RESEARCH BULLETIN

The Institute of Cost Accountants of India

(Statutory body under an Act of Parliament)

Volume 41• No.I• April 2015

Mission Statement

The CMA professionals would ethically drive enterprise globally by creating value to stakeholders in the socio-economic context through competencies drawn from the integration of strategy, management and accounting.

Vision Statement

The Institute of Cost Accountants of India would be the preferred source of resources and professionals for the financial leadership of enterprises globally.

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Cost Accountants
of India

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www.icmai.in

In Association with

NiSM NATIONAL INSTITUTE OF
SECURITIES MARKETS
An Educational Initiative of SEBI

Foreword

It gives me an immense pleasure to note that The Institute of Cost Accountants of India in association with National Institute of Securities Markets (NISM), an educational initiative of SEBI, has published the collaborative issue of Research Bulletin, Vol. 41, No. I, April, 2015 on the theme *"The Capital Markets"*. I believe that a glance through the pages of this volume will definitely enrich the knowledge base of the readers.

The Indian capital market has undergone noteworthy changes in the last two decades. It has become efficient through use of modern techniques and proactive legislation. It has attracted major global interest and has managed to set up confidence of both global and local investors. India needs to set forth good Corporate Governance and infrastructure to provide the necessary boost to the corporate debt market and introduce innovative financial products, while ensuring the best interests of the investors in mind.

In this globalised world, organizations require professionals such as CMAs who have specialized knowledge on business strategy and value creation. The CMAs with their professional expertise can identify trends and opportunities for improvement, analyze and manage market risks and suggest suitable strategies for arrangement of funds to finance the operations, further they can monitor and enforce compliances.

This research publication contains well researched articles on a variety of relevant issues of Capital Markets like Financial Derivatives, Volatility Index, Arbitrage, Stock Market, Commodity Market, etc. for researchers, acade-micians and professionals.

I hope that the readers will be irrefutably contented reading this volume.

CMA (Dr.) A. S. Durga Prasad
President
The Institute of Cost Accountants of India

Message from the Director - NISM

The NISM academic team strives constantly towards addressing various research questions in the domain of securities markets. Topics of research are carefully chosen, especially those that are contemporary in nature and contextually relevant.

The efficiency of markets is a question of empirical testing. Akhlaque Ahmad has performed several empirical tests on market prices based on NSE data in the pre- and post-subprime crisis period. Latha Chari has conducted research on valuation methods with respect to the pharmaceutical industry. Pooja Rani's research is on the nascent developments in the Indian SME sector. Sunder Ram Korivi's work on tax havens provides useful pointers towards international capital flows. A second paper by him is on the changing role of gold and how it is being increasingly viewed as an enabler of financial inclusion rather than as an item of consumption or hoarding. The highlight of all these papers is that, although they have been carried out over the past one year, their findings bear a close relevance to recent policy announcements.

NISM prides itself for policy oriented research as a part of its nation building activities.

I am pleased that this special addition of the ICAI Research Bulletin is an outcome of a collaborative endeavour between national institutes. It is hoped that this marks the beginning of longstanding cooperation between ICAI and NISM.

Sandip Ghose
Director

April 6, 2015

Editor's Note

Greetings!

It is our pleasure to launch the current volume of the Research Bulletin, Vol.41, No. I, April, 2015 issue, on the theme *"The Capital Markets"* which is a collaborative publication in association with *National Institute of Securities Markets (NISM)*, an educational initiative of SEBI. We have published articles on the blazing issues of Capital Market like Financial Derivatives, Volatility Index, Arbitrage, Stock Market, Commodity Market, etc. Capital market enhances production and productivity in the national economy. Thus our aim is to uphold constructive role of the Capital market in the overall socio-economic development of the Nation.

The 'Research Bulletin' will now be a quarterly publication, to match with the international standard. We look forward to constructive feedback from our readers on the articles and overall development of the Research Bulletin. Please send your mails at *research.bulletin@icmai.in*. We thank all the contributors and reviewers of this important issue and hope our readers enjoy the articles.

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An Analysis of the Performance of Sectoral Indices with Relation to BSE SENSEX

Sharmistha Ghosh

Abstract:

A country's capital market has a great significance with respect to its economic growth. Investing in the equity market has always been a matter of concern for the individual investors. SENSEX, better known as the barometer of the country's economy fluctuates with every change in the situations around the country and the globe. The changes in different sectoral indices also have an impact on the change in overall market index as well. In this respect the present paper aims at finding the relation between the sectoral indices with respect to BSE Sensex during the bearish period (2008-2009) and the bullish period (2010-2014). Correlation analysis and Regression analysis of the sectoral indices with the BSE Sensex have been attempted to assess the relative significance of each sector with respect to overall market index. Finally, it is observed that the IT, PSU and Realty sectors showed a negative correlation with the BSE Sensex both during the Bearish phase and the Bullish phase.

Key Words:

BSE Sensex, Correlation, Regression, Small Cap, Mid Cap.

Introduction

Stock market of every country is a significant indicator of economic growth. With liberalisation and opening up of the stock markets, a great amount of effort have been put in to organise and strengthen the securities market in order to make it more appealing for the investors. Understanding the mechanism and dynamics of the stock market has always been a matter of great importance for the traders especially the investors. The sector-based index is designed to provide a single value for the aggregate performance of a number of companies representing a group of related industries or within a sector of the economy. The index is based on a statistical compilation of the share prices of a number of representative stocks.

During the recessionary phase of 2008 the stock markets all over the world happened to get more or less some effect on their performance. The different industrial sectors were affected in some way or the other by the economic crisis. As per different eminent economists, the Indian stock market was not much hit by the crisis. The market indices acted as convenient measures to guage the relation and direction of the different sectoral indices with the overall market index. This in turn may have happened to be of help to the

layman investors. With this aim, a brief review of literature has been attempted in the next section.

Literature Review

The study related to the sectoral return have been an area of interest for most of the researchers although not much work have been done during the period under study. Demirer and Lien (2005) worked on the understanding of the correlation between the different sectors related with market movement in either direction. The study finds that the sectoral correlation is higher in the upside movement market. Only the finance sector had the strong correlation in the downside market in the context of China market. Meric, Ratner, & Meric (2008) found that the global diversification in the bull market of same sector is better than diversification in an individual market with different sectors. Especially in the bear market all sectors in the local market are correlated and hence global diversification would provide a better returns. Wang, Kutan, & Yang (2005) authors have worked with the information of the Chinese stock markets. The authors found that there is higher dependence of stock exchanges on each other for the information. At the same time it has also been found that there was constant reflection on the prices of one sector depending on the information of the other sector. Industry sector is found to be most integrated with the impact on each other due to the information flow and the finance sector could stay alone or indifferent to the other sectors information. In a study titled "Long run and Short run relationship between the main stock indexes: Evidence from

Athens Stock Exchange" by Patra & Poshakwale (2008), it was found that there has been lower relation in the sectoral returns in the long run. However there was significant impact of the banking sector on the other sector indices return and variance. Kallberg & Pasquariello (2008) authors have done analysis on the 81 sectoral indices of the US market and had found there has been large correlation between the excess movements in the sectoral indices. That is there is significant impact between each other in the movement. However there is weak asymmetric that is all indices were significant in movement in a single direction. US monetary and real situations had a positive correlation where as short term interest rates had generated a negative correlation for the sectoral excess square correlations. Kumar & Singh (2011) explained the liquidity of the sectoral indices and market index on the basis of price returns by calculating market efficiency coefficient. The paper find that the sensex returns can be explained with the help of selected sectoral index returns.

Taking all these factors into consideration, the present study aims to fulfill the following vacuum.

Objectives

- To assess the correlation between the different sectoral indices with the BSE Sensex over the bearish phase (2008-2009) and the bullish phase (2010-2014).

- To predict how far the sectoral indices reflect change in the Sensex during the bear (2008-2009) and bull

(2010-2014) phase.

- To assess the correlation between the Midcap and the Small Cap stocks with the market index.

- To analyse which sectoral indices affect the Sensex significantly from the regression analysis of different sectoral indices.

Hypothesis

- All the BSE sectoral indices have strong influence on market return or BSE Sensex during both the Bullish (2008-2009) and Bearish (2010-2014) phases.

Methodology

Type and Source of data

Secondary data on monthly sectoral indices and market index have been collected from the official website of BSE.

Period of study

The study is conducted for a period of 6 years from Jan 1, 2008 to Dec 31, 2014. The period 2008-2009 is considered as the bear phase when the stock market was hit by the global meltdown. The period 2010-2014 is considered as the bull phase when the economy was in the state of recovery.

Tools used

Correlation Coefficient and Regression Analysis was done in order to fulfill the above mentioned objectives using SPSS Software.

Analysis And Findings

Table 1 clearly indicates that the calculated values of correlation coefficient during the bear phase (2008-2009) for all the indices are positive. This suggests that during the bear phase all the sectoral stocks moved in tandem with Sensex and all the sectoral indices also showed a positive correlation with each other during this period.

Table 2 shows the correlation between the Sensex and Midcap and Small Cap indices which suggests there was significant relationship among them during the bearish phase.

Table 3 shows the correlation between the sectoral indices and BSE Sensex during the bullish market (2010-2014). It shows all the sectoral indices have a positive relationship with the Sensex except Metal, Power and Realty, although not very significantly but to some extent obviously. The Auto sector is positively correlated with every other sector except Metal, Power, PSU and Realty. There is an inverse relationship of the Bankex sector with Metal, Power and Realty whereas the capital goods sector is inversely related with only the FMCG sector. Metal, Power, PSU and Realty are again negatively correlated with the FMCG sector. Metal stocks are mostly negatively correlated with the other sectoral indices apart from a few sectors like Capital goods, Oil & Gas, Power, PSU, and Realty. On the other hand the Realty sector although inversely related to Sensex but significantly correlated with the Power and PSU sector.

Table 4 shows the correlation between the midcap stocks and the small cap

Table: 1

Correlations

		SENSEX	AUTO	BANKEX	CAPITAL GOODS	CONSUMER DURABLES	FMCG	HEALTH CARE	IT	METAL	OIL & GAS	POWER	PSU	REALTY	TECK
SENSEX	Pearson Correlation	1	.849**	.947**	.980**	.909**	.749**	.863**	.890**	.969**	.965**	.964**	.925**	.775**	.941**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	24	24	24	24	24	24	24	24	24	24	24	24	24	24
AUTO	Pearson Correlation	.849**	1	.886**	.781**	.588**	.926**	.820**	.863**	.796**	.758**	.770**	.941**	.365	.706**
	Sig. (2-tailed)	.000		.000	.000	.003	.000	.000	.000	.000	.000	.000	.000	.080	.000
	N	24	24	24	24	24	24	24	24	24	24	24	24	24	24
BANKEX	Pearson Correlation	.947**	.886**	1	.941**	.807**	.759**	.759**	.805**	.876**	.871**	.941**	.956**	.678**	.808**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	24	24	24	24	24	24	24	24	24	24	24	24	24	24
CAPITAL GOODS	Pearson Correlation	.980**	.781**	.941**	1	.928**	.656**	.784**	.811**	.934**	.946**	.981**	.895**	.830**	.911**
	Sig. (2-tailed)	.000	.000	.000		.000	.001	.000	.000	.000	.000	.000	.000	.000	.000
	N	24	24	24	24	24	24	24	24	24	24	24	24	24	24
CONSUMER DURABLES	Pearson Correlation	.909**	.588**	.807**	.928**	1	.494*	.768**	.785**	.926**	.887**	.897**	.705**	.929**	.946**
	Sig. (2-tailed)	.000	.003	.000	.000		.014	.000	.000	.000	.000	.000	.000	.000	.000
	N	24	24	24	24	24	24	24	24	24	24	24	24	24	24
FMCG	Pearson Correlation	.749**	.926**	.759**	.656**	.494*	1	.795**	.826**	.726**	.642**	.654**	.836**	.268	.636**
	Sig. (2-tailed)	.000	.000	.000	.001	.014		.000	.000	.000	.001	.001	.000	.205	.001
	N	24	24	24	24	24	24	24	24	24	24	24	24	24	24
HEALTH CARE	Pearson Correlation	.863**	.820**	.759**	.784**	.768**	.795**	1	.963**	.912**	.822**	.718**	.781**	.517**	.884**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.010	.000
	N	24	24	24	24	24	24	24	24	24	24	24	24	24	24
IT	Pearson Correlation	.890**	.863**	.805**	.811**	.785**	.826**	.963**	1	.921**	.813**	.752**	.804**	.544**	.913**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.006	.000
	N	24	24	24	24	24	24	24	24	24	24	24	24	24	24
METAL	Pearson Correlation	.969**	.796**	.876**	.934**	.926**	.726**	.912**	.921**	1	.936**	.909**	.848**	.780**	.962**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000
	N	24	24	24	24	24	24	24	24	24	24	24	24	24	24
OIL & GAS	Pearson Correlation	.965**	.758**	.871**	.946**	.887**	.642**	.822**	.813**	.936**	1	.934**	.875**	.780**	.914**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.001	.000	.000	.000		.000	.000	.000	.000
	N	24	24	24	24	24	24	24	24	24	24	24	24	24	24
POWER	Pearson Correlation	.964**	.770**	.941**	.981**	.897**	.654**	.718**	.752**	.909**	.934**	1	.904**	.841**	.864**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.001	.000	.000	.000	.000		.000	.000	.000
	N	24	24	24	24	24	24	24	24	24	24	24	24	24	24
PSU	Pearson Correlation	.925**	.941**	.956**	.895**	.705**	.836**	.781**	.804**	.848**	.875**	.904**	1	.545**	.762**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.006	.000
	N	24	24	24	24	24	24	24	24	24	24	24	24	24	24
REALTY	Pearson Correlation	.775**	.365	.678**	.830**	.929**	.268	.517**	.544**	.780**	.780**	.841**	.545**	1	.809**
	Sig. (2-tailed)	.000	.080	.000	.000	.000	.205	.010	.006	.000	.000	.000	.006		.000
	N	24	24	24	24	24	24	24	24	24	24	24	24	24	24
TECK	Pearson Correlation	.941**	.706**	.808**	.911**	.946**	.636**	.884**	.913**	.962**	.914**	.864**	.762**	.809**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.001	.000	.000	.000	.000	.000	.000	.000	
	N	24	24	24	24	24	24	24	24	24	24	24	24	24	24

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table: 2

Correlations

		MID CAP	SMALL CAP	SENSEX
MID CAP	Pearson Correlation	1	.995**	.976**
	Sig. (2-tailed)		.000	.000
	N	24	24	24
SMALL CAP	Pearson Correlation	.995**	1	.956**
	Sig. (2-tailed)	.000		.000
	N	24	24	24
SENSEX	Pearson Correlation	.976**	.956**	1
	Sig. (2-tailed)	.000	.000	
	N	24	24	24

**. Correlation is significant at the 0.01 level (2-tailed).

stocks wherefrom it is clear that the midcap stocks are correlated to a greater extent than the small cap stocks with the Sensex during the bullish phase.

Table 5 provides the information of the regression model and the explained ability. An R2 of 1 indicates that the regression line perfectly fits the data and coefficients of the independent variable in the regression equation can be considered for further analysis. Durbin watson value of 2.717 shows negative serial correlation and no auto correlation in the data. Table 6 below provides the coefficients of the each sectoral indices return and their significance of impact upon the market return. It can be observed that Consumer Durables, Healthcare, IT, PSU and Realty have a negative coefficient which can be interpreted as the reverse earners to the Sensex returns. Bank Index, Capital Goods, FMCG, Oil & gas and Teck provides a major contribution to Sensex returns during the period 2008-2009. This also becomes clearer with the coefficient of beta values and the p-value of these sectors which reflects the same information.

Table 7 shows the information of the regression model and the explained ability during the bullish phase (2010-2014). An R2 of .999 indicates that the model explains almost all the variability of the response data around its mean. The Durbin Watson value (1.653) shows positive serial correlation between the sectoral return and the market return during this period. Table 8 shows IT, PSU and Realty have a negative coefficient and may be interpreted as the reverse earners to Sensex returns. Auto, Bank Index, Capital Goods, FMCG, Healthcare (to some extent), Metal, Oil & gas and Teck are major contributors to the market (Sensex) return as reflected by the p-values in the analysis.

Hence, it is seen that the Null Hypothesis gets rejected and all the sectoral indices do not influence Sensex in the same manner during both the Bull and Bear phases of the market. IT, PSU and Realty stocks have negligible influence on the market return in both the periods under study.

Table:3

Correlations

		SENSEX	AUTO	BANKEX	CAPITAL GOODS	CONSUMER DURABLES	FMCG	HEALTH CARE	IT	METAL	OIL & GAS	POWER	PSU	REALTY	TECK
SENSEX	Pearson Correlation	1	.964**	.940**	.481**	.803**	.745**	.926**	.906**	-.119	.599**	-.190	.010	-.250	.925**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.365	.000	.146	.941	.054	.000
	N	60	60	60	60	60	60	60	60	60	60	60	60	60	60
AUTO	Pearson Correlation	.964**	1	.915**	.300*	.849**	.838**	.971**	.914**	-.317*	.411**	-.374**	-.165	-.426**	.918**
	Sig. (2-tailed)	.000		.000	.020	.000	.000	.000	.000	.014	.001	.003	.209	.001	.000
	N	60	60	60	60	60	60	60	60	60	60	60	60	60	60
BANKEX	Pearson Correlation	.940**	.915**	1	.517**	.895**	.673**	.836**	.746**	-.073	.565**	-.118	.130	-.174	.769**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.577	.000	.368	.321	.183	.000
	N	60	60	60	60	60	60	60	60	60	60	60	60	60	60
CAPITAL GOODS	Pearson Correlation	.481**	.300*	.517**	1	.265*	-.193	.155	.209	.758**	.905**	.745**	.846**	.620**	.271*
	Sig. (2-tailed)	.000	.020	.000		.041	.140	.238	.108	.000	.000	.000	.000	.000	.036
	N	60	60	60	60	60	60	60	60	60	60	60	60	60	60
CONSUMER DURABLES	Pearson Correlation	.803**	.849**	.895**	.265*	1	.712**	.785**	.640**	-.281*	.288*	-.324*	-.055	-.384**	.651**
	Sig. (2-tailed)	.000	.000	.000	.041		.000	.000	.000	.030	.025	.011	.679	.002	.000
	N	60	60	60	60	60	60	60	60	60	60	60	60	60	60
FMCG	Pearson Correlation	.745**	.838**	.673**	-.193	.712**	1	.909**	.803**	-.725**	-.016	-.764**	-.613**	-.710**	.779**
	Sig. (2-tailed)	.000	.000	.000	.140	.000		.000	.000	.000	.901	.000	.000	.000	.000
	N	60	60	60	60	60	60	60	60	60	60	60	60	60	60
HEALTH CARE	Pearson Correlation	.926**	.971**	.836**	.155	.785**	.909**	1	.940**	-.451**	.295*	-.507**	-.329*	-.535**	.934**
	Sig. (2-tailed)	.000	.000	.000	.238	.000	.000		.000	.000	.022	.000	.010	.000	.000
	N	60	60	60	60	60	60	60	60	60	60	60	60	60	60
IT	Pearson Correlation	.906**	.914**	.746**	.209	.640**	.803**	.940**	1	-.322*	.361**	-.421**	-.290*	-.483**	.996**
	Sig. (2-tailed)	.000	.000	.000	.108	.000	.000	.000		.012	.005	.001	.025	.000	.000
	N	60	60	60	60	60	60	60	60	60	60	60	60	60	60
METAL	Pearson Correlation	-.119	-.317*	-.073	.758**	-.281*	-.725**	-.451**	-.322*	1	.626**	.957**	.919**	.841**	-.267*
	Sig. (2-tailed)	.365	.014	.577	.000	.030	.000	.000	.012		.000	.000	.000	.000	.039
	N	60	60	60	60	60	60	60	60	60	60	60	60	60	60
OIL & GAS	Pearson Correlation	.599**	.411**	.565**	.905**	.288*	-.016	.295*	.361**	.626**	1	.607**	.710**	.535**	.419**
	Sig. (2-tailed)	.000	.001	.000	.000	.025	.901	.022	.005	.000		.000	.000	.000	.001
	N	60	60	60	60	60	60	60	60	60	60	60	60	60	60
POWER	Pearson Correlation	-.190	-.374**	-.118	.745**	-.324*	-.764**	-.507**	-.421**	.957**	.607**	1	.952**	.928**	-.365**
	Sig. (2-tailed)	.146	.003	.368	.000	.011	.000	.000	.001	.000	.000		.000	.000	.004
	N	60	60	60	60	60	60	60	60	60	60	60	60	60	60
PSU	Pearson Correlation	.010	-.165	.130	.846**	-.055	-.613**	-.329*	-.290*	.919**	.710**	.952**	1	.866**	-.230
	Sig. (2-tailed)	.941	.209	.321	.000	.679	.000	.010	.025	.000	.000	.000		.000	.077
	N	60	60	60	60	60	60	60	60	60	60	60	60	60	60
REALTY	Pearson Correlation	-.250	-.426**	-.174	.620**	-.384**	-.710**	-.535**	-.483**	.841**	.535**	.928**	.866**	1	-.430**
	Sig. (2-tailed)	.054	.001	.183	.000	.002	.000	.000	.000	.000	.000	.000	.000		.001
	N	60	60	60	60	60	60	60	60	60	60	60	60	60	60
TECK	Pearson Correlation	.925**	.918**	.769**	.271*	.651**	.779**	.934**	.996**	-.267*	.419**	-.365**	-.230	-.430**	1
	Sig. (2-tailed)	.000	.000	.000	.036	.000	.000	.000	.000	.039	.001	.004	.077	.001	
	N	60	60	60	60	60	60	60	60	60	60	60	60	60	60

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table: 4

Correlations

		SENSEX	MID CAP	SMALL CAP
SENSEX	Pearson Correlation	1	.846**	.575**
	Sig. (2-tailed)		.000	.000
	N		60	60
MID CAP	Pearson Correlation	.846**	1	.906**
	Sig. (2-tailed)	.000		.000
	N	60		60
SMALL CAP	Pearson Correlation	.575**	.906**	1
	Sig. (2-tailed)	.000	.000	
	N	60	60	60

**. Correlation is significant at the 0.01 level (2-tailed).

Table: 5

Regression Analysis Of Stock Market Return With Bse Sensex As Dependent Variable And 13 Sectoral Indices As Independent Variables (2008-2009)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	1.000a	1.000	.999	*********	1.000	2159.662	13	10	.000	2.717

a. Predictors: (Constant), TECK, FMCG, BANKEX, REALTY, OIL & GAS, HEALTH CARE, AUTO, CAPITAL GOODS, METAL, PSU, CONSUMER DURABLES, IT, POWER

b. Dependent Variable: SENSEX

Table: 6

Coefficient Of Regression Analysis Of Stock Market Return With Bse Sensex As Dependent Variable And 13 Sectoral Indices As Independent Variables (2008-2009)

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-187.584	494.643		-0.379	0.712
	Auto	0.129	0.114	0.062	1.132	0.284
	Bankex	0.325	0.062	0.215	5.262	0
	Capital Goods	0.135	0.055	0.143	2.463	0.034
	CONSUMER DURABLES	-0.059	0.181	-0.02	-0.329	0.749
	FMCG	0.667	0.215	0.065	3.105	0.011
	Health Care	-0.082	0.163	-0.018	-0.502	0.627
	IT	-0.11	0.308	-0.032	-0.356	0.729
	Metal	0.056	0.037	0.08	1.522	0.159
	Oil & Gas	0.38	0.059	0.222	6.446	0
	Power	0.442	0.47	0.093	0.94	0.369
	PSU	-0.044	0.137	-0.022	-0.323	0.753
	Realty	-0.023	0.067	-0.018	-0.34	0.741
	Teck	1.548	0.406	0.288	3.814	0.003

Conclusion

The study attempted to understand the movement of sectoral returns with relation to Sensex during the two phases of the market and to find out if any common relation existed during these two bearish and bullish period. From the correlation analysis it may be concluded that during the period of global meltdown all the sectoral stocks reflected a positive correlation with the Sensex interpreting that it was difficult to diversify across sectors during the period of 2008-2009. Similarly, both the Midcap and Small cap stocks showed significant positive relation with the market index making it difficult for investors to take investment decisions. During the bullish phase, after the market recovered, there was a reverse scenario. Although most of the sectoral indices reflected positive relation with the Sensex but some of the important sectors like Metal, Power and Realty showed an inverse relationship with the market. Among the Midcap and small cap stocks, Midcap stocks showed a greater degree of correlation with the market rather than the Small Cap stocks.

Table : 7

Regression Analysis Of Stock Market Returns With Bse Sensex As Dependent Variable And 13 Sectoral Indices As Independent Variables (2010-2014)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	1.000[a]	.999	.999	**********	.999	4018.543	13	46	.000	1.653

a. Predictors: (Constant), TECK, PSU, CONSUMER DURABLES, REALTY, OIL & GAS, METAL, BANKEX, CAPITAL GOODS, HEALTH CARE, FMCG, AUTO, POWER, IT

b. Dependent Variable: SENSEX

From the Regression analysis of stock market return with BSE Sensex as dependent variable and 13 sectoral indices as independent variables in the bearish period, it may be concluded that Consumer Durables, Healthcare, IT, PSU and Realty were reverse earners to Sensex while rest of the sectors especially the Bank Index and Oil & Gas sector had been good predictors of the market. During the bullish period IT, PSU and Realty continued to act as reverse earners to Sensex while most of the other sectors showed a positive correlation with the market index.

The study shows that during the same period there may be significant difference between the different sectors' contribution towards final Sensex returns. It also depicts that the contribution of IT, PSU and Realty stocks to Sensex return is not significant during any phase of the market. The different phases of the study has pointed out that IT, PSU and Realty stocks may be given priority for investment when the overall Sensex return is showing a down trend and caution should be exercised before investing in the stocks of these sectors. Hence, for the layman investors, this may be a good indicator to primarily take decision and also to take risk as per their capacity based on correlation coefficients of the sectoral returns with the market (Sensex) returns.

Limitations

- The time period of the study is limited to 7 years only.

- Other estimators of statistics may have provided with a more detailed view of the situation.

Table :8

Coefficient Of Regression Analysis Of Stock Market Return With Bse Sensex As Dependent Variable And 13 Sectoral Indices As Independent Variables (2010 - 2014)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	86.516	426.916		0.203	0.84
	Auto	0.15	0.036	0.138	4.141	0
	Bankex	0.284	0.03	0.238	9.555	0
	Capital Goods	0.094	0.028	0.076	3.361	0.002
	Consumer Durables	0.05	0.039	0.021	1.283	0.206
	FMCG	0.554	0.068	0.273	8.195	0
	Health Care	0.091	0.045	0.075	2.027	0.048
	IT	-0.103	0.136	-0.056	-0.752	0.456
	Metal	0.129	0.021	0.122	6.037	0
	Oil & Gas	0.458	0.046	0.149	9.882	0
	Power	0.212	0.273	0.036	0.777	0.441
	PSU	-0.118	0.102	-0.049	-1.156	0.254
	Realty	-0.076	0.077	-0.017	-0.992	0.326
	Teck	1.182	0.271	0.319	4.365	0

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An Empirical Study on Impact of Political Events on Stock Market: Evidence from Recent Trends in India

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Abstract:

The present study attempts to examine and validate the impact on stock markets due to political events such as change in government and/or socio-economic policies. The study has been done by bifurcating data (CNX Nifty Index) into two phases (i.e., Pre and Post Election Phases) and comparing it on Year-on-Year (YOY) basis. The various statistical techniques are applied to analyze the dataset and to refine data to information. The results show that the investors have more reacted out of rational expectation of anticipated economic drive. The indices show that market has reacted to almost every new piece of information; however some seasonal anomalies remain the exception. It is evident from the results obtained that the market behaves to some extent in compliance with semi-strong form efficient arguments.

Key Words:

Efficient Market Hypothesis, Rational Expectation, Stock Indices, CNX Nifty.

Introduction

The impact of information dissemination on asset prices is one of the extensively researched areas in the domain of economics and finance. The earlier studies had concluded that in general, a new piece of information (Political, Macroeconomic, Industry or Firm-specific) has legible impact on prices of financial securities in the stock market. The majority of the studies have been conducted in this respect in the developed economies however the status of the emerging economies is yet to be recognized and validated. Recently in India there has been a change in government with due expectation of opening up of various prospective avenues for overall economic growth. Favorable policies for industrial and export operations which in turn would result in higher profitability of individual economic units leading to all round development was anticipated. Thus the Indian equity market based on theories and previous empirical tests was also supposed to soar. Thus this study is undertaken to document the changes

in stock price movements due to change in Government and check whether the rational expectation has been reflected on the asset prices in stock market.

An efficient equity market is sine qua non for capital formation with accelerated velocity, or else the pace of growth would be sluggish. Hence, in the abundant literature of economics and finance market efficiency has been one of the pondered domains. The Efficient Market Hypothesis (EMH) is a prime theory of neoclassical school of finance. EMH advocates that markets are informational efficient. In information efficient market the current prices of securities reflect the all forms of available information instantly (Fama 1970). Such markets will not yield abnormal returns for a longer period. Market will adapt to the new information and will reach equilibrium.

Theoretical Underpinnings

The efficient market argument is grounded on rational expectation theory which emphasizes that "expectations are an optimal forecast that uses all available information, and they do not differ systematically from the market equilibrium results". The theory further assumes that the agent's prediction about the future value of economically germane variable is not wrong in that all errors occurred are at random. It says that the forecasts would deviate from the expected outcomes only when there is an 'information shock' caused by informational myopia at the time when the expectation was formed. In other words, ex ante the return is predicted to equal its rational expectation:

$$R = R^* + \square \dots\dots\dots\dots\dots\dots\dots (\text{Eq. 1})$$

$$E[R] = R^* \dots\dots\dots\dots\dots\dots\dots (\text{Eq. 2})$$

Where,

R^* is the rational expectation and $\square$ is random error term, expected value of which is 0 and independent of R^*.

The rational expectation theory was the result of perceived shortcomings of the adaptive expectations theory, which propose that expectation of the future value of an economic variable is based on its past values.

Forms of Market Efficiency

The form of efficiency is bifurcated in three broad categories based on the information availability. They are:

❖ Weak Form Efficiency: This form of efficiency is believed to have the information restricted to historical data of economic variables or sequence of returns. Thus the information set represented by S_{t-1} reflects the past information alone. It is mathematically expressed as:

$$\psi\,(\pi_t\,|\dots,\,R_{t-2}\,R_{t-1},|) = 0 \dots\dots\dots\dots (\text{Eq. 3})$$

Where R_t is stock returns for time t, π_t represents excess or abnormal component and ψ is the equilibrium returns. The information if immediately captivated in current returns, the abnormal returns will be deterred out.

❖ Semi-Strong Form Efficiency: This form of efficiency includes all publicly available information in addition to

the sequence of past returns. The publicly available information is referred to the macroeconomic determinants, company performance, favorable government policy and other intrinsic factors. Let λ be the publicly available information set. Then the equation can be rewritten as:

$$\psi\ (\pi_t\ |\ldots, R_{t-2}, R_{t-1}, \lambda_{t-n}|) = 0 \ldots\ldots\ldots \text{(Eq. 4)}$$

❖ Strong Form Efficiency: In the present case along with past and publicly available information some private or monopolistic information is also available in the information set. If the private information is denoted as ξ then the equation becomes as:

$$\psi\ (\pi_t\ |\ldots, R_{t-2}, R_{t-1}, \lambda_{t-n}, \xi\ |) = 0 \ldots\ldots \text{(Eq. 5)}$$

The theory assumes that even monopolistic information would fail to estimate the market with high accuracy. On the other hand there are legal restrictions to make use or trade on private information. Thus, if the insider trading laws exists strong-form efficiency is practically impossible.

Review of Literature

As stated earlier that EMH is one of the rigorously researched areas. In the developed economies scholars have taken care of manifold aspects in the stock market. However studies concerning the emerging economies are handful. Thus a brief review of the previous studies relevant to the present study is represented as follows:

Mahmood, Irfan, Iqbal, Kamran and Ijaz (2014) examined Karachi Stock Exchange 100 (KSE-100 index) over a time horizon of five years and concluded that negative abnormal returns were associated with political events. Also, it was found that taking different time frames produced different abnormal returns due to accumulation effect.

Gul, Khan, Saif, Rehman and Roohullah (2013) studied the impact on stock prices due to various events such as political, natural calamities and terrorism. They employed paired sample t-test statistics on some randomly selected companies from banking and insurance sectors and found that their prices behaved negatively with the outbreak of some national or international event.

Pastor and Veronesi (2012) explained that government shapes the sentiments of the businessman in an economy. The change in policies by the government affects domestic stock prices volatility. On average, stock market return are positive at the announcements of policy decisions without the certainty of policy change but the stock market returns are negative at the announcements of policy changes. The study was done with reference to United States.

Khalid and Rajaguru (2010) used Markov Switching process to show the impact of domestic and international events/news on the domestic financial market. They also found through the study that weak short-term linkages were observed in the market but no long-term causal relationship was noticed.

Dangol(2008) explained the effect of political good-news on the domestic stock market in Nepal. The study revealed that good-news (bad-news) announcements lead to the generation

of positive (negative) abnormal returns.

Vuchelen (2003) analyzed Brussels Stock Exchange, Belgium and explained that efficient stock markets react to news. Political events like elections led to the spread of news about future economic policies which led to the more informed decision by an investor.

Zach (2003) presented data with the conclusion that political events/news do affect the share price volatility. It was also established through the study that stocks that were cross-listed (same stock listed in domestic and foreign exchange) had shown similar behavior (more volatile) but domestic stocks listed in foreign exchange exhibited a different behavior (less volatile) after the outbreak of particular domestic political news.

Kim and Mei (2001) employed GARCH-jump process to examine the effects of political announcements on the market return and volatility in Hong Kong stock markets. It explained that unexpected return jumps are a function of political news and that the impact is largely asymmetric in that bad news is observed leading to greater volatility than good news.

Rationale of the Present Study

Many studies have been done on verifying the EMH in developed or emerging markets but very fewer studies are being conducted to capture the effect of government change in stock price movement. While most of these concluded with the existence of weak-form of efficiency in these markets, particularly developed one but some of these pointed towards the existence of inefficiencies in the emerging markets. In addition to that not many studies on government change effect on stock prices are undertaken in India.

Premise and Objective of the Study

Based on opinion polls and manifestos it was anticipated that the change in Government in the General Election 2014 will open up business opportunities followed by an economic boost up.

* This led to a rational expectation of accelerated growth momentum. Thus the study is conducted with a view to:

- Analyze and understand whether there have been significant variations in the stock market in India after the change of Government.

Data and Methodology

The study is based upon the daily historical indices data of CNX Nifty Index. The study is of comparative nature which separately studies two phases in Year-on-Year (YOY) basis i.e. from 16th May 2013 to 28th February 2014 (Pre-Election Phase) and 16th May 2014 to 28th February 2015 (Post-Election Phase). [The result of General Election 2015 was declared on 16th May 2014]. The data is collected from the website of National Stock Exchange (NSE) and analyzed using statistical techniques such as movement of stock price indices for diagrammatic representation and to visually compare the movements. Logarithmic returns were chosen to calculate stock returns over simple returns to spread out the values of the time series. To facilitate comparability smoothing techniques such as EWMA

and WMA were used. Descriptive statistics to understand the nature and normality of data were used. Further to validate the hypothesis analysis of variance (ANOVA) has been used. All statistical operations are carried out in MS-Excel application.

Hypothesis of the Study

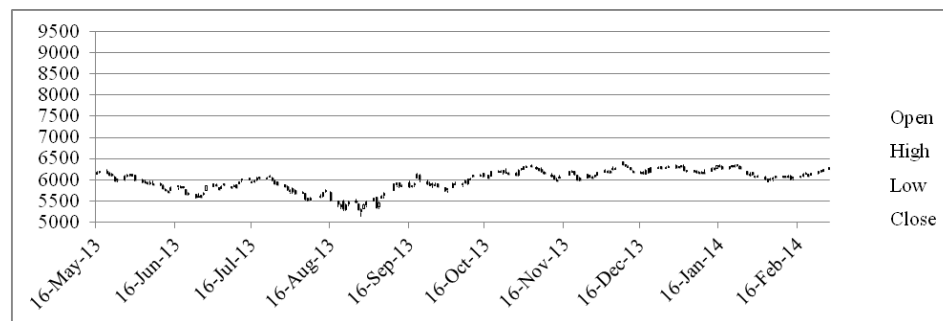The following is the Null Hypothesis:

H_0: There is no significant variation in the market close index of CNX Nifty in the Pre and Post-Election Phase.

Analysis and Interpretation of Results

Movement of Indices

The daily movement of stock indices has been captured as presented below:

Figure 1 (Pre-Election Phase)

Data Source: NSE

Figure 2 (Post-Election Phase)
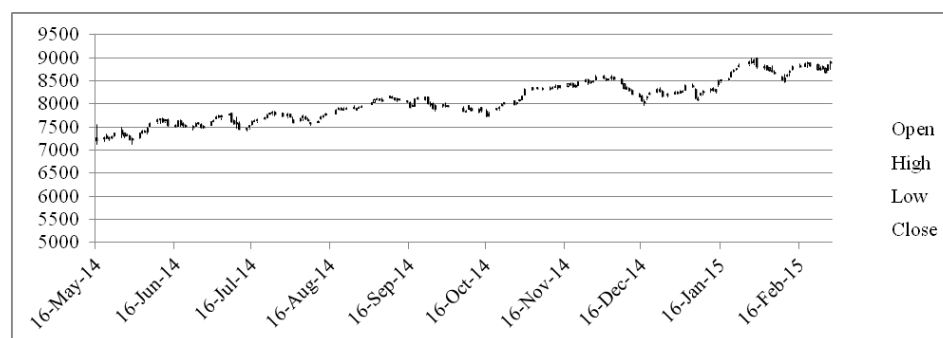
Data Source: NSE

The above figures exhibit an obvious trend of market which complies with the market expectation. In the pre-election phase the stock indices were hovering around 6,000 to 6,500 range. Further it also has some downturn fluctuations during August-September 2013.

In the post-election phase markets exhibited bullish trend. It was nearly touching the 9,000 range. Various initiatives taken to incentivize the business segment and push of flagship programmes like 'Make in India' which is expected to have rapid growth impact on industry could be the underlying reasons. Further the announcement of corporate rate tax cut by 5% in the Union Budget 2015 on 28th February was one of the key reasons for the high closing index of 8901.85 points. Thus from the elementary technical analysis it can be inferred that there have been some improvements in the Indian stock market in this phase which is further subjected to empirical testing. However the traces of seasonal anomalies such as January Effect has been witnessed but then there was no major fluctuations or dip in the market.

Stock Returns

To calculate the stock returns logarithmic returns were chosen over simple returns to spread out the values of the time series as the simple return by definition cannot be lower than minus 1.

Figure 3 (Pre-Election Phase)
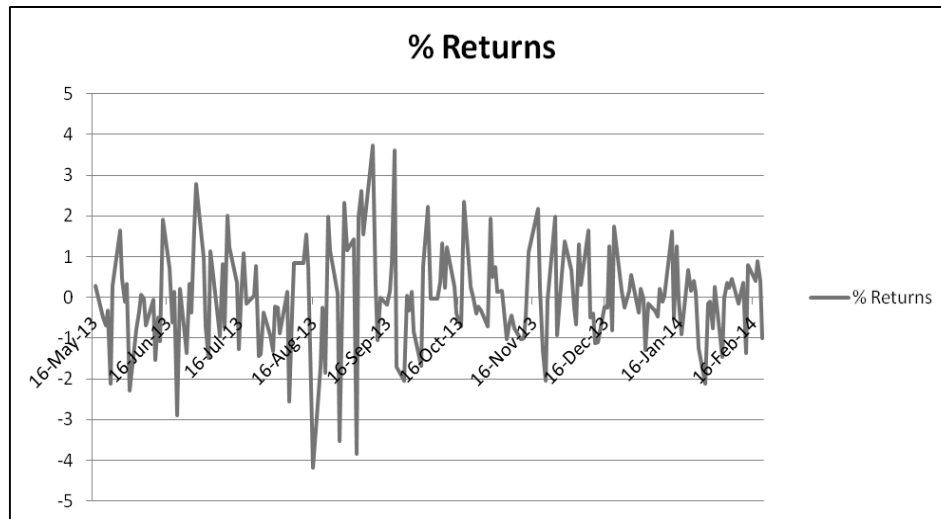
Data Source: NSE and Author's Calculation and Compilation of Data

Figure 4 (Post-Election Phase)
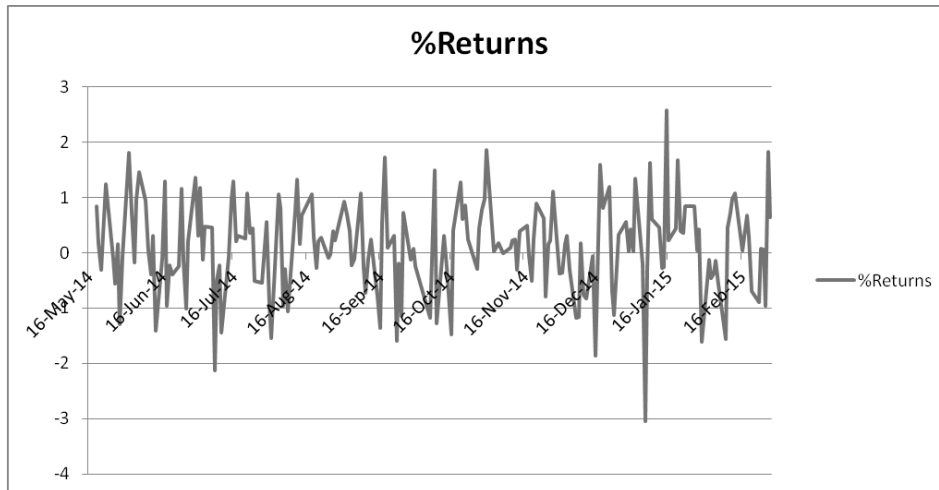
Data Source: NSE and Author's Calculation and Compilation of Data

Table 1 Normal Distribution VAR:

	Pre-Election Phase	Post-Election Phase
Mean Returns	0.008687658	0.109720992
SD of Returns	1.191612534	0.838368483
	VAR	VAR
Bottom 10%	-1.51842525	-0.964691451
Bottom 5%	-1.95134054	-1.269272449
Historical VAR		
n	198	193
Bottom 10%	19.8th Return	19.3th Return
Bottom 20th Return	-1.375056086	-1.009804464
Bottom 19th Return	-1.395215102	-1.060610029
Bottom 19.8[th] Return	-1.379087889	-1.045368359
Bottom 5%	9.9th Return	9.65th Return
Bottom 10th Return	-2.043471714	-1.419191803
Bottom 9th Return	-2.056055321	-1.43940039
Bottom 9.9[th] Return	-2.044730075	-1.426264808

Source: Author's Calculation

The figure 3 and 4 can be interpreted from table 1.

It shows that the mean return has improved by a remarkable margin i.e. from 0.86% to 10.97% which is a great leap coupled up with a fall in standard deviations of return from 1.19 to 0.83. Furthermore the historical variances have also somewhat declined. Hence the volatility of returns is insulated to some margin. Thus the post election phase can be considered to be a relatively favorable market condition.

Figure 5 (Pre-Election Phase)
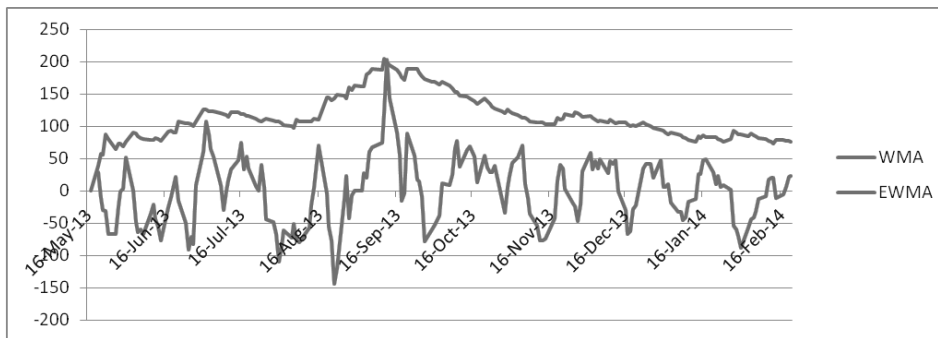
Data Source: NSE and Author's Calculation and Compilation of Data

Figure 6 (Post-Election Phase)
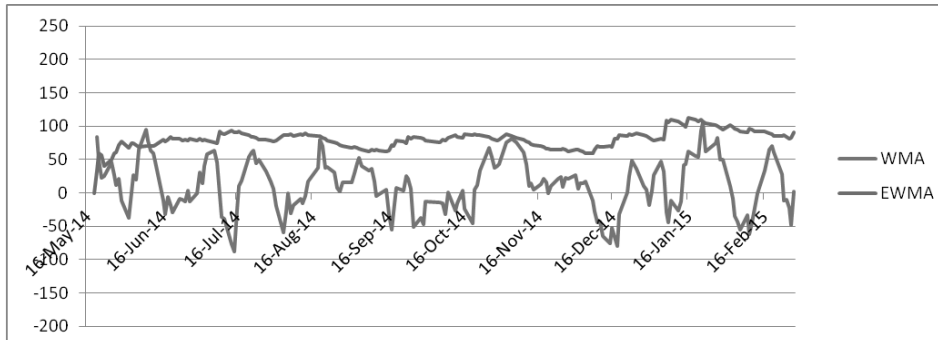
Data Source: NSE and Author's Calculation and Compilation of Data

In figure 5 and 6 above weekly Weighted Moving Average (WMA) and Exponential Weighted Moving Average (EWMA) is plotted to demonstrate the variation of mean and volatility over time. The volatility (proxy by EMWA) moves slowly (unlike returns), but it is more sensitive to negative returns than it is to a positive return market.

Here, in this case it is clearly visible that in the pre-election period the EWMA is

Table 2 (Pre-Election Phase)

Descriptive Statistics		Significance Test		0.05	Test	p-value	SIG?
		Target	P-Value	SIG?	White-noise	0.011378	FALSE
AVERAGE:	0.008688	0	0.459197	FALSE	Normal Distributed?	0.000209	FALSE
STD DEV:	1.191613				ARCH Effect?	0.031414	TRUE
SKEW:	-0.13699	0	0.21915	FALSE			
EXCESS-KURTOSIS:	1.474439	0	4.53E-05	TRUE			
MEDIAN:	-0.00835						
MIN:	-4.16855						
MAX:	3.73797						
Q 1:	-0.67887						
Q 3:	0.619696						

Data Source: NSE and Author's Calculation and Compilation of Data

subjected to more variance as compared to the post-election phase. Thus it can be inferred that the returns in the post-election phase were comparatively stable.

The first part of the table shows the descriptive statistics, the second part shows the test of significance for mean, skewness and excess kurtosis. The level of significance is 0.05 or 5% as highlighted; the third part shows the significance test for white-noise, normality and ARCH effect.

In the pre-election phase the significance tests for mean interpreted by p-value suggest that mean is not statistically different from zero. The skewness test suggests that the data is not significantly skewed. Excess-Kurtosis test found to be true in this case which means the return distribution has fatter or thinner tails than the tails of normal distribution.

The white-noise test says the individual observations are not serially correlated. Here the p-value is less than 5% level which means the sample data is serially correlated. Then we look at the normality test, we perform Jarque-Bera Test and compute p-value in this model. Here, the p-value is lower than the significant level thus the sample data is not normally distributed. Next take a look at ARCH test, we performed a white-noise test for the squared series and computed p-values. In this model p-value is smaller than the significant level. Thus the squared observation does not have ARCH effect.

The distribution curve of the frequency is represented as below:

Figure 7 (Pre-Election Phase)

Frequency Distribution
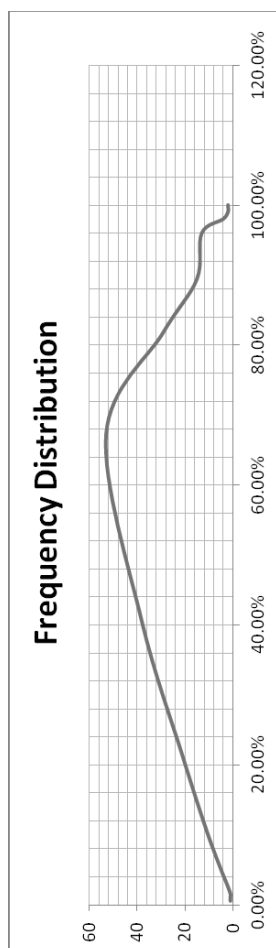
Data Source: NSE and Author's Representation

Table 3 (Post-Election Phase)

Descriptive Statistics		Significance Test	0.05		Test	p-value	SIG?
		Target	P-Value	SIG?			
AVERAGE:	0.109721	0	0.035299	FALSE	White-noise	0.11512	TRUE
STD DEV:	0.838368				Normal Distributed?	0.020397	FALSE
SKEW:	-0.31924	0	0.03733	FALSE	ARCH Effect?	0.251009	FALSE
EXCESS-KURTOSIS:	0.804428	0	0.021443	TRUE			
MEDIAN:	0.164385						
MIN:	-3.0422						
MAX:	2.583066						
Q 1:	-0.30404						
Q 3:	0.620905						

Data Source: NSE and Author's Calculation

Figure 8 (Post-Election Phase)

Frequency Distribution
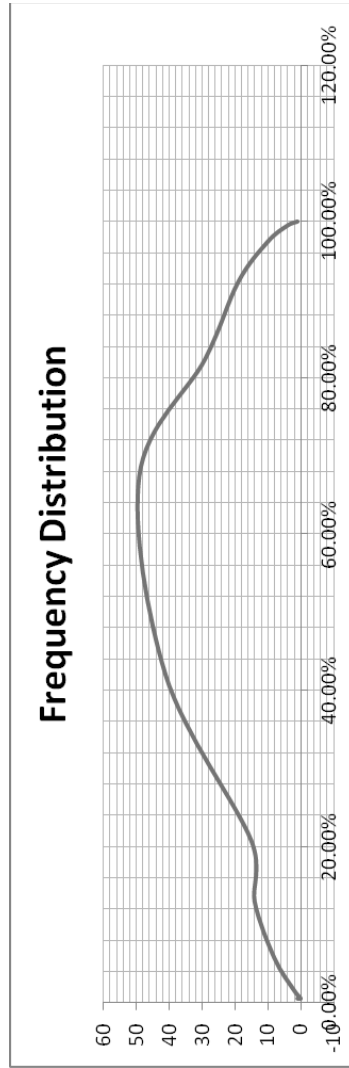
Data Source: NSE and Author's Representation

Table 4 (ANOVA for both Pre-Post Election Period)

Anova: Single Factor							
SUMMARY							0.05
Groups	*Count*	*Sum*	*Average*	*Variance*			
6169.9	198	1185152	5985.615	63007.31			
7203	193	1556696	8065.78	195157.6			
ANOVA							
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*	
Between Groups	422903590.8	1	4.23E+08	3297.926	4.6E-192	1.647967	
Within Groups	49882706.48	389	128233.2				
Total	472786297.2	390					

Data Source: NSE and Author's Calculation and Compilation of Data

The descriptive result is similar to the pre-election phase. Here the p-value is more than 5% level which means the sample data is not serially correlated. In this model p-value is more than the significant level. Thus the squared observation does have ARCH effect.

Test of Hypothesis

H_0: There is no significant variation in the market close index of CNX Nifty in the Pre and Post-Election Phase.

To check and validate the null hypothesis Analysis of Variance (ANOVA) has been used the results are as follows:

The above result shows that the p-value is less than the level of significance i.e. 5% and the F-Ratio is more than its critical value and thus it can be said that the alternative hypothesis (H_1) is accepted at the cost of rejection of null hypothesis (H_0). Thus there have been significant variations after the new government took over. Thus the rational expectation and available information regarding economic spur is reflected in the stock market.

Key Observations of the Study

The present study highlights the following important points:

The plotted daily indices have shown that after the change in the government there has been a steep rise in the stock market. More investments were intended in the securities in expectation of greater future cash flows. The historical variance has marginally reduced after new government came into action. Thus, confidence boosted up in the minds of the investors. As a whole the market was viewed to be more stable. The WMA and EWMA have indicated the similar results that the volatility in the market was relatively low and tending towards stability. The descriptive statistics has shown that the mean return has increased from 0.86% to 10.97% in the post period. Further the standard deviation was also low in the later period. Hence returns increased substantially at a lower risk. Hence the investors are better-off in both aspects. The normality test was failed in both phases. However, the skewness in the post-period is comparatively less. The analysis of variance has shown that there has been a significant change in the stock market after the change in government as represented by p-value is less than the level of significance i.e. 5% and the F-Ratio is more than its critical value.

Thus all the evidences support our assumptions that the expectation of economic growth is reflected in the stock market and the Indian markets are "Semi-Strong Form" efficient.

Concluding Thoughts

The Indian stock market has exhibited the high expectations of investors due to the emphatic pro-growth proposals and achievable targets. An upwardly mobile trend has been captured in the movement of stock indices, seasonal anomalies are the exception. The major reforms in socio-economic sector of the country are being worked upon. As consequence of various announcements such as deferring General Anti-Avoidance Rules (GAAR), concessions to MSMEs and 'Make in India' initiatives stimulating

foreign investments the stock market is expected to escalate further in the near future. If that happens probably that would be further addition of evidence advocating the semi-strong form efficiency in the Indian markets.

Scopes for Further Study

The present study suffers from certain limitations which offer a room for further researches in the concerned domain. The data series is not large enough to make generalized conclusions. To estimate whether the available information is reflected in the indices more focused study on accounting for occurrence of every event is to be captivated which demands for a more rigorous cause-effect relationship. Further, the present study is restricted only to CNX Nifty index, more indices and stocks can be taken care of to minimize sampling error. This would reduce the risk of biases expected to creep in.

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Ascertaining the Best Multiple to Value Pharmaceutical Company Stocks - An Empirical Study

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Abstract:

Valuation of shares is done using different models and methods. Predominantly used methods include Discounted Cash Flow valuation (DCF) and Relative valuation method. DCF method uses the projected cash flow, growth and risk characteristics of firm to arrive at the Equity value. Relative valuation method uses the current prices of equity of similar firms to arrive at the equity value of the firm.

In practice, different analysts use different multiples to value stocks of the same company. The objective of this paper is to use empirical data of companies and arrive at a set of multiples that are capable of explaining share value better than the others. Financial data of Pharmaceutical sector companies for the period 2005-2010 is used for this analysis. Only pharmaceutical sector companies are considered based on the assumption that the primary value drivers like growth, margins and risk characteristics of companies operating in the same sector are likely to be similar. Significant factors that determine the multiples are ascertained using regression. On the basis of regression results, the sample companies are segmented into two sets of peer comparable groups. Valuation and percent is done pricing errors are calculated. The results indicate that selecting comparable companies based on ROE and net profit margins gives less pricing errors. PE multiple, PBV multiple and EVEBITDA multiple outperform others in valuation of pharmaceutical company stocks.

Key Words:

Relative Valuation, Comparable Company Valuation, Empirical Study, Pharmaceutical Sector, Equity Valuation.

Introduction

Value may be defined as the worth of the product or service. Value depends on the benefits expected by the customers and quality of the product or service. In finance, valuation is the process of estimating the value or worth of an asset or liability. Valuation of equity is an important area of research that interests both academics and profes-

sionals alike. The popular methods used for valuation of equity can be classified into 2 types viz. discounted cash flow method and relative valuation method.

Discounted cash flow (DCF) uses projected cash flows, growth and risk characteristics of firm to arrive at equity value of the firm. It is based on the concept that value of equity is determined by the present value of future expected benefits. DCF method of valuation is expected to provide more accurate fair value of equity. However, the method suffers from the following practical limitations. It involves projection of cash flows till perpetuity, which is generally done with simplistic assumptions that may result in inaccurate cash flows. Terminal value, that affects significantly the valuation, is determined using constant growth rates or relative earnings multiples. There are multiple concerns with respect to discount rate used for valuations which are yet to be addressed. Given these limitations, multiple or relative valuation method is found to be more popular and used more often in day to day valuation. Relative valuation is based on the concept that similar assets should command similar prices in the market. In other words, companies that have a similar size, growth, risk and return characteristics should have similar value in the markets. A Relative valuation multiple is the ratio of equity price or enterprise value to a key value driver that may be earnings (EBIT, EBITDA, EPS) or book values (book value of equity or book value of assets) or revenue(Sales). Relative valuation method uses the current prices of equity of similar firms to arrive at the equity value of the firm. It involves conversion of the current prices

of similar assets of firms into standard multiples using value drivers. These multiples are adjusted to reflect the financial position of the firm to be valued and then used to arrive at the value of shares of the firm.

Choice of the right multiple for valuation is an important decision taken by the analyst for valuation. Different research firms and analysts use different multiples for valuation. For instance, UBS Warburg uses Enterprise value (EV) upon Free cash flow (FCF) multiple for valuation of telecom companies while the others prefer to use Enterprise value (EV) upon Earnings before interest, taxes depreciation and amortization (EBITDA). The most popular multiples used by Morgan Stanley Dean Witter?s analysts are price earnings multiple followed by EV/EBITDA and residual income (Fernandez, 2003). Most Indian analysts or firms use PE multiple with forward earnings to value the equity and arrive at the target prices of stocks. A review of academic literature covering this important area of valuation shows that the studies that have dealt with valuation accuracy of the methods are comparatively fewer and most studies are of recent origin. While majority of the papers deal with data of US listed companies, there are a few that deal with European listed companies and much less papers that cover Japanese stocks and BRICK countries is found. Further, the conclusions of the different studies are not similar. They vary from country to country and across time. This paper focuses on valuation accuracy of multiples used for equity valuation using data of Indian pharmaceutical companies. It is felt that the findings of this study will be of use to equity analysts who use

multiples for valuation.

The rest of the paper is organized as follows. Section 2 presents a brief review of literature and the objectives of this study; section 3 details the relative valuation models, the definition of multiples used for analysis and its determinants, the research design is described in section 4. The results of the analysis and its implications are discussed in section 5. The final section 6 gives the summary conclusions and scope for further study.

Literature review

Academic literature covering valuation accuracy of methods can be classified into following categories -

❖ studies that deal with the question of how to arrive at a set of comparable firms for relative valuation,

❖ studies that evaluate the accuracy of absolute valuation methods like the DCF and abnormal earnings methods,

❖ studies that assess the accuracy of relative valuation multiples, and

❖ studies that examine the superiority of absolute methods over relative methods and vice versa.

The earliest of the studies that have examined the valuation accuracy, is the study by Boatsman and Baskin (1981). They use two sets of comparable firms from the same industry to evaluate the accuracy of the Price-Earnings multiple. They conclude that firms with similar historical earnings and growth should be compared to reduce

the valuation errors using price earnings multiple.

As against the above, Alford (1992) advocates the use of up to 3 digits SIC code of the industry classifications to reduce errors in valuation using the price earnings multiple. Subsequent studies by Cheng and McNamara (2000) and Bhojraj and Lee (2002) conclude that use of a combination of industry membership with total assets and further firm characteristics help in improving valuation accuracy over the use of industry membership alone.

Francis, Olsson and Oswald (2000) compare the accuracy of the absolute valuation methods namely Dividend Discount models, Discounted free cash flow models and abnormal earnings model. They infer that the abnormal earnings model estimates are better than the former two models. However, their studies completely ignore relative valuation methods.

Penman (1997) examines the possibility of combining the relative multiples to arrive at more accurate share values. He combines earnings and book values using weights and demonstrates that prices obtained by such combined methods are more accurate and robust across time.

Liu, Nissim and Thomas (2002, 2007) have studied extensively the valuation methods. In their former study they examine the performance of a list of value drivers and rank them. They report that forward earnings measure are the best, followed by historical earnings measure and cash flow measures. Sales are the worst measure. Their latter study investigates the question of whether

earnings or cash flows represent best summary measure of value in the international context. They find that valuations based on forward earnings multiple are remarkably close to traded prices and are more accurate than valuations based on cash flow multiples.

As against the above studies that are restricted to revenue, earnings and cash flow multiples; Lie and Lie (2002) have examined the relevance of book value multiples also. They find that Enterprise value to book value multiple yields better value estimates than sales or earnings multiples. Park and Lee (2003) analysed the accuracy of PE, PBV, PS and PCF multiples using data of Japanese stock markets. They conclude that price to book value is the best predictor multiple. Hermann and Richter (2003) examine the valuation of accuracy of European non financial firms and conclude that earnings multiple provide better values and sales multiples have least accuracy. Their findings are similar to Liu, Nissim and Thomas (2002). Schreiner (2007) also focuses on European data to evaluate the accuracy of multiples and concludes that the ranking of the multiples is earnings followed by cash flows, book value multiples, gross income and finally sales multiples.

Many of the papers that have addressed the issue of the valuation accuracy of multiples have also examined the use of mean, median or harmonic mean of comparable companies as benchmark multiples for valuation. Beatty, Riffe, Thompson (1999), Lie et. al (2002) report that use of harmonic mean results in least errors in valuation, Damodaran (2006) opines that the use of median will result in

better valuation as mean is affected by the extreme values and outliers much more than median.

From the above, it is evident that earlier studies have attempted to evaluate the accuracy of valuation methods using data of US and European markets. Their studies address major issues like determination of comparable companies, valuation accuracy of methods and the determination of benchmark multiple for valuation. The conclusions of different studies are different. This study is an attempt to address all the above issues in the context of Indian capital markets. The objectives of this study are as follows:

❖ To analyse the relationship between multiples and its determinants

❖ To identify multiples that have superior explanatory value and

❖ To arrive at multiples that have better valuation accuracy when compared with other multiples

Relative valuation multiples and its determinants

Description and classification of multiples used for valuation id given along with respective determinants.

Relative valuation multiples

Valuation of equity using multiples involves 3 major steps. Firstly, a value driver like Earnings or book value or sales is selected. Then the bench mark multiple is calculated for a comparable set of firms. This benchmark multiple is applied to the value driver of the firm to arrive its value. Multiples used for relative valuation can be broadly classified into

following categories based on the value drivers that drive them

Earnings multiples: It is based on the assumptions that earnings like EBIT, EBITDA, and EPS drive value. Value can be interpreted as value of the firm which is measured using enterprise value or value of equity measured using market value of equity. The earnings multiple generally used for valuation include PE, EV/EBIT, EV/EBITDA.

Book value multiples: These multiples are based on the assumption that value of assets or assets owned by an enterprise are key drivers of value. PBV, EV/Book value of assets, EV/Replacement costs are major multiples that fall under this category.

Revenue multiples: The revenue or sales is assumed as key driver of value. We have Market capitalization/ sales or EV/Sales as multiples used for valuation.

Industry specific multiples: Non financial factors like production capacity for manufacturing sectors like cement, steel, etc. , number of clients for service industry like telecom, IT etc. are assumed to be key value drivers. The multiples can be Price/production capacity, EV/production capacity, Price/number of customers etc. depending on the industry or sector.

Definition of multiples used for analysis

This study examines the accuracy of PE, PBV, Mcap to sales, EV to sales, EV to EBIT, EV to EBITDA multiples only. The formulae used for calculation of multiples used in this study are given in Table 1.

