNX Nifty index. Implied volatility index (VIX) is often referred to as the 'Investor's-fear-gauge-index'. India VIX signifies the investor's perception of the market's volatility in the near term. This index forecast the expected market volatility over the next 30 calendar days. Implied volatility index is computed as the function of time-to-expiration; risk-free-rate-of-interest; forward-index-level and bid-ask quotes of options. Volatility is calculated using the order book of the underlying index options and is denoted as an annualized percentage term.

In 1993, Chicago Board of Exchange (CBOE) was the first to introduce the VIX, which was originally designed to measure the market's expectation of 30 calendar days. Ten years later in 2003, CBOE updated the VIX to redefine a new way to measure expected volatility that can be widely used by financial analyst, practitioners, risk managers and volatility traders. CBOE VIX is based on S&P 500 SPX index options.

There is a negative correlation between VIX index and stock price index. Consequently, VIX futures and options are designed to develop pure volatility exposure to the volatility traders. CBOE has started these volatility products that are available to all investors. Hence, National Stock Exchange of India can think in this line and can develop some volatility products based on India VIX (2007). As a result, this will provide the liquidity and transparency in the market.

The inverse relation between India VIX and Nifty index

The volatility index is the *fear and greed index* of the investor sentiment and stock market volatility indicator. Volatility index is the forward-looking measure of volatility that the investors expect in the next few trading days. The India VIX is implied by the observed prices of Nifty index options and presents the expected future stock market volatility of 30 day horizon.

Figure 2: Relationship between India VIX and S&P CNX Nifty Index

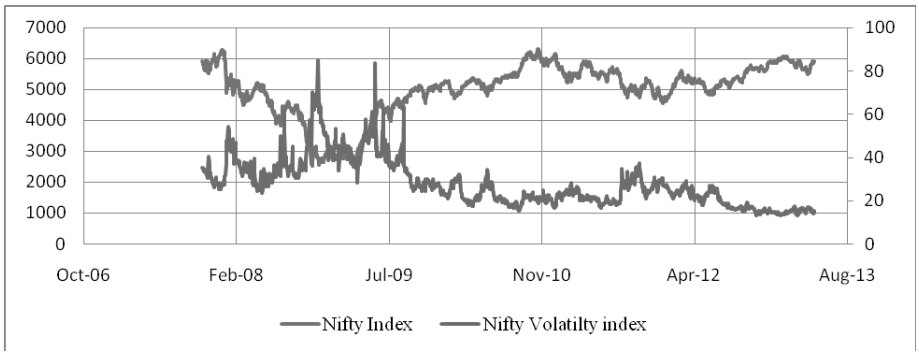


Figure 2 is the time series plot of India VIX and CNX Nifty index for the period 11/01/2007 to 04/30/2013. The visual inspection of the graph clearly explains that for high level of implied volatility the underlying stock index to be observed very low and vice versa. The red scale line shows the plot of India VIX that has been observed quite large volatile during the sub-periods 2009. This period has been regarded as the market turmoil that has occurred due to global financial crises in US and Asian markets. In this period the market was observed to be very high level of implied volatility that has reached upto its maximum 85%, and the Nifty index was recorded as its bottom level (2524.20). The graph clearly shows that after 2010 the market was remained in the low volatility period.

Table 3: Percentage change in Nifty and India VIX the ten worst days from November, 2007 to February, 2014

Date	S&P CNX Nifty	India VIX
24-October-2008	-13.01%	45.5%
21-January-2008	-9.10%	37.02%
11-November-2008	-6.89%	66.99%
10-October-2008	-6.88%	44.7%
7-January-2009	-6.38%	44.36%
17-October-2008	-6.15%	46.72%
22-January-2008	-6.13%	47.59%
6-July-2009	-6.02%	39.89%
6-October-2008	-5.82%	33.75%
22-October-2008	-5.39%	54.75%

Source: *Authors' calculation*

Table 3 explains the inverse relation between two indices for the most ten worst days that experienced for the sample period November, 2007 to February, 2014. This inverse relation occurs due to options trading during the market weakness, when investors are concerned about the moves of Nifty index they seek protection during the market panic. The great

concern and nervousness of the investor allows them to buy options aggressively, consequently the aggressive buying result into high implied volatility of the Nifty index options. Hence, at this point one can say that India VIX measures implied volatility of Nifty options, and India VIX tend to rise when overall market performance of Nifty stocks falls. Table 3 clearly show that on each of the ten worst performing days for Nifty stocks the India VIX was significantly high, in a percentage basis, than the market was in the weak condition.

The Normal range of India VIX

Table 4 characterizes the normal and abnormal range of India VIX since 2007. It has been clearly seen from the table that India VIX median closing was 24.00. 50 percent of the time India VIX closed between 18.91 and 31.66 (i.e. a range of 11.75 point basis), and 90 percent of the time India VIX closed between 14.95 and 48.57 (i.e. a range of 33.62 point basis), Table 4 also speaks that there is great variation in the median close of India VIX through calendar years. In 2012, for example , the median daily close of India VIX was about 18.77, during the same year, the closing levels were about 16.07 and 26.84 for 50 percent of the time and ranges between 14.32 and 26.41 about 90 percent of the time. The abnormal range was experienced is 2008 and 2009, with the India VIX closing between 26.65(25.39) and 65.55(52.71) that is a range of 38.9(27.32) about 90 percent. It essential to know the market anxiety when India VIX remains above the certain level, for example, Table 4, the India VIX will be above 48.57 the chance is about 5 percent of the time (e.g. see Whaley, 2000, 2008) .

