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*Peeush Ranjan Agrawal and
Tanu Agarwal*

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The Pattern of Gross Domestic Saving and Capital Formation in India

Prof. H.K. Singh – Managing Editor



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NOTES FOR CONTRIBUTORS

Our global and political environment is bubbling with great hopes and aspirations of pink health and rising graph of Trade, Industry and Commerce all around. As such, it becomes my humble and honest duty, belonging to the world of academics, to interact and share with some instrumental guidelines for the contributors and participants in the forthcoming issues of the Indian Journal of Commerce.

Research along with its practical implications and usage and utility in the field of business studies has great relevance today. It is therefore, suggested that Papers based on application oriented research are more welcome; especially in the fields of industry, commerce, business studies and management areas. The papers must include tables, diagrams, illustrations and such other tools to support the different and divergent viewpoints. As such, the length of a paper including all these has to be cautiously controlled and should not exceed 20 double space pages. Short communications relating to review articles, report of various conferences, summary/views on several governments' reports, database issues etc. should also not exceed more than 5 double spaced pages and are invited to be published. We also welcome book-reviews and summary of Ph. D. dissertations but not in more than two double spaced pages. Care should be taken that whatever manuscripts are sent for publication in this journal should not have been published elsewhere any time before.

As is the common practice, two copies of the manuscripts typed in double space on A4 size bond paper should be submitted and the electronic version of the paper must accompany 3.5 inch high density floppy diskette in PC compatible WORD 7.0 document format. Papers without floppy/CD will not be accepted. It is informed that all the papers/contributions submitted for publication in the journal will be subjected to peer reviews and the decision of the Editorial Committee will be final.

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FROM THE MANAGING EDITOR DESK

On behalf of the Indian Commerce Association (ICA), we gratefully welcome all the venerated readers of the Indian Journal of Commerce and delegates of the 68th All India Commerce Conference (AICC) being hosted by the Department of Commerce and Business Management, Vinoba Bhave University, Hazaribagh. In the mean time, executive committee of ICA has decided to construct its own building at Greater Noida and we request all the honourable members to help us financially, socially and morally for this most pious task. As illustrious Saint **Kabir Das** has rightly stated '**Laghuta main prabhuta basey,prabhuta tain prabhu door;Chinti le shakkar chale,hatthi tain sir dhool**' which means the Power can be gained through humility; an ant can carry the sugar granule while an elephant can only suck dust to shower it on his head. Another dictum of the same renowned Saint is '**Dheere dheere re mana ,dheere sab kutch hoi;Mali seeche so ghada,ritu aaye phal hoi**' which alludes that it takes time to get results; pour as much water as you want but the plant will flower only in the season. We are working for ICA on the same philosophies, values and traditions so that slow but steady wins the race.



This All India Commerce Conference is devoted to efficacious, substantial and significant six broader topics, described below as: (a) Make in India, (b) Skill Development,(c) Behavioral Finance, (d)E-Retailing, (e)Social media, and (f) Environmental Management.

Make in India is an initiative and motivational program of the Government of India to encourage industrial units to manufacture their products in India. **Prime Minister Shri Narendra Modi** ji launched the Make in India program on 25th September, 2014 in a grand function at the Vigyan Bhawan, New Delhi. The initiative hopes to increase the GDP growth and tax revenue. The initiative also aims at high quality standards and minimizing the impact on the environment. The initiative hopes to attract capital and technological investment in India

Skill Development intends developing yourself and your skill sets to add value for the organization and for your own career development. Fostering an attitude of appreciation for lifelong learning is the key to workplace success. Continuously learning and developing one's skills requires identifying the skills needed for mobility, and then successfully seeking out trainings or on-the-job opportunities for developing those skills. Developing your skills begins with assessing which skills are important for your desired career development. The role of Commerce, Management and Economics disciplines are instrumental for skill development of any country's man power but for emerging economy like ours its sine qua non.

Behavioral Economics and the related arena, behavioral finance, study the effects of psychological, social, cognitive, and emotional factors on the economic decisions of individuals and institutions and the consequences for market prices, returns, and the allocation. It is basically concerned with the bounds of rationality of economic agents. The central issue in **Behavioral Finance** is explaining why market participants make irrational systematic errors contrary to assumption of rational market participants. Such errors affect prices and returns, creating market inefficiencies. It also investigates how other participants take arbitrage of such errors and market inefficiencies. Behavioral finance highlights inefficiencies such as under or over-reactions to information as causes of market trends and in extreme cases of bubbles and crashes.

Electronic Retailing, or e-tailing, can include business-to-business and business-to-consumer sales. E-retailing requires businesses to tailor traditional business models to the rapidly changing face of the Internet and its users. E-retailers are not restricted solely to the Internet, and some brick-and-mortar businesses also operate websites to reach consumers. Online retailing is normally referred to as e-retailing has gained matured shape in developing countries.

Social Media is a unique platform that allows people to create, share or exchange informational ideas in virtual communities and networks. It depends on mobile and web-based technologies to create highly interactive platforms to thrash out, manipulate and modify user-generated content. Social media technologies take on many different forms including blogs, business network, enterprise social networks, social bookmarking and virtual worlds etc.