Determinants of the multiples

The first part of this study attempts to ascertain the relationship between the value multiples and its key determinants. Though a multiple-based approach does not involve explicit projections and present value calculations, it relies on the same underlying principles of more comprehensive valuation approaches: value is an increasing function of future payoffs and a decreasing function of risk (Liu et. al., 2002). Thus, valuation multiples are also affected by fundamental factors that affect the value of a firm viz. its earning capacity, risk and potential for growth (Koller et. al., 2002). These factors can be measured using net profit margin, beta (measure of market risk) and EPS growth. Given that two firms have similar size and returns, a firm that is likely to grow faster than the other is likely to command a higher PE in the market. Understanding the distribution of the multiples across companies and across time periods and the factors (fundamentals) that cause the multiples to change are essential prerequisites to choice of multiples for valuations. Damodaran (2006) outlines the determinants of multiples as follows:

$$PE = f \text{ (Growth, Payout ratios, Risk)} \ldots\ldots\ldots\text{(i)}$$

$$PBV = f \text{ (Growth, Payout ratios, Risk, ROE)} \ldots\ldots\ldots\text{(ii)}$$

$$P\_Sales = f \text{ (Growth, Payout ratios, Risk, ROE, Net profit Margin)} \ldots\ldots\ldots\ldots\text{(iii)}$$

In the above equations,

Growth is defined as the growth in earnings per share given by (EPS_1- EPS_0/

Table 1: Multiples and their respective calculations

Multiple	Formulae	Calculation details
PE – Price earnings ratio	Market price per share(MPS) /Earnings per share(EPS)	MPS- the adjusted* closing price of the share as on the on the year end is taken. The EPS for the year after adjusting for extraordinary i tems is taken to calculate the current PE for the company.
PBV – Price to book value	Price per share/Book value per share	Monthly Adjusted Price is the price of the share as on the year end. Adjusted* Book v alue per share is obtained by Networth/ Numb er of outstanding s hares from the balance sheet as on year end.
Mcap/sales – Market capitalizati on to sales	Market capitalization/Sales	Adjusted market capitalisation as on the year end is taken. The sales for the year under consideration are taken.
EV/sales – Enterprise value on sales	Enterprise value/Sales	EV = Market value of equity + Market (Book) value of Debt. The sales for the year under consideration is taken
EV/EBIDTA	Enterprise value/EBIDTA	EV = Market value of equity + Market (Book) value of Debt. EBITDA – after adjusting for extraordinary items is considered.
EV/EBIT	Enterprise value/EBIT	EV = Market value of equity + Market (Book) value of Debt. EBIT – after adjusting for extraordinary items is considered

* All values are adjusted for stock splits, bonus issue as applicable

EPS_0), Payout ratio is the ratio of DPS to EPS (DPS/EPS).

The risk is measured in terms of beta of the stock given by $Covar_{sm}/ Var_m$, The beta for each stock is calculated using the daily returns data benchmarked against the BSE sensex daily returns for the period of trailing twelve months.

ROE is the return on Equity given by Earnings available to ordinary share-holders/Networth, and Net profit Margin is the earnings available to ordinary shareholders/Sales.

The performance of enterprise value multiples such as EV_EBIT and EV_EBITDA in addition are affected by debt-equity

ratio. A company with zero debt commands higher EV_EBITDA multiples and prices when compared to companies with debt. Debt to equity ratio is also included as one of the determinants of relative multiples of stocks.

Research Design

A description of the method followed to ascertain the determinants of multiples and identification of multiples that have superior accuracy for valuation is given. In addition the sample size and data, sources are also explained.

Methodology for ascertaining significant determinants

The method followed for arriving at significant determinants of multiples is regression. Using regression method will help in determining specific factors that cause the multiples to change. The regression equation so arrived at (if found suitable) can be used to predict the benchmark multiples for valuation purposes in the second stage of analysis in this paper. Finally, firms with similar significant determinants can be grouped into meaningful comparable list of companies for valuation. The following multiple regressions are carried out for each of the relative value multiples explained in Table 1:

Relative value multiple$_{it}$ = α + $\beta_i X_{it}$ + ε

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Where α represents the intercept,

$\beta_i X_{it}$ comprise of determinants EPS growth, beta, ROE, debt_equity ratio and margin along with their respective

Beta coefficients for stock "i" at time period "t"

Relative value multipleit represents the relative multiples PE, PBV, Mcap_Sales, EV_sales, EV_EBIDT, and EV_EBIT for stock "i" at time period "t"taken one at a time.

It is expected that stocks with high EPS growth rate, high ROE, high Net profit margins and low risks are expected to have higher multiples when compared to others. Further, with respect to debt equity ratio companies with zero debt are expected to have lower risk and command better prices than those with higher debt equity ratio.

Determination of multiples with superior explanatory value

The second stage of the analysis aims at ascertaining the multiples that have superior explanatory value with respect to share prices. BSE_CLOSE_PRICE is used as the dependent variable.The multiples PE, PBV, Mcap_Sales, EV_sales, EV_EBIDT, and EV_EBIT are the explanatory variables. Since valuation is done using any one of the above multiples univariate regressions of the BSE_CLOSE_Price with each of the above variables is done. This will help to ascertain multiples that are individually capable of better explaining variations in stock prices. Further, the multiples arrived at above include book value based, earnings and revenue multiples. Book value is the balance sheet value of equity investments into assets that generate earnings. Earnings are the income statement value of what returns the business has earned using these assets. Penman (1997) opines that

"though both value drivers are related, the information content provided by these drivers are different. Considering both these together makes sense". Taking in to account the view, pairwise regressions of BSE_Close_Price with PBV and each of the equity based and enterprise value based earnings and revenue multiples is done. The following regressions are carried out:

$$\text{Price}_{it} = \alpha + \beta_i \text{ (Relative Value multiples}_{it}) + \varepsilon \qquad \ldots\ldots\ldots\ldots(v)$$

Where Price$_{it}$ is the adjusted closing price of stock "i" at time period "t" and the Relative value multiples include PE, PBV, Mcap_Sales, EV_Sales, EV_EBIDT, and EV_EBIT for stock "i" at time period "t" taken one at a time.

This is followed by bivariate regressions where Price is regressed against PBV and each of the relative multiples viz PE, Mcap_Sales, EV_sales, EV_EBIDT, and EV_EBIT for stock "i" at time period "t".

Evaluating the accuracy of relative multiples

The accuracy of PE, PBV, Mcap_Sales, EV_Sales, EV_EBIDT, and EV_EBIT are evaluated. The comparable company set is arrived at based on the results of regression of value drivers on the multiples. Then estimated or target stock price for each period is arrived at using the mean, the median and the harmonic mean of the value drivers of comparable companies. Different authors on the subject have expressed different opinions on the central tendency measure that can be used to arrive at the benchmark multiple for valuation of comparable companies as

detailed in the literature review. This study evaluates the use of all three measures across the comparable sets. The formula used for valuation is given below:

$$\text{Estimated Price}_{it} = \text{(Median/Mean/Harmonic mean)} * \text{(Value multiple}_{it-1}) * \text{Value driver}_t \qquad \ldots\ldots\ldots\ldots (vi)$$

The paper uses the appropriate actual values of value drivers like EPS, Sales, EBITDA, EBIT and book value for the next year to arrive at the value. While valuing companies using PE, PBV the price of the share is arrived at directly using equation (vi). In case of multiples Mcap_Sales, EV_EBITDA, and EV_EBIT the equation (vi) provides estimates of Mcap or EV. Price is estimated using the following formulae respectively:

$$\text{Estimated Price}_{it} = \text{Estimated Mcap/number of shares outstanding}_{t-1} \qquad \ldots\ldots(vii)$$

$$\text{Estimated Price}_{it} = \text{(Estimated EV - net debt}_t)/\text{number of shares outstanding}_{t-1} \qquad \ldots\ldots\ldots\ldots (viii)$$

The pricing errors is quantified using the formula used by most earlier authors like Liu et al (2002), Dragos Ioan Mînjina (2009), etc. as given below:

$$\text{Price error}_{it} = \text{(Estimated price}_{it} - \text{Observed price}_{it}) / \text{Observed price}_{it} \qquad \ldots\ldots\ldots\ldots (ix)$$

The accuracy of the value multiple is evaluated by examining the dispersion of pricing errors. The measures of dispersion used in this study include standard deviation, and inter-quartile range. Value multiples that give the least dispersions are concluded as better

than others.

Sample and data

The data for the purpose of this study includes pharmaceutical sector companies listed in stock exchanges in India. Companies from only pharmaceutical sector are included as it is felt that the companies operating in the same sector will have similar opportunities and risks and are hence more comparable. The top 25 companies in terms of market capitalization are short listed. From this sample, we exclude companies with negative net worth, Earnings per share (EPS), Earnings before interest and Taxes (EBIT) or Earnings before interest, Taxes, Depreciation and Amortization (EBITDA). Further, companies with insufficient data for each quarter are also eliminated. The final sample list consists of 19 large cap companies from Pharmaceutical sector. The list of companies is provided in Annexure I. Quarterly data for the period ending March 2004 to march 2010 is taken. This is effectively converted into yearly data by taking the trailing twelve months (TTM) data from quarterly profit and loss account and balance sheet information. For instance the data for the quarter ended June 2005 is converted into annual data by taking the aggregate of profit and loss account data for 4 quarters of September, 2004, December, 2004, March 2005 and June 2005. The balance sheet information of the quarter ended June 2005 is taken. Thus, for each of the companies we have annual data for 21 periods beginning March 2005 and ending March 2010. Only large cap companies were considered because quarterly data was available consistently only for these most tracked companies.

The financial data is collected from MV Xenius financial database provided by Financial Technologies. The prices of shares is collected from the BSE website and adjusted for the period of study for corporate actions like stock splits and bonus issue if any.

Data analysis and valuation is done using Microsoft excel and SAS version 9.1.3.

Analysis and its implications

The analysis of determinants of the multiples was first done which is followed by ascertainment of multiples that are most accurate and better relate to share prices.

Analysis of determinants of multiples

An attempt is made to understand the distribution of the multiples in the sector across time. Figure 1 shows the trend of the quarterly mean multiples for the sector across the period of the study.

An analysis of the trendlines in figure 1 shows that PE, EV_EBIT AND EV_EBITDA fall within a range of 13-25 for the sector. However, PBV, Mcap_sales and EV_sales are distributed in a range of 3.25-4.97. In the last four quarters from 2009-03 to 2010-03 the entire sectors mean multiples have shown consistently increasing trend. The trend line of the Mcap_sales and EV_sales seem to overlap each other. The correlation coefficients of the multiples are given in Table 2.

From the correlation coefficient matrix, it is seen that Mcap_sales and EV_Sales are having a correlation coefficient of

Figure 1: Mean multiples of the sector for the period 200503-201003
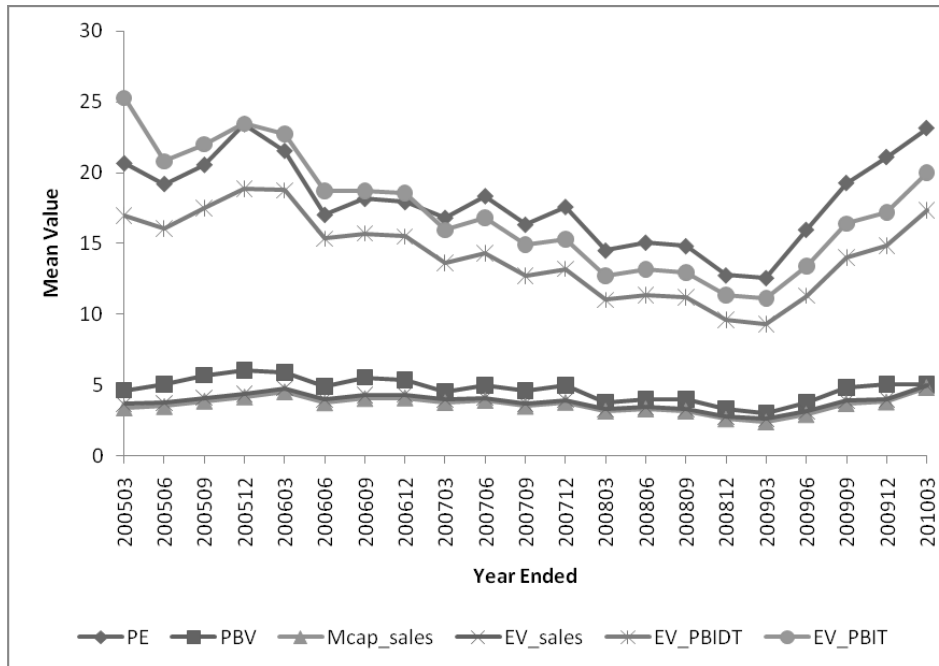
Table 2: Summary statistics and correlation coefficient matrix of relative value multiples

	BSE_Close _Price	PE	PBV	Mcap_ sales	EV_ sales	EV_EBIDT	EV_EBIT
BSE_Close	1						
PE	0.256	1					
PBV	0.355	0.699	1				
Mcap_sales	0.209	0.678	0.704	1			
EV_sales	0.159	0.677	0.692	0.995*	1		
EV_EBIDT	0.011	0.830	0.577	0.789	0.817*	1	
EV_EBIT	-0.073	0.724	0.384	0.577	0.610	0.913*	1

* indicates high correlation

....

0.99 which is very high. Similarly, the correlation coefficient of EV_EBIDT with PE, EV_Sales and EV_EBIT multiples is very high. Hence including two or more of the above variable as explanatory factors in multiples regressions is not expected to give better results.

Similar analysis of the determinants of the multiples is shown in figure 2. From the figure it can be seen that the determinants of the multiples like EPS growth, and ROE show a marginal increase till 2010-01 but then falls slightly in the last quarter. Net profit margin is stable. The beta for the pharmaceutical company stocks is generally found to be less than 1 indicating low market risk. In the first 3 quarters the mean beta of the stocks is found to be ranging between1.04 to 1.23. After this period, the mean beta of the stocks for the sector has fallen. In the last few quarters, it has fallen consistently indicating fall in market risk associated with the sector stocks. In the period after the sub-prime crisis, Indian markets also fell and there was uncertainty with respect to perfor-mance of stocks in sectors like banking, IT etc. The pharmaceutical sector is insulated from such risks. During this period the S&P Pharma Index has shown a consistent increase. The sector stocks have also performed well possibly because of more demand and low market risk as measured by beta.

Six different regressions are done to understand the impact of determinants on the multiples viz. PE, PBV and

Figure 2: Mean value of factors determining the multiples for the period 200503 - 201003
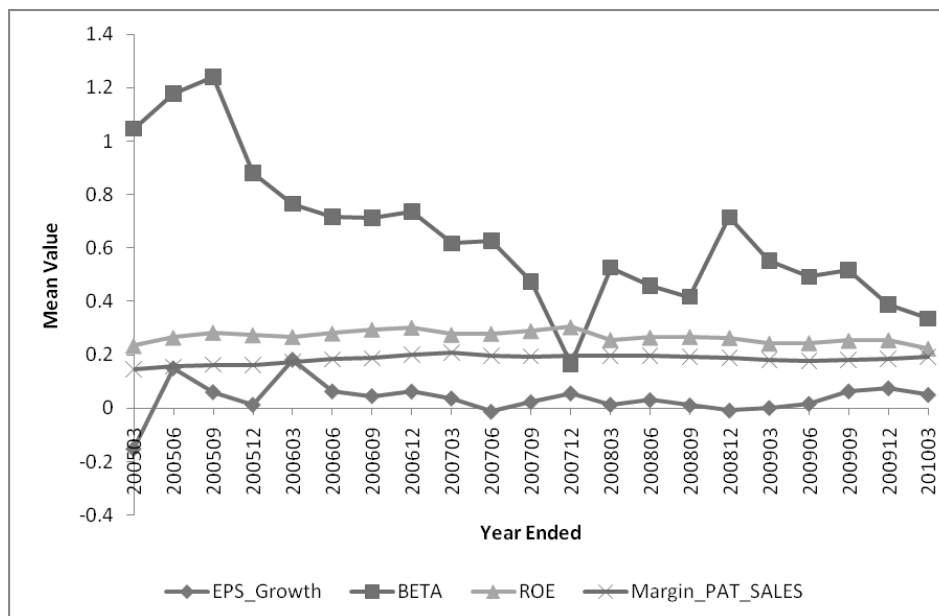
Mcap_Sales, EV_Sales, EV_EBITDA, EV_EBIT. The summary results of the regressions are given in Table 3.

From the table it can be seen that the R square of the regression of PE multiple on it determinants is as low as

Table 3: Summary results of regression of different relative multiples on determining factors

DEPENDENT VARIABLE		INTERCEPT	EPS GROWTH	BETA	NET PROTT MARGIN	ROE	DEBT_ EQUITTY	MODEL R^2
PE	Coefficient	14.598*	-4.815	1.502	19.277	-8.855	4.508*	0.075
	P value	<.0001	0.072	0.121	0.003	0.098	<.0001	
PBV	Coefficient	-1.321	-1.086	0.627	5.397	16.398*	0.935*	0.387
	P value	0.003	0.137	0.018	0.003	<.0001	0.001	
MCAP/SALES	Coefficient	-1.051*	-0.573	0.483	24.437*	-2.766	2.144*	0.559
	P value	0.001	0.270	0.011	<.0001	0.008	<.0001	
EV/SALES	Coefficient	-1.071*	-0.590	0.516	25.374*	-3.402*	2.748*	0.591
	P value	0.001	0.262	0.007	<.0001	0.001	<.0001	
EV/EBIDTA	Coefficient	8.017*	-1.685	2.709	33.980*	-18.337*	10.402*	0.395
	P value	<.0001	0.387	0.000	<.0001	<.0001	<.0001	
EV/EBIT	Coefficient	14.648*	-4.086	3.765*	25.033*	-32.884*	14.694*	0.355
	P value	<.0001	0.175	0.001	0.001	<.0001	<.0001	

* indicates that factor is significant

7% though the regression fit is found to be significant based on its F value. Significant determinants of PE are found to be debt-equity ratio and net profit margin. Both are positively related to PE.

Regression of PBV on its determinant factors has an R square of 38%. Net profit margin, debt equity ratio and ROE are significant. All of them are positively related to PBV.

Regression of Mcap_sales shows that Net profit margin, ROE and debt equity together explain 55% of its changes. While margin and debt equity are positively related to Mcap_sales, ROE coefficient is negative.

The net profit margin, ROE, Beta and

debt equity ratio explain 59% of variation in EV_Sales and all of them expect ROE are positively related to EV_Sales.

EV_EBITDA has beta, margin, ROE and debt equity as significant explanatory factors that explain 39% its variation. All are positively related to EV_EBITDA.

Except EPS_growth all other factors are found to be significant determinants of EV_EBIT. The following conclusions can be drawn from the analysis

❖ EPS_growth and beta are least significant determinant factors with respect to all the multiples.

❖ Debt_equity and margin are found to be significant across all the relative

multiples.

❖ ROE is significant across all except PE multiple.

On the basis of the above results, it is decided that two sets of comparable companies for valuation is formed as given below:

❖ Comparable company Set I: All large cap companies together. The sample set of 19 companies consists of large cap companies from the pharmaceutical sector. Valuation of equity is done using the mean, median and harmonic mean multiple of the entire sample set which may be called as the industry benchmark. List of this set of companies is provided in Annexure I.

❖ Comparable company Set II: Companies with similar range of ROE and net profit margin are grouped together. The average ROE and net profit margin of the sample is taken. Companies are further grouped into comparable sets as follows:

Set II A: This set shall include companies with better than average ROE and net profit margin.

Set II B: This shall comprise of companies with better than average ROE or net profit margin.

Set II C: This set includes the residual set of companies that have less than average ROE and net profit margin.

The list of companies included in each of the sets II A, B and C are given in Annexure II.

Under each of the above sets of companies valuation is done using mean, median and harmonic mean of each of the 6 multiples included in the study for ascertainment of valuation accuracy.

Ascertaining multiples with higher explanatory value than others

The results of the regressions are given in Table 4.

Uni-variate regression of prices with equity and enterprise value drivers shows that all equity based multiples are significant with PBV explaining up to 12% of variations in stock prices followed by PE that explains up to 6% of variations. All enterprise value multiples are found to be insignificant.

The results of the bi-variate regressions actually reveal that combination of PBV with the multiples of PE and Mcap_ sales does not add any explanatory value however combination of PBV with EV_EBIDT and EV_EBIT results in increasing the explanatory power of the regression to 18% and both the variables are found to be positively related to Prices and are significant.

Hence, it is felt that combinations of book value multiples with earnings multiples can result in better prediction of prices than use of single multiple based valuations. Similar conclusions are drawn by Penman (1997).

Evaluating the accuracy of multiples

Valuation is done for each of the sets of comparable companies as described in the research design using mean,

Table 4: Summary results of individual and pair-wise regressions of multiples with prices

DEPENDENT VARIABLE		INTERCEPT	PE	PBV	MCAP_SALES	EV_SALES	EV_PBIT	EV_PBIDT	MODEL R²
PE	Coefficient	248.655*	10.570*						0.066
	P value	<.0001	<.0001						
PBV	Coefficient	232.612*		43.485*					0.126
	P value	<.0001		<.0001					
MCAP/SALES	Coefficient	326.589*			30.618*				0.044
	P value	<.0001			<.0001				
EV/SALES	Coefficient	353.327*				22.144*			0.025
	P value	<.0001				0.001			
EV/EBIDTA	Coefficient	431.315*						0.489	0.000
	P value	<.0001						0.831	
EV/EBIT	Coefficient	476.792*					-2.237		0.005
	P value	<.0001					0.144		

DEPENDENT VARIABLE		INTERCEPT	PE	PBV	MCAP_SALES	EV_SALES	EV_PBIT	EV_PBIDT	MODEL R²
PE	Coefficient	226.909*	0.703	42.023*					0.1259
	P value	<.0001	0.795	<.0001					
MCAP/SALES	Coefficient	242.649*		50.364*	-11.671				0.129
	P value	<.0001		<.0001	0.228				
EV/SALES	Coefficient	254.408*		57.509*		-22.973			0.14
	P value	<.0001		<.0001		0.011			
EV/EBIDTA	Coefficient	324.269*		64.019*			-13.271*		0.182
	P value	<.0001		<.0001			<.0001		
EV/EBIT	Coefficient	306.944*		55.028*				-7.488*	0.1771
	P value	<.0001		<.0001				<.0001	

* indicates that factor is significant

median and harmonic mean of the comparable companies. The results of the analysis and its implications are given below.

Analysis of performance of multiples of Set I comparable companies

The mean, median and harmonic mean of the equity and enterprise value multiples for each of the 21 periods for the entire sample set of 19 companies is ascertained. The estimated price for each company for each of the 21 periods is arrived at using forward value drivers of the multiples. The price estimate so arrived at is compared with the actual market price for the period to arrive at price errors. The measures of dispersion for percent price error, for each multiple calculated is given in Table 5.

The entire median values of percent pricing errors are calculated using either the median or harmonic mean multiples as benchmark is negative. This implies that using median or harmonic mean of value drivers for prediction, results in under valuation of shares. The median values of percent pricing errors arrived at using mean multiples as benchmark is all positive. This indicates that using mean of value drivers for valuation results in over valuation of shares. Further, under all three methods the least standard deviation of errors is found when PE and PBV multiples are used for valuation. This is consistent with the results of regression of prices on multiples in the earlier section. An examination of the inter-quartile range shows the least dispersion of errors for PE and EV_EBIDT. A comparison of dispersions across the methods shows that using harmonic mean for valuation

results in least pricing errors (0.66<0.74<0.83). From the above analysis it can be concluded that PE is the best multiple followed by PBV and EV_PBDIT for set I.

Analysis of performance of multiples of Set II comparable companies

The results of the deviations of the Set II A, II B and II C companies are given in table 6.

For Set II A comparable companies, the median values of percent pricing errors calculated using median are negative for all multiples except PBV and EV_SALES. All the median percent pricing errors across all multiples are negative when harmonic mean is used as benchmark multiple. Hence, using median or harmonic mean as bench-mark results in under valuation of shares across most multiples. However, the median values of percent pricing errors are positive when mean is used as benchmark. This indicates that using mean results in overvaluation of shares. The standard deviations of pricing errors are least for PE and PBV multiples. The inter- quartile ranges of PE, PBV and Mcap_sales multiples are least. Using harmonic means results in lower errors when compared to other two methods.

In case of Set II B companies also the results show that using median and harmonic mean results in under valua-tion of shares and using mean results in overvaluation of shares. Examination of the standard deviations shows that PE and Mcap_sales result in lower pricing errors. Inter- quartile ranges however lead to the conclusion that using PE and EV_EBIDT results in lower pricing errors. As in case of other sets, here also it is seen

Table 5: Prediction errors of Set I comparable companies using median, mean and harmonic mean

Variable	Mean	Std Dev	N	Mini-mum	Maxi-mum	Median	Lower Quartile	Upper Quartile	Quartile Range
MEDIAN									
PE	0.051	0.561*	399	-0.817	2.835	-0.071	-0.355	0.389	0.743*
PBV	0.133	0.820**	399	-0.881	6.614	-0.078	-0.423	0.478	0.901
MCAP_SALES	0.186	0.856	399	-0.924	7.877	-0.005	-0.407	0.571	0.978
EV_SALES	0.448	1.627	399	-0.958	12.633	0.063	-0.365	0.741	1.106
EV_PBIDT	0.152	0.953	399	-0.980	13.397	-0.002	-0.360	0.460	0.820*
EV_PBIT	0.196	1.003	399	-0.971	13.648	0.003	-0.387	0.512	0.899
MEAN									
PE	0.215	0.634*	399	-0.788	3.171	0.087	-0.265	0.566	0.831*
PBV	0.438	0.998**	399	-0.840	7.461	0.186	-0.248	0.858	1.107
MCAP_SALES	0.459	1.085	399	-0.905	10.096	0.207	-0.286	0.924	1.210
EV_SALES	0.484	1.113	399	-0.936	10.388	0.233	-0.286	0.920	1.206
EV_PBIDT	0.362	1.119	399	-0.970	16.060	0.202	-0.248	0.738	0.986**
EV_PBIT	0.431	1.139	399	-0.965	15.230	0.201	-0.248	0.860	1.108
HARMONIC MEAN									
PE	-0.013	0.513*	399	-0.820	2.454	-0.118	-0.402	0.266	0.668*
PBV	0.068	0.761**	399	-0.883	5.953	-0.109	-0.444	0.400	0.844
MCAP_SALES	0.038	0.769	399	-0.932	6.901	-0.143	-0.497	0.357	0.854
EV_SALES	0.054	0.790	399	-0.964	7.130	-0.123	-0.485	0.384	0.869
EV_PBIDT	0.078	0.898	399	-0.982	12.680	-0.052	-0.411	0.370	0.782**
EV_PBIT	0.112	1.099	399	-0.995	16.572	-0.092	-0.424	0.401	0.825

* indicates least deviation   ** indicates second least deviation

Table 6 - Set II A: Comparable companies including companies with ROE and Margin above

Variable	Mean	Std Dev	N	Mini-mum	Maxi-mum	Median	Lower Quartile	Upper Quartile	Quartile Range
MEDIAN									
PE	0.097	0.488**	84	-0.690	1.428	-0.002	-0.269	0.400	0.670**
PBV	0.122	0.452*	84	-0.549	1.336	0.053	-0.260	0.340	0.601*
MCAP_SALES	0.185	0.717	84	-0.956	2.504	-0.003	-0.291	0.382	0.673
EV_SALES	0.211	0.764	84	-0.954	2.679	0.046	-0.289	0.454	0.743
EV_PBIDT	0.336	0.856	84	-0.933	2.922	-0.014	-0.323	0.891	1.215
EV_PBIT	0.330	0.884	84	-0.938	3.191	-0.017	-0.336	0.965	1.301
MEAN									
PE	0.132	0.499**	84	-0.717	1.395	0.018	-0.231	0.416	0.647*
PBV	0.153	0.473*	84	-0.521	1.278	0.081	-0.241	0.438	0.679
MCAP_SALES	0.220	0.812	84	-0.941	3.724	0.009	-0.269	0.395	0.664**
EV_SALES	0.243	0.851	84	-0.940	3.813	0.047	-0.300	0.456	0.755
EV_PBIDT	0.382	0.873	84	-0.933	2.887	0.013	-0.281	0.946	1.227
EV_PBIT	0.494	1.007	84	-0.926	3.989	0.094	-0.261	1.202	1.463
HARMONIC MEAN									
PE	0.012	0.444**	84	-0.736	1.285	-0.077	-0.307	0.286	0.593
PBV	0.032	0.396*	84	-0.556	1.031	-0.016	-0.294	0.248	0.542*
MCAP_SALES	0.029	0.635	84	-0.955	2.589	-0.153	-0.361	0.211	0.572**
EV_SALES	1.217	5.656	84	-0.954	33.730	-0.254	-0.420	0.263	0.683
EV_PBIDT	0.085	0.687	84	-0.948	2.025	-0.198	-0.431	0.541	0.972
EV_PBIT	0.096	0.734	84	-0.950	2.544	-0.189	-0.488	0.564	1.052

* indicates least deviation   ** indicates second least deviation

Table 6 - Set II B: Comparable companies including companies with ROE or Margin above

Variable	Mean	Std Dev	N	Minimum	Maximum	Median	Lower Quartile	Upper Quartile	Quartile Range
MEDIAN									
PE	-0.047	0.533**	84	-0.821	1.882	-0.135	-0.429	0.184	0.613*
PBV	0.015	0.658	84	-0.896	1.489	-0.036	-0.618	0.464	1.083
MCAP_SALES	0.005	0.516*	84	-0.773	1.703	-0.013	-0.468	0.349	0.817
EV_SALES	0.057	0.566	84	-0.772	1.912	0.024	-0.461	0.436	0.896
EV_PBIDT	0.116	0.643	84	-0.803	2.598	-0.015	-0.315	0.443	0.758**
EV_PBIT	0.179	0.733	84	-0.790	3.146	0.027	-0.310	0.520	0.830
MEAN									
PE	0.137	0.628*	84	-0.793	2.517	0.042	-0.297	0.431	0.728*
PBV	0.554	1.001	84	-0.802	2.989	0.390	-0.324	1.130	1.454
MCAP_SALES	0.254	0.652**	84	-0.724	2.367	0.276	-0.337	0.656	0.993
EV_SALES	0.266	0.677	84	-0.728	2.471	0.245	-0.330	0.682	1.012
EV_PBIDT	0.175	0.653	84	-0.795	2.589	0.002	-0.280	0.500	0.780**
EV_PBIT	0.211	0.732	84	-0.789	2.919	0.028	-0.262	0.566	0.827
HARMONIC MEAN									
PE	-0.057	0.525**	84	-0.812	1.977	-0.114	-0.443	0.096	0.539*
PBV	0.004	0.672	84	-0.894	1.641	-0.043	-0.608	0.462	1.071
MCAP_SALES	-0.002	0.521*	84	-0.799	1.590	0.011	-0.495	0.309	0.804
EV_SALES	0.399	3.018	84	-0.862	19.344	-0.013	-0.556	0.350	0.907
EV_PBIDT	-0.036	0.543	84	-0.821	2.026	-0.121	-0.423	0.158	0.580**
EV_PBIT	-0.037	0.585	84	-0.818	2.179	-0.136	-0.445	0.203	0.648

* indicates least deviation   ** indicates second least deviation

Table 6 - Set II C: Comparable companies including companies with ROE and Margin below

Variable	Mean	Std Dev	N	Mini-mum	Maxi-mum	Median	Lower Quartile	Upper Quartile	Quartile Range
MEDIAN									
PE	0.035	0.475*	231	-0.639	1.892	-0.054	-0.346	0.366	0.712*
PBV	0.149	0.762	231	-0.717	5.453	-0.007	-0.310	0.409	0.718**
MCAP_SALES	0.209	0.657	231	-0.693	2.746	0.040	-0.253	0.549	0.802
EV_SALES	0.207	0.665	231	-0.740	2.761	0.045	-0.267	0.531	0.798
EV_PBIDT	0.127	0.544**	231	-0.672	1.946	0.008	-0.312	0.468	0.780
EV_PBIT	0.142	0.605	231	-0.682	2.255	0.002	-0.346	0.475	0.821
MEAN									
PE	0.209	0.578**	231	-0.594	2.586	0.121	-0.245	0.543	0.788**
PBV	0.292	0.812	231	-0.649	5.638	0.100	-0.214	0.645	0.859
MCAP_SALES	0.193	0.661	231	-0.722	2.446	0.038	-0.278	0.543	0.821
EV_SALES	0.205	0.660	231	-0.766	2.387	0.038	-0.272	0.551	0.823
EV_PBIDT	0.227	0.576*	231	-0.597	2.437	0.077	-0.212	0.559	0.771*
EV_PBIT	0.311	0.659	231	-0.590	2.661	0.140	-0.187	0.711	0.898
HARMONIC MEAN									
PE	0.002	0.472*	231	-0.656	2.070	-0.104	-0.378	0.278	0.655**
PBV	0.091	0.728	231	-0.699	5.192	-0.095	-0.342	0.316	0.658
MCAP_SALES	0.014	0.584	231	-0.776	2.446	-0.140	-0.402	0.324	0.726
EV_SALES	0.028	0.569	231	-0.811	1.950	-0.111	-0.384	0.259	0.643*
EV_PBIDT	0.057	0.502**	231	-0.660	2.043	-0.058	-0.330	0.352	0.682
EV_PBIT	0.060	0.544	231	-0.677	2.122	-0.072	-0.369	0.371	0.740

* indicates least deviation   ** indicates second least deviation

that harmonic mean gives least pricing errors.

The results of Set II C companies are a little different from the earlier comparable company sets analysed so far. Using median and mean both result in over valuation of shares. Only harmonic mean results in under valuation of shares. Both standard deviation and

inter-quartile range shows that PE and EV_EBIDT are multiples that result in least pricing errors. Even in this set harmonic mean results in least pricing errors.

The ranking of multiples across the different comparable companies is given in Table 7.

Ranking of multiples across the different

Table 7: Ranking of comparable companies by multiples

MEDIAN					
Variable	**Set I**	**Set II A**	**Set II B**	**Set II C**	**Sum**
PE	1	2	1	1	5*
PBV	6	1	4	2	13
MCAP_SALES	3	3	5	5	16
EV_SALES	5	4	6	4	19
EV_PBIDT	2	5	2	3	12**
EV_PBIT	4	6	3	6	19
MEAN					
PE	1	1	1	1	4*
PBV	6	3	3	5	17
MCAP_SALES	4	2	6	3	15
EV_SALES	5	4	5	4	18
EV_PBIDT	2	5	2	2	11**
EV_PBIT	3	6	4	6	19
HARMONIC MEAN					
PE	1	3	1	2	7*
PBV	6	1	4	3	14
MCAP_SALES	4	2	5	5	16
EV_SALES	5	4	6	1	16
EV_PBIDT	2	5	2	4	13**
EV_PBIT	3	6	3	6	18

* Best rank multiple   **Second best ranked multiple

sets of comparable companies is done with rank 1 for the multiple with least pricing errors based on inter-quartile range and rank 6 for the multiple with maximum pricing errors. The sum of the

rankings across methods is used to arrive at the best ranked multiple. Across all methods of valuation PE multiple if found to be the best followed by EV_EBIDT and PBV. EV_EBIT and EV_Sales are the worst

performing multiples. Further, a comparison of the deviations and inter-quartile ranges across set I and set II shows that both the standard deviations and inter-quartile ranges of each of the multiples in Set II companies are lower than that of the Set I companies. Hence, it can be concluded that using ROE and net profit margin as criteria for grouping companies into comparable companies results in better and more accurate valuations. Our results are similar to the results on Alford (1992) and others.

Summary conclusions and scope for further study

The results of the study show that the PE is the best multiple followed by EV_EBIDT and PBV. Consistently across all sets use of harmonic mean results in least percent pricing errors and undervaluation of shares. Using median also generally results in under valuation of shares. Using mean for valuation results in overvaluation of share in most cases. The percent pricing errors are found to be less when companies are grouped into comparable companies based on ROE and net profit margin as criteria. Hence, it can be concluded that grouping companies into comparable sets on the basis of ROE and net profit margin results in better valuations. Using market capitalization and industry grouping alone is less effective for arriving at comparable companies. The scope of this study can be expanded in multiple ways. Firstly, the study can be done by choosing companies across sectors based on the premise that companies with similar growth rates, risk, and return characteristics must enjoy similar valuations in the market. Use of weighted combinations of multiples may result in better

valuations as shown by the results of the regression in this paper. This aspect can be further explored.

Annexure I

List of all companies used in Set I as comparable companies

Sr. no	Company Name s
1	Abbott India Ltd
2	Astrazeneca Pharma India Ltd
3	Aventis Pharma Ltd
4	Cadila Healthcare Ltd
5	Cipla Ltd
6	Dr Reddys Laboratories Ltd
7	FDC Ltd
8	Glaxosmithkline Pharmaceuticals Ltd
9	Glenmark Pharmaceuticals Ltd
10	Ipca Laboratories Ltd
11	Lupin Ltd
12	Merck Ltd
13	Piramal Healthcare Ltd
14	Novartis India Ltd
15	Pfizer Ltd
16	Sun Pharmaceutical Industries Ltd
17	Torrent Pharmaceuticals Ltd

18   Unichem Laboratories Ltd

19   Wyeth Ltd

Annexure II

SET II A - List of comparable companies with both ROE and Net profit MARGIN above average.

Sr. no   Company Name s

1 Glaxosmithkline Pharmaceuticals Ltd

2 Glenmark Pharmaceuticals Ltd

3 Sun Pharmaceutical Industries Ltd

4 Wyeth Ltd

SET II B: List of comparable companies with either ROE or MARGIN above average.

Sr. no   Company Name s

1 Abbott India Ltd

2 Astrazeneca Pharma India Ltd

3 Lupin Ltd

4 Merck Ltd

SET II C - List of companies with both ROE and net profit margin below average

Sr. no   Company Name s

1 Aventis Pharma Ltd

2 Cadila Healthcare Ltd

3 Cipla Ltd

4 Dr Reddys Laboratories Ltd

5 FDC Ltd

6 Ipca Laboratories Ltd

7 Piramal Healthcare Ltd

8 Novartis India Ltd

9 Pfizer Ltd

10 Torrent Pharmaceuticals Ltd

11 Unichem Laboratories Ltd

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APPENDIX - List of abbreviations used in the paper

- ❖ BRICK countries=Brazil, Russia, India, China and Korea

- ❖ BSE= Bombay stock exchange

- ❖ DCF=Discounted cash flow

- ❖ DPS = Dividend per share

- ❖ EBIT/PBIT= Earnings before interest and taxes or Profit before interest and taxes

- ❖ EBITDA/PBITDA= Earnings before interest, income tax, depreciation and amortization or Profit before interest, income tax, depreciation and amortization

- ❖ EPS=Earnings per share

- ❖ EV_EBIDT =Enterprise Value to EBITDA multiple

- ❖ EV_EBIT= Enterprise Value to EBIT multiple

- ❖ EV_sales= Enterprise Value to Sales multiple

- ❖ EV=Enterprise Value

- ❖ FCF = Free cash flow

- ❖ Margin_PAT_SALES= Net profit margin

- ❖ Mcap_sales=Market capitalization to Sales multiple

- ❖ P_sales=price to sales multiple

- ❖ PBV or Price_BV= Price to book value multiple.

- ❖ PCF= Price to cash flow multiple

- ❖ PE=Price Earnings ratio

- ❖ ROE = Return on equity

Cash Dividend Announcements in India: Evidence from Finance Managers

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Abstract:

Cash dividends are probably the most important form of payout policy and a method of delivering value to shareholders. This paper aims to analyze the results of the survey (using structured questionnaire) on the perception of cash dividends and their announcements by finance managers of dividend-paying firms listed at the Bombay Stock Exchange (BSE). A case for the existence of signaling effects in the stock market in developing economy such as India is made on the basis of the findings. To lend credence to the findings, secondary data were also collated from 2003-2013. The findings reveal that primary motive in India for cash dividend is to attract more investors. Finance managers treat cash dividends as an attractive instrument, thereby increasing the market value of the firm. They express strong support for the signaling theory. The sample companies adopt a conservative approach and emphasize on dividend stability.

Key Words

India, Dividend, Survey, Event Study, Signaling.

Introduction

The finance managers of Indian companies are increasingly becoming proactive with respect to the business and financial decision-making in the wake of globalization, liberalization and privatization. Among these decisions, is the decision to formulate an optimum dividend policy. Various theories and explanations have been put forward to explain the rationale for distributing cash dividends. However, the "best" theory of corporate payout seems far away and largely remains a puzzle (Black, 1976). Hence, the quest for an optimum dividend policy continues to attract the attention of finance managers and researchers/academicians alike.

Various surveys of Chief Financial Officers (CFOs) have attempted to explain the motivations, managerial views and issues behind the dividend policy and the market reaction to such corporate announcements (Baker et al., 1985; Dong et al., 2005; Mc Cluskey et al.2007; Kester and Robbins, 2011). However, based on the literature reviewed, it is apparent that a survey of the views and motivations of Indian finance managers with regard to cash dividends and their announcements largely remains unexplored (to the best

of the authors' knowledge). This survey is a modest attempt to fill this research gap. Further, the survey findings have also been corroborated by secondary data using the 'event study methodology' to lend credence to the survey findings.

The remainder of the paper is structured as follows: Section 1 contains the introduction. Section 2 discusses a brief literature review. Section 3 discusses the research design, data sources and methodology. Section 4 presents the survey results. Section 5 contains concluding observations and implications.

Literature review

Numerous studies conducted (across the world) do not appear to offer a conclusive explanation of the factors that influence a company to pay cash dividends to their shareholders. Feldstein et al. (1983) stated that "the nearly universal policy of paying substantial dividends is the primary puzzle in the economics of corporate finance". This section reviews the pertinent literature on the theories why a firm pays dividend along with the factors and motivations influencing the dividend decision.

Theories on why firms pay dividends

Various theories have been proposed to explain the rationale for distributing cash dividends. Signaling theory is based on informational asymmetry between the mangers and shareholders. Therefore, cash dividends convey positive signals about the company to the investors (Aharony and Swary, 1980). Tax preference theory is based on comparative tax treatment associated with cash received on account of current dividend and cash to be received in future as capital gains arising out of changes in share prices (Elton and Gruber, 1970). Clientele effect theory states that some investors prefer earnings to be paid out as a dividend and other prefer earnings to be retained in the firm (Miller and Scholes, 1978). Agency theory stems from the divergence of interests between managers and shareholders and dividends help to reduce this information asymmetry (Easterbrook, 1984). Life cycle theory argues that firms adjust their dividend policy through time in response to changes in investment opportunities. (DeAngelo et al., 2006). Bird-in-the-hand theory sates that the investors' value dividends more than capital gains and dividends are relevant (Gordon, 1963). Catering theory states that managers pay dividends to investors when they need it, that is, when investors put a stock price premium on payers and do not pay dividends when investors prefer non-payers (Baker and Wurgler, 2004a).

Factors and motivations influencing the dividend decision

Researchers have observed past dividends and current earnings as the major determinants of current dividend decision by the firms (Lintner, 1956; Baker et al., 1985; Baker et al., 2001). However, the studies conducted later noted that the firms also believed in maintaining stable dividends per share and were reluctant to decrease the payout level (Baker and Farrelly, 1988). Further, various empirical surveys were conducted (all across the globe) and found growth in earnings, prior years' dividends, availability of cash, liquidity

constraints and the availability of positive net present value projects as the influencing factors for dividend decision (Pruitt and Gitman, 1991; Baker et al., 2006; Sady et al., 2012).

International Evidences

Various surveys conducted have supported the notion that dividend policy affects share prices, thereby providing evidence of signaling and clientele effects (Baker et al., 1985; Chiang et al., 2006; McCluskey et al., 2007; Kester and Robbins, 2011). A recent survey by Haleem et al. (2011) at Karachi Stock Exchange (KSE) supported the life cycle theory followed by the agency theory, the catering theory, the signaling theory and the residual theory. These findings were in tune with the findings of Baker and Powell (2012). The empirical findings of the positive relationship between stock prices and dividend changes and their announcements were also in line with these survey evidences (Bhattacharya, 1979; Aharony and Swary, 1980; Anwar et al., 2014).

Indian Evidences

The Indian studies are limited within the framework of Lintner's (1956) partial adjustment model and the significant factors involved while formulating dividend decisions. Several empirical studies have discovered Lintner's model to be the best fit explanation for dividend behaviour (Punanandam and Hanumantha, 1966; Krishnamurty and Sastry, 1971; Bhole, 1980; Bhat and Pandey, 1994; Sur, 2005). While others reported investors' preference for dividends, tax structure, profitability and operating activities and clientele effect

as important factors while designing the dividend policy. A latest survey by Saha (2012) also supported the consistency of dividends, thereby supporting the signaling mechanism amongst shareholders.

The uniqueness of this study comes from the fact that it is perhaps the first attempt (to the best of the authors' knowledge) of its kind based on both primary and secondary data evidences at providing the views, motivations and impact behind the cash dividend decisions and their announcements. Therefore, motivated by blend of contradictory evidences in literature regarding the motivational factors and perceptions behind cash dividends, the present survey aims to provide an insight into the Indian stock market.

Methodology, Data Sources and Scope of the Study

The BSE 500 index of the Bombay Stock Exchange (BSE) comprises the top 500 companies listed with the BSE, based on their market capitalization and other considerations. The sample is representative in nature as the BSE 500 companies cover 20 dominant sectors of the Indian economy and represent 93 per cent of the total market capitalization on BSE. The scope of the study is limited to the 422 non-financial companies that announced cash dividends during ten year period 1st April 2003 to 31st March 2013 (as on 7 November 2012, the date of sample selection).

The research instrument for primary data consisted of a questionnaire (Appendix I) based on the earlier surveys on cash dividends (Baker et al., 1985). It was administered to Directors/ Chief Finance

Officers/Company Accountants/Vice Presidents/Managers (Finance) of 422 BSE 500 index companies. The initial response rate was poor; only few companies (twenty two) responded. However, continuous follow-up and e-mails yielded 71 usable responses received out of the 422 sample companies (a 16.8 per cent response rate). Prima-facie, the response rate may be seen as low; however, the number of respondents and the response rate was better when compared to a previous study using a similar method (Trahan and Gitman (1995) had a response rate of 12 per cent). The respondents comprised of General Managers-Finance and Investor Relations (35.21 per cent), Company Secretaries and Deputy General Managers (26.76 per cent), Chairman, Executive Directors and Chief Financial Officers (19.72 per cent) and Vice Presidents and Chief Legal Officers (18.31 per cent). The responses reflect the views of the senior level practitioners /decision-makers, thus, enhancing the credibility of the survey findings.

The relevant data (secondary) were collected from the BSE website for 10 years (2003-2013). The other secondary data sources used to substantiate any missing data were the company's annual reports. The traditional market model as suggested by Brown and Warner (1985) was used to estimate abnormal returns using 'event study methodology' as per Equation 1 is:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + E_{i,t} \tag{1}$$

Where α and β are the estimated parameters, $R_{i,t}$ is the expected return on stock i at time t, $R_{m,t}$ is the corresponding return on the BSE 500 index and $E_{i,t}$ is the error term. The abnormal return (AR) for each day for each firm is then obtained as per the Equation 2:

$$AR_{i,t} = R_{i,t} - (\alpha_i + \beta_i R_{m,t}) \tag{2}$$

Survey Results

The following section presents the results of the survey along with the secondary data results. It lays down the general perception related to corporate payout decisions followed by the views and motives behind the announcements of cash dividends.

Table I: Companies adhering to an explicit target payout ratio

Options	Percentage
Yes	71.83
No	28.17
Total	100

Table I exhibits that nearly three-fourths of the responding companies (71.83 per cent) had an explicit target payout ratio. This indicates the confidence of the sample companies with regard to their expected future earnings as reported by Arnott and Clifford (2003).

Table II: Percentage of earnings (if explicit target payout ratio is followed) paid out as dividends by the sample companies

Percentage of Earning	Percentage
Less than 10 per cent	23.53
10-25 per cent	45.10

Percentage of Earning	Percentage
25-50 per cent	21.57
Above 50 per cent	9.80
Total	100

Table II shows that about half of the companies (45.10 per cent) distributed nearly 10-25 per cent of their earnings as dividends, 21.57 per cent of the sample companies distributed nearly 25-50 per cent of their earnings as dividends while more than one-fifth (23.53 per cent) of the companies distributed less than 10 per cent of their earnings as dividends. It appears that the sample companies rely extensively on earnings to decide and distribute uninterrupted record of dividend payments. The results are thus in tune with the findings of Lintner (1956) model.

Table III: Time- span for the sample companies after which the dividend policy is re-examined

Years	Percentage
1-2 years	36.61
3-5 years	39.44
Any other (please specify)	23.94
Total	100

It was encouraging to note in Table III that nearly two-fifths of the sample (39.44 per cent) re-examined their dividend policy after 3-5 years. Also 36.61 percent re-examined their dividend policy after 1-2 years while the remaining (23.94 per cent) responded saying that their company had no fixed dividend policy.

Table IV: Opinion on whether paying Cash Dividends indicate certainty about the company future earnings prospects?

Options	Percentage
Yes	77.46
No	22.54
Total	100

Table IV reports that nearly 80 per cent of the respondents agreed with the fact that dividend paying companies conveyed the managers' positive expectations regarding the future earnings prospects of the company. The survey findings reflect the stability in the firm's future earnings as well as about the signaling effect associated with the announcements of cash dividends (Baker et al., 1985).

Table V: Impact of cash dividend announcement on stock prices by the sample companies

Options	Percentage
Prices will go up immediately	33.80
Prices will go up gradually over time	52.11
Prices do not change at all	9.86
Prices will decline	4.23
Total	100

Table V supports the fact that market uses dividend announcements as information for assessing security value and that dividend payment provide a 'signaling device' of future company prospects (Aharony and Swary, 1980; Baker et al., 1985).

Table VI: Impact of global financial crisis on cash dividend announcement by the sample companies

Options	Percentage
Yes	29.58
No	70.42
Total	100

The results in Table VI are encouraging as the cash dividend practices of nearly three-fourths of the sample companies (70.42 per cent) are not affected by the financial crisis. This could perhaps be due to the fact that Indian companies follow a stable dividend policy and are highly concerned with dividend continuity.

Motives behind Cash Dividends

The respondent companies were asked to select the three most important motives behind paying cash dividends, in order of priority. A weighted index was calculated for each motive for the purpose of ranking as per Equation 3. Using this index the statements were ranked in descending order.

$$\text{Index} = \frac{[(\text{Primary motive} \times 3) + (\text{Secondary motive} \times 2) + (\text{Tertiary motive} \times 1)]}{6} \quad \dots \dots \dots (3)$$

Notes: The Weighted Score= [{(Rank 1 x 3) + (Rank 2 x 2) + (Rank 3 x 1)} / 6]

Table VII reports the choices made by the respondents regarding the primary, secondary and tertiary motives for cash dividends. The top three motives are listed below in descending order:

i. Cash dividends attract more investors (Primary motive).

ii. Cash dividends gain attention from the investment community (Secondary motive).

iii. Cash dividends increase the total market value of a firm (Tertiary motive)

Thus, the above findings corroborate the empirical findings that cash dividend announcements affects share value and have informational content (Anwar et al., 2014). They convey a positive and stronger future outlook for the company, thus supporting the signaling theory of dividends (McCluskey et al., 2007). In addition to the stated motives, the respondents also mentioned certain other motives (listed below):

● Cash dividends are a means for service to society.

● Cash dividends provide consistent cash flows.

● Cash dividends provide fair return to investors.

● Cash dividends provide fair return to investors.

● Cash dividends protect interest of stakeholders.

Table VII: Management's view of motives behind cash dividend announcement (Ranks 1, 2 and 3 only)

Motive Number	Motives	Primary motive	Secondary motive	Tertiary motive	Weighted Index	Rank
1	Attract more investors	18 (25.40%)	6 (8.50%)	21 (29.60%)	14.50	1
2	Gain attention from the investment community	5 (7.00%)	21 (29.60%)	6 (8.50%)	10.50	2
3	Increase the total market value of a firm	33 (46.50%)	6 (8.50%)	13 (18.30%)	9.00	3
4	Provide informational content for assessing profitability	5 (7.00%)	13 (18.3%)	10 (14.10%)	8.50	4
5	Reduce volatility of stock price	3 (4.20%)	13 (18.30%)	11 (15.50%)	7.70	5
6	Enhance liquidity	3 (4.20%)	11 (15.50%)	10 (14.10%)	6.80	6
7	Any other (please specify)				2.30	7
	- Service to society	1	-	-	-	
	-Consistent cash flow s	1	-	-	-	
	-Fair return to investors	1	-	-	-	
	-Protect interest of stakeholders	1	1	-	-	
	-Improve return on equity and return on net worth	(5.60%)	(1.40%)	(0.00%)		

- Cash dividends improve return on equity and return on net worth.

Views on Issues involving Cash Dividend

The respondents provided their general views on thirteen close-ended opinion statements concerning cash dividends on a five-point Likert scale ranging from strongly agree to strongly disagree (SA, A, No, D and SD), where SA=Strongly Agree (5), A=Agree (4), NO=No opinion (3), D=Disagree (2) and SD=Strongly Disagree (1). The numbers indicated in (brackets) denoted the score accorded to that particular choice. Based on this, an index was constructed for the statements conveying 'agreement' and 'disagreement'. This was done by summing 'strongly agree' and 'agree' on one side and 'strongly disagree' and 'disagree' on the other.

Table VIII reveals five statements for which more than four-fifths (80 per cent) of the respondents have shown their agreement. The table also provides the ranking for these thirteen statements based on their respective means and standard deviation. The statements are ranked in descending order of their mean. The statements with the same mean score are ranked according to the descending values of standard deviation (example for statements 4 and 12). The five top ranking statements are listed below in descending order:

i. Cash dividend creates positive psychological impact on investor.

ii. Cash dividend makes the stock more attractive to the investor.

iii. Cash dividend provides a "signaling device" of future prospects of the firm.

iv. Money talks! An indication that the firm is doing well.

v. Management should be responsive to the shareholders' preferences regarding dividend.

The high level of agreement with these statements is not surprising given that the goal of the firm is to maximize shareholders' wealth by maximizing stock price and value of the firm. This finding is also in congruence with the finding where 'increasing the value of the firm' has been ranked as the tertiary motive by the sample companies.

The survey findings shows that Indian finance managers support the informational and signaling hypothesis of dividend theory and formulate their dividend policy in accordance with Linter's (1956) model. A positive price reaction to dividend changes support Black's (1986, p.535) suggestion; "I think we must assume that investors care about dividends directly".

Empirical Findings

Table IX shows that the positive returns from day three onwards up to day five could be explained through the signaling effect and also through the tax clientele effect, both indicating that shareholders view dividend payments positively (Anwar et al., 2014).

Conclusions and Implications

A number of neoteric findings have emerged from the study. Based on the survey evidence, it can be concluded that Indian companies place more

Table VIII: Management's views on cash dividend statements under five-point Likert scale from strongly agree to strongly disagree (1.Strongly Agree, 2. Agree, 3. No Opinion, 4. Disagree, 5. Strongly Disagree)

Statement Number	Statement	Agree (1 &2) (%)	No Opinion (3) (%)	Disagree (4 & 5) (%)	Mean	Standard Deviation	Rank
5	Creates positive psychological impact on investors	92.90%	2.80%	4.30%	4.13	0.85	1
2	Make the stock more attractive to the investor	87.30	2.80	9.90	4.06	0.74	2
1	Provides a "signaling device" of future prospects of the firm	82.00	7.04	11.30	3.85	0.77	3
6	Money talks! An indication of the firm is doing well	74.60	15.50	9.90	3.79	0.66	4
11	Management should be responsive to shareholders' preferences regarding dividend	73.30	21.10	5.60	3.86	0.63	5
3	Increases the total market value of a firm's stock	67.60	18.30	14.10	3.73	0.53	6
13	Perception of low risk associated with paying stocks	64.80	19.70	15.50	3.55	0.65	7
10	Stockholders prefer cash dividend to stock dividend	52.20	19.70	28.10	3.32	0.40	8
4	Maintains the stock price	50.70	30.90	18.40	3.34	0.55	9

Table IX. Average Abnormal Return (AAR), Cumulative Average Abnormal Return (CAAR) and their corresponding t-statistic values on and around Cash Dividend Announcements during the period 2003-2013

Days	(AAR) (%)	t –statistic	CAAR (%)	t-statistic
-5	0.03	0.209	0.28	0.367
-4	0.08	0.579	0.36	0.471
-3	0.04	0.310	0.40	0.527
-2	0.11	0.795	0.51	0.670
-1	-0.05	-0.373	0.46	0.602
0	0.14	0.992	0.60	0.781
1	-0.02	-0.163	0.58	0.751
2	-0.01	-0.054	0.57	0.742
3	0.10	0.717	0.67	0.871
4	0.04	0.287	0.71	0.922
5	0.01	0.069	0.72	0.935

emphasis on the importance of dividend stability and practice conservative dividend policy. The finance managers' opinion supports strongest agreement with cash dividend creating psychological impact on investors. This finding corroborates the motive to attract more investor as the primary motive among finance managers. Perhaps, the managers believe that cash dividends provide a positive impact on the firm's future prospects and increase the total market value of the firm. Also the respondents seem to believe that dividend policy affects share value, as evidenced by the importance attached to dividend policy in maintaining stock price. The Indian finance mangers are likely to believe that dividends serve as a signaling device regarding the future prospects of a company and dividend paying stocks are relatively less risky. The same is confirmed by empirical findings (Refer Table IX).

In sum, these results would provide an insight into the corporate practices and

the extent to which the Indian managers use the assumptions, models and decision rules generated and taught by academicians in making financial decisions.

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Annexure I

Questionnaire

Cash dividend Announcements in India: Evidence from Finance managers

Purpose: The purpose of the study is to ascertain the views and motivations of the managers of Indian corporates' for cash dividends. Your response would be extremely beneficial to complete the research work. The information provided by you will be kept confidential and reported only in summary form without disclosing the identity of your firm.

Though we would appreciate your response to all questions, you may find a few questions of sensitive nature; we appreciate your constraints of non-response to such questions.

Personal Details

Name

Company

Designation

Years of Experience

Flow of questions: Section A commences with the basic information about the company. Sections B and C relate to (i) corporate payout decisions and (ii) the views and motivations of the managers of Indian corporates' for cash dividends.

Section A-Background Information

1. What is the principal nature of business of your organization? (Please mark '*' as applicable)

a) Chemicals [ ]

b) Metals [ ]

c) Media [ ]

d) Oil and Gas [ ]

e) Media [ ]

f) Power [ ]

g) Textile [ ]

h) Miscellaneous [ ]

i) Agriculture [ ]

j) FMCG [ ]

k) ICT [ ]

l) Telecom [ ]

m) Capital Goods [ ]

n) Diversified [ ]

o) Healthcare [ ]

p) Housing [ ]

q) Telecom [ ]

r) Tourism [ ]

s) Transport [ ]

t) Any other (please specify)

Section B- Views on Cash Dividend

2. (A) Does your firm have an explicit

target payout ratio?

Yes [ ] No [ ]

(B) If yes, please specify the percentage of earnings paid out generally as dividends by your company

a. [ ] Less than 10%

b. [ ] 10-25%

c. [ ] 25-50%

d. [ ] Above 50%

3. How often your firm re-examine its dividend policy?

a. [ ] 1-2 years

b. [ ] 3-5 years

c. [ ] Any other (please specify)

4. Do you think that dividend-paying stocks offer more certainty about the companies' future earnings prospects compared with stocks that do not pay dividends?

Yes [ ] No [ ]

5. Suppose there is a dividend increase announcement, which of the following statement about share prices is most accurate?

a. [ ] Prices will go up immediately.

b. [ ] Prices will go up gradually over time.

c. [ ] Prices do not change at all.

d. [ ] Prices will decline.

6. Has the current global financial crisis affected your firm's most cash dividends announcements?

Yes [ ] No [ ]

7. From the following list of motives, rank the three most important motives (only three) in order of their priority(Rank 1, 2 and 3 only)

	Rank 1	Rank 2	Rank 3
a. Attract more investors	[ ]	[ ]	[ ]
b. Gain attention from the investment community	[ ]	[ ]	[ ]
c. Increase the total market value of a firm	[ ]	[ ]	[ ]
d. Provide informational content for assessing profitability	[ ]	[ ]	[ ]
e. Reduce volatility of stock price	[ ]	[ ]	[ ]
f. Enhance liquidity	[ ]	[ ]	[ ]
g. Any other (please specify)			

Section C- Issues Involving Cash

Dividend Statements

8. Please indicate the extent to which you agree or disagree with each of the following statements about cash dividends in general. The following questions are to be rated under five- point scale from strongly agree to strongly disagree (SA, A, No, D and SD), where SA=Strongly Agree, A=Agree, NO=No opinion, D=Disagree and SD=Strongly Disagree.

Statement	Agree		No Opinion	Disagree	
	SA	A	NO	D	SD
1. Provides a "signaling device" of future prospects of the firm					
2. Make the stock more attractive to the investor					
3. Increases the total market value of a firm's stock					
4. Maintains the stock price within an optimal range					
5. Creates positive psychological impact on investors					
6. Money talks! An indication of the firm is doing well					
7. Eases the sale of new common stock					
8. Facilitates favourable free publicity					
9. Creates a costly cash drain for the corporate					
10. Stockholders prefer cash dividend to stock dividend					
11. Management should be responsive to shareholders' preferences regarding dividend					
12. Only a short-term positive price reaction to the announcement					
13. Perception of low risk associated with paying stocks					

Any other statement you would like to add (please specify)

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Effectiveness of Derivatives Regulation in India

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Abstract:

The issue that is being sought to be addressed in this paper is "Whether the current regulatory frame work for Derivatives with regard to Value at Risk (VaR) margins have been effective in managing the risk in the Indian capital market?" To attempt an answer to the problem "Back-testing" will be under taken with respect to the National Stock Exchange of India (NSE) Nifty index futures for the period June 12, 2000 (starting date of Nifty index futures) to October 30, 2009.

This paper also intends to examine the suitability coherent risk measures such as Expected Shortfall (ES), which is increasingly becoming popular among risk managers and regulators. Extreme Value Theory will be used to compute the ES measure to take care fat tail behaviour of Financial Time Series.

Finally, based on the results obtained in the analysis mentioned above, suitable policy recommendations with regard to risk management of derivatives exchanges will be made.

Key Words :

Derivatives, Value at Risk (VaR), Backtesting, Expected Shortfall (ES).

Derivatives Markets

A derivative productis defined as a financial instrument whose value depends on (or derives from) the values 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. Derivatives transactions have evolved in the past twenty years to cover a broad range of "underlyings," including exchange rates, interest rates, commodities, and equities (Hull & Basu, 2009).