Table 4: The normal range of India VIX for the sample period November, 2007 to February, 2014, and calendar years

Year	Numbers	Percentile						
		5%	10%	25%	50%	75%	90%	95%
All	1566	14.95	16.15	18.91	24.00	31.66	42.22	48.57
2008	**246**	**26.65**	**28.01**	**31.44**	**35.64**	**45.16**	**56.00**	**65.55**
2009	**243**	**25.39**	**26.19**	**28.96**	**38.19**	**44.26**	**50.31**	**52.71**
2010	252	16.99	17.63	19.36	20.99	23.16	28.27	29.99
2011	247	18.20	18.62	20.41	23.16	26.84	29.53	32.01
2012	251	14.32	14.67	16.07	18.77	23.59	25.49	26.41
2013	250	13.67	14.08	15.65	17.92	20.83	26.26	28.09

Source: *Authors' calculation*

Empirical model and results

The empirical relation between volatility index and stock returns has been established in following ordinary least squares (OLS) model. Our data sources consist of daily close of India VIX (IVIX) and Nifty index retrieved from the National Stock Exchange of India (NSE) website. The data points rages from November 1st, 2007 to April 30th, 2013, that has resulted into 1362 trading days.

$$R_t = \text{Intercept} + \beta_1 \Delta IVIX_t + \beta_2 \Delta IVIX^+_t + U_t \quad (2)$$

Where R_t = is the return on Nifty index.

$\Delta IVIX_t$ = is the change in the Nifty volatility index (India VIX).

$\Delta IVIX^{+}_{t}$ = is the positive values of change in volatility index, ($\Delta IVIX^{+}_{t} = \Delta IVIX_t$, when $\Delta IVIX_t > 0$, otherwise zero).

To analyze the asymmetric relation between volatility and stock returns, the eq. (2) has been estimated for the sample consists of 1362 observations (i.e. Sample period 1st November, 2007 to 30th April, 2013).

$$R_t = 0.0538 - 0.0855\,\Delta IVIX_t - 0.0721\,\Delta IVIX^{+}_{t}$$

(1.003) (-3.591) (-2.027)

It has been seen that all the coefficients of the regression model are significantly different from zero. The estimate of intercept term is 0.0538%, the respective slopes of the regressors are - 0.0855% and - 0.0721%. The possible explanation of stock returns and investors' fear relation are: (i) if Nifty volatility index remains constant for the day or week then the Nifty stock index is expected to be rise by 0.0538%;(ii) if Nifty volatility index falls by 100 basis point, then the Nifty index will be Rt = -0.0855(-1.00) = 0.0855%; (iii) and when expected volatility rise by 100 basis point than stock prices will be Rt = 0.0855(-1.00) - 0.0721(1.00) = 0.0134%. This kind of result speaks that there is an asymmetric relation holds between volatility and stock returns. The results have a practical implication for the volatility traders who trade in the options.

Summary and conclusion :

The study has demonstrated the latest development in the Indian derivatives market and provided some insight on the relation between volatility index and stock index. The options based study is useful in the forecasting of the future realized volatility at various forecasting horizons as forward-looking expectation, and also useful in the investment decisions like assets valuation, covered call writing, portfolio management. The implied volatility index is the expected volatility of 30 days horizon of future stock market volatility; hence the study enables to compute the short run expectation (say, 5-day, 10-day, 22-day horizon) of the underlying assets.

Derivatives are used for hedging, speculation and arbitrage, the wise uses of the derivatives provides protection against the future risk on the invested portfolio. Financial institutions invest in the options (equity options, currency options, interest rate options) to underwrite the future risk from the unwanted price fluctuations. Financial institutions and non-financial corporation can quantify their risk limits and the above derivatives can be used for their intended purpose. The investment strategy in form of options is generally exercised by the financial institution in the form of speculation and arbitrage opportunities. The emerging market's options efficiency and volatility index (India VIX) enables the institutional investor to invest in the stock market of emerging economies. The institutional investors can book profit for the growing stock by hedging with the short sale of options, moreover interest rate and currency options can be used for the speculative benefit.

There are several practical implications of the study for authorities making decisions on the regulation of stock markets (SEBI, Securities and Exchange Board of India). Implied volatility index (India VIX) is the investors fear-gauge index for the Indian capital market that provide signal to the volatility traders and policy makers (SEBI and RBI-Reserve Bank

of India). The market efficiency of implied volatility based on the emerging market's volatility index (India VIX) motivates the other emerging stock markets to construct the implied volatility indices in order to gauge the investor's expectation about the future volatility. This kind of study also encourages the NSE (National Stock Exchange of India) to start some volatility products (like F&Os) on India VIX to allow more market liquidity and transparency.

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