Environmental Management System (EMS) refers to the management of an organization's environmental programs in a comprehensive, systematic, planned and documented manner. It includes the organizational structure, planning and resources for developing, implementing and maintaining policy for protection. More formally, EMS is a system and database which integrates procedures and processes for training of personnel, monitoring, summarizing and reporting of specialized environmental performance information to internal and external stakeholders of a firm.

Our reputed journal has been assigned e-ISSN number as 2454-6801 in this year, by NISCAIR and a new website www.ijoc.in has been developed by us. All of you deserve a heartily congratulations for your reputed and acknowledged contributions. We are also in process to acquire impact factor for our journal which will create an additional concussion to our renowned journal. I express my sincere gratitude to all the renowned and famed academicians and researchers who have made every possible attempt for the bringing out best of this renowned and eminent journal effectively and for the exhilaration of commerce and management disciplines in augmentation of global economy. We also invite inestimable and beneficial propositions from illustrious and acclaimed scholars and academicians for suitable and worthy rectifications required for the betterment of this journal.



(H.K. Singh)

Impact of Key Market Parameters on Change in Investment Pattern of FIIs in India During Pre & Post Sub-Prime Crisis Period

Peeush Ranjan Agrawal and Tanu Agarwal

ABSTRACT

FIIs' cumulative investments have reached to US\$ 140 billion by March 2012, increasing from a mere US\$ 3.166 billion in March 2005. Herein this paper, the researchers have attempted to diagnose and device trend of change in investment pattern of FIIs' under the shadow of recent global economic upheaval. The samples used are the quarterly time series data on nine variables, viz., FII Net Investment, FII Gross Purchase, FII Gross Sale, MF Net Investment, MF Gross Purchase, MF Gross Sale, Sensex, Exchange Rate of US\$ to INR and IIP. A period of seven years is taken in two, five years' durations of 2005-2010 and 2007-2012 (28 Quarters). Two durations carry significance, US Sub- prime crisis was followed up with Euro-zone financial crisis, have penetrated in between. The study has been divided into two parts: representing FII as independent variable by using Simple Linear Regression Analysis, and representing FII as dependent variable by using Multiple Linear Regression Analysis. Second duration, FY 2007-08 to 2011-2012 witnessed a cautious approach on the part of FIIs, before entry. Mutual Fund in India remained laggard to FIIs' movement. Sensex continue to be the key parameter to attract or retain FIIs' funds. Volatility in foreign exchange market of Indian Rupee has started influencing investment prospect. A better IIP could off-set loss of fund inflows.

INTRODUCTION

On international fora of financial markets, three major happenings could have vast and intense ramifications across the globe: first, October 1987 in USA; second, October 1997 in South East Asia; and third, October 2007 again in USA. In the first one, India could remain insulated and indifferent but at later ones, the shell was pierced from and around with the entry of Foreign Institutional Investors (FIIs) since September 1992. The backdrops of the three are as under:-

On Monday, October 19, 1987 stock prices in USA declined by the largest amount in the history. Result was the virtual elimination of any buying strength from specialists or market makers. A true panic set in, and the Dow Industrial fell 130 points in the last 30 minutes of trading. During the day 604 million shares were traded on the NYSE, and the Dow Jones Industrial average was down 508 points from Friday's close, a 22.6% drops in one day. Entire International bourses crashed except few like in India (Agrawal, 1997).

In October 1997, the global cycle took another beating, as South-East Asian financial crisis erupted in Thailand after devaluation of Baht to fall in of ASEAN economy as to 'house of cards' in a chain reaction. India was none to bother initially, but started facing heat as FIIs, who had burnt fingers in Hong Kong market, started selling holdings on Bombay Stock Exchange (BSE) to off-set losses and to repatriate back the liquidity to

Key words:

FIIs, Mutual Fund, Sensex, IIP, US\$ to Indian Rupee exchange Rate, Sub-prime crisis JEL Classification Codes: E02, F3, F31

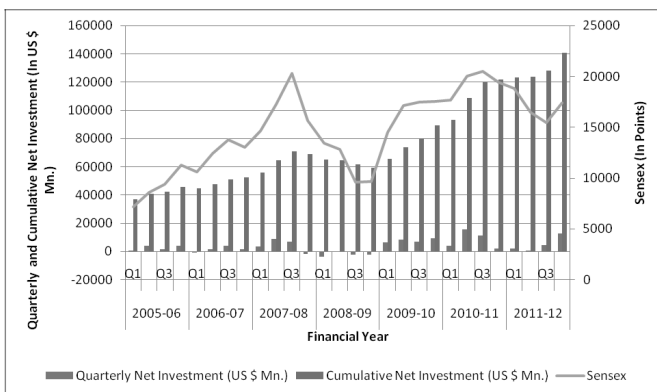
their investing community of West during pre-Christmas weeks. This cross-continental operation of FIIs had made a major dent in Indian market.

Thereafter, by October 2007, the business cycle took another full circle. The crisis of sub-prime, failure of securitized bond market in USA started moving from USA to East, Europe and Asia in furtherance. The sub-prime is a default of payments on a sub-loan securitized by a bank to create new liquidity and engineer more funds out of long term loan, while waiting for its maturity to happen.