The first step towards introduction of derivatives trading in India was the promulgation of the Securities Laws (Amendment) Ordinance, 1995, which withdrew the prohibition on options in securities. The market for derivatives, however, did not take off, as there was no regulatory framework to govern trading of derivatives. SEBI set up Dr. L C Gupta Committee(Gupta, 1998) to develop appropriate regulatory framework for derivatives trading in India. Subsequently, SEBI also set up a committee headed by Professor J R Varma (Varma, 1999-b) to recommend measures for risk containment in deri-

vatives market in India. Derivatives trading commenced in India in June 2000 after framing of the regulatory framework by the SEBI based on these two reports.

Concepts of Regulation

Orderly conduct of markets is the prime concern of any regulator. The concept of 'Regulation' is often considered as a middle path between two extremes of laissez-faire and command and control approaches. There are two leading theories to understand financial markets. First one is the Efficient Market Theory and the other is the Agency Theory(SEBI Committee, 2008).

According to Efficient Market Theory the financial markets are "informational efficient" and, as a consequence, the prices of traded assets already reflect all known information, and instantly change to reflect new information. Therefore, according to theory, it is impossible to consistently outperform the market by using any information that the market already knows, except through luck.

Agency theory explains how to best organize relationships in which one party (the principal) determines the work, which another party (the agent) undertakes. The theory argues that under conditions of incomplete information and uncertainty, which characterize most business settings, two agency problems arise: adverse selection and moral hazard. Adverse selection is the condition under which the principal cannot ascertain if the agent accurately represents his ability to do the work for which he is being paid. Moral hazard is the condition under which the principal cannot be sure if the agent has put forth maximal effort.

To summarize, the key concerns of regulators are: market integrity, systemic safety, and customer protection. All these three concerns are intertwined and inter-related. Therefore, any regulation that has an impact on one of these has to address the other two simultaneously.

As the markets mature, they graduate from compliance based supervision to risk based supervision and as such there will be a transition from rule-based regulation to principle-based regulation. Derivatives markets are, by nature, extremely volatile and hence the risk factor is an important concern for all the players in the market. Risk is defined as "the quantifiable likelihood of loss or less-than-expected returns."(McNeil, Frey, & Embrechts, 2005) In matured markets risk management is one of the main concerns of the regulator.

Derivatives Regulation in India

The main thrust of any Derivatives Regulation would be on:

1) Protection of investors,

2) Ensuring that markets are fair, efficient and transparent; and

3) Reduction of systemic risk.(IOSCO Report, 2003)

According to the Gupta committee (Gupta, 1998) the main objectives of Derivatives Regulation are as follows:

A. Investor Protection: Attention needs

to be given to the following four aspects:

1) Fairness and Transparency,

2) Safeguard for clients' moneys,

3) Competent and honest service; and

4) Market integrity.

B. Quality of markets: The concept of "Quality of Markets" goes well beyond market integrity and aims at enhancing important market qualities, such as cost-efficiency, price-continuity, and price-discovery. This is a much broader objective than market integrity.

C. Innovation: While curbing any undesirable tendencies, the regulatory framework should not stifle innovation which is the source of all economic progress, more so because financial derivatives represent a new rapidly developing area, aided by advancements in information technology.

In order to achieve the above-mentioned objectives the main thrust of any Derivatives Regulation would be on:

1) Accounting Disclosure, and Reporting, since it is widely recognized that accounting standards and disclosure practices for derivatives play an important role in ensuring investor protection and also fairness, efficiency, and transparency in the markets; and

2) Capital and Margin Requirements.

Adequate capitalization is viewed by most regulators as a necessary condition for participation in derivatives activities for mitigating the risk.

The above requirements are necessary for mitigating the risk in the market and to improve the confidence of investors and other market players. The present Derivatives Regulation(SEBI, 1999) stipulates charging upfront margins based on a 99% Value at Risk (VaR) approach for managing the risk. VaR is a measure of Risk, which uses the statistical analysis of historical market trends and volatilities to estimate the likelihood that a given portfolio's losses will exceed a certain amount. VaR is frequently calculated for either one day or two week periods, and is generally given as an X percentage chance that the portfolio will lose Y rupees. After charging initial margins, Mark-to-Market margins at the client level are also charged. Besides charging upfront margins SEBI also stipulates liquid net worth and exposure limits of a clearing member.

Value at Risk

VaR provides a common consistent measure of risk across different positions and risk factors. VaR can be applied to any type of portfolio, and it enables us to compare the risks of different portfolios. It enables us to measure the risk associated with a fixed-income position, say, in a way that is comparable to the risk associated with an equity position. In this the VaR is a distinct improvement over traditional methods (e.g., duration and convexity approaches only apply to fixed-income positions, Greek risk measures only apply to derivatives

positions, and portfolio theory approaches apply to equity and similar positions).

VaR is expressed in the simplest and most easily understood unit of measure, namely, 'lost money'. Many other measures are expressed in less transparent units of measure (e.g., average period to cash flow, etc.). Hence, the VaR is expressed in terms of a unit that is easier to convey.

The simplest way to estimate VaR is by means of historical simulation (HS). The HS approachestimates VaR by means of ordered loss observations.(Dowd, 2005)

VaR can also be estimated by using parametric approaches, the distinguishing feature of which is that they require exact specification of the statistical distribution from which data observations are drawn. Parametric approaches can be thought of as fitting curves through the data and then reading off the VaR from the fitted curve. In making use of a parametric approach, there is a need to take account of both the statistical distribution and the type of data to which it applies.(Dowd, 2005)

Non-parametric approaches, which seek to estimate risk measures without making strong assumptions about the relevant distribution, are also used for VaR estimation. All non-parametric approaches are based on the underlying assumption that the near future will be sufficiently like the recent past that one can use the data from the recent past to forecast risks over the near future - and this assumption may or may not be valid in any given context.(Dowd, 2005)

Value at Risk Models in the Indian Stock Market

Varma (1999-a)provides empirical tests of different risk management models in the VaR framework in the Indian stock market. It is found that the Generalizedautoregressive heteroscedastic and Generalised Error Distribution (GARCH-GED) performs exceedingly well at all common risk levels (ranging from 0.25% to 10%). The Exponentially Weighted Moving Average (EWMA) model used in J. P. Morgan's RiskMetrics methodology(J P Morgan/Reuters, 1996) does well at the 10% and 5% risk levels but breaks down at the 1% and lower risk levels. Varma (1999-a) goes on to suggest a way of salvaging the EWMA model by using a larger number of standard deviations to set the VaR limit. With this modification the EWMA model is shown to work quite well. Given its greater simplicity and ease of interpretation, it may be more convenient in practice to use this model than the more accurate GARCH-GED specification.

Varma Committee Report (Varma, 1999-b) formulates the VaRmodel applicable for the Indian derivatives market. This model is based on the Exponential Weighted Moving Average (EWMA) method popularized by the J. P. Morgan's RiskMetrics system. (J P Morgan/Reuters, 1996). This model is preferred primarily due to simplicity of its computation. In this model the volatility at the end of day t, t is estimated using the previous volatility estimate t-1 (as at the end of day t-1), and the return rt observed in the index during day t:

$$(\sigma_t)^2 = \lambda \,(\sigma_t\text{-}1)^2 + (1 - \lambda)\,(r_t)^2 \qquad (1)$$

where λ is a parameter, which determines how rapidly volatility estimates change.

The VaR model was back tested for the period from July 1, 1990 to June 30, 1998 and it was observed that the actual number of VaR violations is well within the allowable limits of sampling error.

Backtesting of VaR Models

VaR models are only useful insofar as they predict risk reasonably well. Model Validation is the general process of checking whether a model is adequate or not. Backtesting is a formal statistical framework that consists of verifying that actual losses are in line with projected losses. This involves systematically checking the history of VaR forecasts with their associated portfolio returns.

A variety of tests have been proposed in literature to gauge the accuracy of a VaR model. The most widely used test is the proportion of failures test suggested by Kupiec (1995). Kupiecdevelops approximate 95% confidence regions for such a test, which are shown in the table. It may be noted that the choice of the confidence region for the test is not related to the quantitative level p selected for VaR. This confidence level refers to the decision rule to accept or reject the model. These regions are defined by the tail points of the log-likelihood ratio:

$$LR_{uc} = -2 \ln \left[(1 - p)^{T-N} p^{N}\right] +$$

$$2 \ln \left\{ \left[1 - \left(\frac{N}{T}\right)\right]^{T-N} (\tfrac{N}{T})^{N} \right\}$$

which is asymptotically distributed chi-square with one degree of freedom under the hypothesis that p is the true probability. Null hypothesis is rejected if LR > 3.84.

Table1 Model Backtesting, 95% Non-rejection Test Confidence Regions (Jorion, 2001)

Probability Level p	VaR confidence level	Non-rejection Region for Number of Failures N		
		T = 255 days	T = 510 days	T = 1000 days
0.01	99%	N<7	1<N<11	4<N<17
0.025	97.5%	2<N<12	6<N<21	15<N<36
0.05	95%	6<N<21	16<N<36	37<N<65
0.075	92.5%	11<N<28	27<N<51	59<N<92
0.10	90%	16<N<36	38<N<65	81<N<120

Kupiec test focuses exclusively on the property of unconditional coverage; i.e. the test is only concerned with whether the VaR is violated more than 100p% of the time. This test ignores volatility clustering, which means exceptions could bunch closely in time and this should invalidate the model. This is because if the exceptions are not independent then there is a more likely hood of another exception occurring immediately after an exception and VaR model will go awry.

Christoffersen (1998) suggests conditional backtesting procedure to take

account of volatility clustering. His idea is to separate out the particular predictions being tested, and then test each prediction separately. The first of these is the prediction of correct unconditional coverage. The other prediction is that exceedances are independent of each other. This latter prediction is important insofar as it suggests that exceedances should not be clustered over time. Evidence of exceedance clustering would suggest that the model is misspecified, even if the model passes the prediction of correct unconditional coverage.

For the independence prediction, let nij be the number of days that state j occurred after state i occurred the previous day, where the states refer to exceedances (1) / non-exceedances (0), and let π_{ij} be the probability of the state j in given day, given that the previous day's state was i. Under the hypothesis of independence, the test statistic

$$LR_{ind} = -2\ln\left[(1-\hat{\pi}_2)^{n_{00}+n_{11}}\hat{\pi}_2^{n_{01}+n_{11}}\right]$$
$$+ 2\ln[(1-\hat{\pi}_{01})^{n_{00}}\hat{\pi}_{01}^{n_{01}}(1-\hat{\pi}_{11})^{n_{10}}\hat{\pi}_{11}^{n_{11}}] \quad (3)$$

is also distributed as a $\chi^2(1)$, and the estimates of the probabilities are given by

$$\hat{\pi}_{01} = \frac{n_{01}}{n_{00}+n_{01}}, \hat{\pi}_{11} = \frac{n_{11}}{n_{10}+n_{11}}, \hat{\pi}_2$$
$$= \frac{n_{01}+n_{11}}{n_{00}+n_{01}+n_{10}+n_{11}} \quad (4)$$

It follows that under the combined hypothesis of correct coverage and independence, the statistic

$$LR_{cc} = LR_{uc} + LR_{ind} \quad (5)$$

is also distributed as a $\chi^2(2)$. Thus, the Christoffersen approach enables us to test both coverage and independence hypotheses at the same time. Moreover, if the model fails a test of both hypotheses combined, his approach enables us to test each hypothesis separately, and so establish where the model failure arises.

Alternative Risk Measures

Coherent Risk Measures

VaR has several advantages as a risk measure by virtue of the fact that it is a common, holistic, probabilistic risk measure, etc. However, the VaR also has its drawbacks. The VaR estimates can be subject to error, model risk (i.e., the risk of errors arising from models being based on incorrect assumptions) or implementation risk (i.e., the risk of errors arising from the way in which systems are implemented). On the other hand, such problems are common to many if not all risk measurement systems, and are not unique to VaR ones. Yet the VaRalso has its own distinctive limitations as a risk measure. One important limitation is that the VaR only gives maximum loss if a tail event does not occur (e.g., it gives maximum lossin 99% of the time); if a tail event does occur, loss can be more than the VaR, but the VaR itself gives no indication of how much that might be. The failure of VaR to take account of the magnitude of losses in excess of itself implies that two positions can have the same VaR - and therefore appear to have the same risk if the VaRis used to measure risk - and yet have very different risk exposures. This can lead to some very undesirable outcomes.

For instance, if a prospective investment has a high expected return but also

involves the possibility of a very high loss, a VaR-based decision calculus might suggest that the investor should go ahead with the investment if the higher loss does not affect the VaR (i.e. because it exceeds the VaR), regardless of the size of the higher expected return and regardless of the size of the possible loss. Such a categorical acceptance of any investment that increases expected return - regardless of the possible loss, provided only that it is insufficiently probable - undermines sensible risk-return analysis, and can leave the investor exposed to very high losses.

So the VaR has a number of serious limitations as a risk measure. There is one important class of distributions where VaR is in many ways a very good measure of risk: these distributions are the elliptical distributions. In such circumstances the VaR works well, but in such circumstances there is no need of VaR: the VaR is then merely a simple transformation of the standard deviation, and a VaR framework tells nothing that could not have been found out from a basic mean-variance framework. Thus, in the face of elliptical distributions, the mean-variance framework works well and the value of upgrading to a VaR framework is negligible. Yet the whole point of upgrading from the mean-variance framework to something more general is to be able to measure the risks associated with seriously non-normal distributions. The VaR enables this measurement, but it is in exactly these circumstances that the VaR is not a reliable risk measure. Therefore, there is a need for an alternative framework that can give useful risk measures in a seriously non-normal environment.

The theory of coherent risk measures proposed by Artzneret.al. (1997) and (1999) providea formal theory financial risk. The notion of risk itself is hard to conceptualise without a clear idea of what is meant by a measure of risk. To clarify these issues, Artzneret.al. postulated a set of axioms - the axioms of coherency - and began to work out their implications.

Let X and Y represent any two portfolios' returns, and let $\rho(.)$ be a measure of risk over a chosen horizon. The risk measure $\rho(.)$ is said to be coherent if it satisfies the following properties:

1. Monotonicity: $Y \geq X \Rightarrow \rho(Y) \leq \rho(X)$.

2. Subadditivity: $\rho(X + Y) \leq \rho(X) + \rho(Y)$.

3. Positive homogeneity: $\rho(hX) = h\rho(X)$ for $h > 0$.

4. Translational invariance: $\rho(X + n) = \rho(X) - n$ for some certain amount n.

Properties (1), (3) and (4) are essentially 'well-behavedness' conditions intended to rule out awkward outcomes.

The most important property is (2), subadditivity. This tells us that a portfolio made up of subportfolios will risk an amount which is no more than, and in some cases less than, the sum of the risks of the constituent subportfolios. Subadditivity is the most important criterion a 'reasonable' risk measure is expected to satisfy. It reflects an expectation that when aggregate individual risks are aggregated, they diversify or, at worst, do not increase: the risk of the sum is always less than or equal to the sum of the risks. Subadditivity means that

aggregating risks does not increase overall risk.

Subadditivity is more than just a matter of theoretical 'tidiness' and has important practical implications. For example, non-subadditivity is treacherous because it suggests that diversification might be a bad thing, which would suggest the laughable conclusion that putting all your eggs into one basket might be good risk management practice! It also means that in adding risks together there is a possibility ofcreating an extra 'residual' risk that someone has to bear, and that didn't exist before. This would have some awkward consequences:

Non-subadditive risk measures can tempt agents trading on an organised exchange to break up their accounts, with separate accounts for separate risks, in order to reduce their margin requirements. This would concern the exchange because the margin requirements on the separate accounts would no longer cover the combined risks, and so leave the exchange itself exposed to possible loss. If risks are subadditive, adding risks together would give us an overestimate of combined risk, and this means that the sum of risks can be used as a conservative estimate of combined risk.

This spells trouble for the VaR, because VaR is not subadditive. For a risk measure to be subadditive, the subadditivity condition $\rho(X + Y) \leq \rho(X) + \rho(Y)$ must apply for all possible X and Y. It can therefore be proved that VaR is not subadditive if there is a single counterexample where VaR violates this condition. (Dowd, 2005)

The VaRcan be made subadditive if restrictions are imposed on the form of the return distribution. It turns out, in fact, that the VaRcan be made subadditiveonly by imposing the severe restriction that the return distribution is elliptically distributed, and this is of limited consolation because in the real world non-elliptical distributions are the norm rather than the exception. The failure of VaR to be subadditive is a fundamental problem because it means that VaR has no claim to be regarded as a 'proper' risk measure at all. A VaR is merely a quantile. It has its uses as a quantile, but it is very unsatisfactory as a risk measure.

Given these problems with the VaR, alternative, coherent, risk measures that retain the benefits of the VaR - in terms of providing a common, aggregative, holistic, etc. measure of risk - while avoiding its drawbacks need to be considered. If they are to retain the benefits of the VaR, it is also expected that any such risk measures will be 'VaR-like' in the sense that they will reflect the quantiles of the return distribution, but will be non-trivial functions of those quantiles rather than a single 'raw' quantile taken on its own.

Expected Shortfall

A good candidate for a coherent risk measure is the expected shortfall (ES). The ES is the average of the worst 100 (1 - α)% of losses:

$$ES_\alpha = \frac{1}{1-\alpha} \int_\alpha^1 q_p \, dp \qquad (6)$$

If the distribution is discrete, then the discrete equivalent of the ES is given by:

$$ES_\alpha = \frac{1}{1-\alpha}\sum_{p=0}^{\alpha}[pth\ highest\ loss] \times$$

$[probabilty\ of\ pth\ highest\ loss]$ (7)

The subadditivity of ES follows naturally. If there are N equal-probability quantiles in a discrete return distribution, then:

$ES_\alpha(X) + ES_\alpha(Y) =$
$[mean\ of\ N\alpha\ highest\ losses\ of\ X] +$
$[mean\ of\ N\alpha\ highest\ losses\ of\ Y]$
$\geq [mean\ of\ N\alpha\ highest\ losses\ of\ (X+Y)] = ES_\alpha(X+Y)$

    (8)

A continuous loss distribution can be regarded as the limiting case as N gets large. In general, the mean of the Nα worst cases of X and the mean of the Nα worst cases of Y will be bigger than the mean of the Nα worst cases of (X + Y), except in the special case where the worst X and Y occur in the same Nα events, and in this case the sum of the means will equal the mean of the sum. Acerbi (2004) shows that the ES also satisfies the other properties of coherence, and is therefore coherent.

An illustrative ES is shown in Figure 1. If data is expressed in loss terms, the VaR and ES are shown on the right-hand side of the Figure 1: the VaR is 1.645 and the ES is 2.063. Both VaR and ES depend on the underlying parameters and distribu-

Figure 1 Expected Shortfall
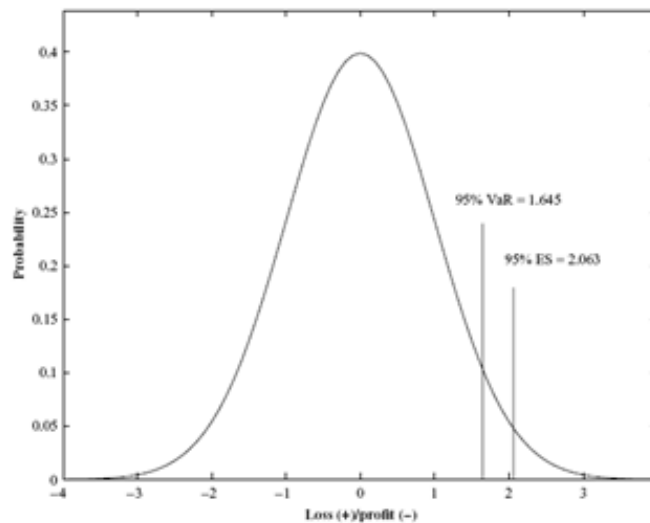
tional assumptions, and these particular figures are based on a 95% confidence level and 1-day holding period, and on the assumption that daily return is distributed as standard normal (i.e., with mean 0 and standard deviation 1).

Like the VaR, the ES provides a common consistent risk measure across different positions, it takes account of correlations in a correct way, and so on. It also has many of the same uses as the VaR. However, the ES is also a better risk

measure than the VaR for a number of reasons(Dowd, 2005):

- The ES tells us what to expect in bad states while the VaR tells us nothing other than to expect a loss higher than the VaR itself.

- An ES-based risk-expected return decision rule is valid under more general conditions than a VaR-based risk-expected return decision rule: in particular, the ES-based rule is consistent with expected utility maximisation if risks are rankable by a second-order stochastic dominance rule, while a VaR-based rule is only consistent with expected utility maximisation if risks are rankable by a (much) more stringent first-order stochastic dominance rule.

- Because it is coherent, the ES always satisfies subadditivity, while the VaR does not.

Extreme Value Theory

The last years have been characterized by significant instabilities in financial markets worldwide. This has led to numerous criticisms about the existing risk management systems and motivated the search for more appropriate methodologies able to cope with rare events that have heavy consequences. The typical question one would like to answer is: "If things go wrong, how wrong can they go?" The problem is then how can the rare phenomena that lie outside the range of available observations be modelled. In such a situationit seems essential to rely on a well founded methodology. Extreme value theory (EVT) provides a firm theoretical foundation on which

statistical models are built for describing extreme events.

EVT focuses on the distinctiveness of extreme values and makes as much use as possible of what theory has to offer. Not surprisingly, EVT is quite different from the more familiar 'central tendency' statistics. The underlying reason for this is that central tendency statistics are governed by central limit theorems, but central limit theorems do not apply to extremes. Instead, extremes are governed, appropriately enough, by extreme-value theorems. EVT uses these theorems to tell us what distributions should be used to fit to extremes data, and also guides us on how to estimate the parameters involved. These EV distributions are quite different from the more familiar distributions of central tendency statistics. Their parameters are also different, and the estimation of these parameters is more difficult. (Dowd, 2005)(Gilli & Kellezi, 2006)

Peaks-over-threshold (POT) or Generalised Pareto approach requires fewer parameters than Extreme Value approaches based on the generalised extreme value theorem. If X is a random iid loss with distribution function F(x), and u is a threshold value of X, the distribution of excess losses over our threshold u is defined as:

$$F_u(x) = P(X - u \leq x/X > u)$$
$$= \frac{F(x + u) - F(u)}{1 - F(u)} \; for \; x > 0 \qquad (9)$$

This gives the probability that a loss exceeds the threshold u by at most x, given that it does exceed the threshold. The distribution of X itself can be any of the commonly used distributions: normal, lognormal, t, etc., and will

usually be unknown. However, as u gets large, the Gnedenko-Pickands-Balkema-deHaan (GPBdH) theorem states that the distribution Fu(x) converges to a generalised Pareto distribution, given by:

$$G_{\xi,\beta}(x) = \begin{cases} 1 - (1 + \dfrac{\xi x}{\beta})^{-1/\xi} & \xi \neq 0 \\ \quad\quad if \\ 1 - \exp(-\dfrac{x}{\beta}) & \xi = 0 \end{cases} \quad (10)$$

defined for $x \geq 0$ for $\xi \geq o$ and $0 \leq x \leq -\beta/\xi$ for $\xi < 0$. This distribution has only two parameters: a positive scale parameter, β, and a shape or tail index parameter, ξ , that can be positive, zero or negative. The GPBdH theorem is a very useful result, because it tells that the distribution of excess losses always has the same form (in the limit, as the threshold gets high), pretty much regardless of the distribution of the losses themselves. Provided the threshold is high enough, therefore, the GP distribution should be regarded as the natural model for excess losses.

To apply the GP distribution, a reasonable threshold u needs to be chosen, which determines the number of observations, Nu, in excess of the threshold value. Choosing u involves a trade-off: threshold u needs to be sufficiently high for the GPBdH theorem to apply reasonably closely; but if u is too high, there will not be enough excess-threshold observations on which to make reliable estimates. There is also a need to estimate the parameters ξ and β. These are estimated using maximum likelihood approaches or semi-parametric approaches. After rearranging the right-hand side of Equation(9), the parent distribution F(x) is defined over 'ordinary' losses as:

$$F(x) = \big(1 - F(u)\big)G_{\xi,\beta}(x - u) + F(u) \quad (11)$$

where x>u. To make use of this equation, an estimate of F(u), the proportion of observations that do not exceed the threshold, is required and the most natural estimator is the observed proportion of below-threshold observations, (n - N_u)/n. Substituting this for F(u), and plugging Equation (10) into Equation (11) gives:

$$F(x) = 1 - \frac{N_u}{n}[1 + \xi\left(\frac{x - u}{\beta}\right)]^{-1/\xi} \quad (12)$$

VaR is given by the x-value in Equation(12), which is given by

$$VaR = u + \frac{\beta}{\xi}\left\{\left[\frac{n}{N_u}(1 - \alpha)\right]^{-\xi} - 1\right\} \quad (13)$$

where a is the VaR confidence level. The ES is then equal to the VaR plus the mean-excess loss over VaR. ES is given by

$$ES = \frac{VaR}{1 - \xi} + \frac{\beta - \xi u}{1 - \xi} \quad \xi < 1 \quad (14)$$

Effectiveness of Derivatives Regulation

In the recent global financial turmoil several financial institutions went bankrupt. Notable names include Lehman Brothers, Bear Streans, etc. Several banks all over the world such as Citi Bank, Bank of America, etc had to be bailed out by the governments from going bankrupt due to liquidity crisis arising out of collapse of the risk management systems. However, no major derivative exchange encountered distress. This is attributed to superior risk management models adopted by the derivative exchanges.

In the recent years there have been several advances in the theoretical foundations of risk management. One

major change is abandoning VaR in favour of coherent risk measures like Expected Shortfall. Another development is moving away from the elliptical distributions to fatter tailed distributions and also using Extreme Value Theory.

In India the regulatory frame work specifies 99% VaR as the risk management tool for derivative exchanges. This is complemented by imposing several liquid net worth requirements and exposure limits of a clearing member. The major derivative exchange NSE also adopted the Standard Portfolio Analysis of Risk (SPAN) system for its risk management. SPAN evaluates overall portfolio risk by calculating the worst possible loss that a portfolio of derivative and physical instruments might reasonably incur over a specified time period (typically one trading day.) This is done by computing the gains and losses that the portfolio would incur under different market conditions.

At the core of the methodology is the SPAN risk array, a set of numeric values that indicate how a particular contract will gain or lose value under various conditions. Each condition is called a risk scenario. The numeric value for each risk scenario represents the gain or loss that that particular contract will experience for a particular combination of price (or underlying price) change, volatility change, and decrease in time to expiration. Thus SPAN is a kind of coherent risk measure such as ES unlike VaR prescribed by the regulator.

Since the inception of derivatives trading, the market worked well without any serious defaults or settlement failures despite large volumes and high levels of volatilities. To this extent the existing risk management appears to have worked quite well. However, there is some serious criticism of this risk management system.

It is argued that high frequency with which margins are revised is itself a source of systemic risk. (Bhalla, 2008)There is a growing disconnect between the VaR methodology prescribed by the regulator and the actual system (SPAN used by NSE) that is closer to the coherent risk measures like ES. The actual risk containment system with multiplicity of margin components delivers protection levels much higher than 99% VaR prescribed by the regulator. (Varma, 2009)

Comparisons are also drawn with Korea Exchange, where a flat margin of 15% is being charged for a long time and yet it has a well developed futures market despite using a crude margining system. Bhalla (2008) argues that more sophisticated margining system in India is actually a source of systemic risk for the market. If margins are revised at a frequency that exceeds the ability of the payment system to mobilize funds from the ultimate client, then large price movements can result in panic unwinding of levered positions that exacerbates the original price movement. This can set up a vicious circle of accelerating volatility and margin calls.

This paper attempts to study "Whether the current regulatory frame work for Derivatives with regard to VaR margins has been effective in managing the risk in the Capital market?" To investigate the research question "Backtesting" will be under taken in respect of the National Stock Exchange (NSE) Nifty

index futures for the period June 12, 2000 (starting date of Nifty index futures) to October 30, 2009. This period covers several extremely volatile days such as May 14 and 17, 2004. Nifty comprises of well diversified 50 stocks accounting for 21 sectors of the Indian economy. Nifty stock has constantly represented more than 55% of the total market capitalization since March 2002. Nifty Index futures account for almost 28% of the turnover of Futures and Options segment of the NSE(NSE, 2009). Therefore, Nifty has been sampled as a portfolio that is the true representative of the Indian Capital market.

The essence of all backtesting efforts is the comparison of actual trading results with model-generated risk measures. If this comparison is close enough, the backtest raises no issues regarding the quality of the risk measurement model. Backtesting will be based on the methodology prescribed by Kupiec (1995) and Christoffersen (1998).

The recent bankruptcies of several financial institutions in the wake of subprime crisis are mainly attributed to the failure of VaR as an effective risk measure. Therefore, there is a call for adopting coherent risk measures to mitigate risk. In this context the performance of ES, which is a coherent risk measure, will also be studied. For the purpose of this study ES will be calculated by applying EVT.

Research Design

VaR Backtesting

The frame work used for the research is based on the VaR calculation method prescribed by the regulator.(SEBI, 1999)

The regulator prescribes the following method for calculation of VaR based margins:

Initial Margin Computation: The initial margin would be computed based on 99% Value at Risk (VaR). The exponential moving average method would be used to obtain the volatility estimate every day. The estimate at the end of day t (σ_t) is estimated using the previous volatility estimate i.e. as at the end of t-1 day (σ_{t-1}), and the return (r_t) observed in the futures market during day t. The formula would be as under:

$$(\sigma_t)^2 = \lambda (\sigma_{t-1})^2 + (1 - \lambda)(r_t)^2 \qquad (15)$$

where

i) λ is a parameter which determines how rapidly volatility estimates changes. The value of λ is fixed at 0.94.

ii) σ (sigma) means the standard deviation of daily returns in the index futures market.

iii) The margins for 99% VaR should be based on three sigma limits (three times the standard deviation). The "return" is defined as the logarithmic return: $r_t = \ln(I_t/I_{t-1})$ where I_t is the index futures price at time t. The plus/minus three sigma limits for a 99% VaR based on logarithmic returns would have to be converted into percentage price changes by reversing the logarithmic transformation. The percentage margin on short positions would be equal to $100(\exp(3\sigma_t)-1)$ and the percentage margin on long positions would be equal to $100(1-\exp(-3\sigma_t))$. This implies slightly larger margins on short

positions than on long positions. The derivatives exchange / clearing corporation may apply the higher margin on both the buy and sell side.

iv) On the first day of index futures trading the formula given above would require a value of σ_{t-1}, i.e. the estimated volatility at the end of the day preceding the first day of index futures trading. This would be obtained as follows:

   a) Calculate the standard deviation of returns in the cash index during the last one year.

   b) Set the volatility estimate at the beginning of that year equal to this average value.

   c) Move forward through the year, one day at a time, using the formula in above to get the estimated volatility at the end of that day using cash index prices.

   d) The estimated volatility by this method at the end of the day preceding the first day of index futures trading would be the value of σ_{t-1} to be used in the formula given above at the end of the first day of futures trading. Thereafter each day's estimate σ_t becomes the σ_{t-1} for the next day.

v) For the first six months of index futures trading a parallel estimation of volatility would be done using the cash index prices and the index futures prices and the higher of the two volatility measures would be

used to set margins, however, during the first six months, in no case shall the initial margin be less than 5%.

vi) The volatility estimated at the end of the day's trading would be used in calculating the initial margin calls at the end of the same day. The volatility estimation and margin fixation methodology should be clearly made known to all market participants so that they can compute what the margin would be for any given closing level of the index. Further, the trading software itself should provide this information on a real time basis on the trading workstation screen.

The above frame work is based on the works of Varma (1999-b), (1999-a), which in turn used the framework of Risk Metrics (J P Morgan/Reuters, 1996).

ES based on EVT

For studying the effectiveness of ES measure, the frame work given by Dowd (2005) and Gilli et. al.(2006) will be used. The parameters of Generalised Pareto Distribution (GPD) required for this analysis will be estimated by using the maximum likelihood estimation method. Gilli et. al.(2006) provides MATLAB code for estimating these parameters. This code is used with suitable modifications for this research.

Data Variables and Data Sources

In this research NSE Nifty data[1] from June

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[1] *NSE Nifty is used a proxy for NSE Nifty Index Futures in view of the relation that Futures price is sum of spot price of the underlying and cost of carry. In this case the cost of carry is the interest.*

Figure2 : VaRBacktesting
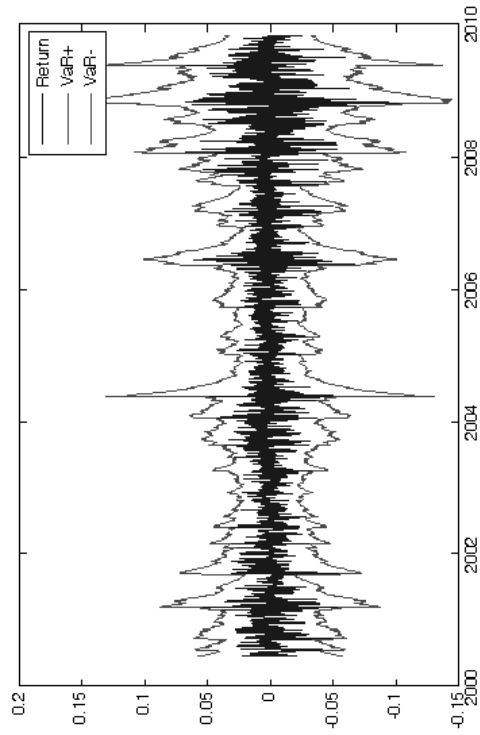
Table 2VaRViolations

S.No.	Date of Violation	Probable reason for high volatility
1	12-Sep-01	Terror attacks on USA on September 11
2	14-Sep-01	Terror attacks on USA on September 11
3	14-May-04	Defeat of NDA Government
4	17-May-04	Political uncertainty in the wake of NDA defeat
5	22-Sep-05	News of I-T raids on stock brokers, cut in circuit filter and imposition of a 100% upfront margin by stock exchanges, and a slump in global markets
6	27-Jul-07	Correction on account of global credit crisis
7	21-Jan-08	Fears of recession in USA
8	18-May-09	Re-election of UPA Government

12, 2000 (date inception of derivatives trading on NSE) to October 30, 2009 will be used for calculation of VaR. The data for calculating initial volatility is NSE Nifty data from June 14, 1999 to June 9, 2000. The Nifty close values will be converted into logarithmic returns for the purpose of analysis.

NSE Nifty data from November 3, 1995 (date of inception of NSE Index) to June 9, 2000 will be used as initial window for computing ES under EVT framework.

The data for this research is sourced from the NSE website:

http://www.nseindia.com/content/indices/ind_histvalues.htm

Data Analysis and Interpretation

VaR Backtesting

NSE Nifty index data from June 12, 2000 to October 30, 2009 has been used to compute VaR as per the framework given by the regulator. i.e margins for 99% VaR should be based on three sigma limits. The graph of logarithmic returns and VaR is given below:

The blue line represents logarithmic returns and green and red lines indicate VaR intervals. It can be seen from the above figure that there are very few violations of VaR during the period June 12, 2000 to October 30, 2009. The dates on which violations took place are tabulated below:

Backtesting statistics based on the methodology prescribed by Kupiec (1995) and Christoffersen (1998) are given below:

$$LR_{uc} = -2\ln\left[(1-p)^{T-N}p^{N}\right] + 2\ln\left\{\left[1-\left(\frac{N}{T}\right)\right]^{T-N}\left(\frac{N}{T}\right)^{N}\right\}$$

(16)

For p = 99% or .99, T=2345, and N=8, the value of this statistic is given by:

$$LR_{uC} = 13.7956 > \chi 2(1)_{0.99}(6.6349) \qquad (17)$$

This means that null hypothesis H0 (The VaR model is correct) is to be rejected. As per the Kupiec Table for 1000 days observations the violations can be between 4 and 7 and intuitively, for 2345 observations the lower limit will be more than 8. In the present case the number of violations is only 8 and hence it can said that the VaR is overly conservative.

$$LR_{ind} = -2\ln\left[(1-\hat{\pi}_2)^{n_{00}+n_{11}}\hat{\pi}_2^{n_{01}+n_{11}}\right] +$$
$$2\ln\left[(1-\hat{\pi}_{01})^{n_{00}}\hat{\pi}_{01}^{n_{01}}(1-\hat{\pi}_{11})^{n_{10}}\hat{\pi}_{11}^{n_{11}}\right] \quad (18)$$

$$\hat{\pi}_{01} = \frac{n_{01}}{n_{00}+n_{01}},$$

$$\hat{\pi}_{11} = \frac{n_{11}}{n_{10}+n_{11}},$$

$$\hat{\pi}_2 = \frac{n_{01}+n_{11}}{n_{00}+n_{01}+n_{10}+n_{11}} \qquad (19)$$

In this case n_{00}=2331, n_{01}=7, n_{10}=6, n_{11}=1. This gives =0.003, =.1429, =.0034. Test statistic is obtained by plugging these values in Equation 4.4:

$$LR_{ind} = 5.7516 < \chi 2(1)_{0.99}(6.6349) \qquad (20)$$

Therefore, null hypothesis H_0 that there is no volatility clustering cannot be rejected with a confidence level of 99% or Type I error α =.01.

EVT based ES

NSE Nifty data from June 12, 2000 (date inception of derivatives trading on NSE)

to October 30, 2009 and will be used for computing ES under EVT framework. Data from November 3, 1995 (date of inception of NSE Index) to June 9, 2000 will be used as initial window for EVT frame work and this will be rolled over till October 30, 2009. In this study the threshold value 'u' is taken as 10% of the tail on either side. The parameters of the generalized Pareto Distribution for a sample $y = \{y_1,...,y_n\}$ are estimated by maximizing the log-likelihood function (Gilli & Kellezi, 2006) $L(\xi,\sigma \mid y)$ given by

$$L(\xi,\sigma|y) = \begin{cases} -nlog\sigma - (\frac{1}{\xi}+1)\sum_{i=1}^{n} log\,(1+\frac{\xi}{\sigma}y_i) & if\,\xi \neq 0 \\ -nlog\sigma - \frac{1}{\sigma}\sum_{i=1}^{n} y_i & if\,\xi = 0 \end{cases}$$

(21)

Figure 3 Expected Shortfall
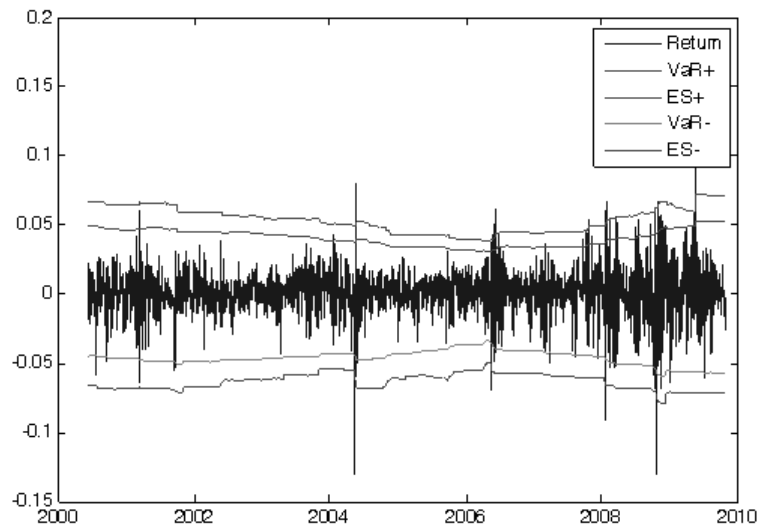
The values and , which maximize the above function are determined by using MATLAB code. Thereafter ES is computed for the period June 12, 2000 to October 30, 2009. The graph of logarithmic returns and 99% ES and VaRis given below:

The concept of ES comes into picture when VaR is violated. ES gives expected loss when VaR is violated. It can be seen from the above figure that there are 18 caseswhere of returnsexceededES during the period June 12, 2000 to October 30, 2009. Intuitively, this numbers appears to be within the tolerance zone. It can be seen from the Figures 4.4 and 4.5 that unlike the VaRprescribed by the regulator, theVaR and ES computed by using EVT methodology do not show sharp fluctuations. This will help in prescribing stable margining system.

Discussion of Results

The backtesting of regulatory VaR model shows that the model is highly conservative in estimating volatility. The test also shows that the model acquits well as far as

independence test is concerned. The graph of VaR shows that the margining system itself is highly fluctuating in tune with varying volatilities. This is one of the major complaints of brokers' and investors' communities also. This calls for a prescription of better margining system by the regulator. On the other hand ES measure computed using EVT methodology appears to show smaller fluctuations and the coherent ES appears to be a good risk management tool than non-coherent VaR.

Limitations of the Research

This research makes an attempt to examine whether ES computed using EVT methodology. This study uses an initial window of 1146 observations (Data from November 3, 1995 to June 9, 2000) for fitting GPD to the tails of return distribution. This number of observations appears to be on lower side. For better fit of GPD there is a need to use larger pool of past data.

For the sake of simplicity and constraints of time this study computes GPD parameters based on the logarithmic return distribution by relaxing the requirement that independentand identically distributed (iid) is required for estimating the tails of the distribution. It may be noted the logarithmic return distribution is not iid though sample autocorrelation function (ACF) of the returns reveal some mild serial correlation due to the fact that the sample ACF of the squared returns illustrates the degree of persistence in variance.

Policy Recommendations

It has been already shown that the present VaR model is highly conserva-

tive and there are a lot of fluctuations in the fixing of margins based on the volatility levels. It was further seen that VaR is not a coherent risk measure and hence it not a suitable risk measure in the market environment where cross-margining is being allowed. Though the SPAN system, being used by NSE, is modelled on coherent risk measures such as ES there is a need for the regulator to consider non-coherent risk measure VaR in favour of ES. The Regulator may also consider releasing the regulatory capital by relaxing the highly conservative limits on margins and going for smooth and steady margining systems, which may cause more violations but within the prescribed limits of backtesting methodologies.

Further, there is need to moving away from the normal distribution to fatter tailed distributions for better estimate of the volatilities. In this regard it was shown that EVT performs creditably in estimating the volatilities based on the fat tailed distributions such as GPD. It is also seen that the band of fluctuations in ES,computed as per EVT methodology,is quite narrow and hence this system is capable of providing stability to margining systems. Stable margining systems will help in promoting liquidity and stability in the market.

Conclusions

Derivative exchanges have fared much better than large financial institutions such as Lehman Brothers etc during the global financial crisis as their models were more robust even if they appeared crude in comparison to the internal models of the large financial institutions. This is an important lesson and there is a need to continue to emphasize robust-

ness in risk management models.

Exclusive reliance on margins is not a good idea. Since margins can be paid out of borrowed funds, they do not constrain the overall leverage in the system. It only ensures that when the excessive leverage leads to a failure, the losses fall on external sources of leverage and not on the counter parties or on the exchanges. Leverage can be a source of systemic risk. A system of capital adequacy for brokers and other intermediaries is an essential element of risk containment in the derivative markets. Many analysts believe that weak capital adequacy systems for the large broker-dealers (investment banks) lead to subprime crisis in 2007 and 2008.

It would be a mistake for exchanges to become complacent about their margining systems. Risk management is a rapidly evolving field with new methods being developed constantly. Regulators must be continually striving to adopt the robust models, which have now become feasible to implement due to advances in computing.Specific recommendations have been given in this study about stock index futures. Similar analyses have to be performed about other derivative products as well.

Scope for Future Research

Further research can consider using a large pool of past data, by extrapolating the index data for the past periods, for fitting GPD to tail of the return distribution using EVT methodology.

The requirement that iid distribution needs to be used for fitting GPD can be achieved by using the filtered residuals of return distribution using an appropri-

ate AR-GARCH model.(McNeil & Frey, 2000)

The regulator is now allowing cross-margining and hence there is a need to look at Copula based models which can be used to model the tails of multivariate distributions in a theoretically appropriate way. Dowd(2005) andBouyeet.al.(2000).

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Effect of Return and Volatility Calculation on Option Pricing: An Analysis Using BANKNIFTY

Akhlaque Ahmad

Abstract:

Predictability in the asset returns and hence the volatility has remained a topic of great concern among the institutional and private investors. The underlying asset in our case is the Bank NIFTY futures. I have tried to predict the volatility using different methods using time series data which are based on historical approach. Then I have applied Black-Scholes Option Pricing Model formulae to calculate the option price of Bank Nifty option and then compared the prices with the actual market trading data of the Bank Nifty option. Our analysis shows that approximation value of option prices derived by different methods are much close to the data of option price mentioned in actual options values at NSE.

Key Words:

Asset Returns, BS Model, BANKNIFTY, Option Pricing, Volatility.

Introduction

In business, uncertainty is a common thing to occur. One who can identify and manages these uncertainties well, emerges successfully. Failure to manage these risks forces several firms to go out of business despite of their technology, skilled labour and market pre-eminence. As result, in the past three decades financial markets have shown the emergence of many instruments which could help these firms to manage the financial risk. The major principle behind these instruments is the fact that a risk-averse individual is willing to pay a price to transfer the risk and an individual with risk-taking ability is willing to bear the risk for a price. Market players discovered the potential of these risk management tools and developed various innovative tools and based on this, they developed various strategies. The most popular among these products are financial futures and options. They are available for foreign exchange, interest rates, stock indices, equities and commodities. These products are also known as derivatives. The largest derivative markets in the world are in government bonds, stock market indices and in exchange rates. The year 1973 was the most important in the field of options trading. In this year, the creation Chicago Board Options Exchange and the publication of the most popular formula in finance, the

option pricing model (i.e., Black Scholes Model) of Fischer Black and Myron Scholes revolutionized the investment world.

In India, derivative markets developed in the late 1980s and were futures-based markets with commodities, primary agricultural commodities, as the underlying assets. In 1952, to prevent speculation on the prices of agricultural commodities, the Government of India came up with a legislation that explicitly banned any kind of futures trading on commodities in India. Derivatives trading over the exchange started in India in June, 2000 with the introduction of index futures trading on the Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE) of India.

This was followed up in July 2001 by the introduction of the index options, options on individual securities, and futures on individual securities on both the NSE and BSE. The market regulator, Securities and Exchange Board of India (SEBI) has been on both the NSE and BSE taking active steps to increase liquidity in the available contracts to make the market more robust and viable for all kinds of investors.

Option pricing models are based on a set of observed parameters as inputs like spot price of the underlying asset, strike price, time to maturity, risk free interest rate and volatility which determine the price of the option. Out of these five parameters, I have the data for spot price, strike price & time period. The two parameters volatility and risk free rate vary through time and market conditions. At the start of the contract, risk free rate is also an observable variable but volatility is estimated using either historical movements or generated by implication. Volatility estimation is important for several reasons and for different people in the market. Pricing of securities is supposed to be dependent on volatility of each asset.

Volatility forecasting is an important role in option pricing, and risk management. In this paper, I have conducted a review of some of the methods like Effective Holding Period Yield (HPY), Continuously Compounded HPY, Rule of 16 and High-Low method to estimate the volatility from time-series data of underlying assets traded in Indian derivative market. Then use the calculated volatility in analytical estimation of the option pricing based Black-Scholes Option Pricing Model to find the BANKNIFTY option pricing and then compare the results to actual market trading pricing.

Literature Review

For a long time now, uncertainty has been of great interest to financial economists and practitioners with its scientific findings well accepted and exploited. Usually, the risk of a stock is measured by its volatility. It is commonly argued that an increase in volatility is good news for the holder of standard options, because volatility unambiguously increases option prices. In real option literature, uncertainty is said to create corporate value through options and the opportunities corporations have. Studies on the topic can be divided into two categories: studies considering the effects of volatility on assets priced absolutely and studies that shows the effect of volatility on derivative assets priced relative to other assets.

Black is among the first to consider the relationship between volatility and the current price. According to him, "If there is more risk to be borne, assuming that expected payoffs from business investment do not change, then stock prices must fall so that investors will continue to hold the existing stocks. A fall in stock prices means an increase in expected returns from stocks". Conditions have been established under which the call's price can be maximized or minimized with respect to volatility, and showed that the call price can also be monotone decreasing with volatility. Studies have addressed the net effect of volatility on derivative assets by assuming that volatility increases the risk premium. It has been observed that the longer term options overreact to the changes in the implied volatility of short maturity options which is the reason behind the inefficiency of the S&P 100 index option market. There is a significant difference in the average implied volatility from the put and call options. Also the ratio of average daily call open interest to average call volume is much lower than the same ratio for put options. It is also found that the information content and estimation error of the high-low estimates were not always superior to the close-to-close variance, and that price discreteness caused the extreme-value method to be significantly downward biased relative to the close-to-close method. It is found that among historical method, improved extreme value method i.e. ARCH and GARCH models and the exponentially weighted moving average of the volatility, the expected forecasting ability is not clearly ranked.

Research Methodology

Data Collection

There are several options being traded at the NSE such as NIFTY, NIFTYMINI, S&P 500, BANKNIFTY, etc. I have selected the data for BANKNIFTY from the several options available in the NSE market. BANKNIFTY is selected for the short duration pricing as it is expiring within the month. I collected the data of corresponding future which is also the underlying asset for previous few years from 1st Jan, 2005 to 31st Aug, 2014. Also I have taken the current date prices of the selected option for the comparison purpose. The data of future prices is collected from website of NSE. The study uses the closing prices along with the high and low prices of the selected futures to measure the volatility.

Methodology of Study

The study involves use of few techniques to calculate the expected return from the given set of data for the future's closing price series. The simplest one includes the difference in the prices of the successive days. This method is also known as effective Holding Period Yield.

$$r(t) = \frac{Price(t+1) - Price(t)}{Price(t)} = \frac{Price(t+1)}{Price(t)} - 1 \quad (1)$$

Here, r(t) represent the return series which is being calculated from the price series Price(t). The expected return μ is calculated from the return series as:

$$\mu = \frac{\sum r(t)}{n} \quad (2)$$

Variance σ^2 is calculated by using the

return series and the mean (expected return, μ) as follows:

$$\sigma^2 = \frac{\sum (r(t) - \mu)^2}{n - 1} \qquad (3)$$

From here we can calculate the standard deviation or in other words the volatility for the daily return. Another method of calculating returns uses the logarithmic difference of the prices also known continuously compounded Holding Period Yield, i.e.

$$r(t) = \ln\left(\frac{Price(t + 1)}{Price(t)}\right) \qquad (4)$$

Another method uses the high and low of the daily future prices [3]. It uses (High - Low) / (High + Low) as the daily high-low return. The origin of this method is probably that (H-L)/2 is half the price range, and (H+L)/2 is the "average" price, between the two extremes. It calculates the percent of its average price by which the stock deviated above and below its average price, computed by the only method that is possible if only the High and Low prices for the period are known, which was common when historical stock price data was expensive to get. Volatilities from all the above methods are then annualized by multiplying it with T where T is the number of trading days in a year and is taken here as 252. Another rule of 16 says to annualize the daily volatilities by multiplying it with 16 instead of T. The average magnitude (absolute value) percentage price change per day which is calculated arithmetically and not log normally, multiplied by 16. All these different volatilities are used to calculate the option prices based on different strike prices toward a fixed maturity time. The prices are calculated by using the Black-Scholes formula for the option pricing. The Black-Scholes

equation [5]:

$$c_t + r\,Sc_s + \frac{1}{2}\sigma^2 S^2 c_{ss} = rc \qquad (5)$$

where c_t represent rate of change of call option price with time, c_s is the rate of change in c with respect to change in underlying stock price and c_{ss} is the double differential of c with respect to stock price. σ is the volatility in the underlying asset price. The analytical solution for the above differential equation is the Black-Scholes formulae:

$$c = S_0 N(d_1) - Ke^{-rt} N(d_2) \qquad (6)$$

$$p = Ke^{-rt} N(-d_2) - S_0 N(-d_1) \qquad (7)$$

where, c the price of the call option and is p represents the put option price. S0 is the underlying asset price, K is the strike price of the asset, r is the risk-free interest rate and T is the time to expiration of the option. N(.) represents the cumulative normal distribution of d_1 and d_2 which are obtained as follows

$$d_1 = \frac{\ln\left(\frac{S_0}{K}\right) + \left(r + \frac{\sigma^2}{2}\right)T}{\sigma\sqrt{T}} \qquad (8)$$

$$d_2 = \frac{\ln\left(\frac{S_0}{K}\right) + \left(r - \frac{\sigma^2}{2}\right)T}{\sigma\sqrt{T}} = d_1 - \sigma\sqrt{T} \qquad (9)$$

The model is based on a normal distribution of underlying asset returns which is the same thing as saying that the underlying asset prices themselves are log-normally distributed. The main advantage of the Black-Scholes model is speed - it lets you calculate a very large number of option prices in a very short time. The Black-Scholes model has one major limitation: it cannot be used to accurately price options with an American-style exercise as it only

calculates the option price at one point in time at expiration (European style Options). Then, based on different volatility calculation methods, the option prices are compared with each other and with the option prices collected from the daily newspaper.

Results And Discussions

The results of volatility calculation using four different methods are given in Table 1. The calculated values are all annual-ized. Daily volatility derived by Simple method (effective HPY), log method and high-low method are annualized by multiplying them with 252. Other hand by rule of 16, the daily volatilities is annualized by multiplying it with 16. The volatility calculated using the high-low method of return have considerably low values than the other 3 methods. It is shown that trends of changing the volatility with respect to every years are same in different methods but magni-tude wise in high-low volatility method is

Table I: Volatility Calculation

Year	lognormal	HPY	Return 16	high-low
2005	5.17055626	5.21942158	5.260682476	0.203742051
2006	6.59597156	6.62363882	6.676000413	0.308854864
2007	3.07777957	3.09314278	3.117594885	0.425267959
2008	7.22064607	7.20927035	7.266261517	1.121082589
2009	1.43371576	1.47837244	1.490059361	0.571608958
2010	0.14381537	0.14386872	0.145006039	0.172078194
2011	0.2010481	0.20039436	0.201978525	0.254361612
2012	0.14246227	0.14199556	0.143118072	0.191809668
2013	0.28025315	0.27445359	0.276623214	0.245634606
2014	0.18256027	0.1809689	0.182399503	0.191611849

less with respect other three methods.

Table II shows the option price calcu-lated using the volatility values of the year 2014 only. At this time the risk free rate of interest is 8.52% approximately. I have calculated the option prices corresponding to different strike prices and compared it with the given closing prices of the call options on these strike

Table II: Option Price Calculation For Bank Nifty CNX

Strike Price	Lognormal Return	HPY	Return 16	High-low	Actual Price
13200	2381.905679	2381.8942	2381.8232	2386.94912	2081.15
13300	2287.900339	2287.8882	2287.804249	2293.733211	2003.8
13400	2194.636979	2194.6242	2194.525911	2201.332393	2139.7
13500	2102.218256	2102.205	2102.090867	2109.847478	2062.55
13600	2010.75374	2010.7402	2010.608736	2019.384667	1986.8
13700	1920.359217	1920.3455	1920.195381	1930.054796	1912.45
13800	1831.1558	1831.1421	1830.972026	1841.972439	1840.15
13900	1743.268875	1743.2554	1743.064199	1755.254891	1768.75
14000	1656.82689	1656.8138	1656.600517	1670.021035	1698.9
14100	1571.960002	1571.9475	1571.711334	1586.390125	1630.05
14200	1488.798613	1488.7869	1488.527274	1504.480502	1563.5
14300	1407.47183	1407.461	1407.177687	1424.408259	1498.6
14400	1328.105873	1328.096	1327.789049	1346.285913	1435.35
14500	1250.822474	1250.8137	1250.483358	1270.221068	1373.8
14600	1175.737299	1175.7297	1175.376552	1196.315142	1313.9
14700	1102.958435	1102.9521	1102.576987	1124.662148	1255.75
14800	1032.58497	1032.5798	1032.184014	1055.347582	1199.3
14900	964.7057035	964.70166	964.2866799	988.4474187	1144.5
15000	899.3980164	899.39502	898.9625944	924.0272536	1091.45
15100	836.7269174	836.72486	836.2769715	862.1415913	1040.1

Strike Price	Lognormal Return	HPY	Return 16	High-low	Actual Price
15200	776.7442931	776.74302	776.2818739	802.8333022	990.4
15300	719.4883683	719.4877	719.0156714	746.1332511	942.45
15400	664.9833877	664.98314	664.5027186	692.0601002	896.2
15500	613.2395168	613.23949	612.7532552	640.6202876	735
15600	564.2529601	564.25294	563.763523	591.808174	808.6
15700	518.006285	518.00605	517.5160901	545.6063513	767.25
15800	474.4689376	474.46829	473.9803678	501.9860984	727.5
15900	433.5979317	433.59668	433.1133017	460.9079716	689.3
16000	395.3386899	395.33666	394.8602151	422.3225121	652.65
16100	359.626011	359.62304	359.1557806	386.1710519	617.55
16200	326.3851411	326.38111	325.9250936	352.3865987	583.9
16300	295.5329186	295.52771	295.0848222	320.8947807	551.75
16400	266.9789702	266.97253	266.5444074	291.6148314	520.95
16500	240.6269305	240.6192	240.2072867	264.4605939	491.55
16600	216.3756624	216.36664	215.9721189	239.3415296	463.55

prices. Fig.1 displays the comparison results of option prices based on different volatility methods.

Conclusions

In this paper, I have used different simple methods to calculate the expected return and to interpret the annualized volatility. We have seen from the results that the same set of data gives variations in expected returns and affects the volatility. The simple method (effective Holding Period Yield, HPY), log method (continuously compounded HPY) annualized with an approximated 252 trading day and simple method i.e. effective HPY with rule of 16 gives very close results with respect to return and volatility. The daily high-low method gives a lower value in comparison to other methods I have used. The rule of 16 is just used to annualizing the daily volatility to 256 trading days

Figure 1. Comparison of option prices

Comparison of Option Prices
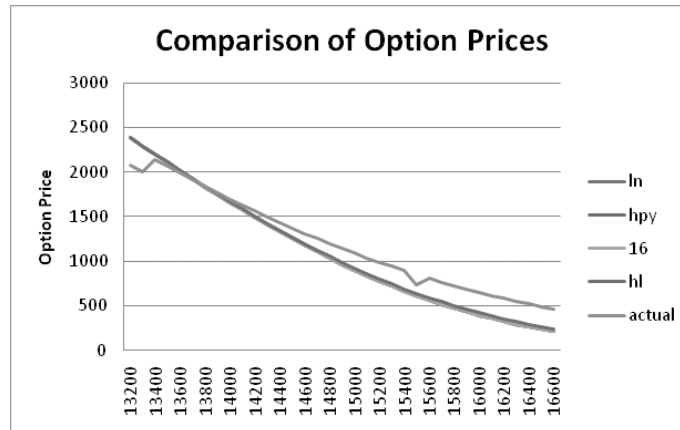
(16≈2521/2=15.8745) which is very close to the assumption of 252 days. Moreover, options prices are also considerably varying for the different methods and changing strike prices. Our analysis shows that approximation value of option prices derived by different methods are much close to the data of option price mentioned in Derivatives Options Trading at NSE.

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Emerging trends in Capital Market - Resource Mobilization from Initial Public Offerings to Corporate Bonds

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Abstract:

Capital Market is the important source of fund generation for corporate entities. Equity has been the major component of capital structure for Initial Public Offerings or Private Placement. Revolutionary change in traditional trends of fund generation can be seen with the introduction of Non-Convertible Debentures (NCD) since 2008. The NCD public issues have replaced equity public issues in capital structure of Indian corporate. Further it has been a significant contributor in overall fund generation and playing pivotal role by increasing the overall resources mobilized by the corporate.

Equity was the most preferred source till 2003-2004 with nearly 25% contribution in overall fund generation which is gradually replaced by NCDs by the year 2013-14, where equity contributing of just 2% including Private Issues is observed. While fund generation only through public issues is seen, corporate bonds have crossed 90% out of total funds generated through public issues.

To analyze and to assess this significant change correlation between total resources mobilized and resources mobilized though equity public issues and through corporate bond public issues between 2004-05 to 2008-09 and 2009-10 to 2013-14 has been calculated and further regression tool has been used to prove the reliability of the statement and to prove that it has been a significant contributor in overall fund generation, increasing the overall resources mobilized by the corporate.

Key Words:

Corporate Bond, Non-Convertible Debentures, Primary Market, Initial Public Issue.

Introduction

Capital markets are the financial markets in which corporate equity and long term debt are issued and traded. It is a center where the demand and supply of long term debt and equity capital meet together. It is a channel to

direct the scattered small savings of the investors are directed towards the corporate for its productive application. It is the medium through which corporate can mobilize the resources required and so capital markets are the barometer of the health of the economy. Capital markets work as a facilitator for the sustainable development of the economy, as it does a dual job of providing long term funds to the corporate and an opportunity to invest in financial assets to investors. It is necessary that it should be well organized and regulated.

One of the important segments of Capital markets is Primary Market. It deals with issuance of new securities. The major function of the segment is it helps corporate, public sector institutions as well as the government raise resources (through issuance of debt or equity based securities).

To serve the economy better it is necessary for the capital markets to develop continuously. Indian capital market, though one of the oldest and largest capital markets in the world has seen a rapid growth and transformation in last few years. Major of the transformations are deregulation and economic reforms, disintermediation and financial sector reforms, institutionalization of capital markets, investors' preference for better disclosures and corporate governance measures on similar grounds to developed markets, globalization and tax reforms etc.

Market Segments

The securities market has two important segments, namely, the primary market

dealing with new issues t and the secondary or stock market facilitating the trading of the issued securities.

Another segmentation of Capital/ securities market can be done based on the instruments issued i. e. Stock or Equity Market and Debt (Bond) Market.

Debt or Bond Market: The bond or fixed income securities market where participants issue, buy and sell debt securities, usually in the form of bonds.

Introduction of non-convertible debentures

One of the big Developments in the primary Capital Market was Introduction of Non-convertible Corporate debentures (bonds).

Corporate Bonds: In broader terms Corporate bonds are fixed income securities issued by corporate i.e. entities other than Government. In general Bonds are also known as debentures. And is defined in Section 2(12) in The Companies Act, 1956 as " Debenture" includes debenture stock, bonds and any other securities of a company, whether constituting a charge on the assets of the company or not;

These are securities issued by private or public sector companies to borrow funds from the market. As per the companies act there is no specific distinction given between Corporate Bonds and Debentures. The term Debentures has been defined in Companies Act 1956 as follows "debenture includes debenture stock, bonds and any other securities of a company, whether constituting a charge on the

assets of the company

Corporate Bond Market in India

The Corporate Bond Market in India is in existence since quite a long but in real sense it is in existence since December 2003, with the amendment in disclosure norms to make listing of companies made mandatory and with an initiative to provide a similar trading system for the bond market as like equity market. The objective being to provide a platform for corporate and investors to exchange and fulfill their needs i. e. mobilizing the funds at affordable rate in case of corporate and for investors, a good investment with good long term returns at less risk.

Need for a well-developed Corporate Bond Market

Supplement and a substitute to the banking system for funding - It is the need of the economy today to have a well developed bond market to supplement and can even work as a substitute for the banking system for meeting the requirements of the corporate sector for long term capital investment.

Necessity for Infrastructure Funding- Corporate bonds are the most necessary market for generating funds for infrastructure projects. Banking industry fails to do so because of the long term nature of the infrastructure funds which cause an asset liability mismatch for banks.

Bank Funding Regulations- The banking industry faces several lending restrictions such as maximum position expo-

sure, sector exposure etc. which play a role in the lending decisions. Debt market allows the corporate to raise funds directly from the public bypassing the intermediaries.

Mopping Public Savings

Corporate bonds can work as an attractive investment instrument for investors seeking higher but secured returns as compared to time deposits; this would help in accelerating the mobilization of funds to savings which again can be used in the investment by the companies concerned.

Need of the Study

To achieve the expected GDP growth of Indian Economy, Development of Corporate Bond Market has been on the top list of agenda of the Government this being the highly untapped market. Many such reforms are taking place since 2007 in full force. It is important to assess if the reforms are in a right direction by checking the contribution of Debt public issues in to the Total resources generated and also by comparing it with the equity issue market, the most favored market of corporates in case of public issues.

Review of Literature

One of the major function and very reason for existence of SEBI is to promote the capital market and protect investor interests. Various major far reaching reforms have taken place before the initiation of SEBI as well, but with the availability of a specific dedicated authority the process has speeded up.

Developments in Capital Market Since 1991

Various reforms have taken place post SEBI reforms. It has helped the capital market reach new highs. Some of the important measures are

- Securities and Exchange Board of India (SEBI) becoming operation-alized

- Setting of National Stock Exchange (NSE)

- Dematerialization of Shares

- Screen Based Trading

- Investor Protection

- Rolling Settlement, Introduction of Clearing Corporation Of India Limited (CCIL) and National Securities Clearing Corporation Limited (NSCL)

- Trading In Central Government Securities

- Credit Rating Agencies

- Accessing Global Funds Market

- Internet Trading

- Derivatives Trading

Since 1991/92 many initiatives in the capital market mainly primary markets of equity and debt were taken by the new authority along with removal of restrictions imposed by the Capital Issues Control Act. To activate the corporate debt market in India the interest rate ceiling on corporate debentures was abolished giving way to market-based pricing of corporate debt issues. The rating was made mandatory In order to improve the quality of debt issues. The role of trustees in case of bond and debenture issues was strengthened over the years. It was made compulsory to list all privately placed debt issues on the stock exchanges and follow the disclosure requirements.

As a result tremendous growth was seen in the primary market the funds raised amount increased to Rs276.21 billion in 1994/95 in comparison to Rs62.15 billion in year 1991/92. Year 1995-96 saw another set of reforms where tighter entry barriers introduced by SEBI for investor protection as a result in 1995/1996 smaller amounts were raised due to the overall downtrend in the market. The number of new capital issues by private sector in 1991\92 was only 364 with 4,312 crores generated from it. It increased to 1,678 in 1994-95 and the amount rose increased to 26,418crore. Since 1995 the capital market was sluggish and the resources raised saw a negative turn and fell to 10,409 crores in 1996-97. In 2003-04, the amount raised from primary equity market was 18,900 crores with only 51 issues. And then the primary equity market saw a steady increase in funds mobilized till the year 2007-08 with around 20percent increase ever year.

During the same period the debt market was losing its shine. The proportion of resources mobilized through Debentures(bonds) went down to -1.2% in 2001-02 to 2003-04 from 11% in the year 1985-90 even after many above mentioned reforms taking place.

With a view to develop Corporate Bonds Market in India many reforms have been

suggested and implemented. Many such changes were made since 2003 onwards to make the Corporate Bond Market more vibrant, both primary and secondary market.

But all these did not give the effect required. The biggest boost came in the form of SEBI (Public Offer and Listing of Securitized Debt Instruments) Regulations, 2008. These were notified in the Official Gazette dated May 26, 2008. The major features of these regulations include rationalization of disclosure requirements, increasing the role and responsibilities of merchant bankers for exercising due diligence and the most important being mandatory listing of private placement of debt issued as per exemption under S.67(3) of the Companies Act. The regulation made provisions for e?issuances of corporate debt and introduction of rationalized listing requirements for debt of a listed issuer. Few of the reforms following these regulations are as follows.

Simplified listing agreement for debt securities were put in place by SEBI in May 2009.

SEBI directed exchanges to present issuer related information on exchange websites in a uniform format in March 2010.

Amendments were made in the Regulations for Mutual Funds, permitting Mutual Funds to set up Infrastructure Debt Funds under the Mutual Funds Framework in August 2011.

SEBI gave the directions that no person connected with the issue shall offer any incentive, whether direct or indirect, in any manner, whether in cash or kind or services or otherwise to any person making an application for allotment of such securities - December 2011

Amendments were made in the SEBI (Disclosure and Investor Protection) Guidelines, 2000 in 2007 which included the following.

1. Requirement of Credit Rating:

2. Issuance of below Investment Grade debt instruments

3. Removal of Structural Restrictions:

4. Compulsory clearance of trades through (NSCCL) or (ICCL) with effect from 1st December, 2009.

Along with SEBI, RBI also took some important measures. Those being creating a reporting platform at FIMMDA, allowing Repo in corporate Bonds, increasing the FII investment limits and the most recent being, in January, 2013 permitted credit Default Swap, an insurance against default, on unlisted but rated corporate bonds even for issues other than infrastructure companies.

Recent Developments in Corporate Bond Market in India

- Finance Bill 2012: Qualified Foreign Investors (QFIs) are allowed to access Indian Corporate Bond market; a separate sub-limit of USD 1 billion has been created for QFIs investment in corporate bonds and mutual fund debt schemes.

- Finance Bill 2013: FIIs will be permitted to use their investment in corporate bonds and Government securities as

collateral to meet their margin requirements.

- A separate bond-trading platform at NSE will be made operational soon.

- The Securities and Exchange Board of India (SEBI) has taken the initiative to collect all the important data of corporate bonds issued domestically and then create a comprehensive database of all corporate bonds issued in the country.

Capital Structure of Indian Corporates in Primary Market

Primary market has been the major source of funds for corporate Year 2013-14 saw an increase of 16.0% in the resource mobilization by corporates in the primary market i. e. to ₹ 4,033 billion (US $ 67 billion). This was the result of an increase in resources mobilized through private placement route; capital raised through private placement saw an increase by 18.1 percent to ₹ 3,899 billion (US $ 65 billion). But, resources mobilized through public issues went down by 4.4 percent to ₹ 133 billion (US $ 2 billion), accounting for a mere 1 percent of the total resources mobilized domestically.

Objectives of the Study

- To study the meaning of Corporate Bonds, the need of a well-developed corporate bond market and the policy developments related to Corporate Bond Market.

- The study the fund generation pattern of Indian Capital Market and the study of trends and shift in trends

in fund generationthrough IPO's pre and post 2008-09 periods.

Scope and Limitations of the Study

In this paper the researcher has concentrated on the specific part of the Capital Structure only, i.e. the proportion of Equity and Debt public issues in the Capital Structure of the Corporate and the impact of Corporate Bond Markets reforms (Introduction of Non-Convertible Debentures) on the same

The study is limited for the period of 10 years (2004 to 2014) and is limited to the comparison of public issue trends and the contribution of debt public issues in to total fund generation.

Hypothesis

H_1: Corporate Bond Market reforms have resulted in change in preference of instruments for capital with special reference to resources mobilized from Initial Public offerings by the Indian corporate

H_2: The corporate bond market reforms increased the fund generation for the corporate sector in India.

Research Methodology

For the purpose of this research paper the secondary data source was applied for the collection of the data. The sources mainly being SEBI guidelines on issue of Debt Securities, RBI Handbook and SEBI statistics and ISMR statistics, for the period of 10 years i. e. from 2004 to 2014. Data collected are edited and coded by using the excel bars. This helps in converting the gathered data into a

tabulated grouped data.

For the purpose of analysis the data is grouped in to two groups' i. e. 2004-05 to 2008-09 and 2009-10 to 2013-14. The data analysis methods used are as follows.

- Percentage Analysis is applied to represent the collected data for better understanding.

- Correlation coefficient analysis is used to measure the strength of the linear relationship between two attributes of debt market investments.

- Regression and R square analysis is used to show the significance of relationship between the variables.

T test (sample for two means) is used to do the critical analysis.

Analysis of Data and its Interpretation

Capital structure is the combination of debt and equity that funds an organization's strategic plan. Capital Structure management has been impacted by a number of the develop-ments like operational reforms in the area of credit assessment and delivery, interest rate deregulation, changes in the competi-tive structure of the banking and credit systems, and the emergence of money and debt markets. Based on these factors the components of Capital structure and their proportion vary. The following table gives us the glimpse of the Resource mobilization by Indian companies divided in Corporate Securities and Government Securities

The data Figure 1 clearly shows a steady increase in amount collected by corporate through public Issues in last

few years. In this paper the researcher has concentrated on this part of the Capital Structure only, i.e. the proportion of Equity and Debt public issues in the Capital Structure of the Corporate and the impact of Corporate Bond Markets reforms on the same.

The study of literature and the develop-ments made in the Capital market in India and specifically Corporate Bond Market in India are with a view to increase the resources mobilized by the corporates and make the Debt Market a strong debt market. And it can be seen that a major step towards it was taken in the year 2008 with the introduction of Non-convertible Debentures. Despite the policy initiatives, the corporate debt constitutes a small segment of the debt market in India. While the primary market for debt securities is dominated by the private placement market, the secondary market for corporate debt is characterized by poor liquidity, although this has improved just slightly in recent years. One of the reasons for the unfavored treatment towards Public issues is Private Placements market. Due to the advantages the Private placement brings with it, it became the most favored source of funding for corporates even taking over the Equity Market Issues and amount generated.

The researcher here aims to analyze the impact of the policy initiatives specially introduction of Non-convertible deben-tures on the funds generated through Capital markets in India through the comparison of the situation in pre-introduction period that is before the year 2009 when the first public issue of NCDs hit the market and the post introduction period, till date.

For the Analysis the data for 10 years has

Figure 1: Resource Mobilization by Government and Corporate Sector

Issues	2011-12 (₹bn)	2012-13 (₹bn)	2013-14 (₹bn)	2011-12 (US $ bn)	2012-13 (US $ bn)	2013-14 (US $ bn)
Corporate Securities	2,336	3,451	4,033	46	63	67
Domestic Issues	2,308	3,441	4,032	45	63	67
Public Issues*	129	139	133	3	3	2
Non-Govt. Public Companies	-	-		-		-
PSU Bonds	-	-		-		-
Govt. Companies	-	-		-		-
Banks & FIs	-	-		-		-
Private Placement	2,180	3,302	3,899	43	61	65
Euro Issues	27	10		0.5	0.1	0.02
Government Securities*1	7,590	8,658	8,971	148	159	150
Central Government #	6,004	6,885	7,005	117	126.7	117
State Governments	1,586	1,773	1,967	31	33	33
Total	9,926	12,109	13,004	194	223	217

• This is equity public issue only.

*1 These are gross market borrowings of Central and State Governments.

only includes amount raised through dated securities.

Source: RBI

Table No. 1 - Proportion of Equity and Debt IPO's To funds generated through IPO's and Total Resources Mobilized

Rs. In Bn

Year	Equity Public Issues	Debt Public issues	Total Public issues	% of EPI to TPI	% DPI to TPI	TRM	% EPI to TRM	% DPI to TRM
2004-05	245	39	284	86.27	13.73	838	29.24	4.65
2005-06	274	0	274	100.00	0.00	1092	25.09	0.00
2006-07	329	4	333	98.80	1.20	1322	24.89	0.30
2007-08	797	16	813	98.03	1.97	1968.58	40.49	0.81
2008-09	142	15	157	90.45	9.55	1900.02	7.47	0.79
2009-10	549	25	574	95.64	4.36	2901.28	18.92	0.86
2010-11	607	95	702	86.47	13.53	2882.49	21.06	3.30
2011-12	129	356	485	26.60	73.40	3032.62	4.25	11.74
2012-13	154	170	324	47.53	52.47	4001.97	3.85	4.25
2013-14	137	424	561	24.42	75.58	3394.99	4.04	12.49

Source: SEBI Handbook of Statistics 2004,2005,2006,2007,2008,2009,2010,2011,2012,2013,ISMR 2004 to 2013

Chart No. 1: Resource Mobilization through Public Issues (Rs.)
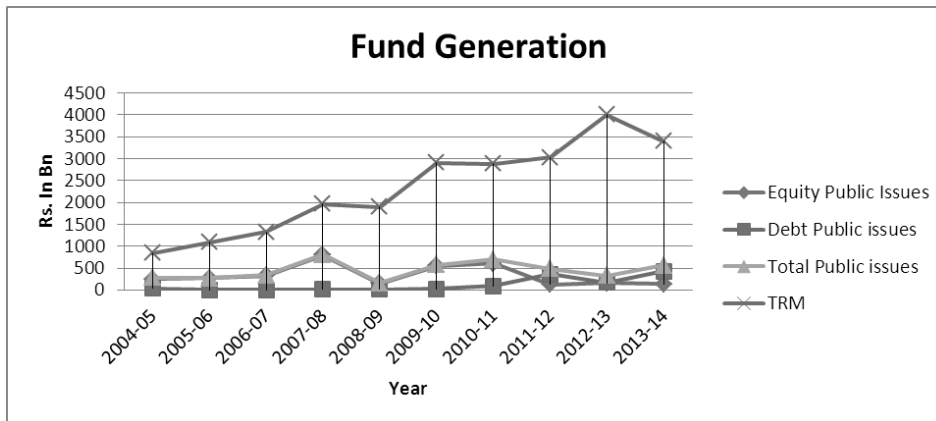
Chart No. 2: Resource Mobilization through Public Issues (%)
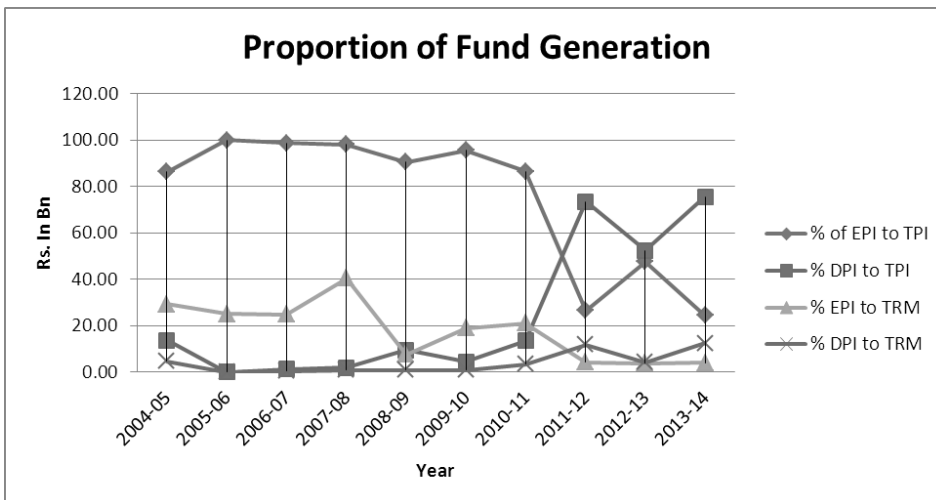
been collected i. e. since 2003- 04 and divided in to two i.e. 2004-05 to 2008-09 and 2009-10 to 2013-14.

The table No. 1 shows the data related to the Resources generated by corporates through Equity and Debt Public Issues, Total resources mobilized through Public Issues and Total Resources mobilized by the corporate overall and Proportions.

The above tables, clearly show the preferences by corporates when it comes to fund generation.

The reforms implemented in Corporate Bond Market specially the Regulations

on Issue and Listing of Debt Securities gave a new instrument to generate funds for Indian Corporate, Non-Convertible Debentures.

The First Issue of NCD's came in the year 2009 by Tata's. And since then there has been a tremendous growth in using this instrument for resource mobilization. Equity has always been the preferred source of funds generation for the Indian Corporates when it comes to the Primary Capital markets. But as has been seen in Table No. 1 the Private debt placement has taken over drastically over the Equity both in terms of number of issues and amount generated. And now with the introduction of NCD's the change in preferences can be clearly seen. It is not that no steps have been taken to develop the equity markets. In fact it has always got the preferred treatment and many reforms have taken place recently. But with all those drastic changes as well the NCD's have taken over the place of equity as a most favored instrument.

The proportion of Equity as a source of funds has gone down significantly over the years. If observed it can be seen that there has been a drastic fall in equity proportion in total resource mobilization since the year 2008-09 onwards. At the same time it can be seen that Debt public issue proportion has been growing consistently since the Issue guidelines have been put in force. The proportion of NCD's has gone up from less than 1% to more than 12 % in just a span of 6 years and from less than 5% to more than 75% when compared with Total resources mobilized Through Public Issues.The exactly reverse trends can be seen in equity proportion.The change can be clearly seen in the following tables. The following tables show the change in trends pretty clearly.

The percentage change in resources mobilized clearly is a signal of change in trends. The table shows that the proportion of equity which was increasing continuously and had even reached nearly 100% mark in the years 2005 to 2007 started falling and has reached just 7% in the year 2013-14 and the newly introduced NCD's proportion has gone up drastically to reach 93% in total resources mobilized by the Corporates through public issues.

But at the same time how much this new instrument is contributing to the total resources generated by the corporate and what is the contribution of Non-convertible Debentures in to the growth of funds generated is yet to be tested.

Though the percentage analysis shows a significant increase in the proportion of resources generated through NCD's to total resources generated but if it has been because of the introduction of NCDs only is an unanswered question. For the purpose further analysis is important.

The analysis helps us state that Debt issue have been replacing Equity public Issues over a period of time. Further it also helps us state that Total resources mobilized are also on an increasing trend.

But it is important to understand the relation between the Debt Public Issues and the Total resources mobilized and Total Resources Mobilized through public Issues to find out if the Introduction of NCDs has been the reason for increase in Total resources mobilized. The correlation table will help us understand the same.

Table No. 2: Correlation between Total Resources mobilized Resources Mobilized through Public Issues and Debt Public Issues between 2004-05 to 2008-09 and 2009-10 to 2013-14

Table No. 2: Correlation between GDP and Total Resources mobilized and its components between 2004-05 to 2008-09 and 2009-10 to 2013-14

Period		TRM	Equity	Debt	RMTPI	EPI	DPI
	TRM	1.00					
	Equity	0.45	1.00				
2004-05 to 2008-09	Debt	0.86	-0.07	1.00			
	RMTPI	0.45	0.99	-0.07	1.00		
	EPI	0.46	1.00	-0.06	1.00	1.00	
	DPI	-0.25	-0.08	-0.23	0.01	-0.04	1.00
		TRM	Equity	Debt	RMTPI	EPI	DPI
	TRM	1.00					
	Equity	-0.80	1.00				
2009-10 to 2013-14	Debt	0.98	-0.90	1.00			
	RMTPI	-0.30	0.05	-0.23	1.00		
	EPI	-0.80	1.00	-0.90	0.05	1.00	
	DPI	0.41	-0.74	0.54	0.64	-0.74	1.00

From the above correlation analysis we can interpret that

1. The analysis suggests that relation between Debt Public Issues and Total Resources Mobilized has turned positive from negative post reforms.

2. The relation between Debt public Issues and resources mobilized through Public Issues has turned negative from slight positive i.e. from .0147 to -.2074 suggesting negative relation between the two

3. The relation between Total Re-sources mobilized and Resources mobilized through public issues has turned negative post reforms, from somewhat positive to strong negative.

4. There is an inverse relation between the resources mobilized through Equity and Debt both for the period 2004-05 to 2008-09 and 2009-2010 to 2013-14 which is a post reforms period. In fact it can be observed that the negative relation has become stronger in Post reforms period.

5. Before the Period 2008-09, 99 percent of the total resources mobilized were through equity and only 1 percent through Debt. Post reforms period there is a complete shift in the scenario and Debt Public issues have replaced Equity Public Issues. The debt proportion has increased to 63% whereas Equity has gone down to just 5%

6. But if a detailed analysis is done between the Debt Public issues mainly Introduction of Non-convertible debentures in the year 2009 and other variables that is total Resources mobilized, Total resources mobilized through Debt and Resourcesmobilized through public issues, the relation has become positive and stronger in the post reforms period suggesting a significant contribution of Public issues of Non- Convertible Debentures.

Analysis

The r-square in Table No 4 has shown an increase from .15 to .40 indicating that Debt public issues were more than the non-debt issues by Indian corporate. Further, the change in the TRM can be largely being attributed to these issues rather than no-debt issues.

But the significance F value and P value do not support the above statement.So to further check the reliability of Data Two tailed sample T test has been used for the analysis.

Total Resources Mobilized

T value (17.21) is much higher than the Critical test for a one tailed test (2.13) so we can state that there is a significant increase in Total Funds generated post 2009.

Same result can also be reached because of the p value for one tailed test is less than alpha (0.05). P value is (0.0000333773120038582)

T value is 17.21 is larger than the critical t value for the two tailed test (2.77) means it can be stated with 95% certainty that there has been a change in the means from before to after.

P value for two tail is (0.00006675462400 77164) less than alpha supporting the above statement.

Table No. 3: Growth in Total Resources mobilized. Growth in Resources Mobilized

Year	TRM	RMPI	Equity PI	Debt PI	Growth in TRM	Growth in RMPI	Growth in EPI	Growth in DPI
2003-04	716	232	189	43				
2004-05	838	284	245	39	0.1704	0.2241	0.2963	-0.0930
2005-06	1092	274	274	0	0.3031	-0.0352	0.1184	-1.0000
2006-07	1322	333	329	4	0.2106	0.2153	0.2007	4.0000
2007-08	1968.58	813	797	16	0.4891	1.4414	1.4225	3.0000
2008-09	1900.02	157	142	15	-0.0348	-0.8069	-0.8218	-0.0625
2008-09	1900.02	157	142	15				
2009-10	2901.28	574	549	25	0.5270	2.6561	2.8662	0.6667
2010-11	2882.49	702	607	95	-0.0065	0.2230	0.1056	2.8000
2011-12	3032.62	485	129	356	0.0521	-0.3091	-0.7875	2.7474
2012-13	4001.97	324	154	170	0.3196	-0.3320	0.1938	-0.5225
2013-14	3395.12	561	137	424	-0.1516	0.7315	-0.1104	1.4941

Table No. 4: Regression analysis Between Total resources mobilized to Debt Public Issues

Year	R Square	Significance F	P Value for One tailed test	P-value		P Value for Two tailed test
				Intercept	X Variable 1	
2004-2008	0.156110976	0.510345926	3.33773E-05	0.174572249	0.510345926	6.68E-05
2009-2014	0.406450393	0.247219729	0.032941084	0.142019686	0.247219729	0.065882

Table No 5: T test for sample means

Particular	T Value	Critical Value for One tailed test	Critical Value for Two tailed test
TRM	17.21	2.13	2.77
DPI	2.51	2.13	2.77

Debt Public Issues

T value (2.51) is greater than the critical test for a one tailed test (2.13) so we can state with 95% certainty that there has been an increase in total funds generated through Debt IPO post 2009.

Same result can also be reached because of the p value for one tailed test is less than alpha.

T value is 2.51 is lesser than the critical t value for the two tailed test (2.77) means it can be stated with 95% certainty that there hasn't been a change in the means from before to after.

P value is greater than alpha supporting the above statement

Analysis:

From the results of Regression Test and T test it can be said that

H_1: Corporate Bond Market reforms have resulted in change in preference of instruments for Capital with special reference to resources mobilized from Initial Public offerings by the Indian Corporate.

H_2: The corporate bond market reforms increased the fund generation for the corporate sector in India.

Conclusion: Capital markets are the backbone of the economy of a country because of the major role it plays to generate funds the Corporates. Over the years it was seen that equity was the most favored instrument when it comes to fund generation through public issue. With the introduction of Non-convertible Debentures there has been a shift in preference by the Corporates. NCDs have now become the most favored source of fund generation through public issue. And further are contributing significantly to the total resources mobilized by the corporate. But at the same time the relation between Debt public issues and resources mobilized through public issues has turned negative post reforms. So it can be said to be a start of new era as far as Total resource generation is concerned. And it can also be said that the efforts are put in a right direction as they are generating expected results. Still the regulatory authorities need to introduce few more corporate and investor friendly reforms to continue the trend by making the issues more corporate friendly so that to end up contributing more to the fund generation.

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Evolving Role of Gold in the Indian Financial System: Recent Evidence

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Sunder Ram Korivi

Abstract:

There is a long-felt need for policy inputs based on the "middle path" perception of gold, in-between the barbaric relic perception of gold and the fiat money status of currencies. An analysis of 157 news items during the period August 2013 through January 2015, covering the 91 experts reveals that such a moderate path is indeed available. Whereas physical gold jewelry in India is an employment and export-generating industry, its financiali-zation through Exchange Traded Funds (ETFs), availability of loans against jewelry and attractive investment status going by rising Private Equity investment reveal linkages between the real and financial sectors. Towards the end of this study period, policy-makers have cast off some of the negative perceptions of the past which drove gold underground, and announced several positive measures, including industry status for jewelry manufacture, steps towards redesigning gold deposit schemes and welcoming recycling of scrap gold, gold refining industry and reopening of gold mines. By converting unstructured data into structured information, this paper presents insights for policy-makers through simple and replicable research methods. Insights from this paper can also be found useful in other developing economies where gold is considered a safe-haven asset by the masses.

Key Words:

Gold, India, Policy.

Background and Context

The subject of gold has attracted a wide spectrum of perceptions in the field of economics. At one end, John Maynard Keynes called gold a barbaric relic, perceiving it as a wasteful consumption or unproductive hoard. At the other end, Asians have a long history of buying gold for its safe-haven status, and, in the process, viewed financial assets with distrust. Is there a middle-path? This is the main aspect of study in the current paper.

The oft-cited Keynesian view of gold is to be viewed in the right and current context. When currencies went off the gold standard, it provided policy-makers with the flexibility to create fiat-

money to finance budget deficits, which was eminently the right thing to do in a deflationary economy, especially the one that prevailed in the 1930s and 1940s. However, the fiscal and monetary stimuli in several developed economies are under severe test, as their economies fail to respond with growth, and their currencies have seen a continual fall in their values against the US Dollar (US$). It is a different matter that the US$ happens to be the reserve currency of the world and continues to be so, despite the magnitude of fiat money it has been issuing especially after the global financial crisis of 2008. Such currency-weakening events could drive people to a more favorable perception towards gold.Today, the US$, the Swiss Franc and gold are probably the last 3 assets that could stand up to the definition of a safe-haven asset. In financial markets, the inverse relationship between the US$ and gold is an established fact, though the magnitude could undergo changes over time.

There is also a long-felt need to understand that in underdeveloped economies, gold plays the role of an investment vehicle that can easily be used as collateral security to raise a loan quickly in a financial emergency. Hence, it would be wrongful to perceive gold purely as an adornment or item of pure consumption or even as an unproductive hoard. An institutional mechanism has emerged in India, where loans against gold jewelry are available and serve the financial inclusion function at the last-mile, for the benefit of those that are unbanked or underbanked. Gold is a highly fungible asset in the Indian context, as it can be converted into cash at a short notice, with very little uncertainty in the ascertainment of its intrinsic or market value.

The manufacture, sale and export of gold make it an economic activity employing several artisans and salespersons, while, at the same time, preserving the intrinsic value of the asset. Jewelry stores extend several savings-oriented schemes across 12 to 36 months, enabling buyers to save for the purchase of gold jewelry in a staggered manner. Buyers are typically price-sensitive in the short run, but insensitive over the long run. This long holding period makes buyers qualify to be defined as investors. Government policy has recently turned favorable towards this sector around November-December 2014, which is the fag-end of the period of study of this paper.

There are also categories of people who buy gold coins, bars and Exchange Traded Funds (ETFs). Paradoxically, this category of persons is highly price-sensitive in behavior. It is ironic that this category of persons are called investors, as their main objective is to gain from price changes, with no long-term investment horizon, in contrast to the buyers of gold jewelry. In reality, such price-oriented behavior reflects speculative behavior.

Thus, the two major realizations, viz., (a)gold jewelry is a distinct asset class with high fungibility into cash, and (b) gold jewelry buyers are long-term investors, represent aspects that are voiced in this paper, so that appropriate policies are formulated to recognize the role of gold jewelry in the economy and in the financial system. Put differently, there is a growing awareness that the prevailing views on gold in western

economic perception actually resulted in harsh, inappropriate and punitive policies in India, which drove gold buying and relative activities underground, in the opinion of the several experts cited in this study.Historically, it was only gold which India could pledge in the 1990s to raise finances overseas, to stave off its Balance of Payments crisis, thus bolstering its safe-haven asset-class status.

This paper closely follows economic events in the 17-month period between August 2013 and December 2014, during which financial markets globally, witnessed high levels of uncertainty and volatility. The objective of this study is to gauge the views of various stakeholders in India, associated with gold in its various forms.

Literature Review

By way of epistemology, the notion that gold is an item of consumption originates from the French verbsumère, which means 'to consume'. This, in turn, originates from the Latin word sumptuarious, which means to take or spend, the same meaning as its English counterpart, sumptuous. As observed by Tuchman (1978), sumptuary laws were enacted in England and Spain in the 14th century limiting or prohibiting expenditure on gold, since it was a scarce commodity and drove money underground from an economy. Hume (1752) observed that the direction of gold flowing between European countries reversed itselfwithin a few years, exhibiting the futility of retaining gold; however, Asia defied this trend, as gold stayed there. Ricardo (1809) noted the attributes of gold in the standard setting process for currency issuance.

Ricardo (1816) also included silver in view of its plentiful availability, but subsequently reversed this decision in 1819. Hamilton (1791) displayed remarkable foresight in the failure of any metal or commodity to serve well as currency. In 1933, US President Roosevelt pushed the Emergency Banking Act, authorizing the prohibition or export of gold or silver and empowering the Secretary of the Treasuryto require the surrender of all gold coin, bullion and certificates (paper notes fully secured by gold) held by the public. Hoover (1952) however, recognized the intrinsic value of gold, when he stated: we have gold because we do not trust the government. Eichengreen (1987) stated that the gold standard demanded a high level of credibility in the actions of governments and central bankers.

Research Problem

Academic interest on the subject of gold purchases by Indians has been in the news since 2013. Economist S Gurumurthy cited the study by the K.U.B. Rao Committee for the Reserve Bank of India (RBI), which stated that the Indian concept of gold buying debunks western theory, as the Indians' buying habit is largely price inelastic. Former Governor of RBI, YV Reddy, also noted that 70% of the time, buyers are peasants and gold is the most suitable collateral security for personal and business loans for unbanked and underbanked rural folk. SoumyaKanti Ghosh, Economic Advisor for State Bank of India, mentioned the need for harmonization in the National Accounting Practices, as the UN System classifies gold purchases as capital investment, whereas the IMF treats gold jewelry as merchandise. He had also called for a

national gold policy as the need of the hour. Prakash Chander, Professor at Jindal School of Government and Public Policy,mooted a Gold Deposit Scheme for Non Resident Indians, to be serviced by interest payments in Rupees. KakaliKanjilalof International Management Institute (IMI) and Sajal Ghoshof Management Development Institute (MDI) observed that the demand for gold among Indians is price elastic in the short run, but inelastic in the long run. Finally, the World Gold Council and Indian Institute of Management at Ahmedabad (IIMA) have set up a think tank to study how gold could be used to help boost economic growth in India, as indicated by Ashish Nanda, Director-IIMA.

Taking a note of the importance of the gold jewelry as an employer as well as exporter, the futility of import curbs and the value of gold as collateral for loans taken by unbanked and underbanked persons, the Indian government is also keen on seeking inputs for the formulation of a national gold policy.

The research problem studied in this paper is stated as under:

1. What specific inputs are available from a wide spectrum of Indian stakeholdersthat can serve as inputs to policy makers for the formulation of a comprehensive national gold policy?

2. Are these inputs recent and current?

3. Can the inputs be presented in a structured form?

4. What are the financial innovations that render the western economic thinking of "gold as a barbaric relic and a fetter to economic growth" to be outdated?

This study is based on an impersonal and impartial analysis of data to provide an empirical basis to the intended findings.

In order to carry out a study on the research problem cited, the research design has been based on the gathering of a mass of recent data capturing a wide spectrum of inputs from various stakeholders, and the deployment of suitable research methods to cull out knowledge from the data, and to be presented in a structured manner for policy-makers. The Data, Methodology are covered in the sections that follow.

Data

Data Period

This study revolved around global events that occurred during the period between August 21, 2013 and January 22, 2015, i.e. 18 months. In India, August-September 2013 was a period of transition from one central bank Governor, Duvvuri Subba Rao to another, RaghuramRajan. The Indian Rupee was at its all-time low, having touched Rs. 68 to the US$. The Indian Rupee was one among the 'fragile five' currencies, the other four being the Brazilian Real, the Indonesian Rupiah, the South African Rand and the Turkish Lira. These five currencies had turned weak in the wake of announcements by US Federal Reserve Chairman Ben Bernanke on a possible tapering of quantitative easing measures, an announcement that strengthened the US$. This currency effect made it more difficult for India to import gold. Interest-

ingly, the last quarter of calendar year 2014 saw a dramatic decline in the global prices of crude oil, having a benign impact on the global prices of crude oil, insofar as Indian imports were concerned. In comparison to the fragile five that witnessed currency depreciation, this time around, commodity exporters, including Russia, experienced a drastic fall in their currencies. This provided space for India to import more gold, offsetting the impact of the oil import bill in India's Current Account Deficit (CAD). Further, in order to curb smuggling and to promote jewelry manufacturers and exports, some import restrictions were eased by the government, towards November 2014.

Data Sourcesand Structure

Some of the data that are available in a structured form are presented in Figures 1 to 3 below and in Tables 1 through 4 of Annexure B to this paper.

Figures 1 through 3 represent the fall in gold holdings in paper (Exchange Traded Form), exports of gold from Switzerland to other jurisdictions including India, and the import pattern of India.

Table 1 provides data on the demand-supply gap, including estimates for Calendar Year 2015, and indicate a possible slowing down in imports. Table 2 provides hard data on the reduction in ETF Folios and the slowdown in ETF unit

sales, which show a decline over the period under study. Table 3 shows the growing interest of Private Equity players in Indian jewelry companies and Table 4 shows the appreciation in share prices of listed jewelry companies in view of the perceived reduction in raw material costs.

While it is easier to analyze such readily available secondary market data, the challenge lies in culling knowledge and wisdom from unstructured data, which is the crux of this paper.

During this eventful period of activity in the US$, crude oil and gold prices, news analytics was performed on events reported in the public domain. This period had approximately 360 working days. During this period of tracking, news items specifically pertaining to gold were filtered, sequenced and placed in chronological order. Gold, as a subject, was prominent in the news, with a total of 157 news items finally available, in unstructured form, for analysis. Data was sourced from press coverage in India, through Business Line, Business Standard, DNA, Economic Times, Financial Chronicle, Financial Express, Hindustan Times, Indian Express, Mint, Times of India and other sources. Some of these sources also reflected global resources such as Bloomberg, Reuters, Wall Street Journal etc. In this process, the views of 91 experts and opinion-makers were collated. A cross-section of the following 6 types of organizations, were covered in this study, as tabulated below.

Policy-makers	Ministry of Finance, Ministry of Commerce, Director General of Export Promotion, RBI, Customs, Air Intelligence Unit, Deputy Superintendent of Police.
International entities	IMF, World Gold Council, London Bullion Association, Shanghai Leading Investment Management, Warburg Pincus, GFMS Thomson Reuters, Dubai Gold Jewelry Group, PAMP of Switzerland, Peru Ambassador to India, Permanent Portfolio Family of Funds, ANZ Group, RBC Capital Markets, Scotia Mocatta, JRG International.
Indian trade bodies	All India Gems & Jewelry Federation (GJF), Indian Bullion & Jewelry Association (IBJA), Delhi Bullion & Jewelry Welfare Association (DBJWA), Koduvally Gold & Silver Manufacturers Association (KGSMA) Associated Chambers of Commerce (ASSOCHAM), Federation of Indian Chambers of Commerce & Industry (FICCI).
Indian manufacturers	Titan Tanishq, PC Jewelers, Senco, Rajesh Exports, PP Jewelers, Joy Alukkas, Kalyan Jewelers, Popley, Thangals, SRSI, MD Overseas, Bluestone, Gitanjali, PN Gadgil, MMTC and mining company Deccan Gold Mines.
Financial sector entities in India	ICICI Securities, Edelweiss, Yes Bank, State Bank of India, Karvy, MotilalOswal, Bank of Baroda, Indian Credit Rating Agency (ICRA), Credit Rating Information Services India Ltd (CRISIL), Kotak Mahindra Bank, National Commodity Derivatives Exchange(NCDEX), Mannapuram, Muthoot, Nomura, First Global, Religare, Angel Comtrade, Geojit Commodies, Indiatrade Commodities, Kolari Capital, Axis Capital, SAIF Partners, ICICI Prudential, HDFC Mutual Fund, WealthRays, Progruss, Brand Capital, FundsIndia.com
Temples (Religious trusts)	Tirumala Tirupati Devasthanam (TTD) and Siddhivinayak Temple.

With the insights from the entities mentioned above, this data was filtered to gauge opinions on the following 5 aspects:

Design	Of gold and schemes for saving, buying, investment, trading, recycling
Current Account Deficit (CAD)	Caused by gold imports
Global factors	Influencing the demand, supply and pricing of gold
Smuggling	Through contraband and over-invoicing of exports, and the responses of policy makers
Mining	In order to reduce imports

In this manner, 157 items of unstructured and raw data has been shaped into a structure, based on chronology, from 93 entities from 6 different types of organizations, classified on the basis of into 5 aspects, for further analysis.

Methodology

Some of the pioneering techniques in news analytics in finance have been explained by Mitra&Mitra (2011) on how financial sentiment can be culled out from news feeds. Academic papers have shown that useful information can be extracted through news analytics. Such social statistics enable researchers to define and measure phenomena in society and quantify the forces which steer markets.

The presentation of hitherto unstructured data in a structured form prepared the ground for analysis. An EXCEL spreadsheet of the dimensions of 146 rows and 8 columns was prepared (157 X 8 = 1256 cells). The 146 rows represented items of data, arranged in chronological order in respect of Dates ranging from August 21, 2013 to January 22, 2015. The 8 columns represented (1) Serial Number (2) Dates (3) Events and their classification into buckets such as: (4) Design (5) Smuggling (6) Global (7) CAD and (8) Mining. For every instance of an impact of any reported news Event on any of the classified buckets, a symbol of Y (Y=Yes) was triggered. Conceptually, it was possible for an event to trigger a Y in more than one bucket. (For example, recycling of gold, a matter of scheme Design, could reduce the CAD. Likewise, Global factors could influence Smuggling). Proceeding in this manner, the news analytics technique roughly follows the generation of a "sentiment index" suggested in Mitra & Mitra, as cited above.

Data represents a set of datum, which, when structured, becomes information and upon analysis, becomes knowledge. Knowledge provides insights into events or phenomena.

Analysis, Findings and Discussion

An analysis of the 157 items of data in the 157 X 8 matrix resulted in the following findings:

Classification Bucket	No. of observations	% to Total	Ranking
Design	86	37.72	I
Smuggling	27	11.84	IV
Global (factors)	44	19.30	III
CAD	61	26.75	II
Mining	10	4.39	V
Total	228	100.00	

Rankings are based on the number of observations in each classification bucket. From the analysis, it can be seen that elements of scheme Design are the most important, whereas Mining is considered the least important. These "buckets" are discussed in the paragraphs below, in the order of their ranking.

Design

The findings are extremely rich in nature. They reveal some misconceptions and also offer out-of-the box innovative design solutions that serve as valuable inputs to policy-makers. A reading of 86 observations can be summarized into 11 strands of thought, as follows:

Motive for Purchasing Gold Jewelry

DGJG (Dubai) opines that youth, worldwide, are attracted to innovative gold jewelry designs. Indians purchase gold jewelry to serve a dual purpose: as an adornment as well as for financial security in the long run. It can easily be pledged to avail of loans in case of financial exigencies, and such pledged gold is released upon repayment of loan obligations. This logic is extended to the gifting of gold jewelry to daughters at the time of marriage. To such individuals, price appreciation of gold from past purchases is seen as an additional advantage, and not the primary reason for possessing gold. One in five Indians is willing to buy gold even if prices rise, and gold jewelry is purchased over a long period in a staggered manner. A WGC-FICCI survey showed that 77% bought gold as a safe investment, 53% primarily as an adornment and 50% for both. From an economic standpoint, a classification of gold jewelry purely as consumption, comes at the peril of ignoring its store value, and appears as inappropriate. South India accounts for 40% of total demand. Gold demand is highest in Tamil Nadu (particularly Chennai and Madurai), Kerala and among the

Marwaris in North India and demand peaks around festivals, especially from September to April, and especially the marriage season from November to February. Interestingly, GJF mooted a gold jewellery circuit, along Surat, Jaipur, Coimbatore, Kolkata and Ahmedabad. WGC supports this idea. Dubai and Thailand are examples of such promotional centres.

In the current lexicon of financial assets, gold is an asset class, as also other alternative investment assets such as art, collectibles and vintage wine. To Indians, gold prices are elastic in the short run but inelastic in the long run. Two types of businesses revolve around this Indian need: jewelry stores and gold jewelry loan companies.

Jewelry Stores

At one end of the spectrum, large jewelry chain stores and ubiquitous small shops around the country cater to the demand for gold jewelry. Savings are tapped by such stores through monthly deposits, exchangeable at the end of 12 to 24 months for purchase of gold jewelry. Such schemes have proved to be extremely popular, going by the schemes of reputed listed companies such as Titan (Tanishq), TBZ, PC Jeweler, Shree Ganesh and Thangamayil, to name a few. However, the Companies Act, 2013, has placed restrictions on the acceptance of deposits by companies through sections 73 and 76, resulting in a halt to such schemes. The successful businesses of the aforementioned jewelry companies have led to an impetus in equity infusions by private equity firms, the prime example being Warburg Pincus which has acquired an equity stake in Kalyan Jewelers. Other such equity infusions include SAIF in Senco, Progruss and Credit Suisse in Shree Ganesh and Brand Capital in Gitanjali Brands, Ratan Tata and Kalaari Capital in Bluestone. Vaibhav Gems, Oyzter-Bay and Caratlane are also beneficiaries of private equity investment. Institutional as well as retail equity investors in jewelry companies gained hugely from the recent fall in international prices in gold, raising the profit margins of jewelry companies, and as a result, their share prices. In order to reduce import dependence, Deccan Gold Mines plans to revive activities in certain mines, and has issued rights shares to its existing shareholders to fund the expanding activities.

Gold Jewelry Loan Companies

At the other end of the spectrum, there are specialist gold loan companies, organized as Non Banking Finance Companies (NBFCs), under the regulatory purview of the Reserve Bank of India (RBI).They provide secured loans against gold jewelry, with stipulated Loan-to-Value (LTV) ratios. Such loans, being secured, are financially inclusive in nature and provide access to persons that are otherwise excluded from the formal banking system. After an initial tightening of the LTV norms, RBI has gone for a subsequent relaxation. Owing to their usefulness in the financial system in the form of last-mile connectivity to the consumer, some of them, such as Muthoot and Mannapuram are preparing to apply for banking licenses as small banks, and provide a diversified range of services to their customer base. The primary mode of funding is through the issue of Non Convertible Debentures (NCDs). Of late, they have been

expressing their difficulty in complying with the requirement of creating a Debenture Redemption Reserve (DRR) as per the Companies Act, 2013, since it will result in a reduction of working capital. This point is justified by NBFCs, saying that since NBFCs have a steady, liquid stream of cash flows from loan recoveries, and very little investment in physical infrastructure such as property, plant &equipment as is the case with manufacturing companies that issue debentures, they will have compara- tively lesser problems in coming up with cash from operations to fund debenture redemptions.

Investors and Speculators

In the current lexicon in finance in usage, investors are classified as those who purchase gold coins and bars and also in the form of Exchange Traded Funds (ETFs) offered by mutual funds. This is as opposed to the buyers of gold jewelry who are classified as consumers. Investors gain during phases of rising prices and lose during phases of falling prices. At this point, it is pertinent to recall the classic 1938 book by John Burr Williams, titled The Theory of Investment Value. In this work, Williams has defined an investor as one who buys an asset for its income, whereas a speculator is defined as one who buys an asset for its price. These definitions by Williams have unquestionably stood the test of time. Now, when compared with the current classification of the buyer of gold coins, bars and ETFs as investors, it goes against the grain of William's definition of a speculator. This is one of the most significant insights from the data. Going by the same definition by Williams, one who purchases gold jewelry over a long period of time in a staggered manner

for financial security, is actually an investor, since any capital gain is a co- incidentaladditional benefit derived from holding the asset. Such a realization could have implications in policy reformulation. In recent times, when gold prices corrected, many people moved out of coins, bars and ETFs and into gold jewelry.

National Accounting Systems

This conceptual-definitional anomaly has also been echoed by Soumya Kanti Ghosh, Chief Economic Advisor to the State Bank of India (SBI). The Interna- tional Monetary Fund (IMF) manual, BPM06, puts gold jewelry under mer- chandised imports. However, under the United Nations System of National Accounts, 1993 (UNSNA), which India adopted in 2000, gold purchases are not treated as consumption under Private Final Consumption Expenditure (PFCE). Considering the role of gold as a financial security in India, there is a need for an appropriate reconciliation in the national accounting system. In view of the aforesaid, the CAD position after excluding gold will present a better picture in the light of the position of gold as capital formation and not consump- tion.

Government Policy on Manufacturing

The government of India has identified jewelry manufacturing as one of the major employers and exporters. As a policy measure, it plans to include jewelry manufacturing as a thrust area under the "Make in India" policy cam- paign. The Department of Industrial Policy and Planning (DIPP) will take measures towards this direction. Import restrictions have been reversed primarily

to assist Indian manufacturers and exporters, as the government has realized that smuggling can be minimized, but not be eliminated. It also reinforces the understanding that in the Indian context, gold jewelry is not a purely consumption decision, but also an indigenous mode of financial inclusion. Additionally, the global weakness in crude oil has taken a major burden off the Indian balance of trade position and the CAD, providing much more leeway for the import of gold, for manufacture and partly for re-export.The government has also planned a proposal for a unique alpha-numeric code for jewelry. This is to ensure purity and traceability. Currently, the Bureau of Industrial Standards (BIS) is the hallmarking authority, and has issued licenses to 14,000 assayers across India. There are also suggestions for declarations of the Income Tax Permanent Account Number (PAN) for single transactions in excess of Rs. 50,000. Suggestions for a unique alpha-numeric code for jewelry and the PAN declarations have witnessed opposition from industry bodies.

Gold Deposit Schemes

According to various reports, estimates of gold with households range between 20,000 to 31,000 tons, with a total value of roughly 50% of India's current GDP. Market Oracle of UK estimated Indian household stocks at 20,000 tons. Karvy Wealth reports a figure of 22,000 tons, whereas MMTC PAMP place the estimate at around 25,000 tons. According to MMTC, banks' core competence is in working capital and not precious metals. The government estimates gold savings stock at 31,000 tons and is likely

to formulate a national gold policy. Scotia Mocatta, a leading international player, places the estimates at 22,000 tons and is likely to seek RBI approval for a gold deposit scheme, in cooperation with GJF members. Renewed efforts have been suggested to tap idle gold within India. An earlier attempt by SBI to implement its Gold Deposit Scheme failed to evoke a response from the public mainly on account of two reasons: First, the interest rate was perceived to be very low, at 1% to 1.5% p.a. Second, the minimum grams of gold deposit was prescribed at 500 gm. Only 30% of people were aware of gold deposit schemes, and 15% of people felt that only SBI offered gold deposit schemes. MMTC PAMP conducted a survey across 7,500 persons across 24 cities in 10 states India and found that 65% of people are interested in gold deposit schemes. A re-design is suggested along the lines of a minimum deposit of 40 grams and an attractive interest rate, backed by gold deposit certificates.

Scrap Gold Recycling and Refining

The government-owned Minerals and Metals Trading Company (MMTC) has entered into a collaboration with PAMP of Switzerland and the GJF members to tap scrap gold for recycling. Banks can also use their branch network to mobilize scrap gold, which can be recycled, in order to reduce import dependence. Muthoot, a gold loan company, also plans to foray into recycling. MMTC also plans to set up refineries to process gold ore (dore), partly for re-export and partly for indigenous purposes. This will also help in reducing the net import bill. Hitherto, the import bill was also higher

because of gold dore refined outside India, which was built into the imported bars. Gold imports are said to imply a flight of capital from India. One acade-mician has suggested that gold deposits from NRIs be encouraged, at attractive rates of interest, along the lines of Foreign Currency Non-Residents (FCNR) deposits, with interest and principal redeemable in Rupees.

Central Bank and Commercial Bank Reserves

India, like central banks the world over, maintains a part of its reserves in gold, in a vault outside the country. This gold can be leased (by constructive delivery, the gold remains in the vault). In consideration, the country can receive cash flows, which, on completion of the lease period, releases the gold back to the owner. India has around 200 tons of gold which can be used to generate foreign currency, if needed. Countries like Turkey have permitted banks to maintain a part of their reserves in the form of gold. India needs a Gold Deposit Schemes, a Gold Bank and a Gold Policy, which are better policy

mechanisms, in place of curbing imports. The World Gold Council (WGC) and the Indian Institute of Management-Ahmedabad (IIMA) have come together to establish a centre for policy research on gold at IIMA.

Religious/Temple Trusts

Gold objects are often donated by devotees into the collection boxes of temples. The Tirumala Tirupati Devasthanam (TTD) has 1,700 tons, with collections getting enhanced on a monthly basis. The trust authorities have entered into an arrangement with SBI wherein the gold is melted into bars for onward lending under a gold deposit scheme, to earn interest on gold that would otherwise be idle, and augments its finances. The Siddhivinayak Temple auctions donated gold to devotees and uses the proceeds to augment its finances. The RBI had at one point in time, initiated a discrete survey of gold with large temples, but subsequently dropped the survey, in the light of a lukewarm response from most temples. Governments could make use of such

Figure 1: Reduction in Gold ETF Folios
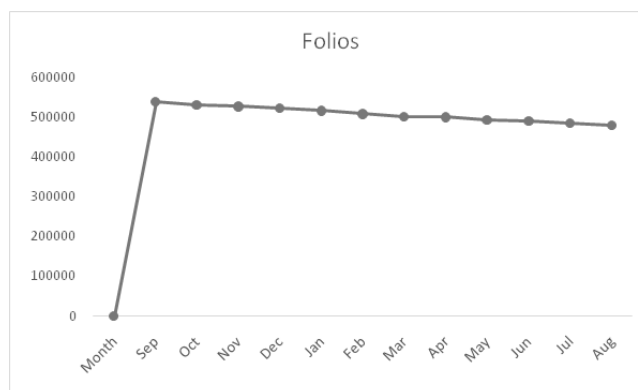
gold as collateral to raise funds at sub-sovereign rates.

Financialization of Gold

Some buy gold ETFs as a diversifier, whereas some buy it for their daughters' marriage. As an investment, gold does not give great returns. It is a hedge. It was observed that investors divest from gold when an economy recovers. The reduction in gold ETF folios in India, from the SEBI and AMFI data is depicted in Figure 1 below.

Growth in bank fixed deposits tapered in December 2014 as investors turned towards mutual funds and gold. On the financialization of gold, another product in the market was: Edelweiss designed a PMS product for HNIs, using quant-based trend analysis to buy and sell paper gold.

ETFs serve as the junction between the financial market and the commodity market. On the financial market front, SEBI has allowed ETFs to hold gold in the form of deposit certificates issued by banks, in addition to gold holdings in dematerialized form. On the commodity market front, NCDEX, the commodities exchange, introduced a contract for 1 kg of gold, which mimics international prices. MCX, the other commodities exchange, also introducedgold futures. Some perceive that derivatives create artificial volumes that inflate prices, and real investing is in the long run. The WGC FICCI study mooted the setting up of an India Gold Exchange and Gold Board.Global miners hedge prices, as market prices fall, whereas

there could be others looking to hedge their positions, as gold prices are volatile in the short run. In November 2014, short-sellers were hit hard on a spike in gold prices. This underscores why hedging instruments and exchange-traded derivatives in regulated markets are important. On the international front, Shanghai plans to commence a gold exchange and set benchmark prices, which is a significant development since China is the world's largest importer of gold and could generate volumes. The other significant market, in West Asia, is the Dubai Gold & Commodity Exchange.

Current Account Deficit

There were 61 observations under this head, summarized as under.

The extent of gold imports, in value were 1/3rd of crude oil, the major import of India.

Under the system of national accounting, gold imports are a part of merchandise, and therefore, contribute adversely to the CAD. It is mostly the middle class that buys gold, and this is a huge segment of the Indian population which is enjoying dual household income and high purchasing power.

India, with 830 tons, was the largest importer in 2012. In 2011-12, imports were 800 tons, and the expectation for 2012-13 was 845 tons. In 2013, China imported 996.3 tons, pushing India to second place, with 977.6 tons. China and India exceeded their 2012 imports by 29% and 24% respectively. Import curbs helped in partly reducing the import of gold, with a

greater emphasis on recycled gold. The period of June-August is the off-season for gold purchases in India. Imports of 450 tons, shot up 26% in September 2014, on high festival demand. Trade deficit was at an 18-month high, exacerbated by crude oil imports. Imports also surged due to a rush by buyers to avail of lower prices. Imports from Switzerland worth Swiss Franc 2.2 billion, almost doubled over the corresponding year ending September 2013. In September, India became the highest importer for the month, overtaking China. The government examined the angles of smuggling, black-money from Switzerland and round tripping by gold jewelry by exporters. Import curbs began to hurt small exporters, who requested for import quotas. RBI entered into consultations with the government for higher curbs, as the CAD worsened. A strengthening of the US$ resulted in lower gold prices, resulting in increased buying from India. In November 2014, India scraped import restrictions, partly on account of the futility in curbing smuggling, and partly on account of the easing of CAD pressure due to falling crude oil import bills. Furthermore, falling prices of gold kept speculators off, opening the door for buyers. On a corresponding year basis, imports in November 2014 saw a seven-fold jump over November 2013. The scrapping of import restrictions adversely impacted those who had built excess inventories, anticipating their continuance. Falling crude oil prices was a phenomenon that few anticipated. Perhaps the government had also realized the employment potential and export potential of the gold jewelry industry. It could also have been the cusp of a policy reversal on the perception of gold as a purely consumption expenditure, and its recognition as a financial security, if harnessed through well-designed gold deposit schemes.

Figure 2 below shows the exports from Switzerland to various countries, in

Figure 2: Exports from Switzerland. Source: Business Line Research
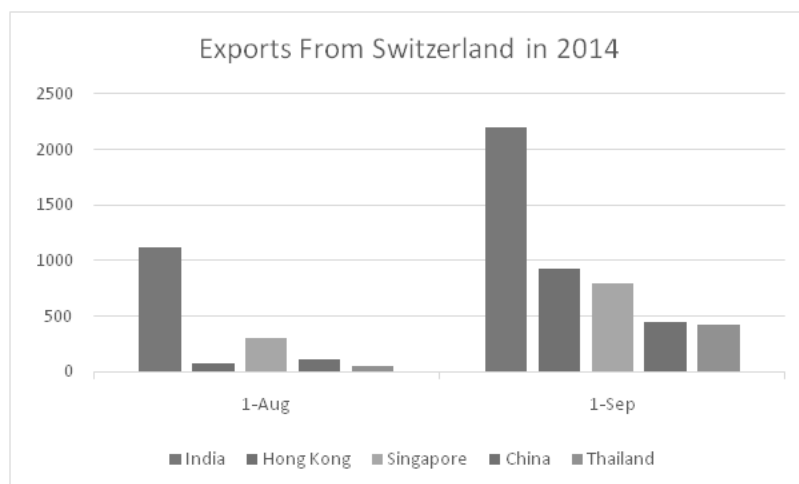
Figure 3: Quarterly Imports into India. Source: Business Standard, GFMS Thomson Reuters and WGC
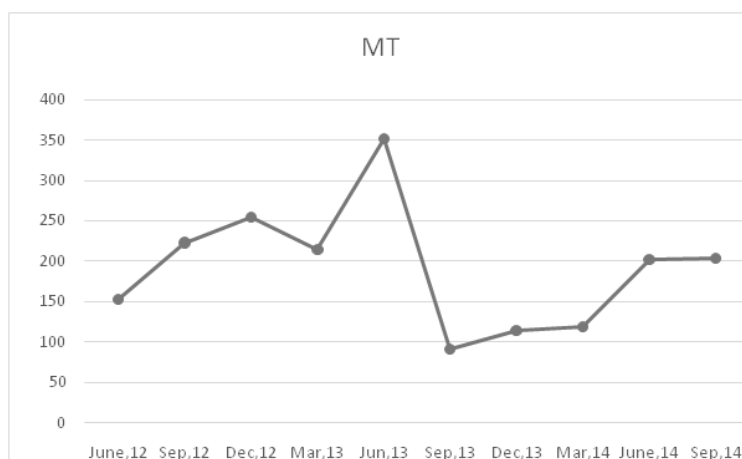
August 2014 and September 2014. A dramatic rise can be seen in Swiss exports, being imports into India.

Figure 3 below depicts the quarterly net imports, available for domestic consumption from June 2012 to September 2014. Here too, a dramatic rise can be seen around June 2013, and one can understand the exacerbating influence on the CAD. There was some cooling off in September 2014.

The government has had a difficult balancing act to perform between curbs, smuggling, CAD and low levels of recycling.

Global Factors

The 44 observations under this head are summarized below.

The Turkish central bank permits its commercial banks to hold a part of their reserves in gold. This serves as a store value against the potentially depreciating Turkish Lira, and also hedges against inflation. The Reserve Bank of India (RBI) is the 11th largest gold holder among central banks all over the world. The top central bankers in this respect are Russia, China, Kazakhstan and Azerbaijan. Russia declined reports that it was due to sell part of its gold reserves to protect its currency.

A strong US$ and economic growth coupled with tapering possibilities in quantitative easing, drove investors away from gold during late 2014. The world's biggest gold ETF, viz. SPDR, booked profits in late August 2014. The rallies in equities led to a fall in gold ETFs. As a consequence, Deutsche Bank exited the precious metals business, with Credit Suisse, Barclays and JP Morgan Chase to follow suit. Switzerland voted against enhanced gold reserves by its banks, thereby lowering global gold prices.

Peru, the 6th largest gold producer in the world, invited export enquiries from India, which is the world's largest importer. Peru also invited Indian companies to explore mining opportunities in Peru. China, the world's second largest importer, planned to launch the Shanghai Gold Exchange in September 2014, to provide an alternative platform to London and New York, for setting benchmark prices. Enhanced economic prosperity drives savers towards gold, in the face of few alternatives.

According to MMTC, there is huge potential for India to be a global gold refining center. It has established a 100 ton per annum center in India, just a fraction of the 900 tons of annual import by India.

Smuggling

There are 27 observations, summarized below.

According to the RBI-appointed K. U. B. Rao Committee, unfavorable policies have driven gold underground. As per the WGC, 28% of gold imports into India in 2014 were through smuggling. ASSOCHAM estimated the extent of smuggling in 2014 to be 150 tons, against WGC's estimate of 200 tons. Gold smuggling was expected to rise 50% in 2014, as per WGC to 200 tons. This is based on exports out of Dubai heading to India, but under-reported in official Indian channels. Export data to India reported by Swiss Customs were valued at Swiss Franc 2.2 billion, raising suspicions of smuggling, round tripping and black money. Imports to India accounted for 27.7% of total Swiss gold exports.

As per the Central Board of Excise and Customs, Reuters and Wall Street Journal, in year ended September 2014, there had been a 7-fold increase in smuggling. Gold is also smuggled through fictitious exports, in order to enhance the import quota of gold bullion. Air Intelligence Unit of Customs reported 605 kg of gold smuggling compared to 70 kg last year. Festive demand and import levy are cited as reasons for the persistence of smuggling. 12 cases of high-value smuggling were reported in October 2014 by Mumbai Customs alone, and the trend continues well into January 2015. Passengers have, thus far, favoredthe Middle East, Nigeria, Malaysia and Thailand as the point of embarking.

Koduvally, near Kozhikode in Kerala, is a haven for gold smugglers to sell their wares. It is a county of 50,000 persons, 2500 families are goldsmiths, 250 in the gold business. Kalyan and Joy Alukkas have also set foot here. Rising import duties are the stimulus. 600 meters have 100 shops, along NH 212.

One suggestion to reduce smuggling is to invite gold deposits form Non-Resident Indians (NRIs) and service the same in rupees, at an attractive rate of interest.

Mining

The 10 observations under this classification are summarized below.

Mining output at Hutti, Uti and Hira-buddini- all in Karnataka State, have stagnated at 2.8 tons p.a. A proposal for the revival of state-owned Bharat Gold Mines limited (BGML) has been examined by Ministry of Finance. Around 40

mines have been prospected. Annual yields from mines are barely 4,500 to 5,000 tons and more of prospecting needs to be done. Import substitution is required to compete against Dubai, Switzerland and Australia. 40% consumption could be through recycling. The Government of India is reviewing a gold mining proposal at Ganajur, by Deccan Gold, 2000 ton-per-day (tpd) ore processing plant. This is one of the 8 mines identified by the Ministry of Commerce. Peru, the 6th largest gold producer, has invited Indian companies to explore mining opportunities in Peru.

Enhanced operational costs of old mines and low levels of recycling are likely to keep gold prices high, despite high imports. When gold prices fall, or are perceived to fall, miners need hedging tools through derivatives such as put options or futures markets to protect their prices. The availability of recyclable gold, together with mining output will be plusses for the gold refining industry.

Thus, the Data have spoken for themselves.

The analysis and discussion in the foregoing paragraphs provides 15 distinct strands of thought. Of these, 11 pertain to Design of schemes, whereas the other 4 strands of though pertain to CAD, Global factors, Smuggling and Mining. The 11 strands of thought, under Design of schemes, cover the entire gamut of: motives for jewelry purchase, manner of purchase of jewelry, surrogates for gold in the form of ETFs and equity shares of jewelry and gold mining companies, and loans against gold jewelry. From an institutional perspec-

tive, the roles of banks and temple trusts are also analyzed and discussed. The other 4 strands of thought covering the impact of gold imports on the CAD, Global factors pertaining to gold, Smuggling and its causes and consequences and prospects for gold mining are also discussed under the umbrella of this study. These 15 strands of thought come from 6 types of entities, based on inputs from 91 practitioners and policymakers. Hence, the output from the analyses could serve as a set of inputs for various stakeholders under a comprehensive, coherent framework with an empirical basis. All the analysis, findings and discussions are based purely on the data, which the researchers have duly collated. This study eschews the oft-practiced approach of measuring the impact of various variables on gold prices, ostensibly carried out for providing a basis for trading strategies.

Summary, Conclusions and Recommendations

The view that gold is purely an item of consumption needs to be seriously revisited, in the light of its re-emergence as an asset class and its fungibility with respect to cash. This is not surprising, since gold has played the role of currency for considerable periods in economic history. The western (Occidental) view that gold is a barbaric relic is limited to the context of the lack of monetary flexibility under the gold standard. In the post 2008 era, fiat money issued by most of the economies in the developed countries have led to the reconsideration of gold as a safe haven asset, and not an item of consumption. In the economies of the developing countries, gold and its various forms have always been seen as

a safe haven asset, as well as the first step in financial inclusion, owing to its pledge and resale value. The adornment aspect is an additional benefit, hence it is not to be as an item of pure consumption.