Herein this paper, the researchers have attempted to diagnose and device trend of change in investment pattern of FIIs' under the shadow of recent global economic upheaval, if any, towards net investments, purchase inflows and sales outflows within and out of Indian securities market, to in tandem with movement of BSE 30 scrip sensitivity Index of India (Sensex); US\$ exchange rate to Indian Rupee (INR); Index of Industrial Production (IIP) and pattern of investment by Indian Mutual Funds (MF).

FIIs in last 20 years, since September 14, 1992, have offered liquidity to the Indian capital market immensely. Its cumulative investments have reached to US\$ 140 billion by March 2012, increasing from a mere US\$ 3.166 billion in March 2005. Refer Graph1.

Graph 1: Quarterly and Cumulative Net Investment of FIIs (In US \$ Mn.) and Sensex



Assumptions since have been afloat that inter-dependence of the two factors: FII Investments and movement of Sensex dance to and for each other, further concretized on disruptions in FIIs inflows to a deeper crisis ahead, on shattering of Sensex, devaluation of INR to US\$, precipitated with weakened IIP in an aftermath of Sub-prime crisis. Indian Mutual Funds could not offer cushion to off-set the loss to Sensex, in spite of sustaining a high

household savings rate to GDP 33 % and a net investment of US\$ 250 billion in January- March 2012 only and after 48 years of presence.

A period of seven years, FY 2005-06 to 2011-12 are taken in two, five years' durations of 2005-2010 and 2007-2012 (in all 28 Quarters). Two durations carry special significance out of the reasons, that US Sub-prime was followed up with Euro-zone financial crisis, have penetrated in between, starting from first five years to second five years.

Major indicators for inception of a recessionary trend, could be litmus-tested on fall in demand of capital and thereby lowering in cost of capital i.e. LIBOR, globally. If Indian growth story could be kept intact, the surplus of fund in the hands of the global investors, facing idle cost may opt out to be in furtherance of investment in Indian financial market via hot route of FIIs.

LITERATURE REVIEW

Agarwal (1997) had observed that correlation between FIIs' action and market reaction was so perfect. Strings were not pulled up from BSE, rather from New York and London. Further that FIIs' had hardly to possess 3% of total market capitalization. Aggarwal, Klapper and Wysocki (2005) examined the investment allocation choices of actively-managed US Mutual funds in emerging market equities after the market crisis of the 1990s. At the country level, they found that US funds invest more in open emerging markets with strong shareholders rights, accounting standards and legal frameworks. Prasanna (2008) observed that foreign investors invested more in companies with a higher volume of shares owned by the general public. Saha (2009) inferred the combined potent force of the FIIs and MFs. Kaur and Dillion (2010) concluded that FII inflows in India are determined by both stock market characteristics and macro-economic factors. Among macroeconomic determinants, economic growth of India (IIP) has positive impact on FIIs investment both in long-run and short-run. Bohra and Dutt (2011) attempted to understand the behavioral pattern of FII in India and figure out the reason for indifferent responses of BSE Sensex due to its inflows. The study noted that, behavior of FII in last decade was opportunistic and profit accumulation as the prime objective behind the portfolio investments in India. Goudarzi and Ramanarayanan (2011) analyzed the co integration and causal relationship between BSE 500 index and FII series in India during financial turmoil of 2008.

Study found that the BSE500 stock index and FIIs series are co integrated and causality between them is bilateral. Jain, Meena and Mathur (2012) examined contribution of FIIs in Sensex using Karl Person's Coefficient of Correlation test. FIIs are influencing the Sensex movement to a greater extent.

Many of the above researchers have studied FIIs' impact on one or other market parameters or vice versa. But did there exist any impact on or out of these parameters to FIIs' changing investment pattern, especially on or out of Sensex, US\$ to INR, IIP and MF, separately and collectively in two durations of special significance? This study has attempted to analyze the multi-variants in a broader perspective.

OBJECTIVE OF THE STUDY

That, whether,

- (i) (a) Sensex really dances to FIIs inflows, to Net Investments, Gross Purchases and Gross Sales; or the movement of Sensex influence the change in the course of its investment pattern?
 - (b) The trends have settled down to stability during 2005-06 to 2009-10, 2007-08 to 2011-12 or to in over all period of seven years?
- (ii) (a) Indian Mutual Funds move to in tandem with FIIs investment pattern or have stored enough depth to counter balance the impact.
 - (b) The pattern has improved to advantage Mutual Fund during 2005-06 to 2009-10, 2007-08 to 2011-12 or to in over all period of seven years?
- (iii) (a) Basic macro-economic parameters like IIP, US\$ to INR are influenced by FIIs strategy towards Net Investment, Gross Purchases or Gross Sales or these parameters do influence the change in the course of its investment pattern ?
 - (b) The trends have changed to maturity during 2005-06 to 2009-10, 2007-08 to 2011-12 or to in over all period of seven years?
- (iv) (a) FIIs carry value as predictor separately to each, Sensex; IIP; US\$ to INR or as dependent or in the groups of two to four parameters?