Recognizing the useful and undeniable role of gold in a developing economy such as India, inputs towards a coherent and comprehensive national gold policy need to be based on a broad spectrum of opinions from across all types of stakeholders. This study provided an opportunity towards the identification of key elements towards such a policy formulation.

The 15 broad strands of thought, together with their corresponding roles in policy-formulation are summarized below in a factual, unbiased form.

S No	Aspect	Recommendation from the Discussions
1	Motive for households purchasing jewelry	77% bought gold as a safe investment, 53% primarily as an adornment and 50% for both. TN and Kerala are the largest markets, followed by Marwaris in North India. South India accounts for 40% of Indian demand
2	Jewelry stores as a business model	Sales promotions through systematic savings &purchase plans. An organized sector is emerging: large, listed companies, with institutional and private equity players, coexist with the ubiquitous small stores and a growing number of online stores
3	Gold jewelry loan companies	Serve the last-mile lending function, performing the financial inclusion function, especially to the unbanked or underbanked
4	Investors and speculators	There is a major definitional error prevailing in this field. Paradoxically, buyers of coins, bars and ETFs who expect to gain from price changes are called investors, whereas those buying jewelry over a long time period as a safe haven are called speculators
5	National Accounting Systems	Under UNSNA, gold purchases are not treated as consumption; but IMF manual BPM06, puts gold jewelry under merchandised imports
6	Government policy on manufacturing	Jewelry manufacture is an employer and exporter, included under the Make-in-India campaign

S No	Aspect	Recommendation from the Discussions
7	Gold Deposit Schemes	Did not succeed due to low interest rates and high level of minimum deposits. Needs redesigning. A survey across 7,500 persons across 24 cities in 10 states India and found that 65% of people are interested in gold deposit schemes. Non Resident Indians could also make deposits in gold, for interest in rupees
8	Scrap gold refining and recycling	MMTC has entered into a collaboration with PAMP of Switzerland and the GJF members to tap scrap gold for recycling. Banks can also use their branch network to mobilize scrap gold, to reduce import dependence
9	Central Bank and Commercial Bank Reserves	Countries like Turkey have permitted banks to maintain a part of their reserves in the form of gold. India needs a Gold Deposit Schemes, a Gold Bank and a Gold Policy, which are better policy mechanisms, in place of curbing imports.
10	Religious/Temple Trusts	TTD has 1,700 tons, with collections getting enhanced on a monthly basis. The trust authorities have entered into an arrangement with SBI wherein the gold is melted into bars for onward lending under a gold deposit scheme, to earn interest on gold that would otherwise be idle, and augments its finances.
11	Financialization	Some buy gold ETFs as a diversifier. As an investment, gold does not give great returns. It is a hedge. Investors divest from gold when an economy recovers. Edelweiss designed a PMS product for HNIs, using quant-based trend analysis to buy and sell paper gold
12	Current Account Deficit (CAD)	Gold imports of account for roughly 1/3rd the value of crude oil imports. Easing oil prices reduced India's crude import bill, paving the way for a rise in gold imports

S No	Aspect	Recommendation from the Discussions
13	Global factors	RBI is the 11th largest gold holder among central banks all over the world. The top central bankers in this respect are Russia, China, Kazakhstan and Azerbaijan. India is the world's largest importer, followed by China. India imports a large quantity of refined gold from Switzerland, accounts for 27% of Swiss exports
14	Smuggling	This is an outcome of price arbitrage. 28% of imports constitute smuggled gold. Import restrictions make smuggling more attractive. Smuggling increased 7-fold in 2014 over 2013
15	Mining	The Government of India is reviewing a gold mining proposal at Ganajur, by Deccan Gold. This is one of 8 mines identified by the Ministry of Commerce. Peru, the 6th largest gold producer, has invited Indian companies to explore mining opportunities in Peru

Some immediate action points emerging for consideration by policy-makers include:

1. A relook into the new Companies Act 2013, particularly sections 73 and 76 pertaining to restrictions on companies (including gold jewelry store companies), is called for. Gold jewelry stores that are incorporated as companies, may consider allowing the acceptance of deposits representing advances towards purchases. RBI and SEBI may be consulted for their views. Use of debit cards and cheques for purchase of gold could be encouraged, as also hallmarking of individual pieces of jewelry and quotation of income tax account numbers for large transactions, to create audit trails.

2. Likewise, gold jewelry loan companies that perform a useful financial inclusion function may be waived off from the stipulation of setting aside a part of their profits towards a Debenture Redemption Reserve, as it will otherwise lock-in precious working capital. The reserve requirements may not be necessitated on account of liquid collateral in the form of gold jewelry. RBI and SEBI may be consulted for their views.

3. The national accounting system may be amended to harmonize the differential treatment of gold imports. Instead of incorporating the IMF method that treats gold as consumption, India could follow the UN System, which treats gold purchases as capital formation (Investment). Likewise, the CAD

calculations may also be adjusted after excluding gold imports, since they constitute capital formation. This will fine-tune policy-making to focus on other imports such as fertilizer chemicals, edible oil, pulses and electronic gadgets.

4. RBI may consider permitting banks to hold a part of their reserves in the form of gold, rather than all-cash. The example of Turkey may be followed. The RBI could also strategically augment gold purchases at every dip, as foreign currencies held as reserves could suffer debasement without warning.

5. A national-level gold bank could provide pre-verified gold deposit certificates, which could form the basis for loans and collateral. Gold deposit schemes could also be redesigned, with a separate scheme for Non Resident Indians. Religious/temple trusts could also be encouraged to participate in greater numbers under gold deposit schemes.

6. India can set up refining centers for treatment of imported gold ore and domestic scrap or recycled gold. There will be savings in import duties as well as revenues from exports of refined gold.

7. Manufacturing industry status for the gold jewelry sector could be considered, since it is a large employer and exporter. The Make-in-India image could also be burnished by setting up jewelry tourist circuits as is the case in Thailand, Netherlands etc.

8. Indian companies could be encouraged to take equity stakes in gold mining companies in Peru and other countries. Besides, mining activity in India could also be given a fillip.

Past policies in India have driven gold underground. A realization has dawned upon policy-makers to channelize the demand for gold, get the sector organized and streamline manufacturing, saving and investment activity to bring it to the mainstream. The Occidental perception of gold as a consumption or hoard is countered by the Oriental perception of gold as the ultimate safe-haven asset. The Occidental perception has run its course, as gold is far more preferable to paper currency especially when interest rates in both cases tend towards zero. The development of the financial sector such as gold loan companies and the financialization of gold in the form of ETFs and shares in listed gold jewelry companies and gold mining companies complement the repertoire of investment opportunities.

The most important takeaway from this study is the misconceived notion that buyers of coins, bars and ETFs are investors, whereas they are speculators who follow prices. Conversely, long-term buyer-accumulators of gold jewelry (with an opportunity to pledge the same for loans, in emergencies) are wrongly termed as consumers. An understanding of this reality will pave the way for a coherent and comprehensive national gold policy for India. Other developing economies may also stand to gain by emulating such a policy.

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Annexure A :

List of 90 Experts Cited (in chronological order)

NAME	ORGANIZATION
David Gornall	London Bullion Assoc
Soumya Kanti Ghosh	SBI
Rana Kapoor	Yes Bank, ASSOCHAM
Jeffrey Franks	IMF
YV Reddy	RBI
Kiran Dixit	TBZ
Ashok Minawala	GJF
Gaurav Kushwaha	Bluestone
Haresh Soni	GJF
Rajan Venkatesh	ScotiaMocatta
Mehul Choksi	Gitanjali
Sanjeev Bhatia	PC Jewellers
Unnikrishnan	Mannapuram
Duan Shihua	Shanghai Leading Investment Management
Samir Shah	NCDEX
George Alex Muthoot	Muthoot
Vikas Sachdeva	Edelweiss

NAME	ORGANIZATION
Manish Sonthalia	Motilal Oswal
Sanjeev Agarwal	Gitanjali
R K Sharma	PC Jewellers
CK Venkatraman	Titan Tanishq
Ramesh Kalyanaraman	Kalyan
Anuj Sharma	SRSI
Rajesh Khosla	MMTC PAMP
PR Soma-sundaram	WGC
PR Soma-sundaram, Louise Street, KrishanGopaul, Alistair Hewitt, Marcus Grubb	WGC, WGC Report
PR Soma-sundaram	WGC, ASSOCHAM Report
Karthik Srinivasan	ICRA
Prashant Jain	HDFC MF
S Naren	ICICI Pru
KiranKavikondala	WealthRays
Javier Paulinich	Peru Ambassador-India at IIGC Pune
Harish Galipelli	Indiatrade Derivatives & Commdts
Prithviraj Kothari	IBJA

NAME	ORGANIZATION	NAME	ORGANIZATION
Cameron	GFMS Thomson	Vani Kola	Kolari Capital
Alexander	Reuters	Kiran Kumar, DC	AIU
Sajith Kumar	JRG Intetn'l	APS Suri, Commissioner	Customs
Krishna Pratap Singh	DGEP	Naveen Mathur	Angel Comtrade
Satish Bansal	MD Overseas	Sugandha Sachdev	Religare
BachhrajBamalwa	GJF	Sandeep Lakhwara	Deccan Gold
Tapan Trivedi	Karvy	Keyur Shah	Muthoot
Murukesh Kumar	Inditrade	Prem Prakash Sharma	DBJWA
Lakshmi Iyer	Kotak AMC	Pankaj Parekh	GJF
Pankaj Parekh	GJF	VP Nandakumar	Mannapuram
Jaison Abraham	DSP	Sudheesh Nambiath	GFMS Thomson Reuters
K Surendran	KGSMA	Harish Galipelli	JRG Intetn'l
PK Mohammed	Thangals	SonalVerma	Nomura
Rajiv Popley	Popley	Shankar Sharma	First Global
Suvankar Sen	Senco	Hareesh V	Geojit Comtrade
Nitin Nachnani	GeojitComtrade	Ajay Manglunia	Edelweiss
TS Kalyanaraman	Kalyan	Sanjeev Lall	DBS
Vishal Mahadevia	Warburg Pincus	DK Joshi	Crisil
S Subramanian	Axis Capital	Arundhati Bhattacharya	SBI
SaurabhGadgil	PN Gadgil		
Sandeep Kulhalli	Titan Tannishq		
PremHinduja	TBZ		

NAME	ORGANIZATION	NAME	ORGANIZATION
Sumit Bali	Kotak Mahindra Bank	Rupa Rege Nitsure	Bank of Baroda
Sunil Kashyap	Scotia Mocatta	Shubada Rao	Yes Bank
Rahul Gupta	PP Jewellers	Didar Singh	FICCI
Bharat Chhoda	ICICI Sec	Tawid Abdullah	DGJG
Abneesh Roy	Edelweiss	Michael Cuggino	Permanent Portfolio Family of Funds
Joy Allukas	Joy Alukkas	Mark Pervan	ANZ Group
Ketan Shroff	IBJA	George Gero	RBC Capital Mkts
Aditi Nayar	ICRA	Srikanth Meenakshi	FundsIndia.com
Anjan Deb Ghosh	ICRA		

Annexure B :

Brief Statistical Outline of Secondary Data on Gold

Table 1: Supply and Demand for Gold in India

Source: WGC, ICRA

Supply	2011	2012	2013	2014E	2015E
Imports	969	860	825	740	850
Recycled	57	117	101	75	70
Others	11	10	8	10	10
Total	1037	987	934	825	930
Demand					
Jewellery	616	552	613	635	680
Bar	368	312	362	190	170
Total	984	864	975	825	850
Supply Gap	-53	-123	41	0	-80

Table 2: Trends in Gold Holdings through ETFs

	AMFI and SEBI: ETF flows			Note: 10 million = 1 Crore
		Net out	Folios	Sales
	Month	Out Rs Cr	Nos.	Rs Cr
2013	Sep	294	539231	1
	Oct	288	531782	7
	Nov	131	527881	14
	Dec	157	523957	1
2014	Jan	165	516667	1
	Feb	178	508578	0
	Mar	149	502613	13
	Apr	146	500518	14
	May	341	494355	7
	Jun	227	490462	1
	Jul	105	485394	1
	Aug	112	480001	5

Table 3: Private Equity Firms Invested in Indian Equities VC Circle

PE deals in Jewellery Stores

Date	Investee	Investor
24-Jan-12	Gitanjali	Brand Cap
27-Jun-14	Shree Gan	Progruss
28-Aug-14	Kalyan	Warburg
9-Oct-14	Senco	SAIF Partners
22 Jan 15	Caratlane	tiger Global

Table 4: Performance of Jewelry Stocks of Listed Indian Companies

Jewellery Stocks 1.12.14

ETIG Database

	Company	Mcap Cr	CMP	% Chg 1 yr	% Chg 1 dy
1	Sh Ganesh	200.63	27.9	-5.1	20
2	Gitanjali	589.7	60.1	10.28	19.96
3	TBZ	1194.6	179.1	36.61	19.28
4	Titan	34593.13	389.65	70.67	5.3
5	Thangamy	261.57	190.65	19.23	4.78
6	C Mahend	98.43	16.25	-92	4.64
7	Tara C	229.83	93.35	5.54	3.84
8	Rajesh	5107.21	172.95	86.87	3.38
9	PC	4442.58	248.05	176.53	2.78

Good Havens! Tax-Arbitrage and the Indian Experience

Abstract:

Tax havens are an outcome of high tax rates in the 1970s. India has joined the concerted international movement in clamping down treaty abuse, in an effort to collect its rightful share of taxes. The sunset clause for tax exemptions for various businesses is approaching, pushing more firms towards profit-shifting towards havens. For tax authorities, data is no longer the problem. Banking secrecy laws are getting diluted due to international pressure, and the flow of data through bilateral information exchange agreements is on the rise. At the policy level, there is a case for (a) removal of a plethora of deductions and exemptions (b) reducing effective rates of taxes to render tax arbitrage irrelevant and (c) easing of procedures to move into the next trajectory of tax administration. There is also a case for strengthening the databases of the tax authorities across countries.

Key Words:

Tax Havens, Tax Arbitrage, Profit Shifting.

Sunder Ram Korivi

Motivation

A developing country like India faces challenges in bridging its budget deficits, particularly in the light of business downturn and lower tax collections. For over 50 years, high domestic tax rates have forced a flight of income to destinations outside India. In subsequent years, the mobility of funds from one country to another has been enabled by electronic transfers of money. Secrecy laws in various tax havens have led to layering of ownership structures of offshore financial entities, and possible re-entry through capital market transactions in round-tripping arrangements. Of late, information on Indian bank account holders has come under the possession of Indian tax authorities through bilateral arrangements. In addition, organizations such as the International Consortium of Investigative Journalists (ICIJ) have shed fresh light on such complex and sophisticated webs of financial transactions. The objective of this paper is to consolidate information from diverse sources and present such dynamic, unstructured information in a structured manner. The desired outcome is to suggest action points for the Indian tax authorities. This paper and its suggestions may be equally relevant for tax authorities in other developing and developed countries.

RESEARCH BULLETIN

Organization of Contents

The Background section and the International Perspective are around the common thread of tax-mobilization efforts in line with the US FATCA-type laws. Since India and its regulators are members of international organizations, the approach is in concert with OECD, G8 and other multilateral bodies. This is followed by a description of the Data and Methodology. In subsequent sections, Information from ICIJ, Other Sources and the Response from Indian Authorities are discussed. The paper ends with a Summary and Conclusion, which highlights key action points.

Background

In nature, winds move from high-pressure to low-pressure areas. Likewise, in the world of finance, movement of international investment is driven by two forces: interest rates and taxes. Tax planning and avoidance are all about organizing business affairs to legitimately mitigate tax impact. In recent times, tax authorities have begun to frown upon 'tax avoidance'. A new line of thinking, i.e. 'tax minimization' is a serious attempt to demarcate between ethical and unethical tax avoidance practices. Efforts by G-8 and other countries at bringing taxes to book come in the face of increasing difficulty in addressing fiscal deficits. With declining output in the manufacturing and services sectors, the financial sector comes under the microscope of the tax-collector, particularly under the Dodd-Frank reform environment. India and several other countries are influenced by OECD and other organizations to join the international movement for plug-ging tax loopholes. The effective tax rates for individuals and corporations in India are a moderate 25% or there-abouts, in line with many developed countries. However, India has legacy problems since high tax rates (some say it was over 100% between 1970 and 1980, as Income Tax was 97% and Wealth Tax was 4%) and capital controls resulted in a flight of money to Switzer-land and other countries. Though tax rates have moderated, round-tripping of income escaping the tax net add to the allure and popularity of tax havens to a certain class of investors. Indians accounted for one of the largest groups holding bank accounts under the shroud of Swiss banking secrecy. India is an emerging 'BRIC' country, with US $ 1 trillion-plus GDP growing at around 5% p.a., and a stock exchange (National Stock Exchange = NSE) that clocks the highest trade volume in the world. These factors highlight the investment interest that India generates, from domestic and overseas investors, on the primary as well as secondary markets. From the tax perspective, there arise investment-related incomes that are taxable, unless there are slices that escape the Indian tax net due to various instruments, devices or jurisdictional aspects.

Data and Methodology

Data has been obtained from various sources: World Bank, ICIJ. Qualitative data have been put together using news analysis which keeps the subject matter contemporary. ICIJ data is a pre-processed, filtered set. This paper presents data in tabulated form, for a logical build-up of the discussion, leading to actionable points for the tax authorities.

International Perspectives: Contours of Tax Mobilization Efforts

USA has put in place the Foreign Account Tax Compliance Act (FATCA), which extends the arms of US tax authorities across countries. In USA, US $ 385 billion is out of the tax net. USA is pursuing the matter with Swiss banking authorities. Swiss authorities have shown a tendency to break away from the past practice of protecting bank secrecy. Similarly, Germany and France are leading thoughts in the EU for plugging tax leaks arising from flight of income to tax havens. Growing awareness due to pressure groups such as Citizens for Tax Justice (CTJ) and the International Consortium of Investigative Journalists (ICIJ) has enabled the public and governments with powerful sets of data. An Indian information technology company, Tech Mahindra, together with a US company, Dion Global, have recently launched FATCA TRAC for Australia and NZ. Similar such aggregating and analytical tools will empower governments in other countries to pursue tax offenders.

Table 1 below depicts 8 countries in various stages of development. As can be observed, lower the level of development, lower, higher the percentage of GDP remaining untaxed. It may be presumed that India, being severely under-banked, with a thriving cash-based economy, a taxed population of under 10%, and legacy of high tax rates and capital controls since 1970, may reasonably be assumed to have a higher percentage of its GDP untaxed.

Table 1: Country-wise % of untaxed GDP

Country	% of GDP untaxed
Switzerland	8.5
USA	8.6
UK	12.5
Germany	16.0
Korea	26.8
Italy	27.0
Greece	27.5
Mexico	30.0

(Source: World Bank, 1999-2007, reproduced from Time, April 15, 2013)

In later developments, fresh data and analysis have come from ICIJ. The consortium has several leading news publications as its members. A statistical outline of ICIJ and its work is tabulated below.

Thus, the data and information available with ICIJ is extensive as well as intensive. It is impressively well-organized, with country wise, entity-wise, ownership-wise and Indian city-wise data in tabulated form. A click on any item of any table provides links to other entities, owners, countries and cities. Mathematically, it may be stated that graph plots are used depict various entities and persons. Inter-connected nodes explain the extent of collusion between parties

Table 2: Data and Analysis by ICIJ

Particulars	Dimensions
Number of files	2.5 million
Number of journalists contributing	86
Countries from which journalists work	49
Nature of data	Names of companies, key shareholders, bank accounts, emails and correspondence
Nature of information	High-tech data crunching, filtering emails and account ledgers
Number of emails	2 million
Data period	30 years
Number of companies covered	120,000
Number of individuals covered	130,000
Countries covered	170

and entities. It can be observed from the ICIJ graphs that the arrangements are elaborate, sophisticated, meticulously planned and executed. Notably, the majority of offshore entities are located in BVI, the main legal consultant is Portcullis Trust Net and the main bank used as a router of transactions is UBS. Interestingly, UBS has recently decided to close down its wealth management business in India.

In subsequent paragraphs of this paper, India-specific data and analysis are discussed. Russia is also facing a similar phenomenon of tax-leakages to havens. The Financial Stability Board (FSB), an international body for coordination across country regulators, has taken cognizance of the ICIJ data. FSB has identified shadow banking, enabled by the tax-immunity and secrecy rules of tax havens, as threats to markets and regulation. This is on account of devices such as repos and lending against collateral, with the pro-cyclical nature of such activities inciting volatility. Round-tripping is also a distinct possibility. According to a study by an economist at McKinsey, $ 32 trillion is the estimated amount hidden in offshore accounts. According to Boston Consulting Group (BCG), the figure is estimated at around $ 28 trillion, in 50-60 tax havens around the world.

It is observed that there are tax havens in developed as well as developing

Table 3: Classification of Tax-havens

By Geography	By Development
Caribbean and Pacific: British Virgin Islands (BVI), Cayman Islands, Cook Islands, Samoa	**Developed:** Switzerland, Liechtenstein, Luxembourg, Singapore
Europe: Liechtenstein, Luxembourg, Switzerland, Cyprus	**Others:** BVI, Cayman Islands, Cook Islands, Samoa, Cyprus, Mauritius, Seychelles
Indian Ocean: Mauritius, Seychelles, Singapore	

countries. Delaware is a known tax-haven within USA, with several US corporations being headquartered there. Nevada is another example. In the case of other tax havens, some of which are protectorates of the erstwhile colonial powers, a benign view is taken of their existence. Two consulting firms that helped most Indians to set up most of the offshore financial companies in BVI and Singapore are: Portcullis TrustNet (Singapore) and Common-wealth Trust Limited (BVI).

The Indian Context

On February 28, 2013, Indian Finance Minister, Mr P Chidambaram, mentioned in his Union Budget Speech in the Parliament that the number of High Net-Worth Individuals (HNIs) declaring an annual income above US $ 166,667 was only 42,800 from a population of 1 billion. The tax-GDP ratio also stands at around 10%. During the budget speech, a mention was also made on General Anti Avoidance Rules (GAAR) and Tax Residency Certificate (TRC), with reference to cross-border investments originating from tax havens.

India-specific data from ICIJ, on offshore entities in tax-havens are tabulated in Table 4.

From the (Table 5), it appears, prima facie, based on the cities and towns named, that the main activities are in the following sectors: Finance, Dia-monds, Real Estate, Mining and Textiles. These sectors need to be examined in detail on criterion such as governance, capital structures, business models and also round-tripping of funds. Notably, in India, there is now a blurring line of distinction between business and politics, across all political parties. Surprisingly, Ahmedabad and Jaipur, despite being state capitals with savvy businessmen, do not feature on this list.

It may also be noted that in 2012 and 2013, Indian tax authorities have been reluctant to continue domestic income tax concessions for industries in special economic zones, export-oriented businesses and some infrastructure businesses. This could possibly exacer-bate efforts of Indian businesses to shift profits and capital out of India. Some of these practices could border on the

Table 4: India-specific Data from ICIJ on Offshore Entities in Tax-havens

Particulars	Dimensions
Number of India-linked entities	505
Number of Persons (Indian shareholders)	612, later reduced to 498
Number of big cities where shareholders reside	13
Number of other towns where shareholders reside	11

(Source: ICIJ)

The location-wise break-up of the 498 individuals is tabulated below.

Table 5: Location-wise Break-up of Shareholders in Tax-haven based entities

S. No.	City/Town	Number of Individuals	Main Activity/Industry
1	Mumbai	184	Finance, Diamonds
2	Delhi NCR	137	Real Estate
3	Kolkata/Calcutta	39	Trading, Manufacturing, IT
4	Bangalore	36	IT
5	Chennai	31	IT, Textiles
6	Hyderabad	14	IT, Real Estate
7	Bellary	7	Mining
8	Surat	5	Diamonds, Textiles
9	Pune	5	IT, Sugar, Real Estate
10	Ludhiana	3	Rubber/Tyres, Hosiery/Textiles
11	Rajkot	2	Pumps, Engineering
12	Madurai	2	Textiles
13	Vadodara/Baroda	1	Engineering

S. No.	City/Town	Number of Individuals	Main Activity/Industry
14	Bhopal	1	
15	Navsari	1	Diamonds, Textiles
16	Ajmer	1	
17	Mayurbhanj	1	Mining
18	Nizamabad	1	
19	Muzzaffarpur	1	
20	Singbhum	1	Mining
21	Others	25	
	Total	498	

(Source: ICIJ)

illegal, hence the enhanced allure of tax havens.

Continuing with data from ICIJ, the favourite destinations for Indian money, in respect of the 498 individuals from 22-plus cities and towns are presented below. Surprisingly, Mauritius does not feature on this particular list (Table 6, below). Perhaps, the tax planners are conscious of the Indian tax authorities' spotlight on Mauritius.

Table 6: Offshore Leaks Database

Havens
B.V. Islands
Cayman Islands
Cook Islands

Hong Kong
Malaysia (Labuan)
Samoa
Seychelles
Singapore
Switzerland
UAE

(Source: ICIJ)

If we consider Mauritius to serve as an aggregator and vehicle for routing 'official' investment into India, the 10 centres named in Table 6, above, probably serve as vehicles for receiving tax-evaded funds from India.

Table 7: Matrix Connecting Cities/Towns to Tax Havens

Haven	Cities/Towns
BVI	Bellary, Singbhum Mayurbhanj, Mumbai (Dharavi)
Malaysia (Labuan)	Nizamabad, Ludhiana

(Source: ICIJ)

Bellary has become infamous on account of the Indian Supreme Court's ban on its illegal mining export activities. Singbhum and Mayurbhanj are also in India's eastern mining belt. From the two illustrations in Table 7, above, it is evident that towns associated with Mining are linked to BVI. Likewise, two individuals are associated with Labuan (Malaysia). The link seems to be the rubber/hosiery industry. Notably, one of the names from Mumbai is traced to Dharavi, a slum area (of Hollywood film 'Slumdog Millionaire' fame). The link is from Dharavi to an entity to in BVI in an extremely complex web of transfers. Dharavi has a thriving leather and garment business and some residents are luxury car owners. From an investigative perspective, it may be worth exploring networks and links leading to smaller towns. A bigger and more elaborate matrix can be built by intelligence teams from the Income Tax department based on such leads and collating more information from individual tax returns. This could be modelled along the lines as ICIJ.

Other Information:

Indian tax authorities have received information directly from Switzerland, France and Germany, among others. According to Swiss bankers, in 2004, Indians were among the largest number of secret account holders. As laws in Switzerland and other western countries toughen, funds are now moving towards Singapore and Dubai (UAE). Swiss authorities have initiated and deepened the dialogue on tax information exchange requests. However, the Swiss will not provide details on information acquired illegally. France provided India with data on accounts with HSBC Bank, Geneva, regardless of the means through which such information was obtained. Germany has been at the forefront of fighting tax evasion aided by banking secrecy laws. The German Finance Ministry has sought the assistance of the media in obtaining information on tax evaders, after revelations of offshore tax structures. India has received names of individuals from 1,400 bank account details purchased by Germany, in 2011, of bank account holders in LGT Bank, Liechtenstein.

During the past 3 years (2010 onwards), the Government of India (GOI) has officially received information on 26 Compact Disks (CDs). These contain specific information on suspicious transactions by Indians with Germany, France, US, Japan, South Korea, Denmark, Czech Republic and Finland. According to experts, there is a possibility of round tripping in the Diamond sector, and of funds spilling over to the real estate sector. Indians engaged in diamond trade travel to Belgium, which is proximate to Switzerland, Luxembourg and Liechtenstein. As exports in diamond trade shrink, funds are diverted to the real estate sector: speculating in land prices and speculating in the prices

of rough diamonds.

Whereas the Japanese and German companies have set up manufacturing bases in India, investors from Singapore and Dubai prefer investing in the Indian financial sector. During the Cyprus crisis at the beginning of 2013, remittances from India to Cyprus-based funds came to a halt, due to fear of safety of the funds. Investment in the Indian real estate sector has taken place through the private equity route, through Mauritius, Singapore and Cyprus. One way to make Mauritius irrelevant is to do away with short-term capital gains tax or rationalize them to a competitively low level.

Response of Indian Tax Authorities

The official response from Indian authorities have come from its Ministry of Finance, the Enforcement Directorate of the Income Tax Act, its central banker - the Reserve Bank of India (RBI) and its securities market regulator - the Securities and Exchange Board of India (SEBI). Specific responses are summarized in the paragraphs below.

A white-paper on black money by the National Institute of Public Finance and Policy (NIPFP) was commissioned by the Ministry of Finance, and tabled before the Indian Parliament in late-2012. For collecting and collating black-money stashed outside India, the coordinating division in GOI's Ministry of Finance is the Foreign Tax and Tax Research division (FT & TR). The Central Board of Direct Taxes (CBDT) has asked its officers to delve deep into information on cross-border transactions. However, the Ministry of Finance indicated a desire to have international tax disputes settled amicably, as expressed to trainees at the Directorate of International Taxation, New Delhi. The number of information requests by India has gone up from 39 in financial year 2010, to 92 in 2011 and 396 in 2012, a 10-fold increase in 3 years.

Indian Income Tax officers from its Indian Revenue Service (IRS), trained at the National Academy of Direct Taxes (NADT), Nagpur, India, are likely to be posted in 14 countries, starting with USA, UK, Cyprus, Germany, Japan, UAE, Netherlands and France.

Consider the following two sets of countries mentioned below and their commonalities:

Table 8: Proposed Countries of Posting for Indian Tax Officers

Set A (countries on which information received on Indian accounts)	Set B (countries in which Indian tax officers are being posted)	Common List (A ∩ B)
Germany, France, US A, Japan, South Korea, Denmark, Czech Republic and Finland. (Total 8 countries)	USA, UK, Cyprus, Germany, Japan, UAE, Netherlands and France (Total 8 countries). Another 6 countries proposed to be covered)	Germany, France, USA, Japan (Total 4 countries)

Specified postings cover only 4 out of 8 countries on which specific information has been received. It is hoped that the additional 6 proposed cover 'Set A' countries more specifically. It is equally important to cover the 10 tax-havens stated in Table 7, or else the Indian tax mobilization efforts seem to be too Mauritius-centric. There are also indications that some Indian efforts are on track, going by Portcullis TrustNet's allegations that Indian authorities are basing their actions on stolen information. This could be an outcome of a last-ditch effort by Portcullis and TrustNet (of BVI) to stave off investigation. Courts in some countries do not take cognizance of evidence based on stolen account records.

India has entered into Double Tax Avoidance Treaties (DTATs) with 85 countries. It had also entered into Tax Information Exchange Agreements (TIEAs) with 14 countries until March 31, 2013. By signing agreements recently with Liechtenstein and Albania, the number of TIEAs has gone up to 16.

Liechtenstein, fabled for the secrecy in its banking laws, has initiated reforms in 2009. The 16 TIEAs also include those with BVI, Bermuda and Cayman Islands. India has numerous pieces of information from several countries on overseas investment by Indian citizens, which are now under various stages of processing and investigation. The Enforcement Directorate, GOI, has initiated proceedings against 17 individuals under the Income Tax Act and also under the Foreign Exchange Management Act (FEMA). The Indian Government had earlier imposed penalties against 18 individuals, bringing the number of issued penalty cases to 35. Singapore,

the heart of Asia's banking and offshore industry will make laundering of profits from tax evasion a crime under a law taking effect from July 1, 2013.

The Finance Act 2012 made it mandatory for Indian tax residents, irrespective of nationality, to report assets outside India in the tax return. Tax residents, even with minimal or no foreign source income, will have to report on:-

- Foreign bank accounts

- Financial interest in any entity

- Immovable property

- Other assets in the nature of investments

- Other accounts of which the resident is a signatory

- Trusts created under foreign laws

Nearly 40% of Direct Foreign Investment and 42% of Foreign Institutional Investment (FII) into India come through Mauritius. 60% of FII exposure to India is through Participatory Notes (P-Notes). The Governor of the Reserve Bank of India (RBI) has flagged off warnings on round-tripping of funds between India and Mauritius. The popularity of P-Notes as a means of investing in the Indian capital markets is also worrisome, due the possibility of round tripping. On January 14, 2013, soothing statements by GOI on the deferment of General Anti Avoidance Rules (GAAR) and exclusion of P-Notes from scrutiny took the Bombay Stock Exchange Sensitive Index (Sensex) up by 242.77 points (1.23%) to 19,906.41 and the National Stock Exchange Fifty (Nifty) up 72.75 points

(1.22%) to 6,024.05 points. Noticeably around end-February and beginning-March in 2013, the Indian stock markets exhibited panic-induced volatility on news that the Indian tax authorities are likely to bring the Tax Residency Certificate (TRC) from Mauritius into question. With FIIs constituting the largest investor group, the Sensex fell 290.87 points (1.52%) to 18,861.54 and the Nifty fell 103.80 points (1.78%) to end at 5,693.00 on Union Budget announcement day on Feb.28, 2013, on the contentious TRC matter. The panic subsided only upon reassuring words from the government.

The Securities and Exchange Board of India (SEBI) has indicated that the Anti Money Laundering guidelines are being revamped. The existing guidelines, called the Anti Money Laundering and Combating Financing of Terrorism (AML/CFT) standards were last revamped in 2010 by the Financial Action Task Force (FATF). SEBI is a member of the International Organization of Securities Commissioners (IOSCO) as well as the FSB and India is one of the signatories of FATF which has around 34 nations as its signatories.

Summary and Conclusions

Tax havens are an outcome of high tax rates in the 1970s. India has joined the concerted international movement in clamping down treaty abuse, in an effort to collect its rightful share of taxes. Defenders of tax havens attempt to classify them as bad and good havens. The bad havens are those that receive income from illegitimate activities for custody and probably laundering, for individuals and unincorporated entities; the good havens are those that act as aggregators to pool international investment into incorporated entities. Efforts of the Indian taxmen in examining transactions from Mauritius are in the direction of investment flowing through incorporated entities, with a possibility of round tripping. There remains a larger issue of examining funds flowing through unincorporated entities, from illegal activities, across 10 tax havens other than Mauritius. Also, within India, investigations need to cover smaller cities and towns, including unincorporated entities and small businesses. The suspect industries are diamond jewellery, real estate, textiles and finance. The sunset clause for tax exemptions for various businesses is approaching, pushing more firms towards profit-shifting towards havens. For tax authorities, data is no longer the problem. Banking secrecy laws are getting diluted due to international pressure, and the flow of data through bilateral information exchange agreements is on the rise. In parallel, data and information, right down to the addresses of key personnel in offshore finance companies, are available through alternate channels such as ICIJ. Action plans of FSB and FATF are tacit recognition of the quality of data and information flowing from ICIJ. Indian tax authorities are on the right track in broad-basing their efforts away from Mauritius, and posting tax officers in other countries. At the policy level, there is a case for (a) removal of a plethora of deductions and exemptions (b) reducing effective rates of taxes to render tax arbitrage irrelevant and (c) easing of procedures to move into the next trajectory of tax administration. There is also a case for strengthening the databases of the tax authorities across countries.

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Market Response to Share Buyback Announcements in the Bombay Stock Exchange

Abstract:

This paper empirically examines the impact of Open Market stock repurchase announcements on stock prices' growth rates in the Bombay Stock Exchange covering the period from July 2008 to September 2012 by using the econometric models of sub-periodic growth rates estimation - Kinked Exponential Models. The results show a mixed impact of share repurchase announcements on stock prices growth rates. The entire sample is then divided into sub-samples based on size of buyback, firm size and type of industry. The findings reflect that, mid-cap firms register higher stock prices' growth rates compared to large-cap and small-cap firms. The findings also show that, size of repurchase is positively associated with the stock prices' growth rates. Finally, the stock price response to share repurchase announcements is found to be favourable for services sector firms than that of the non-services sector firms.

Key Words:

Share Repurchase, Open Market Repurchase, Kinked Exponential Models, Share Price growth, Undervaluation.

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Debdas Rakshit

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Introduction

Share repurchase / buyback[1] by companies was first originated in the US in the late 1960s, and assumed wide popularity by mid 1980s. The share buyback practice is very much popular in US, Canada and UK. The motives behind share buybacks include returning surplus cash to shareholders, increasing promoters' stake, improving earnings per share, reducing takeover threats and most importantly, preventing undervaluation of shares in the stock market. India recognized this corporate practice since late 1998. Indian firms can repurchase shares under the open Market route or under Tender offer route.

Share buyback is believed to inject some buoyancy into stock prices as the buyback price is set at a level higher than the prevailing market price and has thus been regarded as an essential measure to 'rescue a plunging stock market' (Liao, Ke and Yu, 2005). Several US and Canadian market based studies document that share repurchase announcements reflect positive information to the market. Dann (1981),

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[1] Share repurchase and Share buyback are same. We will use these two terms interchangeably in the paper.

Vermaelen (1981), Netter and Mitchell (1989) and Ikenberry et al. (1995, 2000) find significant positive market reaction to the stock repurchases announce-ments. Since its inception in 1998 in India, this corporate practice is still in a nascent stage in India and has remained under researched However, in the recent past, an increasing trend of share repurchase by Indian firms is evident. At this backdrop, this paper makes an attempt to empirically examine whether share repurchase announcements under open market route have any material impact on stock prices' growth rates. The results show that positive influence of share repurchase announcement is evident in some cases but this is not common to all repurchase announcements as theore-tically postulated.

The whole sample is further divided into several subsamples based on firm size, industrial sector and size of repurchase announcement. The results show that the average growth rate of stock prices of small buyback size firms is reduced after repurchase announcement whereas, this growth rate is increased for big buyback size firms. It is also noticed that medium cap firms have received more positive stock response following a stock repurchase announcement than large-cap firms while, small cap firms are unable to receive any positive stock price growth following repurchase announcements. Finally, the stock price response to share repurchase announcement is found to be favourable for services sector firms unlike the non-services sector firms.

The remainder of the paper is designed as follows. The review of literatures is presented in Section II. Section III describes database and methodology. Section IV presents the empirical results and finally Section V concludes.

Literatures Review

Most of the studies covering several aspects of repurchase have been conducted in the developed econo-mies like US, Canada, UK etc. Various studies have examined the underlying motives behind repurchase announce-ment and most common motives identified are returning surplus cash to shareholders, capital structure redesign, anti-takeover mechanism and the application of preferential tax rates ((Liao, Ke and Yu, 2005). Badrinath and Varaiya (2000), Western and Siu (2002), Financial Executive Internationals (1999) etc. also report similar motives behind repurchase announcements.

However, in reality, the principal reason behind share repurchase is to prevent undervaluation of share prices in the market. Dann (1981), Vermaelen (1984), Netter and Mitchell (1989), Comment and Jarrell (1991) find support of the undervaluation hypothesis and observe significant positive abnormal returns around repurchase announcement period in US. Comment and Jarrell (1991) document that, during the period of announcement, abnormal returns are highest for Tender Offers and lowest for Open Market buybacks, indicating that tender offers are more informative to the market. Studies like Ikenberry et al. (1995, 2000) and Balachandran and Troiano (2000) also support the of undervalua-tion theory.

Eberhart and Siddique (2004) find lack of consistent evidence of positive stock returns following repurchase announce-

ments and document that liquidity change is the dominating factor in explaining announcement period's abnormal stock returns. Cook, Krigman and Leach (2004) also support the liquidity hypothesis. Chatterjee and Rakshit (2012) observe that, the positive influence of repurchase on share price is not prevalent in all the buyback cases as hypothesized theoretically. An empirical analysis of share buybacks for the period from 1998-99 to 2002-03 in India reveals that the actual buyback price is less than one half of the maximum price in nearly 50 per cent of the cases analyzed. (Gupta et al. 2006). Hertzel (1991) document that share buyback announcements had little or no effect on the share price of rival firms, the information contained in buyback announcements is primarily company specific.

The regulatory framework around share buyback varies across nations and has significant impact on this corporate practice. Rau and Vermaelen (2002) exhibit that the form and intensity of share repurchase activity in the UK is influenced by the tax consequences associated with pension funds. Firms announcing repurchase in UK earn smaller excess returns, both in the short- run and in the long-run compared to US firms primarily because of the regulatory provisions in the UK that made it less likely, that the firms could disseminate superior information to buy back shares under the situation of under valuation of stock prices.

The issue of whether share repurchase and dividends appear to be substitute payout methods has been examined by several researchers. De Angelo, De Angelo and Skinner (2000) observe that on an average, firms get significant positive abnormal returns around 1per cent when the practice of regular dividend is not changed and a positive special dividend is paid and conclude that share repurchases do not substitute for special dividends. Grullon and Michaely (2000) report that dividend forecast errors are negatively associated with share buyback activity, implying that the difference between actual and expected dividend payments tends to become more negative as the firm spend more money on repurchase. This implies that share repurchases and dividends are substitutes.

In India, there is lack of in-depth study on share repurchase activity and its implications for the corporate and the market at large. While numerous studies have been conducted in developed economies, it has remained almost a virgin area in India. This paper is expected to fill up at least a part of this gap by contributing to the existing literatures with main focus on the impact of Open Market stock repurchase announcement on stock prices' growth rates in the Bombay Stock Exchange.

Database and Methodology

The present paper covers share repurchases announcements from July 2008 to September 2012. For sample selection, two criteria were used: first, the firm should have been listed in Bombay Stock Exchange (BSE) for at least 30 trading days before the repurchase announcement date and second, the firm should have all relevant data required by this study. A total of 54 repurchase programmes met these criteria. The analysis period extends from -30 to + 30 trading days relative to the

buyback announcement date (t =0).

The Kinked Exponential Models

In the stock price growth measurement exercise of pre and post buyback period, a subject of concern is to measure sub-period's growth rates for the comparison of the period wise (dividing the whole period into two sub-periods) performance of the variable concerned. To measure sub-period's growth rates there are several approaches. One of them used by the early scholars is to fit separate growth function for each sub-period. As this method involves estimation of relatively large number of parameters, it results in the unnecessary loss of degree of freedom. An alternative approach is to fit a single trend equation with dummy variables. The form of exponential trend equation with dummy variable for two sub-periods is $\ln Y_t = a + b_1 t + b_2 (t \times D)$, where D=0 for the first sub-period and D=1 for the second sub-period. Here the respective growth rates in the first and second sub-periods are b1 and $(b_1 + b_2)$.

But Boyce (1987) showed that the above approaches, for the measurement and comparison of sub-period's growth rates, suffers from 'discontinuity bias' which implies that each of the estimated sub-period's growth rate is higher or lower than the estimated growth rate for the whole period. To overcome this difficulty, as per the recommendation of Boyce (1987), this paper estimates 'Kinked Exponential Model' of the following form for measuring sub-period's growth rates:

$$\ln Y_t = a_1 + b_1 \left\{ D_1 t + \sum_{j=2}^{m} D_j K_1 \right\} + b_2 \left\{ D_2 t - \sum_{j=2}^{m} D_j K_1 + \sum_{j=3}^{m} D_j K_2 \right\} + \text{------} + b_i \left\{ D_i t - \sum_{j=i}^{m} D_j K_{i-1} + \sum_{j=i+1}^{m} D_j K_i \right.$$

$$+ \text{........} \left. + b_m (D_m t\, D_m\, K_{m-1}) + u_t \right. \text{.............(6)}$$

Where a_1 and b_i values are the parameters, K_i values are kinked points and D_j is the dummy variable for the sub-period j, such that D_j=1 for jth sub-period and D_j=0 for sub-periods other than j. Here i & j = 1, 2... m.

If the origin is shifted to break point (i.e. to the kinked point), the simplified form of the kinked exponential trend for two sub-periods would be as follows:

$$\ln Y_t = a + b_1 (D_1 t) + b_2 (D_2 t)$$

Where D_j=1 for jth sub-period and

D_j=0 for other sub-period (where j=1, 2). Here b1 denotes the estimated growth rate of the first sub-period and b_2 denotes the estimated growth rate of the second sub-period.

It is also enquired whether the estimated growth rates for two sub-periods are statistically significant or not. DW (Durbin Watson) statistic has been used to test the existence of auto correlation problem. For testing the 'goodness of fit' of the estimated trend equation, the study uses coefficient of determination adjusted by the degree of freedom, popularly symbolized as Adjusted R^2.

Here the sub-periods are pre-buyback (first sub-period) period and post-buyback (second sub-period) period of trading days -30 to +30. The trend break here denotes the share repurchase announcement date (t =0).

The sub-periods growth rates have been computed for all the buyback as well as their matching control companies and also for the market index (Sensex) corresponding to the relevant periods. It will facilitate to undertake a comparative analysis among the growth rates of the buyback companies, control companies and obviously, of the market as well. With regard to the analysis of the impact of share repurchase on stock prices, one should adopt a more refined technique for such measurement by means of isolating the effect of share repurchase from that of other general factors influencing stock prices and that can be done by eliminating the effect of general market movement. Hence, the study has selected Sensex as the market indicator.

Control Sample Selection

Stock prices are influenced by a variety of factors like general market trend, industry specific factors and others. In order to isolate the impact of share repurchase from other factors, the control sample methodology is used. Corresponding to every buyback company, a control company (which is a non-buyback company) is selected. Next, the kinked exponential growth rates of the buyback companies, control companies and the Sensex (representative of the market) for the event window of -30 to + 30 trading days around the repurchase announcement date (t =0) are computed and analyzed.

This will facilitate analysing whether any change in stock price growth rate is attributable to share repurchase announcements. For instance, if negative or no change in growth rate is observed for control company and the Sensex but a positive growth rate is seen for the concerned buyback company, it can be taken as the positive impact of repurchase on stock prices.

Formation of 'control sample' is a crucial task which can be done by adopting the method of paired sample. Companies under the 'control sample' may be selected by matching certain characteristics like, the category of industry, size of the company in terms of turnover, market capitalization, or capital employed, nature of the business undertaken by the company etc. Here control firms are selected on the basis of turnover in such a way that the selected control firm has the closest turnover with that of the corresponding buyback firm and it is also ensured that both of them belong to the same industry.

Empirical Results

Analysis of Kinked Exponential growth rates

A summary statistics of the selected stock repurchase programmes are presented in Table- 1. While analysing growth rates of stock prices of the two sub-periods, analysis is made case to case for each of the 54 repurchasing firms, their matching control firms and the Sensex for concerned window period (-30, +30) trading days.

It is to be noted from the values of Adjusted R^2 and F statistic that in all cases Kinked exponential trend gives good-fit.

Further, the estimated values of Durbin-Watson (DW) statistic establish that the auto-correlation problem remains absent in all cases. These statistical features (good-fit and absence of auto-correlation problem) are observed in almost all the cases of growth estimation in this paper. The differences of sub-periodic growth rates of the repurchasing firms are reported in Table 2. Results show that the difference in growth rates (growth rates of second sub-period minus that of first sub-period) are positive in 50 per cent cases whereas, this difference is negative in the remaining 50 per cent cases. Table-3 shows the number of statistically significant and total positive as well as negative growth rates in the first and second sub-periods around the window (-30, +30). Repurchasing firms have reported positive statistically significant growth rates in 18 (32.14 per cent) cases in the second sub-period as opposed to 20 (35.71per cent) cases in the first sub-period. For control firms (Sensex) such percentages are 28.57 per cent (33.93 per cent) in the second sub period and 21.43 per cent (19.64 per cent) in the first sub period. On the other hand, negative significant growth rates are observed in 15 (26.79 per cent) cases in period II as opposed to 12 (21.43 per cent) cases in period I for the repurchasing firms. However, for control firms and Sensex these numbers have remained almost unchanged (20 in period I and 19 in period II for control firms and 17 in period I and 16 in period II for Sensex). In a nutshell, a mixed impact of repurchase on stock price growth rate is observed in the case of repurchasing firms.

Stock price response to the size of buyback

Size of the repurchasing stock is positively related to the abnormal returns of stock repurchase announcements (Garrison, 1989 and Ratner, 1990). Here, the proposed buyback amount as a percentage of paid up capital and a free reserve has been taken as a proxy of the size of buyback. In India, maximum buyback size can be 25 per cent of paid up capital and free reserve. Repurchase announcements up to 10 per cent of paid up capital and free reserve have been taken as 'small' and rests have been considered as 'Big'. The empirical findings are reported in Table 4. The results indicate that the average growth rate of stock prices of small buyback size companies is reduced after share repurchase (from 0.1033 per cent in period I to 0.0148 per cent in period II). However, this average growth rate has increased for Big buyback size Companies (from a negative 0.0979 per cent before repurchase to a positive 0.3796 per cent after repurchase). This finding supports the views of Garrison (1989) and Ratner (1990) that, Size of the repurchase is positively related to the abnormal returns of stock repurchase announcements.

Stock price response to the firm size

Vermaelen (1981), Ho and Michaely (1988) and Ratner (1990) document that the stock price reaction of large firms is less positive than that of small firms around repurchase announcements. Barry and Brown (1984) observe that the mass media tend to provide less news coverage of small firms than large ones, which ultimately leads the large firms' prices to be more informational.

In order to examine the impact of share repurchase on stock prices across firms of different sizes, the market capitalization is taken as a proxy for firm size. Firms have

been categorised (following BSE categorization) into three categories namely, large cap (Market Capitalization is above Rs. 1,00,000 million), medium cap (Market Capitalization is Rs 20,000 to 1,00,000 million) and small cap (Market Capitalization is up to Rs 20,000 million). The results are presented in Table 5. It is observed that the average growth rate of stock prices of small cap firms is decreased after repurchase (from 0.2211 per cent in pre repurchase period to 0.0508 per cent in post repurchase period). However, an opposite picture is evident for medium cap and large cap firms. The average growth rate of medium cap firms is enhanced to 0.2452 per cent in the post buyback period from a negative growth rate of 0.1958 per cent in the pre buyback period. Large cap firms have reported an increase in average growth rate after repurchase although it has remained negative in both the periods. Thus, medium cap firms have received more positive stock response following a stock repurchase announcement than large cap firms whereas, small cap firms are unable to receive any positive stock response following repurchase announcement.

Stock price response to the type of industry

With an aim to examine whether stock price response to repurchase announcements vary across industry type, we have categorised the sample firms in to two classes: services sector firms and non-services sector firms. The results are presented in Table 6. The results show that the average stock price growth rate of services sector firms is increased from a negative growth rate of 0.1776 per cent in pre repurchase period to a

positive average growth rate of 0.0637 per cent in the post repurchase period. However, non-services sector firms have reported a decline in this average growth rate in the post buyback period (0.0889 per cent) from pre buyback period (0.2034 per cent). Hence, the stock price response to repurchase announcement is found to be favourable for services sector firms than the non-services sector firms.

Conclusion

This study uses event methodology to examine the impact of Open Market stock repurchases on stock prices' growth rates in Bombay Stock Exchange (BSE). The empirical findings report a mixed impact of share repurchase on stock price growth rate. The findings indicate that, share buybacks do not necessarily inject buoyancy into stock prices in all the cases as theoretically postulated.

From the sub-sample analysis, the study shows that size of the buyback is positively related to the stock prices growth rate. With regard to the firm size and stock price growth rates following share repurchase announcements, mid-cap firms have received more positive response than large-cap firm, while the small-cap firms are unable to receive any positive stock price response after the share repurchase announcements. Finally, the stock price response to repurchase announcement is found to be favourable for services sector firms unlike the non- services sector firms. These findings reveal that, this corporate activity does not carry much information to the investors and Indian firms, in general, cannot revive their share prices with certainty through share repurchase announcements.

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Table-1: Summary Information of Share Repurchases

Year	No. of Buyback	Shares Buyback as per cent of PCFR*	Announced Motives of Share Buybacks				Average Buyback size Announced (Rs. Mln)	Type of Industry		Market Capitalization (Rs. In million)
			Maximizing shareholder value	Preventing undervaluation of shares	use of surplus cash	Nothing mentioned		Service	Non Service	
2008	12	6per cent-25per cent	8	1	0	3	1673.14	3	9	205.77-600783.04
2009	12	7.45per cent-25per cent	9	0	0	3	425.24	5	7	208.13-24928.53
2010	7	9.98per cent-25per cent	7	0	0	0	1730.17	2	5	869.62-580497.07
2011	18	4.42per cent-25per cent	13	0	1	4	1707.80	8	10	533.85-177058.96
2012	5	6.36per cent-10per cent	5	0	0	0	937.85	2	3	100.55-54008.01
TOTAL	54		42	1	1	10				

*PCFR stands for paid up capital and free reserves

Table 2: Differences in Growth Rates between Post and Pre Repurchase Period

Buyback Company	Pre buyback period	Post buyback period	Difference	Control Company	Pre buyback period	Post buyback period	Difference	Sensex Pre buyback period	Sensex Post buyback period	Sensex Difference
Aegis	0.32	0.54	0.24	Eastern Gas	-1.25	-0.90	0.35	0.20	0.19	-0.01
Alembic	-0.53	0.07	0.59	Sanofi	-0.02	0.78	0.80	-1.05	0.29	1.34
Allied Digi	0.30	-2.33	-2.63	Micro Tech. India Ltd	0.22	0.02	-0.20	0.17	-0.21	-0.38
Amrutanjan	0.92	0.20	-0.72	Mangalam Drugs & Org ltd	-1.50	0.73	2.23	-0.66	0.36	1.02
Amtek	-0.19	-0.77	-0.58	Sundaram Fasteners	0.14	-0.81	-0.95	0.000	-0.002	-0.002
ApolloTyres	1.23	-0.13	-1.36	Kesoram	0.52	-0.37	-0.89	0.39	-0.08	-0.47
Apcotex	0.35	1.25	0.90	GRP	0.60	-0.22	-0.82	0.14	-0.22	-0.36
Avantel	0.21	0.73	0.52	Reznord	1.16	1.99	0.83	1.02	0.99	0.03
Balrampur Chini	-0.55	0.21	0.76	Dhampur Sugar	-0.16	-0.50	-0.34	-0.25	0.28	0.53
Bosch	-0.21	0.08	0.30	Bharat Forge	-0.99	-0.19	0.80	-0.12	-0.04	0.08
Crisil	-0.12	0.07	0.19	Sanghvi movers	-0.84	-0.27	0.57	-0.36	0.16	0.52
De Nora	0.34	-0.33	-0.67	Jetking	-0.50	-0.75	-0.25	0.15	-0.38	-0.53
Deccan Chr1	0.07	-0.85	-0.91	Jagran Prakashan	0.68	0.55	-0.13	0.08	-0.17	-0.25
DLF	-1.41	-1.50	-0.09	Unitech	-1.54	-3.52	-1.98	-0.61	-1.12	0.51
ECE	0.50	-0.69	-1.19	Modison	-0.22	-0.49	-0.27	0.11	-0.49	-0.60
EON	0.15	-1.22	-1.37	Birla Ericsson	0.09	-0.13	-0.22	-0.07	0.20	0.27
EID Parry	-0.48	0.15	0.63	Bannari	0.59	0.74	0.15	-0.42	.019	0.61
FDC	-0.12	0.01	0.13	Parabolic Drugs	-0.81	-0.50	0.31	-0.42	0.05	0.47
Gateway	-0.08	0.24	0.32	ABC India	-0.37	0.23	0.60	-0.16	0.21	0.37
Godrej	1.78	1.74	-0.04	Tanilnadu Petroproducts	0.96	1.75	0.79	1.01	0.97	-0.04
Gujrat Fluoro	0.06	0.30	0.24	Futura	-1.52	-2.10	-0.58	0.05	-0.09	-0.14

Table 2: Differences in Growth Rates between Post and Pre Repurchase Period

Buyback Company	Pre buyback period	Post buyback period	Difference	Control Company	Pre buyback period	Post buyback period	Difference	Sensex Pre buyback period	Post buyback period	Difference
HEG	0.30	0.26	-0.04	Graphite India	-0.17	0.48	0.65	0.04	0.11	0.07
HUL	-0.17	0.57	0.74	Dabur	0.29	-2.38	-2.67	0.08	0.33	0.25
Hydro S&S	0.66	-0.03	-0.69	Vim Plast	0.15	0.02	-0.13	-0.25	0.06	0.31
Indiabulls Securities	0.70	2.44	1.74	Aditya Birla	1.29	1.86	0.57	0.99	1.03	0.04
InfiniteComp	0.33	-0.40	-0.72	Subex	0.51	-0.06	-0.57	0.18	-0.20	-0.38
Indiabulls RealEst	-1.63	1.47	3.10	Swan	-0.39	-0.06	0.33	-0.33	0.40	0.77
IPCA Lab	-1.42	0.35	1.77	Vockhart	-1.76	0.73	2.49	-0.66	0.36	1.02
J K Lakshmi	1.65	0.25	-1.40	OCL	0.69	-0.19	-0.88	0.50	-0.19	-0.69
Kirloskar	0.57	0.07	-0.50	Greaves	0.18	-0.02	-0.20	0.46	-0.19	-0.65
Lakshmi Machine	-0.46	-0.30	0.16	VA Tech	-0.24	-0.44	-0.20	0.03	-0.37	-0.40
Manaksia	0.94	-0.15	-1.09	Sarda	1.66	-0.91	-2.57	-0.05	-0.14	-0.09
Mangalam Cement	0.21	0.39	0.18	Gujarat Sidhee	0.88	-0.47	-1.35	0.88	-0.33	-0.1.21
MRO tek	-0.72	0.60	1.32	Astra	0.34	0.61	0.27	-0.24	0.97	1.21
Onmobile	-1.22	0.07	1.30	Mascan Global	-0.09	-0.22	-0.13	-0.03	0.22	0.25
Panacea	0.29	0.17	-0.12	Nectar	0.12	-0.44	-0.56	0.26	0.08	-0.18
Pennar	1.26	0.06	-1.19	Shah Alloys	1.34	1.56	0.22	1.08	0.97	0.11
Praj	-0.30	0.37	0.67	V A Tech	-020	0.10	0.30	-0.21	-0.02	0.19
Provogue	1.24	0.48	-0.77	Suryalakshmi	0.42	1.53	1.11	0.19	0.31	0.12
PVR	-0.07	0.51	0.58	Inox Leisure	-0.36	0.40	0.76	-0.15	0.10	0.25
Rain Commo	0.23	-0.07	-0.30	Goa Carbon	-0.04	-0.45	-0.41	0.15	-0.28	-0.43
Reliance Infra	0.32	-0.24	-0.56	BGR Energy	0.01	0.11	0.10	0.24	-0.08	-0.32

Table 2: Differences in Growth Rates between Post and Pre Repurchase Period

Buyback Company	Pre buyback period	Post buyback period	Difference	Control Company	Pre buyback period	Post buyback period	Difference	Sensex		
								Pre buyback period	Post buyback period	Difference
Sasken	-0.28	-0.31	-0.03	Tata Elxsi	0.38	-0.07	-0.45	-0.07	-0.02	0.05
Softsol	0.62	0.49	-0.13	Religare	-0.11	0.02	0.13	0.20	0.30	0.10
SRF	0.03	0.34	0.31	Trident	-0.24	0.62	0.86	0.09	0.18	0.09
Supreme Petro	0.23	-0.11	-0.34	Sintex	-0.63	-0.04	0.59	0.56	0.28	-0.28
Surana	0.24	-1.44	-1.68	Cable Corporation	-0.33	-2.54	-2.21	-0.34	-1.22	-0.88
Supreme inds	-1.12	0.42	1.55	Sintex	-0.63	0.04	0.67	-0.56	0.28	0.84
Tips2	0.26	-0.16	-0.42	Nicco Parks	-0.17	-0.23	-0.06	0.03	0.11	0.08
TV Today	-0.51	1.12	1.64	Entertainment Net India Ltd	-1.25	0.97	2.22	-0.23	0.79	1.02
United Phos	-0.41	-0.16	0.25	Bayer	-0.07	-0.16	-0.09	0.20	0.04	-0.16
Valiant1	-0.52	-0.40	0.12	Aishwarya	-0.10	0.23	0.33	-0.59	-1.12	-0.53
Valiant2	0.01	0.93	0.92	Aishwara	-1.68	-1.37	0.31	-0.11	0.49	0.60
Zee	-0.29	-0.31	-0.02	Sun TV	0.49	-0.55	-1.04	0.11	-0.53	-0.64

Table 3: Number of Statistically Significant Positive and Negative Growth Rates

Movement of growth rates	Buyback Companies		Control Companies		Sensex	
	Pre	Post	Pre	Post	Pre	Post
Positive significant	20	18	12	16	11	19
Positive insignificant	12	15	13	9	19	13
Negative significant	12	15	20	19	17	16
Negative insignificant	12	8	11	12	9	8
Total no. of cases	**54**	**54**	**54**	**54**	**54**	**54**

Table 4: Average kinked exponential Growth Rates of Share Prices on the basis of Size of Share Repurchase

	Pre buyback period	Post buyback period
Small buyback size Companies	0.1033	0.0148
Big buyback size Companies	-0.0979	0.3796

Table 5: Average kinked exponential Growth Rates of Share Prices on the basis of firm Size

	Pre buyback period	Post buyback period
Small Cap	0.2211	0.0508
Medim Cap	-0.1958	0.2452
Large Cap	-0.3683	-0.2709

Table 6: Average kinked exponential Growth Rates of Share Prices on the basis of Type of Industry

	Pre buyback period	Post buyback period
Service Sector Companies	-0.1776	0.0637
Non-Service Sector Companies	0.2034	0.0889

Annexure – I: Kinked Exponential Growth rate

Aegis			Sensex			Eastern Gas		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
t1d1	0.324988	0.19515	t1d1	0.202391	0.10694	t1d1	-1.25129	<0.00001***
t1d2	0.562729	0.02698**	t1d2	0.197224	0.11599	t1d2	-0.89837	0.00064***
Adj R2	0.837282		Adj R2	0.862408		Adj R2	0.975221	
DW	1.910549		DW	1.830302		DW	1.318107	

Alembic			Sensex			Sanofi		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
t1d1	-0.527449	0.13796	t1d1	-1.04909	0.00001***	t1d1	-0.0244356	0.88074
t1d2	0.0658851	0.85162	t1d2	0.28901	0.19596	t1d2	0.776487	0.00001***
Adj R2	0.761511		Adj R2	0.872407		Adj R2	0.914064	
DW	1.891701		DW	1.609721		DW	2.037625	

Annexure – I: Kinked Exponential Growth rate

Allied Digital			Sensex			Micro technologies India Ltd		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	4.50654	<0.00001***	const	9.86842	<0.00001***	const	4.88114	<0.00001***
t1d1	0.300262	0.32784	t1d1	0.170724	0.0899*	t1d1	0.222434	0.10807
t1d2	-2.33308	<0.00001***	t1d2	-0.21255	0.03596**	t1d2	0.0241118	0.86019
Adj R2	0.985742		Adj R2	0.885305		Adj R2	0.854866	
DW	1.394662		DW	1.904072		DW	2.29231	
P-value(F)	6.29E-49		P-value(F)	3.62E-95		P-value(F)	7.26E-67	
F(2, 58)	1303.001		F(2, 58)	52329.43		F(2, 58)	5505.237	

Amrutanjan			Sensex			Mangalam Drugs & Organics Ltd		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	5.80985	<0.00001***	const	9.09795	<0.00001***	const	1.73031	<0.00001***
t1d1	0.918713	<0.00001***	t1d1	-0.664144	0.00055***	t1d1	-1.50387	0.00022***
t1d2	0.195007	0.30205	t1d2	0.359144	0.05273*	t1d2	0.726815	0.12503
Adj R2	0.922153		Adj R2	0.734306		Adj R2	0.948955	
DW	1.750741		DW	1.645875		DW	1.824989	

Annexure – I: Kinked Exponential Growth rate

Amtek auto

VAR	COEFF	P-VALUE
const	4.77749	<0.00001***
t1d1	-0.191218	0.49832
t1d2	-0.770028	0.00806***
Adj R2	0.900494	
DW	1.324768	

Sensex

VAR	COEFF	P-VALUE
const	9.71961	<0.00001***
t1d1	0.0003467	0.80962
t1d2	-0.0017712	0.22135
Adj R2	0.875527	
DW	1.757101	

Sundaram Fasteners

VAR	COEFF	P-VALUE
const	4.11339	<0.00001***
t1d1	0.136028	0.23895
t1d2	-0.814313	<0.00001***
Adj R2	0.945797	
DW	2.2401	

Apcotex

VAR	COEFF	P-VALUE
const	4.40644	<0.00001***
t1d1	0.354171	0.04191**
t1d2	1.25184	<0.00001***
Adj R2	0.959476	
DW	1.668894	

Sensex

VAR	COEFF	P-VALUE
const	9.76331	<0.00001***
t1d1	0.136161	0.21161
t1d2	-0.219876	0.04595**
Adj R2	0.807355	
DW	1.700666	

GRP

VAR	COEFF	t STAT
const	6.52277	78.1393
t1d1	0.603396	1.4626
t1d2	-0.22464	-0.5772
Adj R2	0.921809	
DW	1.892888	

Annexure – I: Kinked Exponential Growth rate

Apollo tyres	COEFF	P-VALUE
VAR	COEFF	P-VALUE
const	4.30014	<0.00001***
t1d1	1.23011	<0.00001***
t1d2	-0.127765	0.39901
Adj R2	0.938874	
DW	2.048695	

Sensex	COEFF	P-VALUE
VAR	COEFF	P-VALUE
const	9.78182	<0.00001***
t1d1	0.393044	<0.00001***
t1d2	-0.0755959	0.08615*
Adj R2	0.962753	
DW	1.744016	

Kesoram	COEFF	P-VALUE
VAR	COEFF	P-VALUE
const	5.97944	<0.00001***
t1d1	0.510763	0.00044***
t1d2	-0.367522	0.00952***
Adj R2	0.837507	
DW	2.365527	

Avantel	COEFF	P-VALUE
VAR	COEFF	P-VALUE
const	3.69777	<0.00001***
t1d1	0.21104	0.00907***
t1d2	0.73282	<0.00001***
Adj R2	0.934171	
DW	1.920649	

Sensex	COEFF	P-VALUE
VAR	COEFF	P-VALUE
const	9.35106	<0.00001***
t1d1	1.02367	<0.00001***
t1d2	0.993704	<0.00001***
Adj R2	0.976929	
DW	1.669445	

Rexnord	COEFF	P-VALUE
VAR	COEFF	P-VALUE
const	1.61153	<0.00001***
t1d1	1.16313	0.0003***
t1d2	1.98758	<0.00001***
Adj R2	0.977431	
DW	1.365886	

Annexure – I: Kinked Exponential Growth rate

Balrampur chini

VAR	COEFF	P-VALUE
const	4.22546	<0.00001***
t1d1	-0.551162	0.00003***
t1d2	0.211559	0.09019*
Adj R2	0.829723	
DW	1.636019	

Sensex

VAR	COEFF	P-VALUE
const	9.78684	<0.00001***
t1d1	-0.252051	0.00286***
t1d2	0.277147	0.00113***
Adj R2	0.839955	
DW	1.748204	

Dhampur Sugar

VAR	COEFF	P-VALUE
const	4.24948	<0.00001***
t1d1	-0.160573	0.22721
t1d2	-0.500048	0.00035***
Adj R2	0.881295	
DW	1.561406	

Bosch

VAR	COEFF	P-VALUE
const	8.00614	<0.00001***
t1d1	-0.212216	0.24898
t1d2	0.0825448	0.65227
Adj R2	0.674934	
DW	1.305362	

Sensex

VAR	COEFF	P-VALUE
const	9.14549	<0.00001***
t1d1	-0.121251	0.60388
t1d2	-0.039025	0.86724
Adj R2	0.617674	
DW	1.591394	

Bharat Forge

VAR	COEFF	P-VALUE
const	4.44792	<0.00001***
t1d1	-0.986378	<0.00001***
t1d2	-0.188164	0.27602
Adj R2	0.857043	
DW	1.451685	

Annexure – I: Kinked Exponential Growth rate

Crisil VAR	COEFF	P-VALUE
const	6.77757	<0.00001***
t1d1	-0.116159	0.18709
t1d2	0.0704915	0.42116
Adj R2	0.654626	
DW	1.579388	

Sensex VAR	COEFF	P-VALUE
const	9.66057	<0.00001***
t1d1	-0.361085	0.00055***
t1d2	0.158304	0.11395
Adj R2	0.894646	
DW	1.877308	

Sanghvi movers VAR	COEFF	P-VALUE
const	4.56131	<0.00001***
t1d1	-0.83717	<0.00001***
t1d2	-0.271387	0.10202
Adj R2	0.965543	
DW	1.738528	

De nora VAR	COEFF	P-VALUE
const	4.47736	<0.00001***
t1d1	0.342123	0.06848*
t1d2	-0.326579	0.08164*
Adj R2	0.720744	
DW	1.92211	

Sensex VAR	COEFF	P-VALUE
const	9.75628	<0.00001***
t1d1	0.145657	0.16312
t1d2	-0.378247	0.00053***
Adj R2	0.843143	
DW	1.728098	

Jetking VAR	COEFF	P-VALUE
const	4.08456	<0.00001***
t1d1	-0.497449	0.02051**
t1d2	-0.752455	0.00065***
Adj R2	0.956313	
DW	2.266569	

Annexure – I: Kinked Exponential Growth rate

Deccan chronicl 2

VAR	COEFF	P-VALUE
const	4.38129	<0.00001***
t1d1	0.066823	0.72682
t1d2	-0.846748	0.00004***
Adj R2	0.893547	
DW	1.849528	

Sensex

VAR	COEFF	P-VALUE
const	9.84838	<0.00001***
t1d1	0.0765196	0.51737
t1d2	-0.172323	0.1478
Adj R2	0.891324	
DW	1.762369	

Jagran Prakashan

VAR	COEFF	P-VALUE
const	4.49167	<0.00001***
t1d1	0.681571	0.00218***
t1d2	0.547474	0.01253**
Adj R2	0.937407	
DW	1.653748	

DLF

VAR	COEFF	P-VALUE
const	5.8664	<0.00001***
t1d1	-1.41474	0.00253***
t1d2	-1.50144	0.00142***
Adj R2	0.952557	
DW	1.819137	

Sensex

VAR	COEFF	P-VALUE
const	9.438	<0.00001***
t1d1	-0.607672	0.02663**
t1d2	-1.11755	0.0001***
Adj R2	0.957092	
DW	1.616826	

Annexure – I: Kinked Exponential Growth rate

Ece inds

VAR	COEFF	P-VALUE
const	4.79728	<0.00001***
t1d1	0.501961	0.0061***
t1d2	-0.687201	0.00026***
Adj R2	0.780928	
DW	1.819173	

Sensex

VAR	COEFF	P-VALUE
const	9.83968	<0.00001***
t1d1	0.110631	0.15303
t1d2	-0.488933	<0.00001***
Adj R2	0.947411	
DW	1.550104	

Modison

VAR	COEFF	P-VALUE
const	3.35874	<0.00001***
t1d1	-0.218903	0.01705**
t1d2	-0.487445	<0.00001***
Adj R2	0.93404	
DW	1.843019	

Eid parry

VAR	COEFF	P-VALUE
const	4.97053	<0.00001***
t1d1	-0.476729	0.05151*
t1d2	0.148285	0.53871
Adj R2	0.714441	
DW	1.591302	

Sensex

VAR	COEFF	P-VALUE
const	9.11585	<0.00001***
t1d1	-0.423935	0.05589*
t1d2	0.190261	0.38485
Adj R2	0.663931	
DW	1.561511	

Bannari

VAR	COEFF	P-VALUE
const	6.45808	<0.00001***
t1d1	0.591956	0.15144
t1d2	0.740089	0.07437*
Adj R2	0.90343	
DW	1.508909	

Annexure – I: Kinked Exponential Growth rate

Eon Electric			Sensex			Birla Ericsson		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	4.17715	<0.00001***	const	9.70748	<0.00001***	const	2.57965	<0.00001***
t1d1	0.145925	0.53073	t1d1	-0.0664772	0.37652	t1d1	0.0915888	0.45518
t1d2	-1.22478	<0.00001***	t1d2	0.198074	0.01021**	t1d2	-0.127837	0.29834
Adj R2	0.949226		Adj R2	0.731097		Adj R2	0.430137	
DW	1.818175		DW	1.614811		DW	2.039946	

FDC			Sensex			Parabolic Drugs		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	4.62517	<0.00001***	const	9.79757	<0.00001***	const	3.82515	<0.00001***
t1d1	-0.118937	0.36812	t1d1	-0.424722	<0.00001***	t1d1	-0.80757	<0.00001***
t1d2	0.0148453	0.91025	t1d2	0.050725	0.321	t1d2	-0.497958	0.00299***
Adj R2	0.749912		Adj R2	0.925804		Adj R2	0.974462	
DW	1.547996		DW	1.629304		DW	1.484447	

Annexure – I: Kinked Exponential Growth rate

Gateway			Sensex		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	4.42679	<0.00001***	const	9.54388	<0.00001***
t1d1	-0.0806171	0.83824	t1d1	-0.162427	0.42401
t1d2	0.238446	0.54653	t1d2	0.206253	0.31083
Adj R2	0.922546		Adj R2	0.753337	
DW	0.925128		DW	0.761559	

ABC India			Sensex		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	3.67547	<0.00001***	const	9.37095	<0.00001***
t1d1	-0.36757	0.3824	t1d1	1.00726	<0.00001***
t1d2	0.234864	0.57601	t1d2	0.970631	<0.00001***
Adj R2	0.746925		Adj R2	0.977007	
DW	0.75536		DW	1.670892	

Godrej			Tamil nadu Petroproducts		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	4.43299	<0.00001***	const	2.38258	<0.00001***
t1d1	1.77591	0.00012***	t1d1	0.958441	0.04858**
t1d2	1.74034	0.00016***	t1d2	1.74907	0.00052***
Adj R2	0.976268		Adj R2	0.974161	
DW	1.617411		DW	1.395166	

Annexure – I: Kinked Exponential Growth rate

Gujarat			Sensex		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	5.22933	<0.00001***	const	9.57064	<0.00001***
t1d1	0.0576412	0.69451	t1d1	0.0495067	0.79542
t1d2	0.29981	0.0446**	t1d2	-0.028584	0.88098
Adj R2	0.763192		Adj R2	0.710914	
DW	2.089264		DW	1.897746	

Futura			Graphite India		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	2.8258	<0.00001***	const	4.45233	<0.00001***
t1d1	-1.52021	0.09393*	t1d1	-0.17297	0.32179
t1d2	-2.10196	0.02195**	t1d2	0.478993	0.00757***
Adj R2	0.902493		Adj R2	0.898414	
DW	2.178594		DW	1.596062	

Heg			Sensex		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	5.36565	<0.00001***	const	9.82352	<0.00001***
t1d1	0.301984	0.14767	t1d1	0.0390098	0.74843
t1d2	0.262907	0.20651	t1d2	0.113763	0.35125
Adj R2	0.929289		Adj R2	0.868075	
DW	1.488359		DW	1.690138	

Annexure – I: Kinked Exponential Growth rate

HUL

VAR	COEFF	P-VALUE
const	5.5418	<0.00001***
t1d1	-0.166849	0.16544
t1d2	0.572939	0.00001***
Adj R2	0.924214	
DW	1.76553	

Sensex

VAR	COEFF	P-VALUE
const	9.79775	<0.00001***
t1d1	0.0761332	0.31731
t1d2	0.329247	0.00005***
Adj R2	0.962619	
DW	1.851908	

Dabur

VAR	COEFF	P-VALUE
const	5.4029	<0.00001***
t1d1	0.294754	0.60926
t1d2	-2.37876	0.00011***
Adj R2	0.888996	
DW	1.941258	

Hydro

VAR	COEFF	P-VALUE
const	3.42653	<0.00001***
t1d1	0.661381	0.00051***
t1d2	-0.027103	0.88053
Adj R2	0.648389	
DW	1.9364	

Sensex

VAR	COEFF	P-VALUE
const	9.10522	<0.00001***
t1d1	-0.245534	0.21927
t1d2	0.0586506	0.76779
Adj R2	0.782246	
DW	1.746244	

Wim Plast

VAR	COEFF	P-VALUE
const	3.86943	<0.00001***
t1d1	0.154738	0.0004***
t1d2	0.0219136	0.52216
Adj R2	0.313455	
DW	1.945164	

Annexure – I: Kinked Exponential Growth rate

Indiabulls Real Est

VAR	COEFF	P-VALUE
const	3.80706	<0.00001***
t1d1	-1.62836	<0.00001***
t1d2	1.46682	<0.00001***
Adj R2	0.936102	
DW	1.750731	

Sensex

VAR	COEFF	P-VALUE
const	9.64368	<0.00001***
t1d1	-0.330093	0.00016***
t1d2	0.396894	<0.00001***
Adj R2	0.874781	
DW	1.88378	

Swan

VAR	COEFF	P-VALUE
const	4.10801	<0.00001***
t1d1	-0.395226	<0.00001***
t1d2	-0.0634161	0.24903
Adj R2	0.942522	
DW	2.296657	

Indiabulls Sec

VAR	COEFF	P-VALUE
const	3.24969	<0.00001***
t1d1	0.698365	0.15405
t1d2	2.43871	<0.00001***
Adj R2	0.974964	
DW	1.54878	

Sensex

VAR	COEFF	P-VALUE
const	9.31804	<0.00001***
t1d1	0.990841	<0.00001***
t1d2	1.02858	<0.00001***
Adj R2	0.978495	
DW	1.668059	

Aditya Birla

VAR	COEFF	P-VALUE
const	2.80955	<0.00001***
t1d1	1.28509	0.0247**
t1d2	1.86045	0.00191***
Adj R2	0.987795	
DW	0.69227	

Annexure – I: Kinked Exponential Growth rate

Infinite

VAR	COEFF	P-VALUE
const	5.14749	<0.00001***
t1d1	0.328032	0.02368**
t1d2	-0.395076	0.00696***
Adj R2	0.724879	
DW	1.763158	

Sensex

VAR	COEFF	P-VALUE
const	9.86754	<0.00001***
t1d1	0.178104	0.04305**
t1d2	-0.200191	0.02358**
Adj R2	0.880436	
DW	1.86019	

Subex

VAR	COEFF	P-VALUE
const	4.13933	<0.00001***
t1d1	0.513932	0.20016
t1d2	-0.0569026	0.88641
Adj R2	0.8946	
DW	1.658068	

IPCA

VAR	COEFF	P-VALUE
const	5.82298	<0.00001***
t1d1	-1.42226	<0.00001***
t1d2	0.350306	0.14403
Adj R2	0.937655	
DW	1.543998	

Sensex

VAR	COEFF	P-VALUE
const	9.09795	<0.00001***
t1d1	-0.664144	0.00055***
t1d2	0.359144	0.05273*
Adj R2	0.734306	
DW	1.645875	

Wockhart

VAR	COEFF	P-VALUE
const	4.51768	<0.00001***
t1d1	-1.76423	<0.00001***
t1d2	0.7251	<0.00001***
Adj R2	0.957375	
DW	1.925729	

Annexure – I: Kinked Exponential Growth rate

J K Lakshmi

VAR	COEFF	P-VALUE
const	4.09499	<0.00001***
t1d1	1.64928	<0.00001***
t1d2	0.248072	0.22327
Adj R2	0.97583	
DW	1.631265	

Sensex

VAR	COEFF	P-VALUE
const	9.80005	<0.00001***
t1d1	0.498286	<0.00001***
t1d2	-0.148755	0.00002***
Adj R2	0.948943	
DW	1.934769	

OCL

VAR	COEFF	P-VALUE
const	4.65756	<0.00001***
t1d1	0.691702	<0.00001***
t1d2	-0.194391	0.05871*
Adj R2	0.885624	
DW	1.88881	

Kirloskar

VAR	COEFF	P-VALUE
const	4.968	<0.00001***
t1d1	0.574409	0.00024***
t1d2	0.0725069	0.62351
Adj R2	0.884831	
DW	2.077099	

Sensex

VAR	COEFF	P-VALUE
const	9.80486	<0.00001***
t1d1	0.459539	<0.00001***
t1d2	-0.190408	<0.00001***
Adj R2	0.938684	
DW	1.946675	

Greaves

VAR	COEFF	P-VALUE
const	4.43563	<0.00001***
t1d1	0.177896	0.25448
t1d2	-0.022422	0.88516
Adj R2	0.735164	
DW	2.087405	

Annexure – I: Kinked Exponential Growth rate

Lakshmi Machine

VAR	COEFF	P-VALUE
const	7.76566	<0.00001***
t1d1	-0.457558	<0.00001***
t1d2	-0.296359	0.00159***
Adj R2	0.93598	
DW	1.773281	

Sensex

VAR	COEFF	P-VALUE
const	9.90872	<0.00001***
t1d1	0.0262898	0.7221
t1d2	-0.367655	<0.00001***
Adj R2	0.902335	
DW	1.881207	

VA Tech

VAR	COEFF	P-VALUE
const	7.34418	<0.00001***
t1d1	-0.240886	0.09483*
t1d2	-0.437293	0.00314***
Adj R2	0.909697	
DW	1.960417	

Manaksia

VAR	COEFF	P-VALUE
const	4.762	<0.00001***
t1d1	0.940582	0.00112***
t1d2	-0.146565	0.59503
Adj R2	0.922067	
DW	1.498088	

Sensex

VAR	COEFF	P-VALUE
const	9.76169	<0.00001***
t1d1	-0.0530275	0.44029
t1d2	-0.137776	0.04813**
Adj R2	0.834341	
DW	1.944259	

Sarda

VAR	COEFF	P-VALUE
const	5.71578	<0.00001***
t1d1	1.6555	<0.00001***
t1d2	-0.911064	0.00049***
Adj R2	0.923591	
DW	2.027155	

Annexure – I: Kinked Exponential Growth rate

Mangalam

VAR	COEFF	P-VALUE
const	3.88274	<0.00001***
t1d1	0.209103	0.08259*
t1d2	0.392097	0.0016***
Adj R2	0.855521	
DW	1.877186	

Sensex

VAR	COEFF	P-VALUE
const	9.16561	<0.00001***
t1d1	0.08785	0.58642
t1d2	-0.325368	0.04735**
Adj R2	0.737778	
DW	1.883515	

Gujarat Sidhee

VAR	COEFF	P-VALUE
const	2.15527	<0.00001***
t1d1	0.877164	0.03621**
t1d2	-0.466109	0.2592
Adj R2	0.890036	
DW	1.173447	

Mro Tek

VAR	COEFF	P-VALUE
const	2.95005	<0.00001***
t1d1	-0.716093	0.11143
t1d2	0.60255	0.16548
Adj R2	0.831827	
DW	1.370388	

Sensex

VAR	COEFF	P-VALUE
const	9.06214	<0.00001***
t1d1	-0.239294	0.07821*
t1d2	0.967896	<0.00001***
Adj R2	0.950592	
DW	1.765961	

Astra

VAR	COEFF	P-VALUE
const	3.77893	<0.00001***
t1d1	0.3428	0.10001
t1d2	0.606486	0.00329***
Adj R2	0.878892	
DW	1.93214	

Annexure – I: Kinked Exponential Growth rate

Onmobile

VAR	COEFF	P-VALUE
const	4.05983	<0.00001***
t1d1	-1.2248	0.00069***
t1d2	0.0703527	0.83756
Adj R2	0.900468	
DW	1.773691	

Sensex

VAR	COEFF	P-VALUE
const	9.69321	<0.00001***
t1d1	-0.304766	0.00998***
t1d2	0.222594	0.05655*
Adj R2	0.769956	
DW	1.555967	

Mascon Global

VAR	COEFF	P-VALUE
const	0.135268	0.0083***
t1d1	-0.0926018	0.73865
t1d2	-0.215498	0.43846
Adj R2	0.702053	
DW	1.933203	

Panacea

VAR	COEFF	P-VALUE
const	5.19944	<0.00001***
t1d1	0.287962	0.01471**
t1d2	0.169674	0.14384
Adj R2	0.855583	
DW	1.712511	

Sensex

VAR	COEFF	P-VALUE
const	9.78467	<0.00001***
t1d1	0.260313	<0.00001***
t1d2	0.0778434	0.03312**
Adj R2	0.929801	
DW	1.862158	

Nectar

VAR	COEFF	P-VALUE
const	3.6441	<0.00001***
t1d1	0.119263	0.26464
t1d2	-0.444812	0.00009***
Adj R2	0.82948	
DW	1.839775	

Pennar inds			Sensex			Shah Alloys		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	3.20081	<0.00001***	const	9.37095	<0.00001***	const	2.86191	<0.00001***
t1d1	1.25735	<0.00001***	t1d1	1.00726	<0.00001***	t1d1	1.337	0.00334***
t1d2	0.0638676	0.72607	t1d2	0.970631	<0.00001***	t1d2	1.56191	0.00098***
Adj R2	0.932826		Adj R2	0.977007		Adj R2	0.984238	
DW	1.944893		DW	1.670892		DW	1.294179	

Praj Inds			Sensex			VA Tech		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	4.29116	<0.00001***	const	9.6881	<0.00001***	const	5.8097	<0.00001***
t1d1	-0.298974	0.17245	t1d1	-0.206395	0.09736*	t1d1	-0.202646	0.0963*
t1d2	0.37163	0.09129*	t1d2	-0.0181541	0.88269	t1d2	0.10385	0.38987
Adj R2	0.85402		Adj R2	0.890547		Adj R2	0.612692	
DW	1.977479		DW	1.750021		DW	1.579967	

Annexure – I: Kinked Exponential Growth rate

Provogue			Sensex		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	4.09013	<0.00001***	const	9.63507	<0.00001***
t1d1	1.24472	<0.00001***	t1d1	0.190353	0.1179
t1d2	0.479242	0.00135***	t1d2	0.313886	0.01128**
Adj R2	0.954327		Adj R2	0.91086	
DW	1.631638		DW	1.779493	

Suryalakshmi			Inox leisure		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	3.08906	<0.00001***	const	3.75513	<0.00001***
t1d1	0.422567	0.30243	t1d1	-0.364538	0.07483*
t1d2	1.52861	0.00028***	t1d2	0.39674	0.05311*
Adj R2	0.980366		Adj R2	0.826642	
DW	1.478111		DW	1.871703	

PVR			Sensex		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	4.60151	<0.00001***	const	9.80271	<0.00001***
t1d1	-0.0669418	0.64508	t1d1	-0.145462	0.05143*
t1d2	0.513665	0.00076***	t1d2	0.0956643	0.19601
Adj R2	0.814692		Adj R2	0.762203	
DW	2.182986		DW	1.726305	

Annexure – I: Kinked Exponential Growth rate

Rain VAR	COEFF	P-VALUE
const	3.37698	<0.00001***
t1d1	0.228159	0.21133
t1d2	-0.0741935	0.68259
Adj R2	0.779869	
DW	1.677588	

Sensex VAR	COEFF	P-VALUE
const	9.75372	<0.00001***
t1d1	0.14658	0.16876
t1d2	-0.277932	0.01057**
Adj R2	0.803044	
DW	1.797744	

Goa Carbon VAR	COEFF	P-VALUE
const	4.35203	<0.00001***
t1d1	-0.0369615	0.79891
t1d2	-0.446263	0.00307***
Adj R2	0.865867	
DW	1.763678	

Reliane Infra VAR	COEFF	P-VALUE
const	6.51006	<0.00001***
t1d1	0.320801	0.09286*
t1d2	-0.237839	0.21029
Adj R2	0.749641	
DW	2.019249	

Sensex VAR	COEFF	P-VALUE
const	9.85768	<0.00001***
t1d1	0.241158	0.03773**
t1d2	-0.0832074	0.46609
Adj R2	0.856007	
DW	1.815845	

BGR Energy VAR	COEFF	P-VALUE
const	6.18529	<0.00001***
t1d1	0.0109901	0.97615
t1d2	0.107863	0.76928
Adj R2	0.883943	
DW	1.959573	

Annexure – I: Kinked Exponential Growth rate

Sasken

VAR	COEFF	P-VALUE
const	5.22845	<0.00001***
t1d1	-0.277371	0.1298
t1d2	-0.306134	0.09523*
Adj R2	0.866171	
DW	1.717205	

Sensex

VAR	COEFF	P-VALUE
const	9.90465	<0.00001***
t1d1	-0.0701633	0.36759
t1d2	-0.0164202	0.83245
Adj R2	0.738731	
DW	1.956228	

Tata Elxsi

VAR	COEFF	P-VALUE
const	5.69237	<0.00001***
t1d1	0.384733	0.19224
t1d2	-0.0754606	0.79673
Adj R2	0.728311	
DW	1.785351	

Softsol

VAR	COEFF	P-VALUE
const	3.78499	<0.00001***
t1d1	0.619094	0.0002***
t1d2	0.48826	0.00193***
Adj R2	0.908882	
DW	1.768774	

Sensex

VAR	COEFF	P-VALUE
const	9.62993	<0.00001***
t1d1	0.203698	0.11143
t1d2	0.295147	0.01847**
Adj R2	0.895674	
DW	1.732266	

Religare

VAR	COEFF	P-VALUE
const	5.94277	<0.00001***
t1d1	-0.113425	0.10028
t1d2	0.0164999	0.8089
Adj R2	0.501105	
DW	2.078258	

Annexure – I: Kinked Exponential Growth rate

SRF

VAR	COEFF	P-VALUE
const	5.74852	<0.00001***
t1d1	0.0331392	0.7871
t1d2	0.342967	0.00678***
Adj R2	0.768144	
DW	1.784147	

Sensex

VAR	COEFF	P-VALUE
const	9.82295	<0.00001***
t1d1	0.0929165	0.26701
t1d2	0.184238	0.03018**
Adj R2	0.87987	
DW	1.737491	

Trident

VAR	COEFF	P-VALUE
const	2.6006	<0.00001***
t1d1	-0.240588	0.0836*
t1d2	0.624084	0.00003***
Adj R2	0.84521	
DW	1.56261	

Supreme Inds

VAR	COEFF	P-VALUE
const	4.64375	<0.00001***
t1d1	-1.12466	<0.00001***
t1d2	0.419929	0.01086**
Adj R2	0.869262	
DW	2.030467	

Sensex

VAR	COEFF	P-VALUE
const	9.10499	<0.00001***
t1d1	-0.55983	0.00969***
t1d2	0.283209	0.18118
Adj R2	0.69717	
DW	1.548953	

Sintex

VAR	COEFF	P-VALUE
const	5.15586	<0.00001***
t1d1	-0.625582	0.2293
t1d2	-0.0377922	0.94174
Adj R2	0.715949	
DW	1.336	

Annexure – I: Kinked Exponential Growth rate

Supreme Petro			Sensex			Finolex		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	2.46354	<0.00001***	const	9.16843	<0.00001***	const	3.43165	<0.00001***
t1d1	0.226025	0.47656	t1d1	0.106502	0.62913	t1d1	-0.0552038	0.79673
t1d2	-0.11039	0.72766	t1d2	-0.125689	0.56886	t1d2	-0.258766	0.23007
Adj R2	0.763641		Adj R2	0.668174		Adj R2	0.795964	
DW	1.738945		DW	1.73119		DW	1.414218	

Surana			Sensex			Cable Corporation		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	3.40485	<0.00001***	const	9.52852	<0.00001***	const	3.05743	<0.00001***
t1d1	0.236537	0.25044	t1d1	-0.337452	0.11596	t1d1	-0.333039	0.14924
t1d2	-1.44471	<0.00001***	t1d2	-1.22259	<0.00001***	t1d2	-2.53915	<0.00001***
Adj R2	0.920638		Adj R2	0.958771		Adj R2	0.97499	
DW	1.908334		DW	1.480623		DW	1.961498	

Annexure – I: Kinked Exponential Growth rate

Tips 1

VAR	COEFF	P-VALUE
const	3.89786	<0.00001***
t1d1	-0.370164	0.28993
t1d2	0.0572424	0.86939
Adj R2	0.855013	
DW	1.397736	

Sensex

VAR	COEFF	P-VALUE
const	9.72509	<0.00001***
t1d1	-0.108595	0.44207
t1d2	0.140973	0.31917
Adj R2	0.932904	
DW	1.850182	

Prime Focus

VAR	COEFF	P-VALUE
const	5.26628	<0.00001***
t1d1	-0.924165	0.0021***
t1d2	1.54953	<0.00001***
Adj R2	0.942228	
DW	1.429929	

Tips 2

VAR	COEFF	P-VALUE
const	4.06248	<0.00001***
t1d1	0.260463	0.00031***
t1d2	-0.16167	0.02057**
Adj R2	0.667388	
DW	2.163997	

Sensex

VAR	COEFF	P-VALUE
const	9.75339	<0.00001***
t1d1	0.0321657	0.59287
t1d2	0.110983	0.06867*
Adj R2	0.829174	
DW	1.715959	

Nicco Parks

VAR	COEFF	P-VALUE
const	2.79826	<0.00001***
t1d1	-0.172004	0.01048**
t1d2	-0.229333	0.00125***
Adj R2	0.826143	
DW	2.310219	

Annexure – I: Kinked Exponential Growth rate

TV today			Sensex		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	4.05492	<0.00001***	const	9.06346	<0.00001***
t1d1	-0.514359	0.01893**	t1d1	-0.233541	0.19573
t1d2	1.12465	<0.00001***	t1d2	0.791138	0.00004***
Adj R2	0.896971		Adj R2	0.928427	
DW	1.214111		DW	1.754414	

United			Sensex		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	4.7668	<0.00001***	const	9.71283	<0.00001***
t1d1	-0.407601	0.00018***	t1d1	-0.159752	0.09447*
t1d2	-0.160775	0.11955	t1d2	0.0361419	0.70192
Adj R2	0.890075		Adj R2	0.888628	
DW	1.683169		DW	2.02193	

Entertainment Network India Ltd			Bayer		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	4.68073	<0.00001***	const	6.65653	<0.00001***
t1d1	-1.25336	0.00041***	t1d1	-0.0726568	0.09126*
t1d2	0.973204	0.00513***	t1d2	0.201069	0.00001***
Adj R2	0.893106		Adj R2	0.660302	
DW	1.358271		DW	2.039769	

Annexure – I: Kinked Exponential Growth rate

Valiant 1			Sensex			Aishwarya		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	3.10871	<0.00001***	const	9.4472	<0.00001***	const	2.00095	<0.00001***
t1d1	-0.517269	0.01187**	t1d1	-0.589308	0.02856**	t1d1	-0.098046	0.57293
t1d2	-0.395386	0.0518*	t1d2	-1.11817	0.00008***	t1d2	0.231677	0.20152
Adj R2	0.760117		Adj R2	0.956292		Adj R2	0.608569	
DW	2.056551		DW	1.615933		DW	1.896771	

Valiant 2			Sensex			Aishwarya		
VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE	VAR	COEFF	P-VALUE
const	2.55147	<0.00001***	const	9.65922	<0.00001***	const	2.8939	<0.00001***
t1d1	0.0100107	0.94681	t1d1	-0.10886	0.08321*	t1d1	-1.67569	0.00066***
t1d2	0.934474	<0.00001***	t1d2	0.489355	<0.00001***	t1d2	-1.37007	0.00468***
Adj R2	0.887509		Adj R2	0.932011		Adj R2	0.988544	
DW	1.791348		DW	1.820807		DW	1.417183	

Modeling Risk and Return across Indian Stock Market - An Empirical Study on Bombay Stock Exchange and National Stock Exchange

Swapan Sarkar

Abstract:

Modeling risk and return in the stock market has always been a priority among the market participants because successful modeling may lead to consistent abnormal return by applying systematic trading strategies. However modeling is possible only if the market is inefficient where successive price changes do not follow random walk.

Indian stock market was traditionally believed to be efficient in weak form. Unfortunately recent studies have raised serious questions over this traditional belief. Researchers have shown, based on advance statistical techniques, that return in Indian stock market does not follow random walk and hence there may be sufficient scope for modeling the return series for both mean return and risk.

In this context, the article makes a sincere attempt to model both the mean return and volatility (Risk) in the Indian stock market based on various advance modeling techniques and thereby revisits the weak form efficiency of Indian burses.

Key Words:

BSE Sensex, Correlation, Regression, Small Cap, Mid Cap.

Introduction

Ever since the introduction of formal stock exchange dealings, investors are always in search of systematic trading strategies that can earn above normal rate of return. However such an attempt can succeed only if the trajectory of stock price changes can be estimated precisely, which again requires modeling the stock returns effectively. Fortunately, there has been tremendous improvement in the field of statistics and analytics during last few decades that has made this modeling simpler to a great extent. As a result these techniques have been successfully applied by many researchers to explain a number of unique characteristics of stock market return including conditional mean and time varying volatility and thereby to model returns across stock exchanges around the world. Our study aims at identifying such scope in the context of Indian stock exchanges through a set of comprehensive advanced modeling techniques.

Implications of Modeling Risk and Return of Stock Market

Modeling stock market risk and return is closely associated with the concept Efficient Capital Market. According to Fama (1970), a capital market is efficient

in weak form if it is not possible to earn above normal return based on past price information. In other words, in a weak form efficient market stock price changes would follow a random walk leaving no scope for anyone to predict future changes. Hence successful modeling of market return would act as a contrary evidence of weak form inefficiency of the stock market apart from helping investors devise effective strategies to earn above average return. From this perspective our study is likely to serve twofold purposes.

Literature Review

(a) On studying the behavior of stock prices: Early attempts to study the stock price behavior can be traced back to the beginning of previous century. Bachelier (1900) was the first to point out that price movement in market is random. Later Cowles (1933) found that there was no significant evidence of any ability of investors to outguess the market. Kendall (1953) examined the behaviour of 22 U.K stock and commodity price series in search of regular cycles. Instead of discovering any regular price cycle, he found each series to be "a wandering one....." Regarding stock price behaviour only, H.V. Roberts (1959) was the first to question the existence of systematic patterns in stock prices. He demonstrated that a series of cumulative random numbers, which are obviously free from any systematic patterns, may closely resemble the actual stock price series but changes in the stock prices do not exhibit any pattern just like the changes in random numbers. Granger and Morgenstern also provided substantial empirical support for the random walk phenomenon; using some statistical tests of dependence between successive stock price changes (e.g. Serial Correlation and Runs Test) they found generally insignificant departures from randomness. Samuelson (1965) also found supportive evidence for random walk. Following this Fama (1970) developed a formal theoretical structure of market efficiency which shifted attention of researchers from random walk and weak form of efficiency to other two forms of efficiency (semi-strong and strong form) also. However research attempts to study stock price behavior did not come to an end here. Friend et al. (1970) and Williamson (1972) found results in support of random walk in US stock market whereas Solnik (1973) supported the random walk model in European market. Fisher (1996) also suggested autocorrelations of monthly returns. Worthington and Higgs (2006) examined 27 emerging market using daily return and traditional as well as unit root tests to find that most emerging markets do not follow random walk.

In India, Rao and Mukherjee (1971), Ray (1976), Sharma and Kennedy (1977), Kulkarni (1978), Barua (1981) and Sharma (1983) conducted studies in various regional as well as national stock markets to find mixed results. Yalawar (1988) used non parametric tests on 122 listed stock of BSE and found existence of significant auto-correlations. Gupta (1989) and Obeidullah (1990) found significant support for the weak form using serial correlation test and run test on weekly returns. Sunil Poshakwale (1996) studied the daily prices of SENSEX and found that weekend effect is persistent in BSE meaning the market is inefficient. P.Srinivasan (2010) studied

the daily closing values of NIFTY and SENSEX using ADF test and PP test. The results confirmed that the return series does not contain any unit root and hence the market is not efficient in the weak form.

(b) On Modeling Stock Market Return: Studies on modeling stock market return and risk (i.e. Volatility) are comparatively less in number as the tools required for these types of studies were developed only after 1970s. Even then a considerable number of studies are available already, at least in International context. Aggarwal, Inclan, and Leal (1999) examined the stock market volatility of 10 largest emerging markets in Asia and Latin America using GARCH models. They found that shifts in volatility of considered emerging markets is related to important country-specific political, social, and economic events. Balaban, Bayar, and Faff (2003) forecasted stock market volatility of fourteen stock markets. They employed eleven models and use symmetric and asymmetric loss functions to evaluate the performance of these models. Kasch-Haroutounian and Price (2001), Glimore and McManus (2001), Poshakwale and Murinde (2001) and Murinde and Poshakwale (2002) found that significant autocorrelation, high volatility persistence, significant asymmetry, lack of relationship between stock market volatility and expected return and non-normality of the return distribution are basic characteristics of stock market volatility in transition countries.

Studies in Indian context are, however, still scanty. Pal (2005) studied volatility of SENSEX using advanced modeling techniques. Joshi and Pandya used different ARCH based models to study volatility of Nifty and SENSEX. Mishra et al.(2010) examined volatility of Nifty and SENSEX returns using TGARCH approach. P.K.Mishra (2010) also used unit root test and GARCH models to explain volatility in SENSEX.

Research Gap

The studies on modeling market return and associated volatility in Indian burses suffer from a number of shortcomings. At first, all the studies considered only the two most popular indices in India namely SENSEX and Nifty. However these two constitute only the top 30 and 50 market capitalization stocks and thus cannot represent the entire market movements effectively. A broad base index such as BSE 100 or CNX 500 could have more clearly captured the market volatility. Secondly, asymmetric volatility issue has been taken up for Nifty and SENSEX only in the study by Mishra et al. This phenomenon requires better analysis using other indices also. Keeping this in mind the current study will try extending the advanced models like ARMA and GARCH to other indices. It shall also try to address the asymmetric volatility issue in the context of other broad base indices.

Objective of the Study

The central objective of this study shall be to identify a model that can precisely explain the risk and return characteristics across Indian stock market. However, in this process, the study would try to address the following specific objectives.

i. To model the return i.e. conditional mean return (since returns depend on events) across Indian stock

market with reference to indices selected from BSE and NSE.

ii. To model the risk i.e. volatility of return across Indian stock market with reference to indices selected from BSE and NSE.

iii. To test the weak form efficiency of BSE and NSE.

Empirical Methodology

Data and Sample Period

The present study has considered only Bombay Stock Exchange (BSE) and National Stock Exchange (NSE) to represent Indian stock market. This is because -

i. Both BSE and NSE have nationwide reach with huge number of trading members. BSE is world's No. 1 exchange in terms of listed members.

ii. Together they constitute more than 90% of the stock market activity in India.

iii. They offer the best of trading technology which can even compete with international practices.

iv. All the other stock exchanges hardly have significant trading activities and are even at the edge of being closed down.

Further it has selected three indices each form BSE (SENSEX, BSE 100 and BSE 500) and NSE (Nifty, CNX 100 and CNX 500). All these indices constitute individual stocks selected based on

their market capitalization. Whereas, SENSEX and Nifty are the most popular, others are broad based indices containing progressively higher number of stocks. Now, for each of the indices under BSE and NSE, we considered a sample period starting from the inception of such index up to 31.03.2014. Daily closing index values have been collected the for the above sample period using the database available in the official website of BSE and NSE.

Daily index returns ($R_{m,t}$) are calculated as:

$R_{m,t}$ = Ln (It / I_{t-1}), Where, R_t = return at period t; I_t = index at period t; I_{t-1} = index at period t-1 and ln = natural log.

Statistical test techniques have been applied on the return series calculated as above.

Research Methods

Financial time series, especially stock market return series often exhibit certain interesting features. They have fatter tails than normal distribution and are found to be leptokurtic. They also show statistically significant serial correlations even at higher lags. What adds to this is the excess volatility at times, also known as volatility clustering, a feature technically known as heteroscedasticity. Thus, in order to model the return series a number of statistical techniques have been applied. These are as follows:

Ljung-Box Q Test on Serial/Auto Correlation

This is a complementary to the traditional auto correlation test and tests existence of serial independence up to a given lag on overall basis, a prior

condition of existence of white noise and pure random walk. **Ljung-Box Q**

$$Q^* = T\ (T+2) \sum_{k=1}^{m} \frac{\hat{\tau}_k^2}{T-k} \sim \chi_m^2$$

Where is the k th autocorrelation, T is the number of observations and m is the maximum lag. It is asymptotically distributed as a c_m^2 under the null hypothesis that all m autocorrelation coefficients are zero. Accordingly, a statistically significant Q statistic will confirm a non random series fit to be modeled.

Tests of Stationarity; Unit Root Tests

The theory behind time series estimation is based on stationary time series. A series is said to be (weakly or covariance) stationary if the mean and auto covariances of the series do not depend on time. Any series that is not stationary is said to be nonstationary. A common example of a nonstationary series is the random walk. However, the random walk is a difference stationary series since the first difference of is stationary. A difference stationary series is said to be integrated and is denoted as I (d) where'd' is the order of integration.

Standard inference procedures do not apply to regressions which contain an integrated dependent variable or integrated regressors. Therefore, it is important to check whether a series is stationary or not before using it in a regression. The formal method to test the stationarity of a series is the unit root

test. The equation of unit root test is,

$$y_t = \alpha + \rho y_{t-1} + \varepsilon_t$$

This is basically an autoregressive process (and RW with a drift but without a trend; for a with trend model another term β_t is also included). If $\rho = 1$, it means unit root is present and the series is a random walk. But if $\rho < 1$, we conclude that there is no unit root and the series is stationary.

In this study we have used two powerful tests on unit root. These are:

(a) Augmented Dicky Fuller Test (ADF Test)

The study uses Augmented Dickey - Fuller (ADF) unit root test which consists of estimating the following regression:

$$\Delta Y_t = a_0 + \delta\ Y_{t-1} + a_1 t + \sum b_i \Delta\ Y_{t-i} + \varepsilon_t$$

Where ε_t is a white noise, t is the trend term, a_0 is an intercept (constant) and δ, β_i and a_1 are coefficients. The appropriate lag may be set based on minimizing Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC) or Hannan Quinn Criterion and MacKinnon's critical values are used to determine the significance of the test statistic.

Using the above equation, the null hypothesis of a unit root ($\delta = 0$; where $\delta = 1-\rho$) is tested against the stationary alternative of ($\delta < 0$). Acceptance of null hypothesis implies the existence of a unit

root or non- stationarity, thereby indicating presence random walk and weak form efficiency of the market. As a result modeling becomes infeasible.

(b) Philips Perron Test (PP Test)

Phillips and Perron (1988) propose an alternative (nonparametric) method of controlling for serial correlation when testing for a unit root. The PP method estimates the non-augmented DF test equation, and modifies the t-ratio of the coefficient so that its asymptotic distribution is unaffected by serial correlation.

The test can be applied kernel-based sum-of-covariances to estimate the residual spectrum at frequency zero. Finally MacKinnon's critical values are used in order to determine the significance of the test statistic associated.

Techniques for Modeling Return and Risk

a) Modeling Mean Return; ARMA Model

Autoregressive and Moving Average (ARMA) is basically a combination of Autoregressive process and Moving average process and hence assumes that the current value of some series y depends linearly on its own previous values plus a combination of current and previous values of a white noise error term. The model could be written as-

$$Y_t = \alpha_1 Y_{t-1} + \ldots + \alpha_p Yt\text{-}p + \varepsilon_t + \beta_1 \varepsilon_{t-1} \ldots + \beta_q Yt\text{-}q$$

Where ε_t is the error term.

Although the existence of ARMA models predates them, Box and Jenkins (1976) were the first to approach the task of estimating an ARMA model in a systematic manner. Their approach was a practical and pragmatic one, involving three steps:

(1) Identification

(2) Estimation

(3) Diagnostic checking.

Identification involves determining the order of the model required (order of AR and MA term) to capture the dynamic features of the data. This can be done by ACF and PACF (auto correlation and partial autocorrelation) plotting or by using Information Criterion (AIC, SBIC or HQIC).

The second step involves estimation of the parameters of the model specified in step 1. This can be done using least squares or maximum likelihood, depending on the model.

Step three involves model checking -- i.e. determining whether the model specified and estimated is adequate. Box and Jenkins suggest two methods: over fitting and residual diagnostics.

Now, a series is considered to be sufficiently predictable by a best fitted ARMA model if it produces statically significant coefficients of either the variable or error or both. Hence, such a phenomenon, for a stock or index return series, will clearly confirm weak form inefficiency of the market.

b) Modeling Volatility; ARCH and GARCH Models

The basic assumption underlying the ARMA models mentioned above is that the time series is homoscedastic i.e. it has constant or unconditional variance and hence they consider modeling only the conditional mean. But in practice most of the financial time series have conditional or time varying variance. Thus Engle (1982) proposed an autoregressive conditionally heterosce-dastic (ARCH) model for specifying conditional volatility. GARCH model essentially generalizes the ARCH model by modeling the conditional covariance as an ARMA process instead of an AR process like the ARCH model. Thus GARCH (p, q) can be represented as follows: (Mean equation may be an ARMA process also)

$$y_t = a_0 + a_1 y_{t-1} + \cdots + a_q y_{t-q} + \epsilon_t = a_0 + \sum_{i=1}^{q} a_i y_{t-i} + \epsilon_t$$

$$\varepsilon_t | \Psi_{t-1} \sim N(0, \sigma_t^2)$$

$$\sigma_t^2 = \alpha_0 + \alpha_1 \epsilon_{t-1}^2 + \cdots + \alpha_q \epsilon_{t-q}^2 + \beta_1 \sigma_{t-1}^2 + \cdots + \beta_p \sigma_{t-p}^2$$

$$= \alpha_0 + \sum_{i=1}^{q} \alpha_i \epsilon_{t-i}^2 + \sum_{j=1}^{} \beta_j \sigma_{t-j}^2$$

Where $\alpha_0 > 0$, $\alpha_i \geq 0$ for i= 1,2,3....q and $\beta_j \geq 0$ and j= 1,2,3...p

In the above equations α is the ARCH term and b is the GARCH term.

While higher order GARCH models are possible, in general the GARCH (1,1) model will be sufficient to capture volatility.

GARCH models are really helpful in explaining two important characteris-

tics of financial time series namely -

- Fat tails or excess kurtosis (financial time series are leptokurtic and not normally distributed).

- Volatility clustering i.e. large changes tend to follow large changes, and small changes tend to follow small.

c) Explaining Information Asymmetry; Threshold GARCH Model

Simple GARCH models sometimes fail to explain some of the observed properties of financial time series. For example, stock return series are often characterized by the stylized fact that conditional variance tends to be higher after a decrease in return than after an equal increase i.e. volatility is higher when stock prices are falling than when prices are rising. Thus bad news (or negative returns) is more likely to be associated with greater volatility than good news (or positive returns). This is called asymmetric volatility effect or volatility due to information asymmetry. Threshold GARCH (TGARCH) or simply TARCH model, a variant of GARCH model, can effectively model such information asymmetry.

Under TGARCH model the variance equation is modified as

$$\sigma_t^2 = \alpha_0 + \sum_{i=1}^{p} \alpha_i \varepsilon_{t-i}^2 + \sum_{k=1}^{r} \gamma_k S_{t-k} \varepsilon_{t-k}^2 + \sum_{j=1}^{q} \beta_j \sigma_{t-i}^2$$

Where $S_{t-i} = 1$ when $\varepsilon_{t-i} < 0$ and $S_{t-i} = 0$ when $\varepsilon_{t-i} \geq 0$

That is, depending upon, whether ε_{t-i} is above or below the threshold value zero

Table 1: Descriptive Statistics of Sample Indices Return Series

Statistics	SENSEX	BSE 100	BSE 500	Nifty	CNX 100	CNX500
Mean	0.000601	0.00059	0.000559	0.000556	0.000672	0.000511
Median	0.00095	0.001126	0.001659	0.000876	0.001483	0.001541
Maximum	0.1599	0.154902	0.146179	0.163343	0.159417	0.15034
Minimum	-0.13661	-0.12748	-0.1244	-0.13054	-0.13049	-0.12885
Std. Dev.	0.017587	0.01698	0.01618	0.017287	0.015941	0.016112
Skewness	-0.06591	-0.09912	-0.46622	-0.07811	-0.33973	-0.48564
Kurtosis	8.743278	9.671503	9.040754	9.665947	12.0719	9.687407
Jarque-Bera	7953.631	10736.13	5895.12	10592.42	9676.142	7041.891
Probability	0**	0**	0**	0**	0**	0**
Observations	5784	5784	3787	5718	2806	3701

Note: ** Statistically Significant at 1% level

(0), ε^2_{t-i} has differential effect on the conditional variance σ^2_t. When ε_{t-i} is positive, total effects are given by $\alpha_i \varepsilon^2_{t-i}$, but when ε_{t-i} is negative, total effects are given by $(\alpha_i + \gamma_i) \varepsilon^2_{t-i}$. So one would expect γ_i to be positive for bad news to have larger impact. This phenomenon is also known as leverage effect.

It may be worthy to mention in this context that, there are other variants of GARCH model also. However TGARCH is considered to be the most appropriate in the context of stock return series.

Empirical Results

Behavior and Characteristics of Return Series

Descriptive Statistics and Correlogram:

The descriptive statistics of return series for all the six indices have been reported in Table 1 below.

The results reveal that all the BSE and NSE Indices returns under study are nega-tively skewed with very low mean and standard deviation, suggesting lower expected returns and risk. The measure of kurtosis (more than 3 in all cases) suggests that the daily return series have fatter tails (lepto-kurtic) than the normal distribution over the sample period. Jarque-Bera (JB) statistic with significant p value indicates that the return series are not normal. So, the results are quite consistent as in most of the studies financial time series, especially security returns, are found to have similar characteristics.

In addition to descriptive statistics, correlogram (Table 2) of the sample series indicates that Q statistic is signifi-cant at 1% level for almost all the lags for each of the six indices. Thus all the sample series have significant auto-correlation even at higher lags.

Stationarity Characteristics

To detect the stationarity characteristics of the series, we have used Augmented Dickey-Fuller Test (ADF Test) and Philips Perron Test (PP Test) on all the three forms

Table 2: Correlogram of Sample Indices Return Series

Lag	SENSEX		BSE 100		BSE 500		Nifty		CNX 100		CNX 500	
	AC	Q-Stat	AC	Q-Stat	AC	Q-Stat	AC	Q-Stat	AC	Q-Stat	AC	Q-Stat
1	0.084	40.491	0.114	75.467	0.115	50.398	0.094	51.057	0.082	18.839	0.126	58.667
2	-0.022	43.366	-0.005	75.601	-0.007	50.597	-0.03	57.363	-0.03	22.122	-0.015	59.496
3	0.014	44.544	0.019	77.774	0.011	51.04	0.013	58.381	-0.01	22.202	0.006	59.649
4	0.003	44.609	0.009	78.252	0.017	52.159	0.016	59.895	-0	22.208	0.014	60.389
5	-0.01	45.136	-0.005	78.38	-0.004	52.206	-0.01	60.127	-0.02	23.451	-0.004	60.447
6	-0.029	49.859	-0.019	80.474	-0.035	56.811	-0.03	65.358	-0.05	29.319	-0.034	64.625
....	....	....	....	....	....	....	....	....	....	....	....	....
31	-0.012	104.95	-0.02	167.21	-0.008	123.05	-0.02	137.95	-0.02	79.488	-0.003	133.93
32	0.019	107.09	0.018	169.02	0.013	123.69	0.003	138.01	-0	79.489	0.003	133.96
33	0.011	107.86	0.013	170.08	0	123.69	0.017	139.66	0.004	79.525	0.002	133.97
34	-0.009	108.28	-0.001	170.09	-0.011	124.14	-0	139.67	0.01	79.805	-0.008	134.23
35	-0.015	109.5	-0.011	170.8	-0.02	125.67	-0.02	142.21	-0.03	81.81	-0.021	135.82
36	0.007	109.8	-0.001	170.81	-0.001	125.67	0.002	142.24	-0	81.814	-0.005	135.92

Note: All Q Statistics are statistically significant at 1% level: AC= Auto-correlation Coefficients

Table 3: Results of ADF and PP Test

	ADF TEST STATISTICS			PP TEST STATISTICS		
Index	With Intercept	Without Intercept	With intercept & trend	With Intercept	Without Intercept	With intercept & trend
SENSEX	-69.9208	-69.851	-69.9272	-69.879	-69.8631	-69.8809
BSE 100	-67.7938	-67.7262	-67.7961	-68.497	-68.5525	-68.4893
BSE500	-54.7895	-54.7375	-54.7852	-54.8023	-54.8354	-54.7968
NIFTY	-53.0822	-53.0137	-53.0842	-68.6993	-68.6993	-68.6971
CNX 100	-48.7731	-48.7024	48.789	-48.78	-48.6264	-48.789
CNX 500	-53.5905	-53.5508	-53.5838	-53.5983	-53.5788	-53.5912
Test critical values:						
1% level	-2.56572	-3.43231	-3.96106	-2.56572	-3.43231	-3.96106
5% level	-1.94093	-2.86229	-3.41129	-1.94093	-2.86229	-3.41129
10% level	-1.61663	-2.56722	-3.12748	-1.61663	-2.56722	-3.12748

of random walk (without intercept, with intercept and with intercept and trend). Optimal lag length is determined by the Schwarz Information Criterion (SIC) for ADF test and Newey-West Criterion using Bartlett Kernel under PP test. Moreover MacKinnon's critical values are used to determine the significance of the test statistic. The null hypothesis of a unit root has been rejected in favour of the stationary alternative in each case if the test statistic is more negative than the critical value. The results are:

We find that the test statistic is more negative than the critical value for each of the six indices under study for both ADF and PP test, thereby clearly indicating that the return series do not contain any unit root and hence are stationary in nature.

Modeling Conditional Mean Return

Existence of statistically significant serial correlation among the return series under study at near and distant lags clearly indicates that there is significant scope for modeling the conditional

mean of the series. Further the series are also found to be stationary (without having any unit root), which confirms that an Auto Regressive and Moving Average (ARMA) model will best suit the series and not an ARIMA model (used for modeling Non- stationary time series). Now, in order to identify the best fit we followed the approach 'minimizing the information criterion' to decide on the optimal lag length to be considered. We opted to minimize the Akaike Information Criterion (AIC) for the selected lags. We considered a maximum of 3 lags for each of the AR and MA terms, thereby a total of 15 possible lag combinations for each of the return series. The reason behind considering up to 3 lags only is the fact that a simple AR (p) process can well be represented as a MA( ) process and vice-versa. Hence, a maximum of ARMA (3, 3) would be sufficient to capture the characteristics of the data at any time. To test the statistical significance of the constant term and coefficients t test has been employed. The results are:

It is found that, except for SENSEX and

Table 4: Results of the Best Fitted ARMA Model of Optimal lag.

Stock (Model)	Variable	ARMA Coeff	t-Stat	P value	Stock (Model)	Variable	ARMA Coeff	t-Stat	P value
SENSEX	C	0.000381	2.6415	0.0083*	NIFTY	C	0.00055	2.237972	0.0253#
	AR(1)	0.053858	0.127883	0.8982		AR(1)	0.332625	3.035114	0.0024*
	AR(2)	0.739953	2.702997	0.0069*		AR(2)	-0.838612	-12.92889	0*
	AR(3)	0.199695	1.062592	0.288		AR(3)	-0.254854	-2.339621	0.0193#
	MA(1)	0.030897	0.073506	0.9414		MA(1)	-0.234392	-2.217285	0.0266#
	MA(2)	-0.773346	-3.219838	0.0013*		MA(2)	0.776876	12.29876	0*
	MA(3)	-0.254202	-1.194679	0.2323		MA(3)	0.361971	3.437653	0.0006*
BSE100	C	0.000593	2.355582	0.0185#	CNX100	C	0.000674	2.123016	0.0338#
	AR(1)	0.923472	22.24492	0*		AR(1)	0.999508	5.091355	0*
	AR(2)	-0.914226	-22.49241	0*		AR(2)	-0.450298	-1.648625	0.0993
	MA(1)	-0.806853	-18.77666	0*		AR(3)	-0.388829	-1.99379	0.0463#
	MA(2)	0.808107	20.25595	0*		MA(1)	-0.916769	-4.84725	0*
	MA(3)	0.123825	9.288452	0*		MA(2)	0.34855	1.336648	0.1814
						MA(3)	0.459393	2.463774	0.0138#
BSE 500	C	0.00056	1.930325	0.0536	CNX 500	C	0.000522	1.655437	0.0979
	AR(1)	0.388715	17.5873	0*		AR(1)	1.927779	202.6193	0*
	AR(2)	-0.948597	-45.12306	0*		AR(2)	-0.972021	-103.1551	0*
	MA(1)	-0.273602	-10.08699	0*		MA(1)	-1.801244	-96.35298	0*
	MA(2)	0.888613	36.57924	0*		MA(2)	0.720428	21.59511	0*
	MA(3)	0.122165	7.483437	0*		MA(3)	0.134023	8.118621	0*

Note: * Significant at 1% level; # Significant at 5% level

Table 5: Volatility of Index Return Series
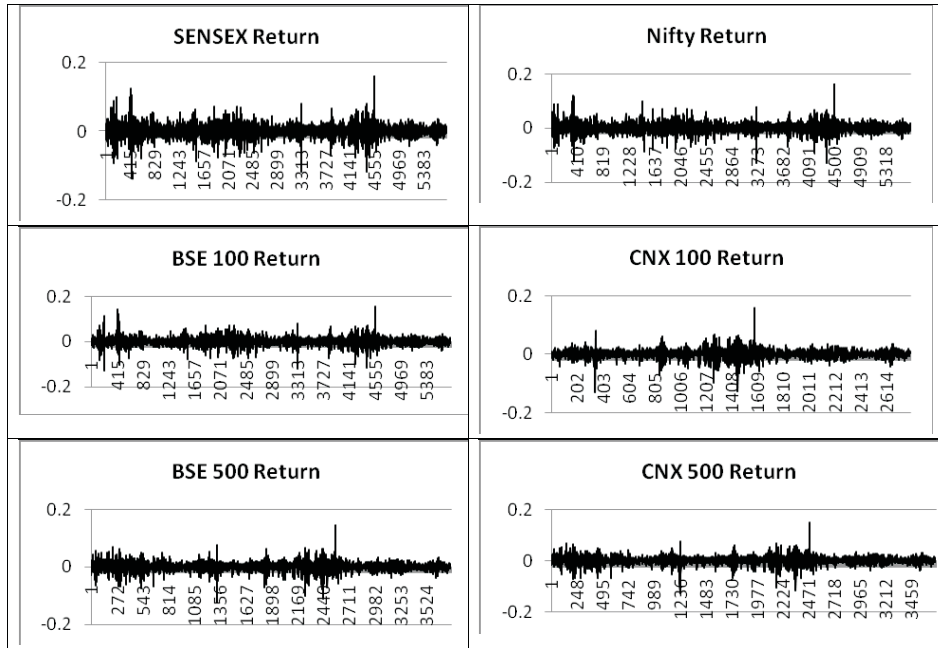
Table 6: Results of ARCH LM Test on ARMA Model

Index	Model Type	F stat	p value
SENSEX	ARMA(3,3)	373.4925	0*
BSE 100	ARMA(2,3)	436.3156	0*
BSE 500	ARMA(2,3)	319.2047	0*
NIFTY	ARMA(3,3)	347.9469	0*
CNX 100	ARMA(3,3)	182.1659	0*
CNX 500	ARMA(2,3)	328.4967	0*
Note: * Significant at 1% level			

CNX 100, all other indices under study have statistically significant coefficients of the lagged variable and/or innovations (errors) at 1% levels and in few cases at 5% level. Even for SENSEX and CNX 100 Returns, some of the coefficients are statistically significant at 1% or 5% level. All this clearly suggests that stock market returns can be efficiently modeled on previous returns and/or current or previous innovations using a properly selected lag length structure.

Modeling Volatility of Returns

As mentioned earlier, best fitted ARMA models, though can effectively model the conditional mean, they are not

Table 7: Results of GARCH (1,1) Model (Variance Equation only)

Index (Model)	ARMA Variable	Coeff	t-Stat	P value	Index (Model)	ARMA Variable	Coeff	t-Stat	P value
SENSEX ARMA (3,3)	C	4.34E-06	8.427803	0*	NIFTY ARMA (2,3)	C	4.73E-06	9.565378	0*
	RESID(-1)^2	0.111814	18.69597	0*		RESID(-1)^2	0.11334	19.72899	0*
	GARCH(-1)	0.877777	153.5488	0*		GARCH(-1)	0.875057	164.3113	0*
BSE 100 ARMA (2,3)	C	4.42E-06	9.481651	0*	CNX 100 ARMA(3,3)	C	4.01E-06	6.563798	0*
	RESID(-1)^2	0.12259	19.65534	0*		RESID(-1)^2	0.118494	13.54287	0*
	GARCH(-1)	0.86773	149.4684	0*		GARCH(-1)	0.868836	97.76577	0*
BSE 500	C	5.17E-06	8.227986	0*	CNX 500	C	4.95E-06	8.298586	0*
ARMA(2,3)	RESID(-1)^2	0.141001	15.95909	0*	ARMA(2,3)	RESID(-1)^2	0.136792	15.96115	0*
	GARCH(-1)	0.844855	98.57741	0*		GARCH(-1)	0.849401	104.9681	0*

Table 8: Results of ARCH LM Test on GARCH (1,1) Model

Index	Mean Eqn. Model Type	Variance Eqn. Model Type	F stat	p value
SENSEX	ARMA(3,3)	GARCH (1,1)	1.044558	0.3068
BSE 100	ARMA(2,3)	GARCH (1,1)	2.648568	0.1037
BSE 500	ARMA(2,3)	GARCH (1,1)	0.834503	0.361
NIFTY	ARMA(3,3)	GARCH (1,1)	1.164734	0.2805
CNX 100	ARMA(3,3)	GARCH (1,1)	0.187518	0.665
CNX 500	ARMA(2,3)	GARCH (1,1)	0.555286	0.4562

Note: None is significant

always capable to explain other important characteristics of the return series like fat tail etc. Moreover they also fail to capture the associated volatility structure. In our case also we find that stock market returns exhibits excess volatility (Table 6) at times (i.e. heteroscedastic). Moreover the volatility is more after a fall than an increase. In other words, there exists clear evidence of volatility clustering and asymmetric volatility as shown below.

To see whether the ARMA structures were at all capable of explaining such volatility clustering (also known as ARCH effect) we have applied a popular test on heteroscedasticity namely ARCH LM test. The results of the test have been incorporated in table 6 below.

As expected we find that for all the six indices, F statistic under ARCH LM test is statistically significant at 1% level. This essentially suggests that ARMA was not sufficient to capture those characteristics of the series and some advanced volatility model should be tried.