- (b) These basics of Indian economy have proven to be pivotal during 2005-06 to 2009-10, 2007-08 to 2011-2012 or to in over all period of seven years?

DATABASE AND METHODOLOGY

- (i) **Selection of Sample and Sources of data:** The sample duration of the study spans from financial years 2005-06 to 2011-12, use the quarterly time series data on nine variables, viz., FII Net Investment, FII Gross Purchase, FII Gross Sale, MF Net Investment, MF Gross Purchase, MF Gross Sale, Sensex, Exchange Rate of US\$ to INR and IIP. Quarterly data of all these variables have been collected from the official websites of BSE, RBI and CMIE. For all the nine variables abbreviations have been used, such as: FNI (FII Net Investment), FGP (FII Gross Purchase), FGS (FII Gross Sale), MNI (MF Net Investment), MGP (MF Gross Purchase), MGS (MF Gross Sale), SnX (Sensex), ExR (Exchange Rate of US\$ to INR) and IIP (Index of Industrial Production).

The study uses Simple and Multiple Linear Regression Analysis to examine two way inter-dependence of all nine variables. SPSS 16.0 has been used for the analysis. The study has been divided into two parts : first part (Table1A) represents FII as independent variable by using Simple Linear Regression Analysis, and second part (Table1B): represents FII as dependent variable by using Multiple Linear Regression Analysis.

- (ii) **Hypotheses:** In all, 14 hypotheses (within total 42 sub-hypotheses) have been formulated and tested on the basis of F Significance values in tables 1A and 12 hypotheses (within total 36 sub-hypotheses) in table 1B with the results noted as 'Accepted' or 'Rejected' for three durations FY 2005-2010; 2007-2012 and in all 2005-2012. Under table 1A out of 42 sub-hypotheses, 23 are Accepted and 19 Rejected. In table 1B, all 36 hypotheses have been accepted. Refer Table 1.1, 1.2.

Table: 1.1 Summary of Hypotheses Table (FII as Independent Variable)

S. No.	Hypotheses (Refer Annexure Table 1A)	Abbreviations
H1	FII Net Investment is a Significant predictor of Sensex	FNI→SnX
H1a	FII Gross Purchase is a Significant predictor of Sensex	FGP →SnX
H1b	FII Gross Sale is a Significant predictor of Sensex	FGS→SnX
H2	FII Net Investment is a Significant predictor of MF Net Investment	FNI→MNI
H2a	FII Gross Purchase is a Significant predictor of MF Gross Purchase	FGP →MGP
H2b	FII Gross Sale is a Significant predictor of MF Gross Sale	FGS→MGS
H2c	FII Gross Purchase is a Significant predictor of MF Gross Sale	FGP→MGS
H2d	FII Gross Sale is a Significant predictor of MF Gross Purchase	FGS →MGP
H3	FII Net Investment is a Significant predictor of Exchange Rate	FNI →ExR
H3a	FII Gross Purchase is a Significant predictor of Exchange Rate	FGP → ExR
H3b	FII Gross Sale is a Significant predictor of Exchange Rate	FGS →ExR
H4	FII Net Investment is a Significant predictor of Index of Industrial Production	FNI→IIP
H4a	FII Gross Purchase is a Significant predictor of Index of Industrial Production	FGP→IIP
H4b	FII Gross Sale is a Significant predictor of Index of Industrial Production	FGS→IIP

Table 1.2 Summary of Hypotheses Table (FII as dependent variable)

S. No.	Hypotheses (Refer Annexure Table 1B)	Abbreviations
H5	Combinations of Sensex and Exchange Rate are Significant predictors of FII Net Investment	SnX & ExR →FNI
H5a	Combinations Sensex and Exchange Rate are Significant predictors of FII Gross Purchase	SnX & ExR →FGP
H5b	Combinations Sensex and Exchange Rate are Significant predictors of FII Gross Sale	SnX & ExR→ FGS
H6	Combinations Sensex and Index of Industrial Production are Significant predictors of FII Net Investment	SnX & IIP → FNI
H6a	Combinations Sensex and Index of Industrial Production are Significant predictors of FII Gross Purchase	SnX & IIP→FGP
H6b	Combinations Sensex and Index of Industrial Production are Significant predictors of FII Gross Sale	SnX & IIP→FGS
H7	Combinations MF Net Investment, Sensex and Index of Industrial Production are Significant predictors of FII Net Investment	MNI, SnX & IIP → FNI
H7a	Combinations MF Net Investment, Sensex and Index of Industrial Production are Significant predictors of FII Gross Purchase	MNI, SnX & IIP → FGP
H7b	Combinations MF Net Investment, Sensex and Index of Industrial Production are Significant predictors of FII Gross Sale	MNI, SnX & IIP→ FGS
H8	Combinations MF Net Investment, Sensex, Exchange Rate and Index of Industrial Production are Significant predictors of FII Net Investment	MNI, SnX, ExR & IIP → FNI
H8a	Combinations MF Net Investment, Sensex, Exchange Rate and Index of Industrial Production are Significant predictors of FII Gross Purchase	MNI, SnX, ExR & IIP → FGP
H8b	Combinations MF Net Investment, Sensex, Exchange Rate and Index of Industrial Production are Significant predictors of FII Gross Sale	MNI, SnX, ExR & IIP→FGS

(iii) Summary of Top Five R value: Rankings on the basis of R value on top five positions of FIIs as independent variable and separately five as dependent variables

have been drawn under table 1C. This table 1C further reflects shift in rankings onwards for the other two durations. Refer Table 1C.