Modeling Conditional Variance and Volatility Clustering

In this study we have used GARCH (1, 1) model as a GARCH (1, 1) model can sufficiently capture volatility over a long time period. The results of GARCH (1, 1) model on all six index return series have been reported in Table 7.

The results show that the variance equation coefficients are all statistically significant at 1% level which essentially suggests that GARCH (1, 1) model has successful contributions to model the

volatility.

Further, results of ARCH LM test (table 8) show that F statistic is insignificant in all cases confirming that there is no ARCH effect left. It suggests that GARCH (1, 1) model has provided an adequate explanation for the excess volatility and fat tail features of the return series.

Modeling Asymmetric Volatility

Apart from fat tails and volatility clustering our sample return series exhibit higher volatility when stock prices are falling than when prices are rising. As mentioned earlier, this phenomenon found in most stock/index return series is known as 'information asymmetry'. Theory suggests that the possible reason behind such a notion is the fact that bad news (or negative returns) is more likely to be associated with greater volatility than good news (or positive returns).

To verify such argument we have used Threshold GARCH or simply TGARCH model. We used simple TGARCH (1, 1) model with the following equation for conditional variance:

$$\alpha_t^2 = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \gamma_1 S_{t-1} \varepsilon_{t-1}^2 + \beta_1 \sigma_{t-1}^2$$

Where the dummy variable, $S_{t-1} = 1$ when $\varepsilon_{t-i} < 0$ (bad news) and $S_{t-1} = 0$ when $\varepsilon_{t-i} \geq 0$ (good news). When ε_{t-i} is positive, total effects are given by $\alpha_1 \varepsilon_{t-1}^2$, but when ε_{t-1} is negative, total effects are given by $(\alpha_1 + \gamma_1)\varepsilon_{t-1}^2$. If it is found that γ_1 is positive, we may conclude that bad news will have larger impact than good news and as a result volatility will be higher in period of falling prices as compared to that of rising prices - which is also exhibited by

Table 9: Results of TGARCH (1.1) Model

Index (Model)	Variable	Coeff	t-Stat	p	Index (Model)	Variable	Coeff	t-Stat	p
SENSEX ARMA (3,3)	C	4.75E-06	9.055202	0*	Nifty ARMA (2,3)	C	5.10E-06	9.96023	0*
	RESID(-1)^2	0.085174	12.93966	0*		RESID(-1)^2	0.083618	12.17069	0*
	RESID(-1)^2*(RESID(-1)<0)	0.060618	6.514477	0*		RESID(-1)^2*(RESID(1)<0)	0.063996	6.850281	0*
	GARCH(-1)	0.872903	145.4154	0*		GARCH(-1)	0.871647	157.3524	0*
BSE 100 ARMA (2,3)	C	4.83E-06	10.16796	0*	CNX 100 ARMA (3,3)	C	4.77E-06	8.674448	0*
	RESID(-1)^2	0.088968	13.75679	0*		RESID(-1)^2	0.025071	2.505458	0*
	RESID(-1)^2*(RESID(-1)<0)	0.070301	7.732752	0*		RESID(-1)^2*(RESID(-1)<0)	0.15889	10.11791	0*
	GARCH(-1)	0.864671	141.3217	0*		GARCH(-1)	0.876611	91.75213	0*
BSE 500 ARMA (2,3)	C	5.55E-06	9.435085	0*	CNX 500 ARMA (2,3)	C	6.56E-06	10.21673	0*
	RESID(-1)^2	0.056189	5.653537	0*		RESID(-1)^2	0.062213	5.577805	0*
	RESID(-1)^2*(RESID(-1)<0)	0.133965	10.14237	0*		RESID(-1)^2*(RESID(-1)<0)	0.135863	9.473532	0*
	GARCH(-1)	0.856522	95.32263	0*		GARCH(-1)	0.84282	85.70459	0*

Note: * Significant at 1% level   # Significant at 5% level

Table10: Results of ARCH LM Test on TGARCH

Index	Mean Eqn. Model Type	Variance Eqn. Model Type	F stat	p value
SENSEX	ARMA(3,3)	TGARCH (1,1)	0.06415	0.8001
BSE 100	ARMA(2,3)	TGARCH (1,1)	0.517983	0.4717
BSE 500	ARMA(2,3)	TGARCH (1,1)	0.03254	0.8569
NIFTY	ARMA(3,3)	TGARCH (1,1)	0.122952	0.7259
CNX 100	ARMA(3,3)	TGARCH (1,1)	1.130127	0.3878
CNX 500	ARMA(2,3)	TGARCH (1,1)	0.514617	0.4732
Note: F Statistics are insignificant				

the return series under study. The results of the model are shown in Table 9 below.

The results of TGARCH model (Table 9) reveal that apart from the coefficients of the variance equations being statistically significant, 1 is positive in all cases meaning higher volatility in the events of bad news.

Moreover the ARCH LM test statistic (Table 10) is found to be insignificant in all the cases, which indicates that no ARCH effect is left and the model has the same benefits as offered by the GARCH model used beforehand.

Conclusion

The study employed the most comprehensive set of modeling techniques to model the sample return series along with a number of powerful tests to analyze their characteristics. The results closely resembled to that of other emerging stock exchanges of the world. All the return series were found to be non-normal with significant serial correlation at near and distant lag. Also they were stationary and hence confirmed suitability of ARMA instead of ARIMA model. The results of ARMA process were also found to be satisfactory with most coefficients being statistically significant. In addition, GARCH results with significant α and β in all cases supported the hypothesis that conditional volatility changes over time due to volatility clustering as the sum of $(\alpha+\beta)$, a measure of volatility persistence, is very high in most indices implying that the effects of shocks tend to last for long periods before they die out. The results indicated that returns exhibit persistence and volatility clustering. Finally, TGARCH model effectively explained the information asymmetry of returns and successfully completed the modeling task. Since prediction based on past returns is not possible in a weak form efficient market, the results also confirms the weak form inefficiency of the Indian market. Thus it may be concluded that unlike the developed countries, Indian burses can still be predicted, only that we need is to device the best model.

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On the Relationship between Implied Volatility Index and Realized Return Volatility

Imlak Shaikh

Abstract:

The volatility estimation based on historical return now became least preferred tools in line of ex-ante option implied volatility based forecast. The aim of this study is to analyze the relation between realized volatility and volatility forecast using implied volatility index and forecast based on historical returns. The competing volatility forecasts are obtained for 10 -day and 22 -day forward-looking horizon, and the estimation is presented in ARCH/GARCH in-sample and out-of-sample framework. The empirical result evidence that implied volatility is the unbiased forecast of realized volatility, while Risk Metrics and GJR forecast remain biased estimate of realized volatility. DM-test explains that implied volatility is the best candidate in explaining future volatility for 10 -day horizon. The practical implication of the study holds importance in the volatility estimation and portfolio risk assessment using forward-looking volatility forecasts.

Key Words:

Implied volatility; Realized Volatility; India VIX; Forward-looking; GJR-GARCH; Risk Metrics.

Introduction

The forecasting of stock market volatility remains the main concern in valuation of financial assets, and the importance of volatility forecasting cannot be underestimated in monetary policy decision, investment proposals, stock valuation and portfolio risk management. It is an essential task to the quants to estimate the true value of future stock market volatility. Traditionally speaking, in last two decades there was much attention given on the ARCH/GARCH, historical volatility, Risk Metrics, stochastic volatility etc. in stock market volatility assessment. The second strand of volatility studies become more prominent among the academics, practitioners and policy makers is the option's based implied volatility. Under the market efficiency, an option instantaneously impounds the arrival of new source of information; hence implied volatility estimate based on observed option price gives the true volatility measure of future stock market volatility for the remaining life of the option. Some of the significant contributions on this appears (e.g. see Canina and Figlewski, 1993; Christensen and Prabhala, 1998; Hansen,2001; Christensen and Hansen, 2002; Shaikh and Padhi, 2013; Shaikh and Padhi, 2014 a,b), they show that implied volatility is the best predictor of future stock market realized volatility. More particularly, one can say that the

prediction ability of implied volatility validates the joint hypotheses of market efficiency and applicability of BS-options pricing model.

The formal study of option based implied volatility and its forecasting ability has been analyzed in the studies of Fleming et al. (1995), Blair et al. (2001), Simon (2003). Fleming et al. (1995) explore the forecasting ability of implied volatility and inter-temporal relation between volatility and stock returns. Blair et al. (2001) argues that option based volatility forecast (VIX) with various forecast horizon provide most accurate forecasts of future stock market volatility. Giot (2002, 2005) describes the information content of volatility indices, volatility forecasts based on VIX and VXN for the S&P100 and NASDAQ100 indices, and con-clude that VIX and VXN contain highest information in the volatility forecasting and market risk assessment.

Fleming et al. (1995), Simon (2003), Giot (2002, 2003, 2005) and Frijins et al. (2010a, 2010b) explore the forecasting performance of implied volatility based on the in-sample and out-of-sample forecasts, show that implied volatility outperforms the conditional volatility. Poon and Granger (2003) and Lopez and Navarro (2012) have shown the importance of volatility forecasting in the financial market. The critical review has shown that implied volatility outperforms other competing volatility forecasts (such as historical volatility, realized volatility, GARCH-GJR, RiskMetrics etc.) in the prediction of future stock market volatility.

Morauz et al. (1999) and Skiodopulus (2004) examines the predictive ability of French market volatility (VX1) and Greek volatility index (GVIX), they conclude that volatility index can be used to predict the future stock market volatility of various horizon and investor can use the information contain in the implied volatility in-order-to to build profitable options strategy.

Arak and Mijid (2006) argues that VXO and VXN volatility index are the forward-looking and gauge of investor sentiment. Aboniomi (2006), Banerjee et al. (2007) and Hsu and Murray (2007) address various issues on the relationship between volatility index and realized volatility. Aboniomi (2006) deals this relation using linear and probit model and conclude that volatility trading yields positive return based on the forecast of linear model. Banerjee et al. (2007) find strong predictive ability of VIX while Hsu and Murray (2007) find the possibility of mispricing and market inefficiency.

More recently Yang and Liu (2012) and Siriopoulos and Fassas (2012) analyze the forecasting power of TVIX and GRIV index for the Taiwan and Greek options market respectively. Yang and Lin (2012) show that TVIX is the strong indicator of future stock market volatility, and TVIX based forecasts outperforms the GARCH forecast. Siriopoulos and Fassas (2012) also find the similar results for the Greek options market and conclude the GRIV index best explain the realized volatility beyond that impound in the historical volatility.

The aim of this paper is to analyze the relationship between implied volatility and realized return volatility, and the other volatility forecasts based on the conditional volatility framework. The India VIX is the volatility index based on

the CNX Nifty options, the India VIX is calculated in real time and the same disseminated to the market participant. Hence, here we want to test the forward-looking forecasting ability of India VIX against the forecast based on the historical returns. The empirical work has been expressed in in-sample and out-of-sample framework using RiskMetrics, GJR-GARCH models. The empirical evidence based on the OLS and 2SLS clearly show that implied volatility forecasts outperform than the RiskMetrics and GJR based forecasts. The practical implication of this relation- ship are of twofold:- (i) First, this kind of relationship encouraged the volatility traders to forecast the future stock market volatility using options based volatility (ii) Second, as implied volatility is the forward-looking expectation of the future stock market volatility can be used as the risk assessment tools in the risk management (e.g. VaR).

Data and empirical model

Data sources and description

To analyze the information content of India VIX as the forecasts of future stock market volatility, the daily closing of India VIX has been downloaded from NSE. The sample period consist of November, 2007 to April, 2013. The corresponding underlying CNX Nifty stock index has been obtained, and contemporaneous stock return has been calculated in order to obtain other volatility forecast measures. The t + h forward-looking volatility forecasts are obtained for 10 - day and 22 -day horizon.

In-sample ARCH/GARCH forecasts

In order to assess the superiority of

implied volatility and historical return volatility in-sample ARCH/GARCH framework is used. In addition, in the variance equation, squared lagged implied volatility has been allowed in the nested regression to know the predictive ability of India VIX against historical return volatility. More intuitively, to allow information asymmetry GJR-GARCH asymmetry term also allowed in the nested regression.

Out-of-sample forecasts

We calculate various competing volatility forecasts using India VIX and historical return on Nifty equity index. The forward-looking volatility forecast 10 - day and 22 -day horizon is obtained for implied volatility, RiskMetrics and GJR-GARCH. The implied volatility is rescaled for daily volatility and forecasts are obtained for 10 -day and 22 -day horizon. Similarly, the RiskMetrics and GJR-GARCH forecasts are obtained using the same forward-looking horizon.

Realized volatility

Realized volatility is the historical return based volatility forecasts obtained as the square root of the sum of square of returns for the 10 -day and 22 -day horizon.

Empirical model

To analyze the information content of various competing volatility forecasts as the forecast of realized volatility an ordinary least squares method has been express as follows:

$$RV_t = \alpha + \beta_i \sigma_{it} + \varepsilon_t \qquad (1)$$

σ_{it} = Volatility forecast for 10 -day and 22 -

day horizon

i = Implied volatility, RM, GJR-GARCH

Rv_t = Realized volatility

ε_t = White noise error term

Moreover, there are some possibilities of measurement errors with the implied volatility (e.g. Christensen and Prabhala, 1998 Christensen and Hansen, 2002 and Shaikh and Padhi, 2014) hence 2SLS estimates are also reported.

Hypotheses

(1) Implied volatility is the unbiased estimate of future realized volatility, based on OLS results.

(2) 2SLS estimate is more consistent than OLS estimate.

(3) The group of volatility forecasts is equally important in the forecasting of realized volatility, based on DM-test.

Forecast evaluation based on DM-test

we obtain the residual for RV-Implied Volatility, RV- RM, RV- GJR using Root Mean Square Errors (RMSE) criterion. DM -test (1995) has been employed to assess which volatility forecasts is the best forecaster of stock market volatility. $RMSE = e_t = (RV_t - \sigma_i)^2$.

Summary statistics

Table 1 summarizes the descriptive statistics for various volatility forecasts of 10 -day and 22 -day horizon. Panel A and B represents the mean and other statistic for realized volatility and other competing volatility forecasts. The average realized volatility for 10 -day horizon found to be 4.71%, and the average implied volatility, RM, GJR forecast are respectively 4.62%, 4.90% and 5.02%. One can notice that average implied volatility is very close to realized volatility, this signifies that implied volatility is the best candidate to explain volatility forecast of 10 day horizon. The identical results are also visible from Panel B for the mean score of volatility measures for 22 -day horizon. It is seen that the standard deviation of 10 -day horizon is lesser than the 22 -day horizon, this explain that as the prediction horizon increases variability of forecast also increases. One of the interesting fact one can notice that stock return volatility forecasts are more variable as the standard deviation appears higher than the SD of implied volatility. Once can say that historical return volatility forecast are more variable and implied volatility is the smoothed expectation of realized volatility (e.g. Christensen and Prabhala, 1998; Christensen and Hansen, 2002).

Table 2 report the correlation metrics between realized volatility and volatility forecast of 10 -day and 22 -day horizon. It is seen clearly from the table the coefficient of correlation appears statistically significant, this implied that all volatility forecast explain the future stock market volatility. But, the coefficient of correlation for GJR-forecast speaks that it explains more that the implied volatility and RiskMetrics forecast. The second best forecast is implied volatility, but for true comparison DM-test can be performed in the next section. Figure 1 and 2 also describe the

Table 1 Summary statistics

Panel A Forecasts 10-day horizon	Mean	Max.	Min.	SD	JB-stat	PP-test	Obs.
Realized volatility	0.0471	0.1913	0.0112	0.0294	2988.27	-4.41 a	1351
Implied volatility	0.0462	0.1419	0.0217	0.0186	633.44	-3.59 a	1361
RiskMetrics	0.0490	0.1517	0.0150	0.0262	734.35	-2.60 a	1361
GJR-GARCH	0.0502	0.1803	0.0204	0.0269	1930.47	-2.87 b	1351
Panel B Forecasts 22-day horizon	**Mean**	**Max**	**Min**	**SD**	**JB-stat**	**PP-test**	**Obs.**
Realized volatility	0.0713	0.2524	0.0195	0.0412	1393.15	-3.18 a	1339
Implied volatility	0.0686	0.2104	0.0322	0.0275	633.44	-3.59 a	1361
RiskMetrics	0.0726	0.2249	0.0222	0.0389	734.35	-2.60 c	1361
GJR-GARCH	0.0750	0.2464	0.0313	0.0393	1452.63	-2.58 c	1339

Significant at a1%, b5%, c10% level.

Table 2 Correlation metrics

Correlation	Implied volatility	RiskMetrics	GJR-GARCH
RV Forecasts 10-day horizon	0.7191 a	0.6848 a	0.8691 a
RV Forecasts 22-day horizon	0.7147 a	0.6827 a	0.9187 a

Significant at a1%, b5%, c10% level.

Figure 1
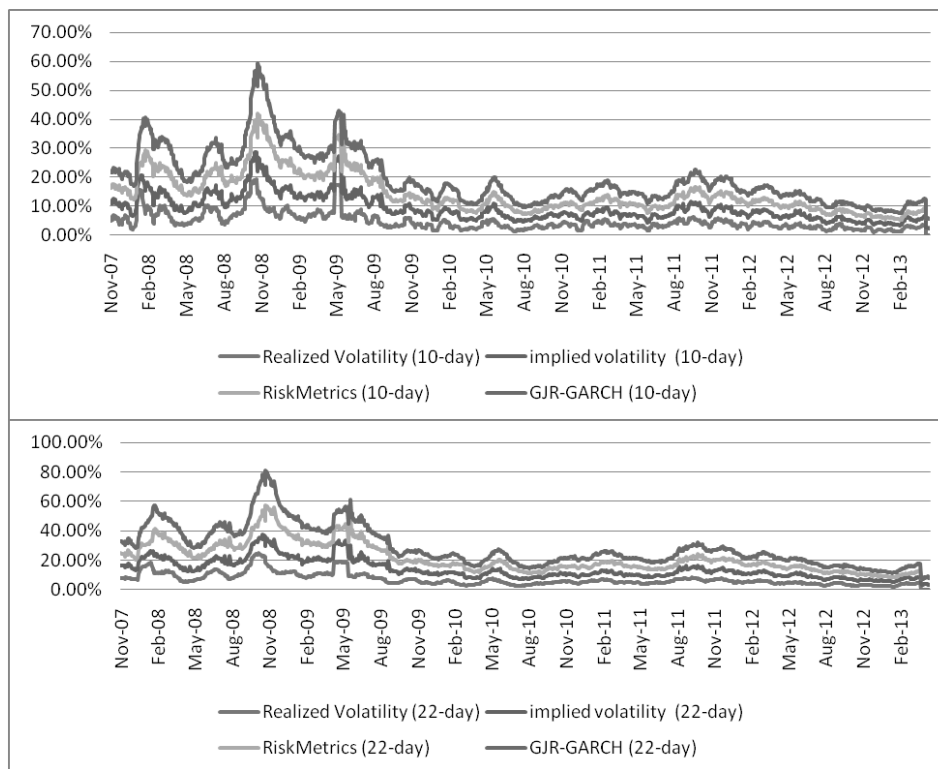
time series plot of 10 -day and 22 -day volatility forecasts with realized volatility, the visual inspection of the graph clarifies that all volatility forecasts conform to the realized volatility with insignificant gap. The empirical results are reported in the next section on this relationship.

Empirical results and discussion

Table 3 describes the stock market volatility assessment in terms of India VIX and historical returns of Nifty index. The GARCH parameters in the first raw appears statistically significant; this indicates that volatility persists in the stock returns over a period of time. When we include the information asymmetry term using GJR model, the asymmetry parameter also remains statistically significant. The log-likelihood value increases marginally as compare to GARCH specification. Now, in the next row we wanted to know how implied volatility explain the stock market volatility in ARCH framework, it is seen clearly that historical return do not explain the stock market volatility, and implied volatility appears statistically significant. Moreover, when we consider only implied volatility in the nested

regression still implied volatility remains more powerful in explaining the stock market volatility. The last regression clearly explains that historical return and expected volatility index best explain the stock market volatility with highest log-likelihood.

Table 4 report the HAC-OLS results on the relation between realized volatility and competing volatility forecasts. The results are presented for 10-day and 22-day forward-looking forecasts horizon. The slope coefficient of implied volatility with 10-day and 22-day horizon appears respectively 1.14 and 1.08 positive significant; moreover the intercept term remains insignificant. Hence, the empirical results explain that implied volatility subsumes the important information to explain the future stock market volatility with 10-day and 22-day horizon. In addition, as we report the Wald F-stat for the test of joint hypostases that intercept = 0 an slope = 1, in case of 22-day horizon the null is accepted at 10% level of significance. At this point one can say that implied volatility is the unbiased estimate of future stock market volatility. Now, looking at the second forecast RM, the slopes are respectively 0.76 and 0.72, but smaller than the slope of implied volatility. Similarly, the slope for GJR forecast appears 0.95 and 0.96 positive significant. The results lead us to believe that implied volatility is the best candidate among other volatility forecast, hence one can conclude that RM and GJR are biased forecast of realized volatility. But for the true comparison we perform DM-test reported in the next paragraph.

Table 5 explains the 2SLS estimation for the implied volatility under the suspicion that it is measured with errors. The presence of error-in-variable (EIV) violates the core assumption of OLS regression that regressor and errors are independent. The measurement error causes the under estimation of slope and over estimation of intercept. Hence, instrumental variable estimation is used to obtain the fitted values of implied volatility and the same is replaced in the second stage of OLS. The 2SLS slope for 22-day horizon appears 1.09 and Wald-test F-test also remains insignificant. Moreover, the Hausman H-stat (1.58) appears to be insignificant. This indicates that implied volatility is not measured with error and OLS estimates are more consistent that the 2SLS.

Table 6 reports the ranking of various volatility forecasts based on Diebold and Mariano (1995) test. To explain the future realized volatility of the 10-day and 22-day horizon we have three competing volatility forecasts. To employ DM-test we need the difference between RV and forecasts that is obtained using loss function based on RMSE. The null hypothesis is that the group of volatility forecasts is equally important in forecasting the RV. Table 6, for 10-day horizon DM-statistic appears significant for the two group of volatility forecast namely implied volatility and RM, the negative t-statistic implies that first forecast (i.e. implied volatility) is the best to explain the realized volatility. But, next two values of DM-statistic explain that GJR is the best estimate for the future volatility. Similarly, for 22-day horizon the first rank goes to RM and second to the GJR forecast.

Conclusion

The study aims to explain the relationship

Table 3 forecasting with VIX in ARCH/GARCH framework

Model	Estimate					LL
	Omega x 10^4	ARCH	GARCH	GJR	IVIX$^2_{t-1}$	
GARCH	0.0136 (1.42)	0.0874 [a] (3.85)	0.9120 [a] (45.19)			3855.45
GJR-GARCH	0.0166 (1.44)	0.0343 (1.25)	0.9101 [a] (48.66)	0.1084 [b] (2.39)		3870.07
ARCH-IVIX	-0.2967 [a] (-3.55)	0.0408 (1.05)			1.2367 [a] (12.42)	3870.34
IVIX	0.3122 [a] (-3.73)				1.2903 [a] (13.25)	3868.98
GARCH-IVIX	-0.0760 (-1.34)	0.0782 [a] (2.88)	0.6743 [a] (5.49)		0.3191 [c] (1.79)	3874.85

Parenthesis shows the t-statistics. Significant at a1%, b5%, c10% level.

Table 4 Simple OLS estimation of Realized volatility on various forecasts

Model	α	β	Adj.R^2	Wald-stat
Volatility forecasts based on 10-day horizon				
IMP	-0.0058(-1.37)	1.1387(10.44)[a]	0.52	11.45 [a]
RM	0.0095(3.10)[a]	0.7657(9.95)[a]	0.47	61.94 [a]
GJR - GARCH	-0.0005(-0.21)	0.9482(15.33)[a]	0.76	37.61 [a]
Volatility forecasts based on 22-day horizon				
IMP	-0.0026(-0.49)	1.0706(11.42)[a]	0.51	7.17
RM	0.0186(4.68)[a]	0.7208(10.60)[a]	0.47	89.95 [a]
GJR - GARCH	-0.0009(-0.31)	0.9638(19.31)[a]	0.84	38.52 [a]

Parenthesis shows the t-statistics. Significant at a1%, b5%, c10% level.

Table 5 Instrumental variable/ 2SLS estimation of Realized volatility on various forecasts

Model-2SLS	Fitted values of implied volatility index			
Forecast Horizon	α	β	Adj.R²	Wald-stat
RV 10-day	-0.0068(-1.66)c	1.1616(10.85)a	0.52	14.22 a
RV 22-day	-0.0042(-0.81)	1.0944(11.82)a	0.51	6.18

Parenthesis shows the t-statistics. Significant at a1%, b5%, c10% level.

Table 6 Diebold and Mariano Test (1995)

Volatility forecasts 10 - day horizon			
	Implied volatility-RM	Implied volatility-GJR	RM-GJR
DM-Statistic	-3.791	6.098	9.992
(p-value)	(0.000)	(0.000)	(0.000)

Volatility forecasts 22-day horizon			
	Implied volatility-RM	Implied volatility-GJR	RM-GJR
DM-Statistic	14.10	11.76	7.844
(p-value)	(0.000)	(0.000)	(0.000)

The loss function is based on RMSE. The null hypothesis is that the group of volatility forecasts is equally important in the forecasting of realized volatility.

between realized volatility and volatility forecast based on the historical returns and option's implied volatility index. The three competing volatility forecasts namely implied volatility, RM, GJR is obtained for t + h forward-looking horizon. The relationship has been studied using simple OLS and 2SLS, moreover DM-test employed to rank the best volatility forecasts.

The OLS results show that implied volatility is the unbiased estimate of future realized volatility and at the same time volatility forecast based on the historical returns also subsumes the information to explain the future stock market volatility. The OLS results explain that implied volatility is the best candidate for realized volatility, and RM and GJR are the second best alternative to forecast the future volatility. The DM-test also supports this result, but, based on the 22 -day horizon RM is the best and second best forecast is GJR.

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Private Placements in the Indian Capital Market
- with reference to the Companies Act, 2013

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Abstract:

Private placements are gradually becoming means of raising long-term funds in the Indian capital market by both private and public companies. Thereafter, an overview of the concept of private place-ment is given to enable a better appreciation of its unique role in raising funds for organizations that are not publicly quoted in a regis-tered stock exchange. The changes in the provisions of the new Compa-nies Act, 2013 in regards to private placement have been done keeping in mind, the investors' protection. Fixed timelines for share allotment and levy of interest on late refund of subscription money with interest are some good steps towards safeguarding investors' interests. The paper endeavour to present an overview of private placements as sources of long term funds in the Indian Capital Market. It also looks at the issues raise in the private placement procedure and the changes made in the new Companies Act, 213 with respect to old Companies Act, 1956.

Key Words:

Private Placement, Long-term Funds, Resource Mobilization, Securities.

Introduction

Savings, investments and the borrowings are the three widespread phenomena imbibed in the financial system of any country. The persons or institutions with excess funds invest and the deficit economic units resort to borrowing in order to cover their shortfalls. Similarly, when business houses suffered from any fund deficit or need to expand their operational activities, they need to raise long-term funds in the capital market of the country. When it decides to raise its capital, speed and fewer procedural requirements are two factors which are of major concern. This becomes even more crucial when foreign shareholders are involved and time has to be fac-tored for potentially securing internal approvals at various levels for those investments by such foreign sharehold-ers. There are many methods to raise the capital, though; companies often take recourse to private placement for allotting shares and increasing their capital. It is basically, used to refer to the sale of securities of a company that is not quoted on the floor of a regular stock exchange to a select group of investors.

Private placement is considered as a vital means of raising capital and it is in increasing trend in the world capital markets as it has some unparalleled advantages compared with other refinancing ways. Firstly, based on

keeping constant expansion pressures of current stock markets and avoiding secondary market shock. Listed firms can raise sufficient external capitals from equity-controlled shareholders, institutional investors and strategic investors using private placement. Secondly equity-controlled sharehold-ers can pour quality assets into listed firms through private placement and higher-quality stock assets are intro-duced into capital market, which are helpful to reducing re-investment time and future related party transactions, enhancing sustainable profitability and independence of listed firms. Thirdly regulatory section need lower informa-tion disclosure of private placement and implement easy audit procedures, which are helpful to saving financing costs and time at the same time protecting commercial secrets of listed firms (Wang and Zu, 2014).

Private placements typically occur in the form of block deals issued to firm managers, private equity players, or banks and other financial institutions. It was reserved primarily for private unquoted companies as well as small firms who are desirous of raising long term funds; but who are unable to bear the technicalities and cost of an initial public offer (IPO). In recent times however, some emerging markets have relaxed their rules and regulations which barred publicly quoted firms from raising funds in the capital market through private placements. Private place-ments from its very name is supposed to be private, and allowing firms that are publicly quoted in the Stock Exchange to engage in it could prove very dangerous as it could lead to a great deal of malfeasance in the capital market. In the background of these issues, the objective of this paper is to provide an overview of private place-ments as sources of long term funds in the Indian Capital Market. It also look at the issues raised in the private place-ment procedure and the changes made in the new Companies Act, 213 with respect to old Companies Act, 1956.

Private Placement as sources of Long-term funds

The private placement route offers several advantages to issuer for raising resources. The time taken by, as well as the cost of issue for the private place-ment route is much less for the issuer as compared to the public and right issues. Olowe (1997) opined that private placement is an arrangement whereby an issuing house arranges for the company shares to be bought privately by small number of investors such as high net-worth individuals and institutional investors. A private placement as the name indicates is a placing carried out privately rather than through the Stock Exchanges new issue market. A private placing of securities could be described as occurring on the primary finance market (Freear, 1985). In private place-ments, securities are placed by a stockbroker with clients who have already agreed to subscribe, advertising and underwriting costs are avoided and the security does not benefit from access to the Stock Exchange trading market. Also they tend to be smaller in size with low marketability which greatly reflects in its price. Wruck (1989) argues that private placements ensure better monitoring by more informed, sophisti-cated investors, and hence, the market reacts positively to their announcement in anticipation of improvements in

allocation of corporate resources. Hertzel and Smith (1993) suggest that private placements can mitigate the information asymmetry problem discussed in Myers and Majluf (1984). According to them, management can credibly convince investors in a private placement about the firm's prospects through one-on-one negotiations - which would be infeasible when dealing with a large number of public investors.

Issues in Private Placement

Although, there are ample of examples where private placement are very good for the long-term finance of the companies, but still there are several issues raised in the private placement market by researchers which need to be addressed in the Indian context. The main problem of private placement particularly in equity is to determine the issue price of private placement. Rational issue price and price discount are directly related to the vital interests between old and new shareholders, and are related to the successful implement of private placement program. Reasonable pricing of private placement is reflected by price discount level of private placement. As per the SEBI regulations the issue price in a private placement cannot be lower than the maximum of the most recent market price and the average market price in the previous six months. This rule is clearly aimed at discouraging managers from "timing" the market and also from "manipulating" stock prices in order to issue shares to themselves at low prices (managerial self-dealing). Hertzel and Smith (1993) find that price discounts of private placement reflect information costs borne by private

investors and abnormal returns reflect favourable information about firm value, information effects appear to be relatively more important than owner-ship effects for the smaller firms. Hertzel and Rees (1998) propose that private equity placement conveys favourable new information to investors and that the information reflects the changes of future earnings. Cronpvist and Nilsson (2005) suggest that private placements are often made to passive investors, thereby helping management solidify their control of the firm. Price discounts of private placement, stock-price reac-tions, post placement activities of the purchasers, and large blocks of stock favour managerial entrenchment as the explanation for many private place-ments.

Private placements as a favoured destination

In all these plethora of issues, private placement is still considered as the preferred destination for raising capital in short span of time. Private placements occupy a particular niche in the Capital Market of most economies where it serves as an absolute means of raising long term funds for small and medium size firms. Such firms are usually faced with the highest issue costs in public issues (Brealey and Myers, 1996). Such firms in terrible need of funds who are faced with high floatation cost would find private placements very enticing.

In terms of instrument, debts instruments, mainly bonds and debentures of different maturities, were preferred the most. The equity portion was raised in the form of preference shares. The factors that led to private placement becom-ing a favoured route for Indian corpo-

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rate and financial institutions are as follows as given by Pathak (2011):

● The prolonged subdued conditions in the primary market since 1995-96.

● Private placements in India were not bound by any regulatory system till September 2003.

● Private placement has no lock-in period except when it is in favour if promoters.

● There is no compliance system for the merchant bankers in private placement as in the case of public issues.

● The limit of bank's investment on debt has been made this market more buoyant.

● Benefits of operational flexibility and attractive pricing.

● Short-term debentures and non-convertibles debentures are more popular with issuers and investors in this market.

The major issuers of privately placed securities are financial institutions, banks and central and state-level undertakings. The subscribers are banks, provident funds, mutual funds and high net worth individuals. In India privately placed securities are admitted for trading, but are not listed. Banks do not trade these securities and hold them till maturity. Hence, there is no secondary market for such securities. There is still not much depth in the private placement market as the number of investors is quite low and it is regulated as per the Companies Act and the SEBI guidelines

in India. Further they have to comply with the listing agreement of stock exchanges.

As given by Emenike (2014), private placement is best used when:

● A company needs cash to turn itself around and cannot spell out its hopes in a prospectus to raise funds by public subscription. Hence, sophisticated investors are invited privately who can make a value judgment on the company's prospects and put up the money for investment purposes only;

● The company wants to raise money for special purposes, like a take-over or merger quickly;

● The privately owned company needs the financial muscle for going public;

● A privately owned company wants to remain private but desires to use the facilities provided by the capital market for funds raising (Osaze, 2002).

Available data indicates that private placement has become the preferred route for raising capital by both private and public sector companies. In India, this route has gained enormous importance during the last few years, in view of the prolonged subdued conditions in the new issue market. Table - 1 reveals that from 2008-09 to 2009-10 the amount of resources raised through private placement almost doubled from Rs. 956.89 billion to Rs. 2332.94 in private sector, and the same momentum of raising resources through private placement, traced in public sector also.

Table - 1   Resource Mobilisation in the private placement market in India

(₹ Billion)

Year	Private sector						Public sector						Grand total	
	Financial institutions		Non-financial institutions		Total		Financial institutions		Non-financial institutions		Total			
	No. of issues	Amount	No. of issues	Amount	No. of issues	Amount	No. of issues	Amount	No. of issues	Amount	No. of issues	Amount	No. of issues	Amount
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2000-01	208	132.63	171	98.43	379	231.06	112	262.01	96	185.30	208	447.31	587	678.36
2001-02	363	160.19	309	126.01	672	286.20	167	173.58	119	188.98	286	362.56	958	648.76
2002-03	327	94.54	550	156.23	877	250.77	157	204.07	110	214.64	267	418.71	1144	669.48
2003-04	344	125.51	296	62.09	640	187.60	132	264.61	102	186.79	234	451.41	874	639.01
2004-05	255	209.74	462	148.20	717	357.94	124	255.31	69	220.80	193	476.11	910	834.06
2005-06	375	264.63	571	147.27	946	411.90	137	391.65	32	161.19	169	552.84	1115	964.73
2006-07	632	484.14	892	334.26	1524	818.41	127	521.17	30	119.08	157	640.25	1681	1458.66
2007-08	905	882.91	711	413.86	1616	1296.77	132	561.86	67	268.63	199	830.48	1815	2127.25
2008-09	687	605.86	383	351.03	1070	956.89	123	656.15	91	427.53	214	1083.69	1284	2040.57
2009-10	1630	1424.41	640	908.53	2270	2332.94	151	742.90	67	356.96	218	1099.85	2488	3432.80
2010-11	878	719.77	460	494.76	1338	1214.53	212	989.83	38	179.60	250	1169.43	1588	2383.96
2011-12	530	389.37	62	240.01	592	629.38	231	1235.07	35	318.04	266	1553.11	858	2182.49
2012-13	640	869.73	141	547.08	781	1416.80	246	1372.54	58	512.69	304	1885.23	1085	3302.04
2013-14	851	859.84	139	329.01	990	1188.85	223	1759.29	92	951.09	315	2710.37	1305	3899.22

Note   :   Data for 2013-14 are Provisional.

Source :   Compiled in RBI based on data received from Merchant Bankers and Financial Institutions.

The public sector garnered huge resources from the private placement markets. The resource mobilisation in the private placement market in the last few years is in increasing trend. Now, the question arises, after the implementation of the stringent rule of the new Companies Act, 2013, the resource mobilisation in the private placement markets will increase?

Private Placement in the new Companies Act, 2013

The Companies Act, 2013 primarily prescribes four modes of increasing share capital: Public issue, Rights issue, Bonus issue and Private placement. In the case of public issues, securities are allotted to the general public. A public or a private company can also increase its share capital base through a rights issue where securities are allotted to the existing shareholders on a pro-rata basis. This route is apt for companies who intend to raise capital without diluting stake of their existing shareholders. Under a bonus issue, a company can issue fully paid-up bonus shares to its members out of its free reserves, security premium account or capital redemption reserve. A private placement of securities is an offer by a company, to a select group of persons to subscribe its securities.

Private placement is discussed in details of Chapter III, Part II of the Companies Act, 2013 deals. Section 42 of the Companies Act, 2013 defines 'private placement' which is resemble to the interpretation of the Supreme Court as "any offer of securities or invitation to subscribe securities to a select group of persons by a company (other than by way of public offer) through issue of a private placement offer letter and which satisfies the conditions specified in this section including the condition that he offer or invitation is made to not more than 50 or such higher number of persons as may be prescribed (excluding QIB's and employees offered securities under ESOP) in a financial year".

The new provisions of the Companies Act, 2013 have widened the scope and cover a whole lot of instruments by using the word 'securities, and not 'shares', which can include shares, bonds, debentures and other marketable securities etc. The Companies Act, 2013 under section 42(4) mandates a company to comply with the provisions of SEBI Act & SCRA, if any offer or invitation is not in compliance with the provisions of the section and such offer or invitation shall be treated as a public offer.

In order to ensure greater control and compliance over the private companies, the Companies Act, 2013 has withdrawn most of the exemptions as available under the Companies Act, 1956 and made significant changes in the provisions relating to private placement of securities, which was an important route for raising the funds by the companies. The companies Act, 1956 did not define the term 'private placement' rather certain offers of shares or debentures/invitation to subscribe for shares or debentures to any section of the public were not regarded as public issues under section 67(3) the Act, 1956 i.e where shares or debentures are available for subscription or purchase only to those receiving the offer/invitation and offer/invitation is a domestic concern of the issuer and

Figure – 1

```
                                    Issues
                                       │
        ┌──────────────┬───────────────┼──────────────┐
        │              │               │              │
   Public Issues   Right Issue    Bonus Issues    Private
        │                                          Placements
   ┌────┴─────┐                              ┌────────┼─────────┐
   │          │                              │        │         │
Initial    Further                        Private  Preferential Qualified
Public     Public                         Placements issues/    Institutional
Offer      Offer                          (For      allotments  Placements
(IPO)      (FPO)                          unlisted  (For listed (For listed
(For       (For listed                    companies) companies) companies)
unlisted   companies)
companies)
   │          │
┌──┴───┐   ┌──┴───┐
│      │   │      │
Fresh  Offer Fresh Offer
Issue  for   Issue for
       Sale        Sale
```
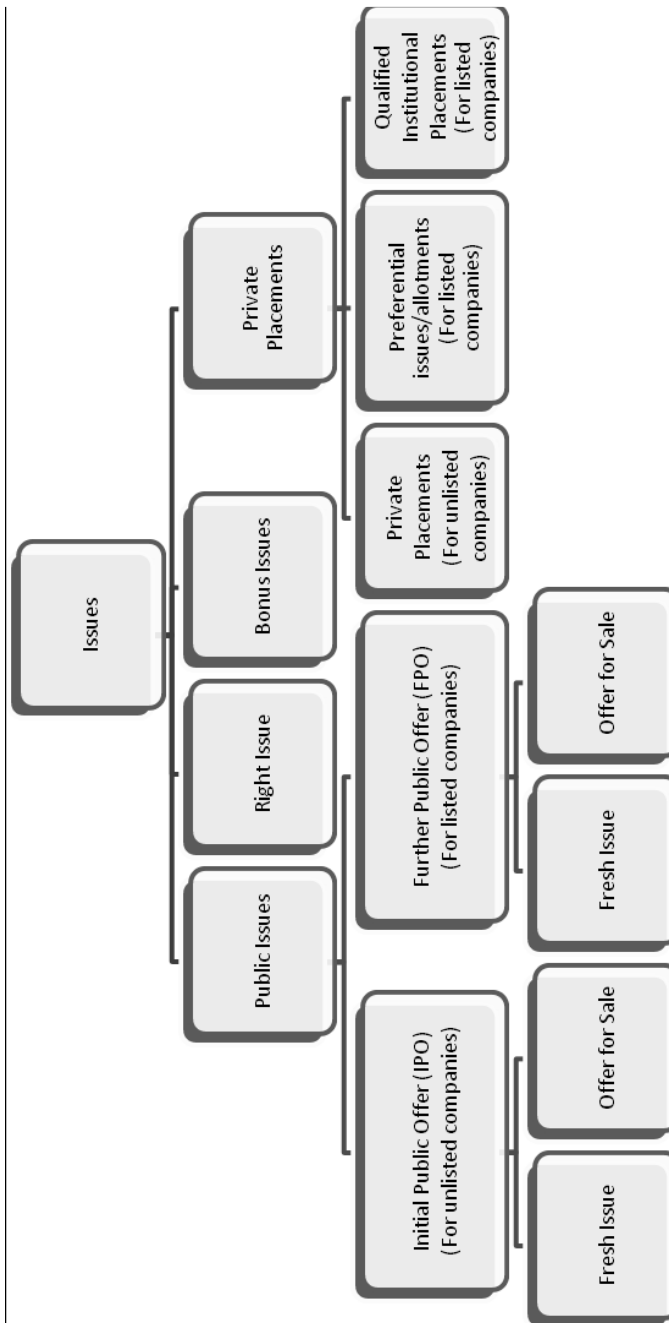
those receiving the offer/invitation, were termed as private placement. However, as per the proviso to section 67(3) of the Companies Act, 1956, when a company made an offer or invitation to subscribe for shares or debentures to 50 or more persons, such offers was treated as made to public. Under the Companies Act, 1956 the conditions relating to private placement were applicable only to public companies. On the contrary Act, 2013 provides various conditions for private placement of shares and debentures which apply to both private companies and public companies.

Background of the change

The changes made in the new Companies Act, 2013and the conditions imposed in relation to private placements by companies seem to have been issued on the background of the case of Sahara Group. Two subsidiaries companies of the Sahara Group, Sahara India Real Estate Corporation Limited (SIRECL) and Sahara Housing Investment Corporation Limited (SHICL) issued unsecured optionally fully-convertible debentures (OFCDs) amounting to about Rs 24,000 crores to more than two crores investors. The large scale collection of money from the public by Sahara through issuance of OFCDs were minutely scrutinised by Securities Exchange Board of India (SEBI) and they issued a show cause notice to SIRECL and SHICL inter alia stating that the issuance of OFCD's are public issue and therefore liable to be listed u/s 73 of Companies Act, 1956 and also directed to refund the money solicited and mobilized through the prospectus issued with respect to the OFCDs, since they had violated various

other clauses of the SEBI (Disclosure and Investor Protection) Guidelines, 2000 and also various provisions of the SEBI (Issue of Capital and Disclosure Requirements) Regulations, 2009.

However, Sahara Group defended that OFCDs were issued in the nature of "hybrid instruments" as defined u/s 2(19A) the Companies Act, 1956 and SEBI did not have jurisdiction to administer those securities since Hybrid securities were not included in the definition of 'securities' under the Securities and Exchange Board of India Act, 1992, or the Securities Contract Regulation Act, 1956 (SCRA), instead it would be governed by the Central Government under section 55A(c) of the Companies Act, 1956. Later on the Supreme Court held that OFCDs issued by Sahara Group were public issue of debentures, hence securities and once the number 49 is crossed, it attract the proviso to Section 67(3) and will be treated as an issue to the public. Further, it also attracts Section 73(1) of Companies Act, 1956 and application for listing becomes mandatory which falls under the administration of SEBI u/s 55A(1) (b) of the Companies Act, 1956.

Penalty for Contravention

Regulations related to private placements across the world shed some light on the critical issue of managerial self-dealing. Regulators typically restrict possible self-dealing in private placements by either (i) prohibiting managers from participating in private placements altogether, or (ii) placing restrictions on the issue price in a private placement to ensure that managers are unable to expropriate shareholder wealth by issuing shares to themselves or other\

friendly investors at huge discounts. On the same line, the new Companies Act, 2013 also become more stringent in dealings with private placement According to Section 42(10) of the Act, 2013, if a company makes an offer or accepts monies in contravention of the section 42 of the Act, 2013, the company, its promoters and directors shall be liable for a penalty which may extend to the amount involved in the offer or invitation or two crore rupees, whichever is higher. The company is also required to refund all monies to subscribers within a period of thirty days of the order imposing the penalty.

Since the requirements for raising the funds by way of private placement have been made more stringent, it will significantly increase the compliance burden on private companies looking to raise funds through private placement. As no specific exemption has been provided for private companies or small companies, it will lead to reduce flexibility available to private companies and the companies operated by closely held people for the raising funds. However, through the implementation of this section, better governance of all companies is expected which will lead to the transparency in the affairs of the Company and accountability of the directors. The strictness of this section can be seen as a result of the loopholes in the earlier Companies Act, 1956 which lead to Sahara Group case.

Conclusion

There are various reasons why private placements are preferred over other kind of issues like rights or a bonus issue from the companies' standpoint. In the right issue or bonus issue, a company can issue only 'shares', whereas in a private placement, it can issue 'securities' i.e. shares, debentures and even hybrid instruments like compulsorily convertible debentures even to persons other than shareholders too. The changes in the provisions of the new Companies Act, 2013 in regards to private placement have been done keeping in mind, the protection of investors. Fixed timelines for share allotment and levy of interest on late refund of subscription money with interest are some good steps towards safeguarding investors' interests. Companies cannot now promise share allotment, collect money from interested investors and then delay allotment and issue of share certificates. In order to ensure that private placements stay private, the Companies Act, 2013 clearly prohibits advertisements. As a result, unlike the practices under the Companies Act, 1956, companies cannot now utilize media, marketing channels, services of agents and brokers or other distribution channels to make a private placement. The mandate for maintaining separate bank accounts has introduced transparency and accountability. Further, with high quantum of penalty for violation of section 42 and detailed provisions, paves way for the better governance for all the companies and we can expect there is no instance of misinterpretation of the law by the companies. Indian business houses that are willing to raise their capital through private placement have to comply with the stringent rules laid down by the new Companies Act, 2013 and SEBI regulations and at the same time they also have to be cautious enough to decide the price of the issues.

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Regulation and Corporate Finance: Case of FCCB issuances by Indian firms

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Abstract:

Issuance of Foreign Currency Convertible Bonds (FCCBs) by Indian firms is regulated to a large extent by various agencies. We examine various aspects of prevailing regulations and analyze trends in issuance of FCCBs by Indian firms during 1993-2013 in light of these regulations. Market conditions, firm specific financing objectives and other factors that may influence capital raising activities have been addressed in many previous studies. This paper attempts to throw light on the influence of regulatory requirements on corporate financing in the Indian context. Regulators may like to re-examine these trends and frame future policies and issuers will also be able to evaluate appropriateness of FCCBs as a financing instrument in meeting their objectives.

Key Words:

Regulation, FCCBs, India, Trends.

Introduction

Historically, businesses were financed out of equity contributions and borrowings from banks and financial institutions. As political boundaries became a lesser hindrance for doing business and scale of operations expanded the need for supplementing these traditional sources were increasingly felt. As is the case with production technologies, competitive pressures contributed significantly to the evolution of financial strategies that served the management objectives better. Deposits from public, bonds, debentures, preference shares, warrants, convertibles and other instruments presented themselves as an answer.

In Indian context, financing choices were limited because of numerous legislative controls instituted by regulators such as Ministry of Finance, Reserve Bank of India, and Ministry of Industries and Commerce. For over two decades after independence multilateral agencies like International Finance Corporation and Asian Development Bank and Indian development finance institutions like Industrial Development Bank of India, Industrial Finance Corporation of India and Industrial Credit & Investment Corporation of India were key providers of industrial finance. Supporting them were State Finance Corporations and State Industrial Development Corpora-

tions at the regional level.

Gradually with relaxation of legislative controls, Indian firms could also use various innovative financing options to meet their objectives. For instance; in the Indian context; issuance of foreign currency convertibles was permitted only from late 1993 onwards. In this paper we focus on Foreign Currency Convertible Bonds (FCCBs) issued by Indian firms.FCCBs are corporate debt instruments denominated in a currency different from the issuer's domestic currency. The coupon and principal is payable in the foreign currency. The bonds usually carry an option to the investor to exchange, either in whole or in part, the principal and interest accruing thereon for equity shares of the issuer. In some cases the issuer may also have an option to redeem the bonds before maturity.

Issuing firms can decide the issue terms such as coupon, tenor, pricing, call protection and call price to meet their objectives while adjusting to the legal environment and market conditions. However; in the Indian context exhaustive regulations govern not only aspects like issuer eligibility but also other characteristics of the issue such as size, pricing, tenor etc. Thus; FCCBs issued by Indian firms are different from similar instruments issued in other countries. A closer examination of these regulations and their influence on trends in use of FCCBs by Indian firms will be useful to both regulators and issuing firms. Regulators may like to re-examine these trends and frame future policies and issuers will also be able to evaluate appropriateness of FCCBs as a financing instrument in meeting their objectives.

Indian firms have accesses overseas capital markets for their financing requirements. They have raised capital in the form of Equity (i.e. ADRs/GDRs), Convertible Debt (i.e. FCCBs) and Non-Convertible Debt. On average FCCBs represent nearly 26% of total capital raised from overseas capital markets during 1993 to October 2013. As can be observed from Figure 1, FCCBs have been widely used as a financing instrument especially during the period 2002-2009. Given the use of FCCBs issues by Indian firms, there is a need to analyse trends, issues and challenges to issuers.

The rest of the paper is structured as follows. We first review literature related to convertible bonds. Then in the next section we examine various aspects of the regulatory environment prevailing on date in the Indian context. We also present the trends on use of FCCBs by Indian firms in light of these regulations. We conclude with some insights on areas for further research.

Literature on why Convertible Bonds

In this section we review relevant literature on convertible bond financing. We present the literature according to the research question addressed therein.

Why Convertible Bonds?

Agency problem (i.e. shareholder-creditor conflict of interest) and information asymmetry (between mangers and investors) are the main theories explaining use of convertible bonds. Shareholders in highly levered firms can have incentives to increase firm risk by accepting more projects having volatile

returns. Jensen and Meckling (1976) and Green (1984) propose that convertible bonds can be used by firms to resolve/mitigate this risk-shifting problem. The incentive to convert increases with firm value but conversion dilutes the equity held by current shareholders. Therefore, in the presence of convertible debt; shareholders' incentive to accept risky projects with high potential returns is reduced. Other studies by Chesney and Gibson-Asner (2001), Julio et al (2007) extend Green's work. Empirical evidence shows that convertibles are more likely to be used by small growth oriented firms; they are used to finance R&D expenses or acquire intangible assets.

Stein (1992) argues that firms faced with a situation where raising equity is unattractive due to significant information asymmetries, may resort to issuing convertible debt as an indirect method of raising equity. Convertible debt mitigates the adverse selection costs (negative signalling) associated with raising equity. It acts as a substitute for equity in firms with significant information asymmetries and high financial distress costs. Stein's model extends the findings of previous surveys done by Pilcher (1955), Brigham (1966) and Hoffmeister (1977) where respondents (mainly managers of firms) referred to "delayed equity" as the prime motive for issuing convertible bonds.

Mayers (1998) focuses on appropriateness of convertible debt to resolve a future financing problem where firms may need funds in stages for expansions and emerging growth opportunities. Mayers proposes that the conversion feature of convertible debt helps in reducing the problems associated with sequential financing as well as controlling the overinvestment problem. This view is further supported by Cornelli and Yosha (2003) and Chang et al (2004).

Why Foreign Currency Debt?

Henderson et al (2003) observe that international debt accounts for more than 90% of all international security issues. They also find that the share of foreign convertible bonds amongst all convertible bonds has been steadily increasing. Therefore, the importance of studying issues like currency denomination and choice of markets in relation to debt securities.

As noted by Keloharju and Niskanen (2001), Kedia and Mozumdar (2003) and Aabo (2006) hedging exposure to foreign exchange risks (in the form of receipts or assets in foreign currencies) explains firms' preference to raise debt in foreign currencies as against domestic currency. Further as noted by Shapiro (1984), Rhee et al (1985), Jorion and Schwartz (1986) and Hodder and Senbet (1990); the presence of market imperfections (flotation costs, corporate tax arbitrage, legal barriers and costs of information gathering for foreign investors) gives rise to opportunities for minimizing borrowing costs and thus influences currency denomination of debt. Other researchers (Dufey (1972), Siegfried et al (2007) and Habib and Joy (2008)) have also shown that the choice between domestic and foreign currency is affected by conditions (size and depth) of local debt market, the desire to diversify investor base, the duration of the underlying sovereign bond markets, nominal interest rate differentials between two currencies and exchange rate volatility.

Law/Regulation and Corporate Finance

Rights of providers of capital (i.e. equity shareholders and creditors/bond holders) are protected in various ways and to varying degrees across countries. Shleifer and Vishny (1997), La Porta et al (1997) examine differences in the provisions of corporate laws (with respect to legal protection offered to providers of capital) and their enforcement in various countries. Their studies find that in countries with poor shareholder protection laws; debt is more widely used. This is because default on debt is easier to define and observe. Consequently firm in countries with strong creditor protection laws rely more on debt capitalwhereas firms in countries with strong shareholder protection laws rely more on equity capital. Rajan and Zingales (1995), Miller and Puthenpurackal (2001), and Reese and Weisbach (2002) are other studies which emphasize the connection between legal systems and corporate finance and provide similar insights.

While these aforesaid studies refer to ordinary or straight debt; others have extended these studies to call protection terms in convertible securities. Firms can time calling the bond to meet their next investment requirements. Korkeamaki and Moore (2004) find that investments after a convertible issue are closely related to the call protections terms. Demirguc-Kunt and Maksimovic (1999) argue that legal systems promote stock market development and therefore convertibles will be more equity-like in countries that provide better shareholder protection. Convertibles issues in these countries are therefore expected to have weaker call protection terms which can be used to force investors to convert from bond-holders to shareholders. Korkeamaki (2005) uses cross country sample of convertible bonds and provides further evidence of the relation between call protection terms, coupon rate and legal systems prevalent in the issuers' country. In countries with weak bankruptcy laws; convertibles are found to have strong call protection terms.

Most of these studies reviewed above have focused on bonds issued by American/European firms or other well developed debt markets. In view of differences in the stage of development of capital markets, the regulatory environment there is scope for examining convertible debt issuances by firms from emerging markets. Also these studies have focussed mainly on domestic currency convertibles though some also include foreign currency convertibles. There is a lack of studies focussing exclusively on the foreign currency convertibles. Further; the relation between law and issuance on convertible debt has been examined from the context of the local bankruptcy laws and/or laws for protection of minority shareholders. However; FCCBs issued by Indian firms are substantially different. The issuer has little freedom in structuring/designing the convertible debt as most issue terms themselves are subject to regulations. Thus an analysis of the regulations and their influence on use of FCCBs as a financing instrument is useful before extending it to legal systems within the country.

Data

A list of Indian firms which have issued FCCBs from 1993 to October 2013 is from PRIME Database. This database pro-

vides the name of the issuing firm, industry classification of the issuer, issue date and issue size. For other terms/features of the issue; the issuing firm' Annual Reports are referred to online from the ISI Emerging Markets. Details of the regulations and amendments thereto are accessed online from Reserve Bank of India.

There are a total of 305 issues of FCCBs by Indian firms during this period. However, Annual Reports are not available for the period 1993-2002. Therefore issues from 2003 to 2013 are only analysed. In some cases complete detailed information about the terms/features of the issue is not mentioned in the Annual Reports. Subject to this; all available data is analysed and presented in the next section.

Regulations and Trends in Issuance of FCCBs

In the Indian context issuance of Foreign Currency Convertible Bonds was permitted only in 1993. The Ministry of Finance vide Notification No. S-11(25)/CCI-II/89-NRI, dated 12th November, 1993 outlined the "Issue of Foreign Currency Convertible Bonds and Ordinary Shares (Through Depository Receipt Mechanism) Scheme, 1993". All FCCB issuances have to further comply with the policy guidelines applicable to ECBs as notified and amended from time to time. Issuers are also governed by provisions of the Companies Act; 1956, Foreign Exchange Management Act; 1993 and Income Tax Act; 1961.

The policy guidelines as originally issued contained many restrictive clauses regarding issuer eligibility, end use of funds, total financing per annum, prepayment, pricing etc. These guidelines were liberalized gradually through amendments issued from time to time.

After relaxation of exchange controls in the early 1990s, Indian firms have accessed overseas capital markets for primary issues of equity, straight debt and convertible bonds. As can be observed from Figure 1, during 1993-2001, Indian firms mainly accessed overseas capital markets for equity funds. Equity funds represented about 59% of total capital raised through primary issues in overseas capital markets during this period while FCCBs represented a mere 11%. However, during 2002-2009nearly 40% of total capital raised has been through FCCBs. This reflects the increased use of FCCBs as a financing instrument in recent years by Indian firms.

It is observed from Figure 2 that during 1993-2001, FCCBs have been issued only intermittently. This period accounts for only about 6% of total funds raised through FCCBs over the years. A declining trend in the total funds raised may be primarily due to factors like many tight regulatory restrictions on total financing costs and end use of funds making many Indian firms not eligible to issue FCCBs. As against this, the period during 2002-2009 witnessed an increasing trend and accounts for about 83% of total FCCB issuances. This may be due to a combination of factors like increased economic activities, gradual amendments to the regulations governing FCCBs, and growth of Indian equity markets. During 2009-13 the total capital raised through overseas capital markets has declined considerably mainly due to the effects of the global

Figure 1: Overseas Primary Market Issues by Indian firms
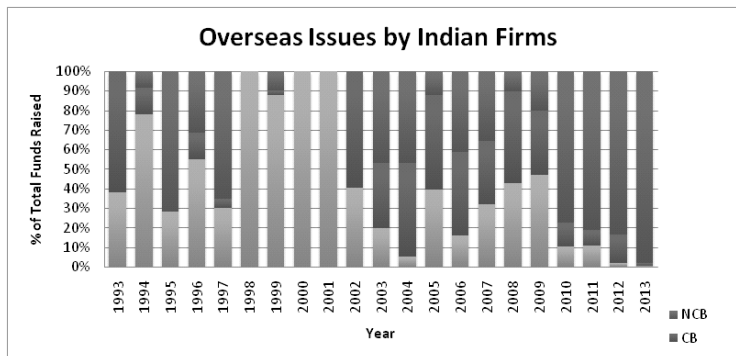
Source: PRIME Database, India

Figure 2: FCCB issues by Indian firms
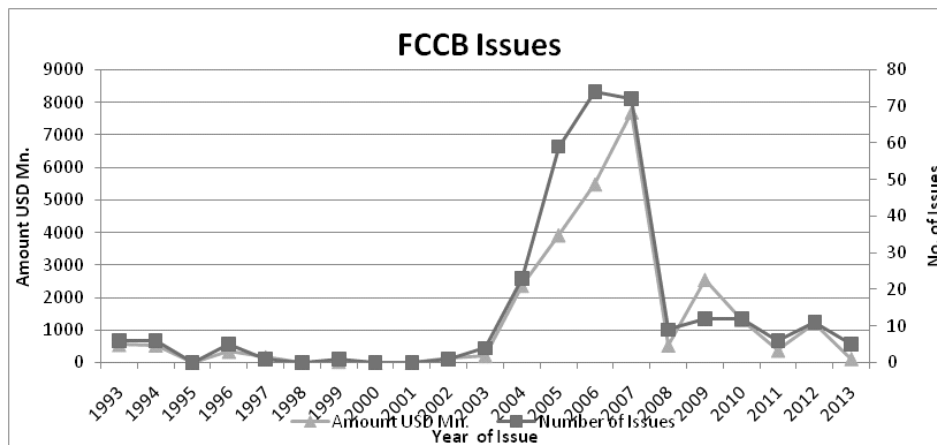
Source: PRIME Database, India

economic meltdown. As such; post 2009 the use of FCCBs has declined.

A closer examination of the FCCB issuances by Indian firms during 2003-2013 in light of the policy framework governing their issuance reveals the following issues and challenges.

Eligibility: FCCBs are treated as Foreign Direct Investment (FDI) in the issuing firm.

As such the issuing firm must ensure that the proposed issue does not violate maximum limits for FDI in the sector in which it operates. If the FDI limit is likely to be exceeded, the firm must obtain prior clearance from FIPB and the Finance Ministry, GOI.

Primarily Corporate bodies registered under Indian Companies Act, 1956 which are listed on Indian stock

exchange are eligible to issue FCCBs. Initially unlisted companies were not eligible. However, from September 2005 onwards unlisted companies seeking to raise capital through FCCBs were eligible subject to simultaneously seeking listing in the domestic markets.

Housing Finance Companies (HFCs) were not eligible issuers initially. But from August 2005 onwards listed HFCs were also permitted subject to fulfilment of conditions regarding minimum net worth & issue size conditions. This led to an issue of USD 500 million by Housing Development Finance Corporation in September 2005. This was the largest issue of FCCBs by any Indian firm till then.

Further amendments have notified NGOs engaged in micro financing activities, Multi-State Co-operative Societies engaged in manufacturing activities and NBFCs exclusively involved in infrastructure financing as "eligible issuers" in 2005, 2006 & 2009 respectively. However, there have been no issuances of FCCBs by such NGOs/Co-operative Societies/NBFCs till date.

Thus, Individuals, Not for Profit organiza-tions and Trusts are not allowed to issue FCCBs. Further, to protect interests of investors and misuse of funds, compa-nies restrained from accessing capital markets by the SEBI are also not permit-ted to issue FCCBs. NBFCs, FIs and HFCs though eligible issuers, are required to seek specific prior approval from the RBI.

Only International Banks, Multilateral Financial Institutions, International Capital Markets, Export Credit Agen-cies, Suppliers of equipment and Foreign Collaborators are recognized as lenders or investors of FCCBs. Thus,

the bonds may be subscribed to only by non-residents.

As given in Table 1, more than 200 companies from diverse sectors have raised funds through FCCBs to meet their financing requirements/objec-tives. Predominantly FCCBs have been issued by firms in Metals & Forgings, Automo-biles & Auto Components, Pharmaceu-ticals & Hospitals (nearly 11% each), Power Generation & Supply, Telecom-munications and Information Technol-ogy (around 9% each). Firms in other sectors like Oil Exploration, Chemicals & Fertilizers, Hospitality, Food & Agro-Business, Transport & Logistics and Banking/Financial Services etc. have also issued FCCBs.