Table: 1C Summary Table - Top Five Hypotheses of Table 1A & IB as per R-value in all three durations

2005-06 to 2009-10 (First Duration)					2007-08 to 2011-12 (Second Duration)					2005-06 to 2011-12 (Full Duration)				
Rank (T-1A)	Hypothesis	Particular	R	F-value	Rank (T-1A)	Hypothesis (1st period Rank)	Particular	R	F-value	Rank (T-1A)	Hypothesis (1st period Rank)	Particular	R	F-value
1	H1a	FGP→SnX	0.853	48.002***	1	H1a (1)	FGP→SnX	0.805	33.215***	1	H1a (1)	FGP→SnX	0.888	97.099***
2	H1b	FGS→SnX	0.788	29.432***	2	H1 (8)	FNI→SnX	0.668	14.469***	2	H1b (2)	FGS→SnX	0.811	49.989***
3	H4b	FGS→IIP	0.749	23.027***	3	H1b (2)	FGS→SnX	0.620	11.236**	3	H4b (3)	FGS→IIP	0.772	38.412***
4	H2c	FGP→MGS	0.670	14.700***	4	H3b (10)	FGS→ExR	0.453	4.638*	4	H4a (6)	FGP→IIP	0.748	32.985***
5	H2b	FGS→MGS	0.655	13.538**	5	H4a (6)	FGP→IIP	0.420	3.854	5	H2c (4)	FGP→MGS	0.688	23.331***
Rank (T-1B)	Hypothesis	Particular	R	F-value	Rank (T-1B)	Hypothesis (1st period Rank)	Particular	R	F-value	Rank (T-1B)	Hypothesis (1st period Rank)	Particular	R	F-value
1	H8b	MNI, SnX, ExR & IIP→FGS	0.881	12.990***	1	H8a (3)	MNI, SnX, ExR & IIP→FGP	0.809	7.114**	1	H6a (5)	SnX & IIP→FGP	0.893	49.016***
2	H7b	MNI, SnX & IIP→FGS	0.847	13.548***	2	H7a (4)	MNI, SnX & IIP→FGP	0.808	10.008***	1	H7a (4)	MNI, SnX & IIP→FGP	0.893	31.515***
3	H8a	MNI, SnX, ExR & IIP→FGP	0.861	10.702***	3	H5a (6)	SnX & ExR→FGP	0.807	15.910***	1	H8a (3)	MNI, SnX, ExR & IIP→FGP	0.893	22.651***
4	H7a	MNI, SnX & IIP→FGP	0.860	15.209***	4	H6a (5)	SnX & IIP→FGP	0.806	15.809***	2	H5a (6)	SnX & ExR→FGP	0.890	47.450***
5	H6a	SnX & IIP→FGP	0.857	23.432***	5	H8 (8)	MNI, SnX, ExR & IIP→FNI	0.799	6.619**	3	H8b (1)	MNI, SnX, ExR & IIP→FGS	0.887	21.143***
										4	H7b (2)	MNI, SnX & IIP→FGS	0.856	21.869***
										5	H6b (7)	SnX & IIP→FGS	0.841	30.320***

(Note: * indicates the variable significant at 5% significance level; ** indicates the variable significant at 1% significance level and *** indicates the variable significant at 0.1% significance level)

FINDINGS

The key four market parameters have their own bearing upon FIIs' changing investment pattern and vice-versa. Drawn on the basis of tables 1A and 1B, graphs 1A (i) to (iii); graphs 1B (i) to (iii) positioned on best rankings of R values and further, graphs 1A (i) to (iii) and graphs 1B (i) to (iii) ranking best F Significance values, the findings of the study could be arrived as under:-

- (i) Sensex continues to be the Litmus-test: Sensex is the aggregate of market value of major Indian corporates, reflecting its net worth and potential for return. Over the duration of seven years, Indian market index has proven record of reliability and dependence for FIIs' investment decisions as buyer, seller and net investor, holding throughout the best positions in top 1st, 2nd and 3rd positions on R-values, as foremost dependent variable. On Significant F value, throughout, FGP, FNI and FGS maintained top 1st to 3rd. However, during second duration, FNI switched on to 2nd position from 14th position in first duration, as FIIs might have consolidated its investments to a better net position optimizing purchases with of sales in a post Sub-prime fluid environment.
- (ii) Zig-zag Mutual Funds: On pursuing R-Value, Indian Mutual Funds have acted more on holding inverse

- (iii) Embedded to Fundamentals: During the first duration, FIIs influenced upon IIP movements for exit (sales), the dependent parameter IIP occupy 3rd position. During second duration IIP slipped its position to lower level as dependent to FGS. However, the entry (FGP) got to cautious buying affecting IIP, is laid on to 4th rank. During full duration, both sales and purchases made by FIIs do influence IIPs largely in the Country.

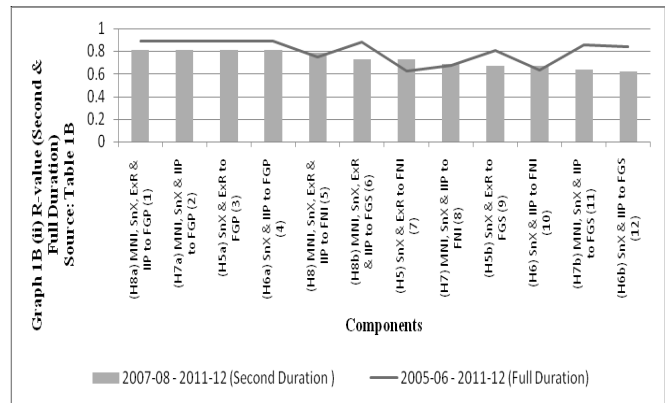
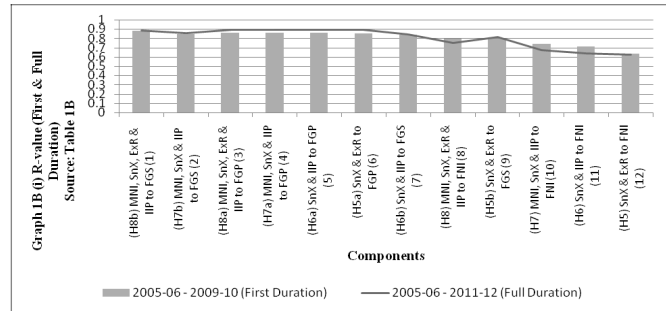
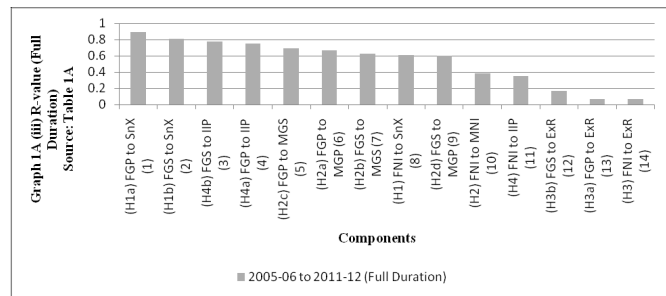
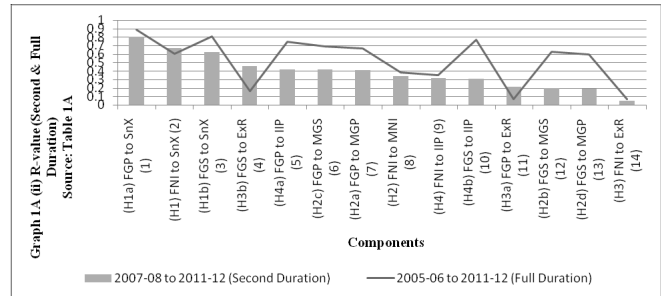
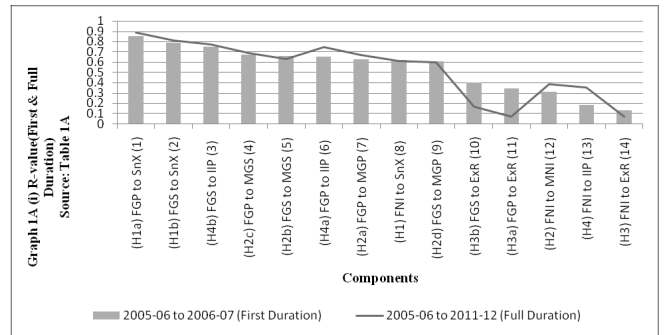
Taking on F value, IIP as dependent to FGS remained on 3rd position in first duration, but slipped little to 5th in second duration as market took a beating on a slow down. In over all period, industrial fundamental IIP was on 3rd and 4th best dependent variables to FGS and FGP influencing variables. In a separate study made, IIP acts as a modest predictor to Sensex also.