Table 1: Industry Classification of FCCB issues by Indian firms

Industry	Amount USD Mn.	%
Automobile & Automobile Components	3,009.96	11.09
Banking & Financial Services	864.00	3.18
Construction & Infrastructure	601.02	2.21
Chemicals & Fertilizers	1,194.97	4.40
Food, Beverage & Hospitality	1,073.25	3.95
Pharmaceuticals & Hospitals	2,812.60	10.36

Industry	Amount USD Mn.	%
Machinery & Equipments	310.49	1.14
Electronics	675.00	2.49
Engineering	132.00	0.49
Diamond Cutting & Jewellery	275.00	1.01
Metals & Forgings	2,810.42	10.35
Paper & Plastics	560.00	2.06
Information Technology	2,358.62	8.69
Mining/Minerals	705.00	2.60
Oil Exploration & Petrochemical	1,315.00	4.84
Transport & Logistics	1,109.18	4.09
Telecommu-nications	2,660.62	9.80
Textiles	648.38	2.39
Others	1,308.15	4.82
Power Generation & Supply	2,718.36	10.02
Total	27,142.02	100.00

Source: PRIME Database, India and Annual Reports of respective compaies

End Use: Capital raised through FCCBs is permitted to be used for Import of capital goods, new projects, moderniza-tion/expansion of existing production units. The scope was enlarged in 2004 to include investments in overseas wholly owned subsidiaries and joint ventures, overseas mergers/acquisitions. Further amendments in 2008 and 2009 permit-ted payments for spectrum allocation and development of integrated townships. But we find that no FCCBs have been issued till date to finance spectrum allocations or develop integrated townships.

Subject to prior approval and fulfilment of other terms and conditions specified by RBI, funds may also be utilized for premature redemption of FCCBs issued earlier. Refinancing of rupee loans availed from domestic banks is permissi-ble in case of sea ports, airports, roads and power sector through a scheme of take-out finance From July 2011 onwards firms were allowed to issue fresh FCCBs to meet redemption obligations of old outstanding FCCBs to the extent of their redemption value.

In line with the permissible end use as specified by the ECB guidelines, about 68% of the funds have been used for funding capital expenditure plans (including expansion/modernization of plants and import of capital goods) as shown in Figure 3. Nearly 24% of the funds have been used to finance overseas acquisitions and investments in subsid-iaries/joint ventures. Around 8% of funds have been used for refinancing of old loans/redemption of old FCCBs. Due to regulatory restrictions on end use of funds we do not observe much diversity in actual utilization of funds. We thus notice that due to end use regulations funds raised through FCCBs have been

used for capital investments. This is in contrast to the international evidence where convertibles have been mainly used to finance risky investments like R&D or acquiring intangibles.

Figure 3: End Use of FCCB funds by Indian firms
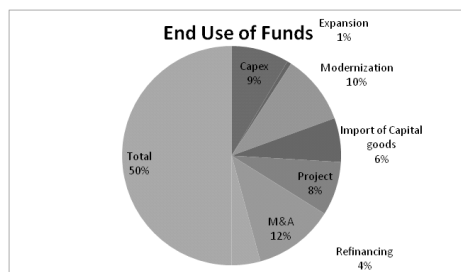
Source: Annual Reports of respective firms

Issue Size: Companies in service sector (hotels, hospitals, software companies) may raise up to USD 100 million or equivalent per financial year without any previous approval for rupee and/or foreign currency expenditure. Others may raise up to USD 500 million per financial year. Specific approval is required if the amount to be raised exceeds these limits in any year.

As given in Table 2, FCCB issue size ranges from USD 5 millions to USD 500 millions. Nearly 80% of number of issues are of small size - up to USD 100 millions and represent about 42% of total funds raised. A small minority of 4% of the issues exceeds an issue size of USD 300 million and represents about 21% of total funds raised.

Apart from firms in the service sector (hotels, hospitals, software companies); firms from many other sectors like steel, textiles, media & entertainment and shipping have also issued FCCBs for less than USD 100 millions.

Table 2: Issue Size of FCCB issues by Indian firms

Issue Size USD	No of Issues	% No of Issues	USD Mn.	% USD
0-100	238	79.33	10,154.95	41.90
101-200	40	13.33	6,336.84	26.14
201-300	10	3.33	2,687.00	11.09
301-400	6	2.00	2,119.29	8.74
401-500	6	2.00	2,940.00	12.13
Total	300	100	24,238.08	100

Source: Prime Database, India and Annual Reports of respective firms

It may be noted here that the permissible issue size is restricted at a flat sum of USD 500 million. However, restricting the issue size relative to the size of the issuing firm may be more prudent as this may prevent the firm from facing financial crisis in case of eventual non-conversion of bonds.

Currency Denomination: The currency denomination choice is entirely left to the issuer. As such issuers may prefer to issue bonds in the currency in which most of their revenues are denominated so that the FCCBs act as a natural hedge to foreign exchange risk. Also the choice of currency denomination is limited as the Indian Rupee is not fully convertible. Indian firms have mainly issued U.S. Dollar denominated FCCBs as reported in Table 3. Around 95% of the funds is raised is through U.S. Dollars only. Some

companies have also raised Euro (3% of funds raised) or Japanese Yen (2% of funds raised) denominated FCCBs.

Table 3: Currency Denomination of FCCBs issued by Indian firms

Curr-ency	No of Issues	% No of Issues	USD Mn.	% USD
U.S. Dollars	282	94.31	21,307.06	94.95
Euro	10	3.34	619.09	2.76
Japa nese Yen	6	2.01	450.58	2.01
Swiss Francs	1	0.33	64.50	0.29
Total	299	100	22,441.23	100

Source: Annual Reports of respective firms

Maturity: The bonds must have a minimum average maturity of 3 years for amounts up to USD 20 million. In case of amounts above USD 20 million and upto USD 500 million, a minimum average maturity of 5 years is required.

Less than 4% of the issues have tenures of 3 years as shown in Table 4. These comprise only of small issues (up to USD 20 millions) and represent less than 1% of total funds raised. More than 90% of the issues (representing 94% of total funds raised) have tenures of 5 years. Also, in less than 4% of issues (representing 5% of funds raised) the tenure exceeds 5 years and extends up to 13 years.

Table 4: Tenure (issue date to maturity date) of FCCBs issued by Indian firms

Tenure	No of Issues	% No of Issues	USD Mn.	% USD
3 years	10	3.79	120.25	0.57
5 years	244	92.42	19,727.06	94.27
more than 5 years	10	3.79	1,078.56	5.15
	264	100.00	20,925.87	100.00

Source: Annual Reports of respective firms for the years 2004-2010

It appears that most firms have issued bonds with tenures of 3 or 5 years to comply with the regulations. However, the payback time required for the investments/projects financed through FCCBs may be a more appropriate consideration in determining the tenure of these bonds.

Listing: Listing of the FCCBs on an overseas stock exchange is not manda-tory in Indian context. However, in order to attract better valuations for the securities and to provide investors with an exit route most of the issues are listed. As mentioned in the annual reports of the respective firms, the bonds are listed on overseas stock exchanges mainly at Singapore, Luxembourg, London, and Hong Kong. Few issues of very small size are not listed.

Financing Costs: The all-in-financing cost includes coupon, other fees and expenses payable, redemption premiums and related costs. The all-in-financing costs (as currently prevailing) cannot exceed 300 basis points over the 6 month LIBOR (for currency of borrowing) where the maturity period is up to 5 years. In case of maturity period exceeding 5 years, the costs cannot exceed 500 basis points over the 6 month LIBOR (for currency of borrowing). These ceilings are reviewed from time to time and adjusted to reflect the macro-economic policies.

As seen in Table 5(A), most of the bonds issued are either 'zero coupon' (51% of issues) or carry low coupons of 0.5-4% (nearly 43% of the issues). In 6% of the issues, the coupon is equal to or exceeds 5%. However, in most cases a redemption premium is payable at maturity if the bond is not converted as can be observed from Table 5(B). Redemption premiums ranging from 5% to about 60% are observed in most cases. The redemption premium ranges up to 20% of principal in about 18% of the issues and from 21% - 40% of principal in 45% of the issues. In 37% of issues, redemption premium even exceeds 40% of the principal. Thus, it is noticed that though the coupon may be zero/low, the yield to maturity is much higher.

Pricing: The pricing should not be less than the higher of the following two averages

- The average of the weekly high and low of the closing prices of the related shares quoted on the stock exchange during the two months preceding the relevant date and

- The average of the weekly high and low of the closing prices of the related shares quoted on a stock exchange during the two week preceding the relevant date.

Table 5(A): Coupons on FCCBs issued by Indian firms

Coupon	No of Issues	% No. of Issues
0%	100	51.28
0.5%-2%	56	28.72
2.1%-4%	27	13.85
5% and above	12	6.15
Total	195	100

Source: Annual Reports of respective firms for the years 2004-2010

Table 5(B): Redemption Premium on FCCBs issued by Indian firms

Redemption Premium	No of Issues	% No of Issues
upto 10%	6	5.77
11-20%	13	12.50
21-30%	20	19.23
31-40%	27	25.96
41-50%	35	33.65
51% and above	3	2.88
Total	104	100

Source: Annual Reports of respective

firms for the years 2004-2010

The "relevant date" is the date on which the Board of the issuing company passes the resolution authorizing the proposed issue. Until 2008 the guidelines required issuers to consider equity price movements during 6 months preceding the relevant date. The guidelines were amended to enable issuing firms to take advantage of the most recent changes in equity prices.

As the date of the specific Board meeting is not available in public domain for all cases, we compare the conversion price relative to the stock price prevailing on the date of the FCCB issue. We find conversion premiums (the difference between conversion price and market price expressed as a percentage of market price) ranging upto more than 100%. In few cases we also find 'negative premiums'. This may be attributed to the volatility of stock prices between the 'relevant date' and the actual date of issue of FCCBs.

Again the regulations specify the 'floor' for pricing but do not specify any 'caps'. In case of adverse market conditions presenting themselves during the tenure of the bonds; too large conversion premiums may reduce effectiveness of FCCBs.

Security: The borrower/issuing firm is free to decide the nature of security to be provided to the lenders. However, creation of charge over immovable assets and financial securities is subject to FEMA Regulations/Notifications.

We find that all FCCBs issued by Indian firms are "unsecured".

It may also be noted here that creation of specific reserves to meet redemption requirements is not mandatory. In the absence of both (charge over assets or creation of reserves); adverse market conditions and/or financial condition of the issuing firm may lead to situations where firms are unable to meet redemption obligations. Such failure will not only adversely affect the defaulting firm but also the credibility of Indian firms in international capital markets. Hence appropriate regulations may be introduced to address these issues.

Prepayment/Buyback: RBI had allowed repurchase/buyback of FCCBs by issuers only from December 2008 to March 2009. The buyback had to be at a minimum discount of 15% to the book value. Buyback could be executed with existing foreign currency reserves or fresh ECB raised for this purpose. Bonds so repurchased had to be cancelled and could not be reissued. Once again RBI permitted buyback of FCCBs during July 2011 to March 2012. The buyback had to be at a minimum discount of 8% to the book value.

It is to be noted that buyback was permitted only during certain periods. Further, buyback of FCCBs issued by Indian firms had to be executed not at market determined discounts/values but at the values specified by RBI. As such we do not observe any buybacks in case of FCCBs issued upto 2004. We also do not observe any buybacks in case of FCCBs issued in 2009 and 2010. In case of FCCBs issued during 2005-2008; bonds were repurchased to the extent of only 2.70% of the total issue value. The very low buybacks may be attributed to the unwillingness of the investors to accept

steep discounts and rather receive the redemption values on maturity.

As many issues are still outstanding and are unlikely to be converted; RBI may consider allowing buybacks again in future. However; in view of poor investor response in previous instances and financial implications of large redemption obligations for the issuers, it may also consider permitting buybacks at market determined discounts.

Conclusions

Issuances of FCCBs by Indian firms as well as issue characteristics are governed by many regulations. In this study, we have therefore analysed the trends and challenges in use of FCCBs as a financing instrument by Indian firms in light of the prevalent regulatory environment. We find that most aspects related to effective use of FCCBs as a financing instrument have received attention of the regulatory authorities. In most cases amendments to the regulations have been beneficial to Indian firms intending to access global capital markets. In few instances some of the regulations (such as permitting spectrum allocations as eligible end use or permitting buybacks at specified discounts) do not appear to have had desired impact. Certain matters such as issue size being relative to the size of the firm, tenure of the bonds being linked to project life, size of conversion premium, creation of redemption reserve may need to be addressed by the regulators and issuing firms to the improve the effectiveness of FCCBs as a financing instruments.

Apart from regulations; equity/bond market conditions, other macro-

economic factors as well firm specific conditions may affect the issuance/use of FCCBs as a financing instrument. Issuing firms will need to maintain a fine balance between regulatory compliances, market conditions and their financing objectives to successfully issue FCCBs.

Further research on cross country comparison of issue characteristics will enable us to comment on effectiveness of the instrument. An evaluation of corporate laws in different countries as compared with India and the influence of legal systems on the issue characteristics will also help develop greater understanding about the relation between law and corporate finance.

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Extent of Retail Investors Participation in Indian Stock Market- A Survey of Selected Cities in India

Kajal Gandhi

Abstract:

The economic liberalization process undertaken by the Indian government during early 1990s has opened up new dimensions for Indian economy. The Indian capital market especially stock market has achieved new heights with the implementation of liberalized reforms. Since then the stock market has grown in leaps and bounds. Despite of such robust growth of stock market, participation of retail investors is minimal. In this paper a survey was undertaken in five cities of India to assess participation of retail investors. Indian retail investors still prefer traditional forms of investment like Bank Fixed Deposits, Post office savings, National Saving Certificates etc. Indian stock market remains to be dominated by Foreign Institutional investors and Domestic Institutional Investors. To counter affect such, it is necessary that domestic retail investors should participate more in the Indian Stock Market.

Key Words:

Retail Investors, Indian Stock Market, Chi-square test.

Introduction

The purpose of this study is to make an assessment of the incidence of retail participation in the stock market in India. To be more specific, the study seeks to ascertain the retail investors' attitude towards stock market investing and to assess their perceptions of the various aspects of the Indian stock market. Most of the retail investors do not have much investment expertise and most of them have but modest investment portfolios. The mode of making investment decisions and developing investment portfolios by retail investors are different in many respects from those by institutional and high-wealth investors. It is the latter category of investors who actually dominate the stock market. But retail investors are also important and they are also able to play a critical role in the growth of the stock market. Retail participation is particularly important for small cap companies. For some obvious reasons, institutional investors are not quite keen to invest in these companies. Retailers can be very important for the survival of small cap companies. Another important role of retail investors lies in providing a stable ownership base for companies. This is because most retail investors trade relatively infrequently. However, all this can happen only when retail participation in the stock market is sufficiently large. The

present survey provides first-hand information on the contents of retail investors' investment, and their trading habits and decision making.

This paper is divided into five sections. Section 1 explains the procedures used to conduct the retail investors survey. The section also describes the form and content of the questionnaire used for the purpose. Section 2 describes the profile of the respondents. Section 3 analyzes the responses received from the respondents. Section 4 provides the concluding remarks.

The Survey Process

The survey was conducted in five cities: Mumbai, Delhi, Kolkata, Chennai and Ahmadabad. It started in January 2010 and lasted till July 2011. The total number of respondents surveyed was 1000. The number of respondents from each city was 200. They consisted of persons of various gender, marital status, age groups, income groups, occupation and percentage of income they saved. Initially, a pilot survey was conducted in above five cities taking 50 people from each city at the survey of retail investors was random. The result of Chi-square test performed on above showed that qualification and marital status were important factors affecting one's propensity to invest in stock market. The results were crosschecked by an indirect oral interview which was conducted with an expert in this field who at that time was a key official of Mutual Fund-SKP Securities Ltd. It was finally observed that that qualification was the most significant factor affecting investment decisions of respondents in the market. Based on this outcome, final population was divided into above

mentioned strata and the remaining samples were collected using stratified sampling method. Around 57% Graduates, 26% Higher Secondary, 56% Post-Graduates and above and remaining 10% Secondary and below secondary were selected.

Respondents' Profile

As has been mentioned earlier, we have surveyed 1000 retail investors. They come from 5 big cities. The profile of the respondents surveyed is explained below.

As observed from above Table 1.1 that male respondents as compared to female are greater in all the five cities. In every city married respondent are larger as compared to unmarried except Mumbai where number of marital status are same. Majority of respondents in all five cities belong to the age group of 26 to 35 years (i.e. 47%).Majority of respondents in all five cities belong to the class of graduates (i.e. 57%). Salaried person are highest respondent (44%) as compared to other professional in all five cities. People who belong to lower middle class whose income is under 3 Lacs are highest respondent in all five cities. People whose saving is in between 10% to 30% are highest in number in all five cities.

The above result throws light upon low participation of respondents in stock market. The retail participation in selected countries like Australia was 41% of population by end of 2008, 21% by end of 2008 in Hong Kong, 18% by end of 2008 in UK, 10.5% by 2007 in China, 39.5% by end of 2008 in Taiwan, 27.7% by 2009 in US whereas India has only 1.3% of retail participation by end of 2010 (Shah J., 2012).

Table 1.1: An Overview of Demographic Distribution of Respondents City-wise

Demographic Factors	Mumbai	Kolkata	Ahmedabad	Delhi	Chennai
Male	142	146	171	157	190
Female	58	54	29	43	10
Married	100	142	122	136	138
Unmarried	100	58	78	64	62
Under 25	77	8	70	45	29
26 TO 35	91	89	97	86	108
36 TO 45	27	63	21	39	38
46 TO 55	5	32	8	16	23
56 TO 65	-	7	2	10	2
65 & Above	-	1	2	4	-
Below Secondary	6	22	1	4	3
Secondary	9	19	2	20	24
Higher Secondary	51	49	51	37	73
Graduates	127	102	128	116	95
Post Graduates & Above	7	8	18	23	5
Business	73	76	47	73	67
Professional	16	25	9	12	11
Salaried	101	60	107	55	114
Student	2	8	14	31	4
Home Maker	8	27	20	20	2
Retired	-	4	3	9	2
Under 3 Lacs	127	177	139	112	126
3 Lacs TO 5 Lacs	62	17	59	61	61
5 Lacs TO 10 Lacs	10	6	2	24	13
10 Lacs TO 20 Lacs	1	-	-	1	-
Above 20 Lacs	-	-	-	2	-

Demographic Factors	Mumbai	Kolkata	Ahmedabad	Delhi	Chennai
Between 10% to 30%	148	181	172	134	143
Between 30% to 50%	43	19	23	58	45
Between 50% to 70%	9	-	5	8	6
More than 70%	-	-	-	-	6

Response Analysis

Propensity to Invest in Stock Market across Different Groups of Demographics

In this section, we try to analyze the propensity to invest in stock market across different groups of demographics. To ascertain which demographic factor affects most on one's choice of investing or not in the stock market, , we performed Pearson's chi-square test1, the result of which can be summarized as follows:

Here, we want to test the Null Hypothesis (H_0): there is no significant difference in propensity to invest in stock market across different groups of demographic factor like sex, marital status, qualification, age group, income group etc.

Alternative Hypothesis (H_1): there is significant difference in propensity to invest in stock market across different groups of demographic factor like sex, marital status, qualification, age group, income group etc.

If the level of significance i.e. $p < 0.05$, then we reject null hypothesis otherwise accept it.

As observed from above Table 1.2 that gender was a significant factor among respondent's choice of investing in stock market in cities like Mumbai, Kolkata, Delhi and Ahmedabad. Marital status showed a significant difference only in cities like Mumbai and Ahmedabad. Age group factor showed a high significant statistical difference in cities like Ahmedabad and Chennai then followed by Mumbai. Income group of respondent was highly significant factor in Ahmedabad. Qualification was seen to be highly significant in Mumbai, Kolkata and Chennai and also seen to be significant in Ahmedabad. Again, occupation was also seen to be significant factor in all five cities.

This result is in line with previous studies which showed that demographic factors play an important role in one's choice of investing in stock market which is a high risk investment avenue. Investor's risk tolerance positively correlates with the investor's demographic factors, such as age, level of education, income, marital status, and wealth (Lease, Lewellen, and Schlarbaum, 1974, 1977; Riley and Chow 1992). Investor's risk tolerance tends to increase with the age. Investors tend to be risk averters when they are approaching retirement. Besides that, the level of investor's education

Table 1.2 Analyzing Propensity to Invest in Stock Market across Different Groups of Demographics using Chi-square Test*

Different Group of Demographics	Mumbai	Kolkata	Ahmedabad	Delhi	Chennai
Gender vs. investor/Non Investor	0.024	0.001	0.011	0.034	0.709
Marital Status vs. Investor/Non investor	0.042	0.063	0.003	0.87	0.2
Age Group vs. Investor/ Non Investor	0.041	0.473	< 0.001	0.175	< 0.001
Income Group vs. Investor/ Non Investor	0.065	0.892	0.001	0.06	0.41
Qualification vs. investor/ Non investor	< 0.001	< 0.001	0.046	0.129	< 0.001
Occupation vs. Investor/ Non investor	< 0.001	0.016	0.008	0.021	0.016

*respective P-value

influences positively investor's risk behavior (Schooley and Worden, 1999). More specifically, investors with specific jobs, namely corporate executive, lawyer, doctor, tend to be more risk tolerant (Barnewall, 1987).

Again, Warren et al. (1990) and Rajarajan (2000) predict individual investment choices (e.g., stocks, bonds, real estate) based on lifestyle and demographic attributes. These investors see rewards as contingent upon their own behavior (Rajarajan, 2002).

As pointed out by Evans (2004) those investors less than 30 years old tend to take more risk than do the older ones.

Purpose of Making Investment

The purpose of making investment varies among investors. Different people invest for different reasons though the basic objective remains same for all i.e. obtaining maximum return out of one's investment.

From the response of the survey, purpose for making investment by respondents was analyzed.The analysis was based on the mean of ranks obtained in order of preference.

It is observed from Table 1.3 that people who prefer to invest in stock market for business purposes belong mainly from Kolkata and Mumbai compare to other cities those who don't invest but prefer to invest for business purposes belong to Chennai & Delhi.

People who prefer to invest in stock market for retirement purpose belong mainly from Delhi and Chennai as compared to other cities and those who don't invest but prefer to invest for retirement purpose belongs from Delhi and Mumbai. People who prefer to invest in stock market for unforeseen purpose belong mainly from Chennai and Ahmedabad compare to other cities and those who don't invest but prefer to invest for unforeseen purpose belongs from Delhi and Mumbai. Mumbai, Kolkata and Delhi have the highest number of respondents who invest as well as don't invest but prefer to invest in stock market as an investor. People who prefer to invest in stock market for children's educations belong mainly from Kolkata, Delhi, Chennai and Mumbai compare to Chennai those who don't invest but prefer to invest for children's educations belong to Chennai & Delhi.

In Mumbai people prefer to invest in stock market mainly for investment and business purpose. In Kolkata people prefer to invest in stock market mainly for children's education, investment and for business purpose. In Ahmedabad people prefer to invest in stock market mainly for unforeseen events. In Delhi people prefer to invest in stock market mainly for children's education and retirement. In Chennai people prefer to invest in stock market mainly for children's education, unforeseen events and retirement planning.

In case people don't invest but prefer to invest in stock market as an investment in Mumbai, Kolkata, Delhi and Chennai. Ahmedabad always wants to invest in stock market for any unforeseen events.

As observed from Table 1.4 that among all cities, Mumbai and Kolkata have significant propensity to invest in stock market for business purpose. Chennai

Table 1.3: Mean of Ranks Obtained According to their Preference for Investing

Options	Yes					No				
	M	K	A	D	Ch.	M	K	A	D	Ch.
As a Business/ Profession	2.9	3.1	2.2	2.8	2.9	2.5	2.5	1.6	2.9	2.9
Retirement Planning	2.6	2.6	2.1	3.1	3.1	2.8	2.4	1.6	3	2.4
Unforeseen Events	2.7	2.1	3	2.8	3.2	2.8	2.2	2.3	2.8	2.7
As an Investor	3.7	3.2	1.8	2.7	3.4	3.4	3.7	1.6	3.2	3.4
For Children's Education	3	3.7	2.2	3.5	3.4	2.9	1.7	2.1	3	3.5

Table 1.4: Results from ANOVA Test Showing Propensity to Invest of Respondents across Various Means of Investment*

Propensity to Invest	Mumbai	Kolkata	Ahmedabad	Delhi	Chennai
As a Business/ Profession	0.039	0.056	0.071	0.578	0.928
Retirement Planning	0.17	0.267	0.003	0.784	< 0.001
Unforeseen Events	0.544	0.582	0.027	0.985	0.008
As an Investor	0.219	0.084	0.228	0.083	< 0.001
For Children's Education	0.822	< 0.001	0.579	0.047	0.626

*respective P-Value

Table 1.5 Result from ANOVA Test Showing Allocation of Income by Respondents (Investors/ Non-Investors) in Various Investment Avenues*

Various Investment Avenues	Gold	Governm ent Securities	Insuranc e	Bank FD	Post Office SS.	Shares	Property	Others
Mumbai	< 0.001	0.935	0.347	0.001	<0.001	< 0.001	0.002	0.998
Kolkata	0.055	0.432	0.067	0.276	0.007	< 0.001	0.002	< 0.001
Ahmedabad	0.043	0.081	< 0.001	0.004	0.052	< 0.001	0.001	0.791
Delhi	0.917	0.963	0.1	0.458	0.954	< 0.001	0.074	0.028
Chennai	< 0.001	0.091	< 0.001	0.002	0.016	< 0.001	<0.001	0.033

*respective P-Value

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and Ahmedabad have high significant propensity to invest in stock market for retirement plan and unforeseen events. Only Chennai have higher significant to invest in stock market for investment. Only Kolkata and Delhi have higher significant to invest in stock market for children's education.

It is observed from above Table 1.5 that in Mumbai, there is significant

difference in mean spending in Gold, Post Office saving scheme, shares and property. In Kolkata, there was a high significant difference in mean spending of respondents among Post Office S.S., shares, Property and Others. In Ahmedabad, there was observed significant difference in mean spending in Insurance, shares, Property and Gold. In Delhi, there was significant difference in

Table 1.6: Frequency of Respondents Who Considers Following Factors While Making Normal Investment

Factors	Mumbai	Kolkata	Ahmedabad	Delhi	Chennai
Return on investment	157	142	31	98	36
Time frame of Investment	77	29	26	115	58
Capital Requirement	73	6	13	77	53
Knowledge of investment	89	20	14	88	65
To earn more than inflation rate	99	6	11	46	49
Market Sentiments/ security	104	30	10	74	48
Ease of Investing	108	123	10	49	42
Terms of investment	200	200	200	200	199
Don't consider any of the above	3	1	1	3	10

mean spending in shares, property and others. Whereas in Chennai, there was a high statistical difference in mean spending of Gold, Insurance, shares and Property and then followed by a significant difference in Bank FD, Post office saving scheme and others.

Expectations from One's Investment

Expectation from investment varied from person to person. The graph below depicts the total number of respondents opting for a particular expectation.

The city-wise results as observed from table 1.6 showed that people from

Table 1.7 Distribution of Respondents about Their Awareness on Equity Yielding Higher Returns than Other Investment in Long Run

Center			Frequency	Percent
MUMBAI	Valid	YES	113	56.5
		NO	87	43.5
		Total	200	100.0
KOLKATA	Valid	YES	180	90.0
		NO	4	2.0
		Total	184	92.0
	Missing	System	16	8.0
	Total		200	100.0
AHMEDABAD	Valid	YES	44	22.0
	Missing	System	156	78.0
	Total		200	100.0
DELHI	Valid	YES	80	40.0
		NO	120	60.0
		Total	200	100.0
CHENNAI	Valid	YES	60	30.0
		NO	139	69.5
		Total	199	99.5
	Missing	System	1	0.5
	Total		200	100.0

Table 1.8: Distribution of Respondents about Their Awareness on Equity Yielding Higher Returns than Other Investment in Long Run

Center			Frequency	Percent
MUMBAI	Valid	YES	113	56.5
		NO	87	43.5
		Total	200	100.0
KOLKATA	Valid	YES	180	90.0
		NO	4	2.0
		Total	184	92.0
	Missing	System	16	8.0
	Total		200	100.0
AHMEDABAD	Valid	YES	44	22.0
	Missing	System	156	78.0
	Total		200	100.0
DELHI	Valid	YES	80	40.0
		NO	120	60.0
		Total	200	100.0
CHENNAI	Valid	YES	60	30.0
		NO	139	69.5
		Total	199	99.5
	Missing	System	1	0.5
	Total		200	100.0

Mumbai, Kolkata and Delhi considers a return on investment as a major factor behind investment. Mumbai, Delhi and Chennai considers majority of factors like time frame of investment, capital requirement for investment, Knowledge of Investment, to earn more than inflation rate, market sentiments/security. Terms of investment are almost equally important to all cities. Mumbai, Kolkata, Delhi and Chennai also consider ease of investing as a one of the important factor before investment. Some people in Chennai feel they

Table 1.9: Factors/Changes Necessary to make Stock Market Investment more User Friendly

Factor to make Stock Market User Friendly	Mumbai	Kolkata	Ahmedabad	Delhi	Chennai
Ease of Trading	112	11	37	115	48
Good Advisor	97	28	40	160	115
Stability of the Market	103	48	18	108	112
More knowledge of Products in stock market	69	112	10	55	44

consider some other factor apart from this stated factor.

As observed from table 1.7, almost 90% people of Kolkata are aware of higher return on equity than other investment in compare to other cities. More than a half of the populations of Mumbai are aware of higher returns on equity than other investment. Majority of Delhi and Chennai people are unaware of higher return on equity than other investment in compare to other cities. Significant proportions of Ahmedabad people have no saying on this matter as 78% people didn't answer anything regarding this.

As observed from table 1.8 Mumbai, Delhi and Chennai respondent's feel they don't invest in stock market because they are afraid of losing money, they have lack of knowledge regarding investment, they have time constraint to monitor investment, there is difficulty in documentation & operation in stock market, they feel there is lack of good advisor who guide them to earn higher return even they feel there is lack of stability as an absence of fixed returns on capital.

As observed from 1.9 that in Mumbai, respondents gave more weight age to ease of trading and stability of the market followed by good advisor and more knowledge of products in stock market. In Kolkata, respondents stressed more on more knowledge of products in stock market and cities like Delhi and Chennai, voted more for good advisor, stability of the market and ease of trading.

Concluding Remarks

In India, participation of retail investors in

stock market is comparatively low. India has one of the highest savings rates in the world. But only a small percentage of household savings in India is invested in the stock market. The primary destinations of savings across household categories in India are banks, post offices, insurance products, and metals. Investment experts and capital market researchers have tried to find out the major reasons for Indian household investors' not choosing the stock market as the primary investment destination. It has been observed that the reasons are many and varied. There is doubt about the safety of stock market investments. Most retail investors find the stock market activities too complex and difficult to comprehend. The continued volatility of the market is considered by many to be a great demotivating factor. The frequent occurrence of scams and frauds is also cited to be an important reason why ordinary household investors try to avoid the stock market route. The results from our survey of retail investors reveal that the fear of losing money is the primary reason why the respondents try to avoid stock market investing. Other reasons that are cited include procedural complexity, inability to monitor investments and absence of stable returns.

Our survey of retail investors was conducted across five large Indian cities-Mumbai, Delhi, Kolkata, Chennai, and Ahmadabad. The results show that only 38 percent of the respondents have invested in the stock market. Of these, a sizeable number is just passive investors. Moreover, these investors invest only a small fraction of their savings in the stock market instruments. The investors we surveyed all belong to the middle class community; about 95 of the respondents have income under Rs 6.00 lakh. In our survey, we have tried to ascertain the investment-related behavior of the respondents. The questionnaire required respondents to tell about their saving habits, awareness of investment opportunities, objectives of making investments, and investment preferences. One of the key findings of the survey is that insurance endowment policies are the most preferred investment instruments among the respondents. This is followed by property, gold and bank deposits. Our questionnaire required respondents to give their views as to the changes that should be effected in order to make stock market investments more user-friendly. About 44 percent of the respondents believe that stock market investing can be made more attractive if the quality of investment advisory services is improved. Bringing about stability in market is considered by many (about 39 percent) to be an important way in which improvements can be brought about. About 32 percent of the respondents opine in favor of easing the trading procedures.

Retail participation in stock market in India is of paramount importance. The development of the capital market is not possible without increasing the base of investors. It is through enhanced retail participation that the investor base can be widened. The current low retail participation is due to many complex issues. The matter should be pursued seriously. Since the problems are very complex, it is not possible to solve them simply by making some policy changes. There are issues like price manipulation, corrupt accounting practices, overpricing and incorrect grading of

IPOs which need concerted efforts to resolve. Regulators should take stern action against all sorts of malpractices in the Indian stock market. They should seriously pursue investor protection.

Notes:

1. Pearson's Chi-square test or Chi-square test is a non-parametric statistical test to determine if the two or more classifications of the sample are independent or not. Chi-square can be used as a 'test for goodness of fit' which is generally used to determine how well the assumed theoretical distribution like Binomial, Poisson or Normal distribution fit to the observed data. Secondly, 'test for independence of attributes' shows whether two or more attributes are interrelated and thirdly, a 'test of homogeneity' to ascertain whether there is a homogeneity among several population in terms of its characteristics and evaluates the equality of several population of categorical data.

   The formula for obtaining Chi-square value is as follows:

   $$\square 2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

   Where n is the number of cells in the table. The obtained test statistic is compared against a critical value from the chi-square distribution with (r - 1)©- 1) degrees of freedom(Frank et.al., 2012).

2. Analysis of Variance or ANOVA is a statistical technique to analyze variation in a response (continuous random variable) measured under conditions defined by discrete factors (classification variables, often with nominal values). ANOVA is used frequently to test equality among several means by comparing variance among groups relative to variance within groups.

3. Active investors are those who are continuously involved in buying and selling actions in the stock market (www.investopedia.com). They want to overrule market average returns by picking attractive stocks, bonds, mutual funds, time when to move in and out of markets or market sectors and place leveraged bets on the future direction of securities and markets with options, futures and other derivatives. In their bid to outperform market they often take help of various methods like fundamental analysis, technical analysis, and macro-economic analysis to determine profitable future investment trends.

   Whereas Passive investors on the other hand are those who are not frequently transacting in stock market activity and are risk averse. They make no attempt to distinguish between attractive and unattractive securities or forecast securities prices, or time markets and market sectors. Though they want to make profit in long term, but accept the average returns. Passive investors will purchase investments with the intention of long-term appreciation and limited maintenance.

   For the purpose of our analysis, in context of retail individual investors, passive investors are taken as those investors who participate very less in

stock market in comparison to active investors.

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Strengthening the Backbone of Indian Economy: SME Exchange in India, a Global Comparative Study

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Abstract:

More than 16% of the Indian SMEs have either shut down their business or have incurred losses in their business as a consequence of the 2009 meltdown of the economy. The Indian Banking system lagged in its support to SMEs during that time, resulting in unemployment, closure of units with SMEs entering in to a debt trap. Eligibility norms for further capital raising may need to be revisited from the perspective of SMEs. The SME Model Listing Agreement needs to be further simplified in relation to the post-listing compliance requirements. The establishment of the ITP is a step in the right direction. SEBI's recent initiative in providing an impetus to the SME sector by establishing a dedicated platform for the listing and trading of their securities is laudable. As is true of all new reforms and initiatives, there will always be varied critiques on how the structure could be improved.

Key Words:

SMEs, SME Capital, SME Listing, SME Exchange.

Importance of a SME Exchange

The Indian SME sector has been growing rapidly, particularly in the last decade, SMEs have made very significant contribution to the overall economy which has started impacting the Indian GDP. At present, the SSI sector accounts for over 90% of industrial units in the country, 40% of value addition in the manufacturing output and approximately 35% of India's exports.

The Global Economic Meltdown of 2009 has made India understand that though insulation in economy and country as whole is there; one cannot avoid the external shock. Changes in the global economy will have cascading effect on India too. More than 16% of the Indian SMEs have either shut down their business or have incurred losses in their business as a consequence of the 2009 meltdown of the economy. The Indian Banking system has not come forward to support the SMEs during that time, due to the stringent guidelines by RBI and resulting factor was lot of unemployment, closure of units with SMEs entering in to a debt trap.

In the case of SMEs the Entrepreneur has a distinct disadvantage of not being able to hire a professional team and create a winning ambience. This did push the SMEs to the precipice with dire

consequences of massive slow down without any solution in sight.

SME exchanges are specialized equity markets, differentiated from the main exchange that provides risk capital for promising entrepreneurs, promoting innovation crucial for sustainable economic growth. These exchanges offer greater access to growth capital for innovative SMEs, new jobs through entrepreneurship, more investment opportunities for domestic portfolio investors and local venture capitalists. The main reasons for having an SMEs exchange are:

It provides an immense opportunity for investors to identify and invest in emerging, high-growth SMEs and participate in the valuation of companies. This will ultimately create wealth for all the stakeholders, including investors. In addition, there are tax benefits for investors.

India tried to open the risk capital window to SMEs twice in past: first with Over-the- counter Exchange of India (OTCEI) launched in 1990 and second with 'BSE Indonext' launched in 2007. The earlier attempts indicate that retail investors shied away from investing in SMEs either because of lack of knowledge about track record and business models of SMEs or investor's lack of patience in understanding nuances of the issues and envisioning prospects thereof. It is third time that an attempt has been made to create SME dedicated platform.

Failure of the Over-the-counter Exchange of India (OTCEI)

An Exchange with a difference that is

how the Over the Counter Exchange of India (OTCEI), arrived on the financial market scene about eight years ago. Even then, it boasted of modern, investor-friendly systems most of which were adopted by big brothers Bombay Stock Exchange and the National Stock Exchange, much later. The Exchange started off well during the boom of 1994, but somewhere along the way after that, it lost out in the race for a slice of the financial market.

The OTCEI had failed because of two major reasons. One, none of the participants in the OTCEI market had made any significant gains. Issuers found that marketing their issues on the OTCEI is not easy. Neither did listing give them any publicity. Some of the prospective issuers had, therefore, chosen the path of inflating their capital and seeking listing on a regular stock exchange. Investors have hardly had any worthwhile returns from OTCEI shares, with a few exceptions.

The intermediaries, be they members or dealers, had also failed to make any major gains, while the responsibilities cast on them in terms of sponsorships and market making with low spreads have proved to be exacting. Most of them enrolled themselves to become stockbrokers as the dealership was available quite easily and rather cheaply, compared to the membership of other stock exchanges.

Secondly, the procedure of trading and settlement on the OTCEI was quite cumbersome, with registration requirements proving to be a deterrent for investors and the T+3 continuous settlement programme casting, as pointed out by Dave Committee, an

onerous responsibility on the support systems such as custodians, clearing houses and banks apart from the back offices of dealers.

Experiences Abroad

In several countries in the world, sustained efforts are made to foster the second tier market to cater to the needs of small companies. In the US, the Over-The Counter (OTC) market regulated by the National Association of Securities Dealers (NASD) has been functioning for a long time. This has been a prime market for new and growing companies. NASD introduced in 1971 an electronic quotations system called the National Association of Securities Dealers Automatic Quotations (NASDAQ) with prescribed listing norms.

Failure of BSE- INDO NEXT Exchange

BSE IndoNext was formed to benefit small and medium size companies, the investors in these companies and the capital market as a whole. Investors and the companies, which are listed only on Regional Stock Exchanges (RSEs) have been impacted severely, as the RSEs are recording either nil or negligible trading volumes. Investors in such small and medium companies are therefore unable to find an exit route and realize fair market value of their investments.

The report finalised by a panel appointed by the Securities and Exchange Board of India (SEBI) on the future of the Regional Stock Exchanges (RSEs) post-demutualisation, has brought into focus the dismal performance of the Indonext platform of the Bombay Stock Exchange (BSE) Ltd, which was launched amidst much

fanfare for companies listed on RSEs. The special platform has failed to generate any sizeable volume and its monthly average turnover accounts for less than 5% of that of the BSE. In fact, it has fallen below 5% in the last two months. Incidentally, in January 2006, Indonext accounted for more than 6% of the average turnover of the BSE.

Another challenge was liquidity, which has often been an issue for hundreds of mid- and small-caps on BSE. One of the main reasons is that many SME promoters hold such a huge chunk of their company's shares that there is little left to trade. They are unwilling to dilute their stake. For example, promoters hold 75 per cent of the shares of Orient Ceramics, a company that listed on BSE in 1993.

However, the share of Indonext was still higher in 2005, especially in August and September when it was nearly 8%. Thereon it has witnessed a steady decline. Analysts say the prime reason for the failure of Indonext is that there are not many takers for companies listed on the RSEs as there is hardly any information available to the investing mass and enough marketing has also not been done. The failure of BSE Indonext primarily due to the stringent norms (entry norms, asset base, exclusively listed on regional stock exchanges et al) should act as a reminder for the market watchdog.

An alternative platform for SMEs is good thinking, but it's worthless if there is nothing much to lure SMEs themselves. Globally, the London Stock Exchange's Alternative Investment Market (AIM) depicts a perfect success story of such platforms. Currently, it accounts for 91% of total LSE IPOs and 40% of all European

IPOs. Even companies from India are aiming for AIM. The major reason behind AIM's success is the flexible listing norms that AIM offers, compared to the mainstream trading platform (whereas BSE IndoNext never had anything uniquely different to offer).

Existing Framework for SME Listings in India

SEBI has introduced the SME Model Listing Agreement[1]. This was in continuation of SEBI's earlier initiative in this regard. In its previous notification[2], SEBI had amended the SEBI (Issue of Capital and Disclosure Requirements) Regulations, 2009 (SEBI (ICDR) Regulations) by inserting a specific chapter (i.e., Chapter XA, which was later renumbered as Chapter X-B) for the issue of specified securities by SMEs[3]. Subse-

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[1] Circular no. CIR/CFD/DIL/6/2010 dated May 17, 2010

[2] Notification no. LAD-NRO/GN/2010-11/03/1104 dated April 13, 2010

[3] Chapter X-B of the SEBI (ICDR) Regulations is applicable to companies whose post-issue face value capital does not exceed rupees ten crores. In addition, companies whose post-issue face value capital exceeds rupees ten crore but is up to rupees twenty five crore, may also issue their securities under this Chapter.

[4] Through its circular no. CIR/MRD/DSA/17/2010 dated May 18, 2010

[5] Pursuant to this, amendments were notified to the SEBI (ICDR) Regulations, the SEBI (Merchant Bankers) Regulations, 1992 (" Merchant Bankers Regulations "), SEBI (Foreign Institutions Investors) Regulations, 1995 (" SEBI FII Regulations "), SEBI (Venture Capital Funds) Regulations, 1996 (" SEBI VCF Regulations "), SEBI (Substantial Acquisition of Shares and Takeovers) Regulations, 1997 (" Takeover Regulations ") and the SEBI (Stock Brokers and Sub-Brokers) Regulations, 1992 (" Stock Broker Regulations "). In addition, guidelines for market-makers on SME Exchanges (" Market Maker Guidelines ") were notified on April 26, 2010 to operationalise the SME Listing Framework, which mandates market-making for all the scrips listed and trading on the SME Exchanges

quently, SEBI further strengthened the framework for the issue, listing and trading of securities by SMEs[4] (SME Listing Framework) by aligning all the relevant regulations to accommodate separate listing and trading arrangement for SMEs[5].

SME Listing Framework collectively refers to the (i) Chapter X-B, (ii) the SME Model Listing Agreement and (iii) the amendments to the relevant regulations[6].

Policy Initiatives

In order to fill this vacuum and based on constant demand from the SME sector, SEBI introduced Chapter X-B in SEBI (ICDR) Regulations, 2009 (initially introduced as Chapter X-A and renumbered through a subsequent amendment) enabling creation of a separate platform for SMEs desiring access to the capital market. Some of the key features of the regulations are:

a. Transparency in reporting financial and material information about the issuer Company and its promoters - detailed requirement of the offer document and listing agreement with the SME Exchange insisted upon, on similar lines as for listing on the Main Board;

b. Increasing the threshold limit of investment to Rs. 1 lakh, thus ensuring that marginal investors do not make investment in SMEs. The increased investment level would also ensure that investors belonging to the HNI category or from the institutions would participate in the investment of SMEs either in the primary or the secondary market;

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[6] Ibid

c. Introduction of the concept of market making for a minimum period of 3 years to ensure that enough liquidity is maintained in the initial period for investors, existing or prospective. In a way, it also provides an option for initial investors to exit from the investment by selling shares to the market maker;

d. Insistence of minimum subscriber level of 50 for a successful public issue;

e. Increased onus on the Merchant Banker for due diligence and filing final prospectus or red herring prospectus with SEBI and Registrar of Companies before opening of an issue and also providing market making for the shares for a period of 3 years, either on own accord or through a tie up with a nominated investor. Also, honoring commitments of defaulting underwriters on devolvement is the responsibility of the Merchant Banker;

f. 100% underwriting of shares so that the SME issuer is ensured of success of the public issue in terms of raising capital; and g. Relaxing the norm for grading of initial public offering.

In addition to the above, SEBI has issued SEBI (Alternative Investment Fund) Regulations, 2012 which when read together with Sec. 10(23FB) of IT Act, 1961, provides for income tax exemption to Venture Capital Fund (VCF) or Venture Capital Company (VCC) and Alternative Investment (SME) Category I Funds (See Annexure), provided:

a) At least 75% of their corpus are invested in SMEs or SMEs listed on SME Exchange

b) At least 2/3rd of their investments are in unlisted SMEs or which are listed on the SME Exchange and balance in other investments such as shares of Venture Capital Undertakings (VCUs) whose shares are proposed to be listed or such listed companies which are financially weak or is a sick industrial undertaking. Additionally, SEBI (Alternative Investment Fund) Regulations, 2012 provides that Alternative Investment Fund (SME) Funds may enter into tie up with Merchant Banker for subscribing to the unsubscribed portion of the shares issued on SME Exchange.

Amendments to the SEBI (ICDR) Regulations

The eligibility and disclosure requirements for SMEs proposing to list on the SME Exchanges are contained in the recently introduced Chapter X-B of the SEBI (ICDR) Regulations (Chapter X-B)[7]. The eligibility requirements for a public issue mentioned under Regulations 25-27 have been made inapplicable to SMEs. In addition, the draft offer document is not required to be filed with SEBI for observations/comments. Chapter X-B also introduces certain innovative concepts which do not exist for listing on the Main Exchanges. One is that of the "Nominated Investor" (NIs), which is defined as a qualified institutional investor or private equity fund, who subscribes to the issue in case of under-subscription or assists in the market making process. The role of NIs is espe-

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[7] Chapter XA for the "Issue of Specified Securities by Small and Medium Enterprise" introduced through SEBI Circular no. LAD-NRO/GN/2010-11/03/1104 dated April 13, 2010 and later re-numbered to Chapter XB by SEBI notification no. LAD-NRO/GN/2011-12/25/30309 dated September 23, 2011.

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cially relevant as other investors could potentially place reliance on NI's participation in making their investment decision as participation by sophisticated investors is usually an indication of the investment being a reliable one[8].

The other is that of market-making which has been made mandatory for a minimum period of three years from the date of listing or migration from the Main Exchanges. This was done following concerns expressed by merchant bankers that compulsory market-making obligations could result in them holding large portfolio of shares similar to private equity investors, which might not be their expertise/line of business[9]. The merchant bankers are now allowed to have a contractual arrangement with NIs, whereby the shares bought/sold pursuant to market making by them will be ultimately transferred to/from the NI. It is important to clarify that the NI, as a concept, does not correspond to that of the NOMAD under AIM; however, that of the merchant banker in the Indian context is analogous to the NOMAD.

It is important to note that all other provisions of the SEBI (ICDR) Regulations, unless specifically excluded, remain applicable to SMEs. Thus, the regulations governing preferential allotment, publicity restrictions, proportionate

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[8] SEBI Order no. WTM/PS/ISD/02/2011 dated September 21, 2011 in the matter of market manipulation using GDR Issues, which provides, in the context of FIIs investing in GDR issuances, that "...Indian investors may invest in such companies with high percentage of holding by FIIs/Sub-Accounts, despite them being less liquid, since companies with high FII holdings are generally considered more valuable as FIIs are expected to be sophisticated investors ..."

[9] http://www.sebi.gov.in/boardmeetings/128/ stockexchanges.pdf

allotment would also apply to SMEs.

SME Model Listing Agreement

The SME Model Listing Agreement is required to be entered into by SMEs for the purpose of listing of the offered securities on the SME Exchanges and contains certain relaxations from the Main Exchanges' equity listing agreement. However, this relaxation appears cosmetic in light of the recent circular by the Ministry of Corporate Affairs (MCA), allowing for companies to send their long form annual report through electronic mail to shareholders. In addition, financial results of SMEs may be submitted on a half-yearly basis instead of the mandated quarterly filings for the Main Exchanges. Further, listed SMEs are not required to publish their financial results and can instead make them available on their respective websites.

Other Regulations

Amendments have been also notified to other regulations to further operationalise the SME Listing Framework. The Merchant Bankers Regulations have been amended to reflect 100% underwriting and mandatory market-making provided under Chapter X-B. Similarly, amendments have also been effected to the Stock Brokers Regulations to provide for no separate registrations for already registered stock brokers and affiliated sub-brokers to trade on the SME Exchanges. Appropriate amendments have also been made to the SEBI FII Regulations, SEBI VCF Regulations and the Takeover Regulations. Insider Trading Regulations[10] and the FUTP

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[10] Securities and Exchange Board of India (Prohibition of Insider Trading) Regulations, 1992, as amended

Regulations 24, also remain applicable to SMEs in their current format.

In order to facilitate capital raising by small and medium enterprises including start- up companies which are in their early stages of growth and to provide for easier exit options for informed investors like angel investors, VCFs and PEs etc., from such companies, it was decided by SEBI to permit listing without an Initial Public Offer and trading of specified securities of small and medium enterprises (SMEs) including start-up companies on Institutional Trading Platform (ITP) in SME Exchanges[11].

The Institutional Trading Platform (ITP)

(i) The ITP shall be a platform for listing and trading of specified securities of small and medium enterprises including start-up companies in a 'SME Exchange' as defined under regulation 106N(1)© of ICDR Regulations;

(ii) The ITP shall be accessible only to informed investors who are either individuals or institutions and the minimum trading lot shall be ten lakh rupees on this platform;

(iii) Companies listed on ITP shall not make a public issue of its securities.

Capital raising has been made significantly conducive for SME's

(i) A company listed on ITP shall not make an initial public offer while being listed on the platform.

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[11] *SEBI (Listing of Specified Securities on Institutional Trading Platform) Regulations, 2013(ITP Regulations) vide Gazette notification No. LAD-NRO/GN/2013-14/27/6720 dated October 08, 2013.*

(ii) private placement or through a rights issue.

International Framework

The significance of discussing established international frameworks for SMEs and their experiences is to provide a background to the analysis in the subsequent section on the Indian legal and regulatory regime.

UK Alternative Investment Market (AIM)

Today AIM is firmly established as one of the world's leading growth markets with a universe of companies from a wide range of sectors around the world.

Since its launch in 1995, more than 3,100 companies have joined AIM, raising over £67 billion to fund their growth. A number of factors have contributed to this success including:

● A balanced approach to regulation which facilitates a smooth transition to becoming a public company and allows companies to focus on growing their business once on market

● A network of advisers that is experienced in supporting companies from the time they first consider a flotation, through to helping them raise capital to fulfill their growth potential

● An international investor base that has the knowledge and understanding to effectively provide capital to companies as they progress and has confidence in the regulatory environment.

● Geographical reach and wide sector coverage The diversity of sectors and regional coverage on AIM, with

Differences between admission criteria and continuing obligations for AIM and the Main Market

Main Market	AIM
Minimum market capitalization	No minimum market capitalization
Normally three-year trading record required	No trading record requirement
Minimum 25 per cent shares in public hands	No prescribed level of shares to be in public hands
Prior shareholder approval required for substantial acquisitions and disposals (Premium Listing only)	No prior shareholder approval for most transactions*
Sponsors needed for certain transactions (Premium Listing only)	Nominated Adviser required at all times
Pre-vetting of prospectus by the UKLA	Admission documents not pre-vetted by the Exchange or by the UKLA in most circumstances. The UKLA will only vet an AIM admission document where it is also a Prospectus under the Prospectus Directive

companies from 40 different industries from over 28 countries

● Visibility and profile With customers, suppliers, investors and other key stakeholders

The performance of these alternative trading platforms has been influenced by the prevailing economic conditions. For instance, GEM had been quite successful since its launch listing approximately 220 companies and raising over HK$40 billion of equity capital by 2007[12]. The launch of GEM coincided with the global technology boom of 1999-2000.

[12] Discussion Paper on the Growth Enterprise Market, Hong Kong Exchanges and Clearing Limited, July 2007, available at http://www.hkex.com.hk/eng/newsconsul/mktconsul/Documents/cp200707e.pdf

However, owing to failure of some companies coupled with a few scandals, GEM became more conservative while scrutinizing listing applications.

Problems being encountered

Even with the introduction of the regulations for SMEs listing and SME Exchange for over years, and tax exemption available for investors, the response to SME Exchange has been lackadaisical, mainly on account of the following reasons.

Regulatory requirements which result in increasing the capital raising cost

Costs associated with any public issue

Comparison between AIM, GEM & Mothers

Minimum public float	No requirement of minimum public float in AIM. Requirement exists in GEM, MOTHERS.
Requirement of previous trading record	Previous trading record not required in AIM and unlike in GEM and MOTHERS.
Corporate governance disclosures	Apart from jurisdiction-specific disclosures, the regulatory framework for all these jurisdictions permits the companies to develop appropriate corporate governance codes.
Key Intermediaries	Several intermediaries are designed to assist companies with various listing requirements. Among the three legal regimes discussed, AIM envisage the broadest role for one of the market intermediary- the NOMAD in the AIM context.
Migration to respective main exchanges	Migration to the respective main exchanges for the three regimes discussed, is permitted subject to fulfillment of various quantitative/eligibility criteria (which are jurisdiction-specific) stipulated by their respective main exchanges.

can be clubbed in the following major heads: Publicity related expenses i.e. making the details of the public issue known to the prospective investors; Fees paid to various intermediaries associated with the issue and Compliance related expenses for continuing with listing of the issue.

Also, if book - building process is adopted - revision in floor price or price band, if any, has to be announced by way of press releases. Given the size of the SME issue, the cost of releasing advertisement could be a substantial cost for the SMEs when compared to the issue size.

With regard to fee paid to various intermediaries, the most critical responsibility rests on the Merchant Banker viz. due diligence of the offer document, market making, assessment of underwriters' capabilities, tie-up with various other intermediaries, underwriting that portion of underwritten shares that any underwriter fails to honour etc. of the aforementioned roles, the role for market making and honouring commitments of underwriters who fail to subscribe their portion on devolvement are additional responsibilities when compared to responsibilities on the Main Board. From a Merchant Banker's point of view, the market making role entails

commitment of additional capital, requiring additional funds arrangement at their end. Though Merchant Banker can enter into arrangements with nominated investors for market making purpose, the onus nevertheless rests with the issuer and Merchant Banker for finding suitable investors with strong financial muscle and as such does not seem to be a feasible way out.

Lessons from International Frameworks

a) Legal and Regulatory Requirements: Challenges

This sub-section analyzes Chapter X-B and the SME Model Listing Agreement, from the perspective of

(i) eligibility requirements for listing;

(ii) analysis of the IPO process envisaged for SMEs and the adjunct procedural requirements; and

(iii) corporate governance compliance requirements, both pre- and post-listing.

A review of Chapter X-B reveals that even though some of the regulatory requirements applicable to regular companies have been either relaxed or removed for SMEs, all the disclosure requirements under Schedule VIII of the SEBI (ICDR) Regulations are still applicable.

Eligibility Requirements under the SME Listing Framework

The eligibility parameters for issuer companies such as threshold of net tangible assets, track record of distributable profits, net worth and aggregate issue size, minimum post-issue face value capital do not have to be complied with by SMEs.. However, in case the post-issue face value capital of the SMEs listed on the SME Exchanges increases by any further issue of equity shares, to more than rupees ten crores and up to rupees twenty five crores, the SMEs may migrate to the Main Exchange. Migration becomes mandatory in case of an increase of the post-issue capital beyond rupees twenty five crores. However, for the purpose of migration pursuant to a capital raising (i.e., follow-on public offer, rights issue, qualified institutions placement, etc), SMEs would necessarily need to comply with the relevant eligibility and compliance criteria under the SEBI (ICDR) Regulations.

As is the case with India, a comparison of the AIM model with the main board of the LSE also reveals lower legal and regulatory compliance requirements and certain advantages. For example, eligibility requirements such as minimum public float, trading history, prior shareholders' approval for major acquisition, disposals do not exist for companies proposing to list on the AIM exchange[13]. The success of the alternative AIM framework, projected as having greater

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[13] An analysis of the AIM admission and compliance criteria reveals certain advantages that companies have by opting for this alternative model over the main exchanges: (a) For eligibility purposes, requirements of minimum public float, trading history, prior shareholders approval for major acquisitions and disposals (except for reverse takeovers) do not exist for companies listing on AIM; and (b) The AIM listing requirements contemplate a continuing role of the nominated advisor ("NOMAD") as an agent of the company at all times, even post-listing. Also, as in the case of the SME Exchanges in India, the admission document is not required to be pre-vetted by the UKLA or the exchange in most cases.

regulatory flexibility, may be evidenced by certain statistics on migrations of companies from the Main Exchanges- in 2005, 40 companies moved directly from the main market to AIM, while only two companies moved from AIM to the main market. However, for an indication of the success of the SME Exchanges, the 'wait and watch' approach might necessarily be the best.

IPO Process for SMEs and adjunct procedural requirements

Chapter X-B specifically addresses certain procedural aspects of the offering process such as minimum application value, standardized market lots for IPOs and subsequent secondary market trading (in accordance with the price band of the offer) , minimum of 50 allottees participating in the issue and compulsory market-making of the offered securities for a period of three years pursuant to listing. Analogous requirements for market lots and minimum number of allottees do not exist under the AIM Rules for Companies.

Whilst the requirement for minimum number of allottees seems to be targeted to maintain a diverse investor base, the standardized market lots requirement stems from SEBI's objective to ensure investment by sophisticated and informed investors in these less regulated companies- primarily due to perceived investment risks associated with relaxed regulatory settings. However, on the flip side, the market lot requirement could also impact liquidity and discourage retail investors and day traders resulting in an increased relevance of market-makers in providing an exit option to investors.

Corporate Governance Compliance: Pre-listing Requirements and Post- listing Continuous Obligations

The corporate governance requirements for SMEs directly listed on or migrated to the SME Exchanges, as with the companies listed on the Main Exchanges, originate from the listing agreement entered into with relevant stock exchanges. The SME Model Listing Agreement is closely aligned in its requirements to that of the Main Exchanges. The variance that exists between these two models is limited to less stringent reporting requirements in certain circumstances for SMEs.

Whilst these relaxations are a step in the right direction, stringent corporate governance compliance requirements are akin to those prescribed for the Main Exchanges.

The AIM listing framework provides for the concept of the NOMAD. It is the responsibility of the NOMADs to assess the suitability of the company to list on the AIM as well as to facilitate compliance with all listing requirements under the AIM Rules for Companies, including corporate governance norms. The AIM Rules for NOMADs also provide for an indicative checklist of certain diligence tests and verifications methods which the NOMAD should conduct in order to satisfy the above condition. The AIM Rules for Companies do not specifically contain detailed corporate governance norms.

Role of the Merchant Bankers under the SME Listing Framework

The role and obligations of the merchant bankers in a SME listing process seem

greater than those on a typical public offering on the Main Exchange. It is here that certain complexities and concerns lie.

Market Making

Market making has been made mandatory for a period of three years from the date of listing/migration for all scrips listed and traded on the SME Exchanges. In this regard, SEBI has introduced the Market Maker Guidelines to give effect to this requirement.

This move to introduce market- making might alleviate some of the liquidity concerns being raised by industry participants, but only for the first three years. The assumption is that the shares would gain visibility and liquidity by the end of this period, but in case this does not happen, liquidity concerns could prove to be a deterrent for companies proposing to list on this exchange.

Underwriting

The underwriting of the issue of securities on the SME Exchanges is required to be 100% and is not just restricted to the minimum subscription level. Of this, merchant bankers are subject to an individual underwriting obligation of at least 15% of the issue size.

Certain merchant banks have raised concerns on their increased role under the SME Listing Framework without a corresponding fee incentive. Merchant bankers' fees are typically based on the issue size and hence are anticipated to be considerably lower than on the Main Exchanges. Additional concerns have also been expressed by investment banks on the compulsory market making requirement. This requirement is perceived to be impractical as banks as well as the brokers to whom the market making responsibilities are delegated, may not commit to such a long term obligation.

Internationally, in the context of the AIM framework, the responsibility of assessing the suitability and credibility of a company for admission to the AIM exchange rests with NOMADs. As the NOMADs are monitored by the LSE, the exchange can take disciplinary action against the NOMADs where it is in breach of its obligations under the eligibility criteria set for them, or has failed to act with due care and skill or has impaired the reputation and integrity of AIM. The obligations of the NOMAD persists even post-listing in an advisory capacity; such an arrangement is not envisaged in the Indian context, except mandatory market making for a three year period. Further, under the AIM structure, NOMADs are incentivized in the form of fee for assessing the suitability of the company on the LSE and thus, the credibility of the NOMAD's assessment can be arguably prejudiced as they derive monetary benefit from this exercise. This is a significant concern as the judgment of NOMADs might be potentially compromised or, at the very least, be more sympathetic towards companies proposing to list. Whilst the operational advantages of such a system are considerable from the perspective of the companies as well as the exchanges and new companies gain from the personalized services offered by NOMADs, one should be mindful of such concerns as well.

Concluding Remarks

The SME Listing Framework is a promising initiative expected to encourage SMEs to raise funds on the capital markets. However, this analysis currently remains preliminary and my assessment is purely from a legal/regulatory perspective. This analysis can be validated once the operations of the SME Exchanges commence and SMEs start accessing this route to raise funds.

Nevertheless, there are advantages of undertaking such an exercise at this juncture.

In respect of other regulatory requirements, eligibility norms for further capital raising may need to be revisited from the perspective of SMEs. Additionally, applicability of the allocation/allotment requirements contained under the SEBI (ICDR) Regulations might need to be reviewed in order to strengthen the focus on sophisticated investors.

The SME Model Listing Agreement should also be further simplified in relation to the post-listing compliance requirements (including corporate governance). In its present format, excepting certain relaxation to the intimation requirements, the SME Model Listing Agreement is akin to the equity listing agreement of the Main Exchanges, which may be particularly arduous for smaller companies.

The establishment of the ITP is a step in the right direction but should provide an edge for SMEs belonging to the services sector or in the technology space, where escalated growth rate and high returns on capital are possible, the alternative of raising capital from VCFs and PEs are more attractive on a private placement basis than opting for the SME Exchange route of listing of IPOs

To conclude, SEBI's recent initiative in providing an impetus to the SME sector by establishing a separate dedicated platform for the listing and trading of their securities is laudable. As is true of all new reforms and initiatives, there will always be varied critiques on how the structure could have been improved and how the existing framework may have been effectuated better.

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