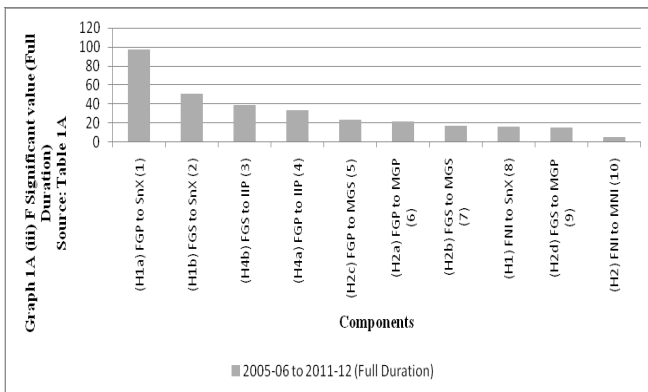
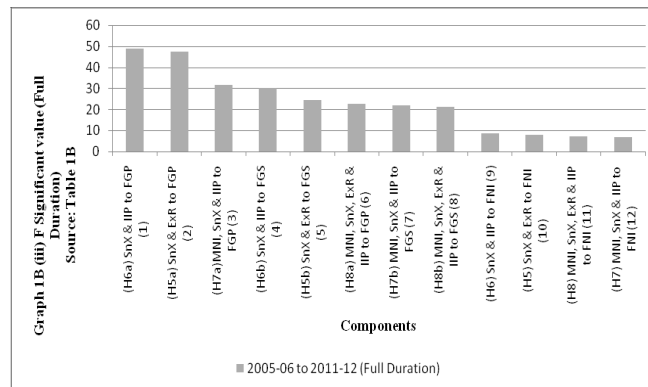
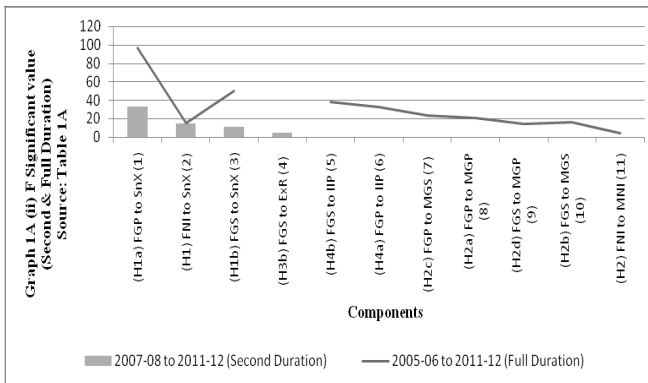
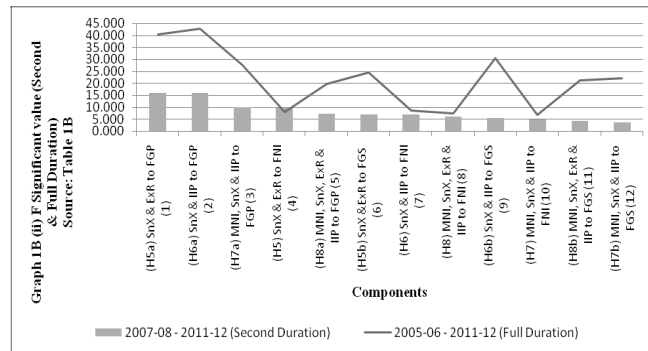
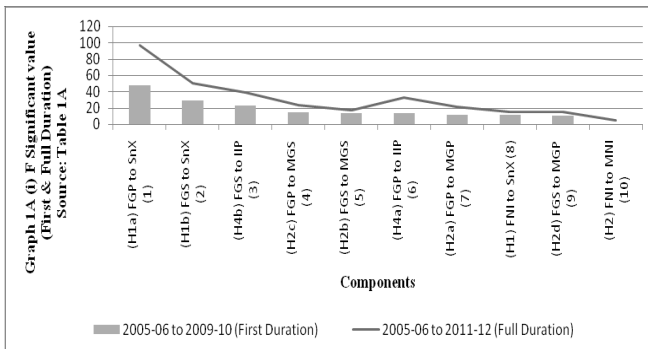
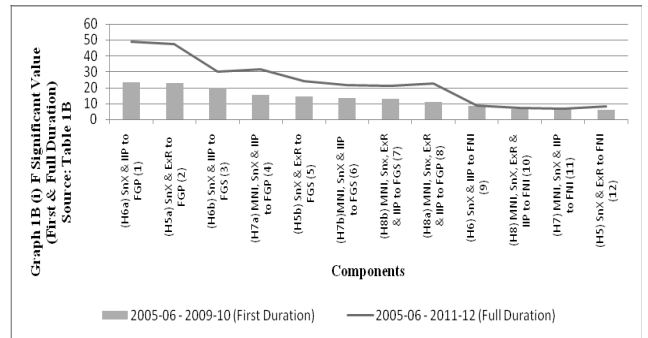
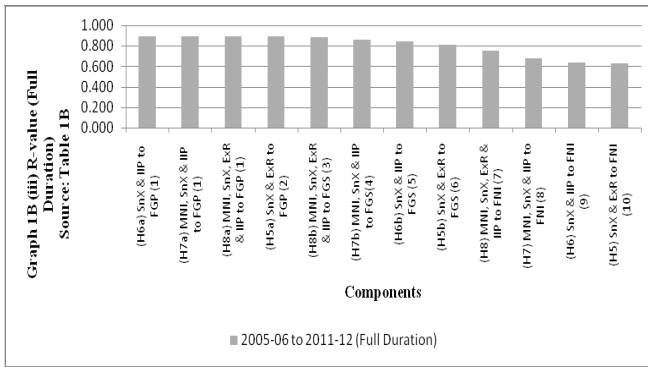
(iv) Foreign Exchange Rate Now Matter: FIIs inception was mainly drawn 20 years before to augment liquidity in capital market and never seen in first duration as source to stabilize US\$ to INR. But on sales pressure built in by FIIs during second duration, INR devalued for repatriation of capital back in US\$ form. FGS and FGP as influencers to INR Exchange rate to US\$ scaled up from a lower dependent variable to a very important 4th position as a FGS to ExR. In overall duration FGS/FGP/ FNI to ExR remained on lower ranks. On F value, in second duration, FGS to ExR got accelerated on to 4th position with falling INR to US\$,making FIIs worried about a weakening INR and thereby building sell pressure on INR as well as Sensex to slide further.

(v) U-Turn Strategy: On pursuing R value, using multiple regression analysis, all four variables as market influencers MNI, SnX, ExR & IIP to FIIs' exit (Sales), stand to on highest predictors during the first duration. The same four predictors during second duration, act on 1st position to influence FIIs' at entry (purchase) level ,inferring that FIIs became more cautious before buying instead of indulging in distress sales and that may cost them heavily. Same four predictors minus ExR, to FGS stand 2nd in first duration, takes a U-turn with FGP as dependent variable in second duration. In over all duration four parameters collectively determine FGP on second best position for long term stay.

U-turn in FIIs' approach is further witnessed in second duration as IIP combination with MNI, SnX to FGS on 2nd position in first duration turns out to FGP as dependent variable in second duration. A combination of Snx, ExR to FGP on 3rd position further justifies the U-turn finding, as it was on lower positions before. On F significant value test, FGP as dependent value to the multiple variables of SnX & Exr ; SnX & IIP ; MNI, SnX & ExR the predictors, are scaled up to hold best 1st to 3rd positions

respectively in second duration. FIIs' entry level cautions have become more significant in overall period also.





CONCLUSION AND POLICY IMPLICATIONS

FII's do not purchase cautiously for a longer presence and have not opted out of India under distress, is a major shift in its investment approach. Indian Mutual Fund Industry has failed to lead market Sensex, leaving it to mercy of FII's. Foreign exchange rate of Indian Rupee bears now an added independent variable to be discounted before, in a post Sub-prime crisis scenario. Fundamentals of market like IIP remain crucial to investment decision.

SUMMARY

Second duration of FY 2007-08 to 2011-2012 witnessed a cautious approach on the part of FII's, before entry. Mutual Fund in India remained laggard to FII's' movement, both ways on sell pressure of FII's, Mutual Funds follow to sell in distress and on buying by FII's, Mutual Funds choose to

sell in order of booking profit. Sensex continue to be the key parameter to attract or retain FIIs' funds. Volatility in foreign exchange market of Indian Rupee has started influencing investment prospect as has now occupied second position after Sensex in determining FIIs' investment approach, in a post-Sub-prime scenario. A better industrial prospect, IIP could off-set loss of fund inflows. There is a caution before a purchase decision being used by FIIs, discounting four market parameters independently or in multivariate form, than opting for distress sales by FIIs. These seem to stay longer, is a major shift in approach witnessed in second duration.

LIMITATION OF THE STUDY

By using closing values of used parameters of four Quarters, each year in five years' duration, this study averages out the short term fluctuations, and arrives at periodical interpretation only, without substantiating outcomes with macro or micro happenings on the ground. This study attempts to derive the change of course of investment pattern of FIIs in India, in two broad, pre & post Sub- Prime durations.

Table 1A Simple Linear Regression Analysis (FII Independent Variable)

S.No.	Components	Financial Year	R	R ²	Adjusted R ²	F-Value	Hypotheses Accepted/ Rejected
1.	H1	FII Net Investment is a Significant predictor of Sensex					
	FNI→SnX	2005-06 to 2009-10 (20-Q)	.620	.385	.351	11.258**	Accepted
		2007-08 to 2011-12 (20-Q)	.668	.446	.415	14.469***	Accepted
		2005-06 to 2011-12 (28-Q)	.608	.369	.345	15.209***	Accepted
2.	H1a	FII Gross Purchase is a Significant predictor of Sensex					
	FGP→SnX	2005-06 to 2009-10 (20-Q)	.853	.727	.712	48.002***	Accepted
		2007-08 to 2011-12 (20-Q)	.805	.649	.629	33.215***	Accepted
		2005-06 to 2011-12 (28-Q)	.888	.789	.781	97.099***	Accepted
3.	H1b	FII Gross Sale is a Significant predictor of Sensex					
	FGS→SnX	2005-06 to 2009-10 (20-Q)	.788	.621	.599	29.432***	Accepted
		2007-08 to 2011-12 (20-Q)	.620	.384	.350	11.236**	Accepted
		2005-06 to 2011-12 (28-Q)	.811	.658	.645	49.989***	Accepted
4.	H2	FII Net Investment is a Significant predictor of MF Net Investment					
	FNI→MNI	2005-06 to 2009-10 (20-Q)	.308	.095	.044	1.883	Rejected
		2007-08 to 2011-12 (20-Q)	.340	.116	.067	2.354	Rejected
		2005-06 to 2011-12 (28-Q)	.384	.148	.115	4.503*	Accepted
5.	H2a	FII Gross Purchase is a Significant predictor of MF Gross Purchase					
	FGP→MGP	2005-06 to 2009-10 (20-Q)	.627	.393	.360	11.675**	Accepted
		2007-08 to 2011-12 (20-Q)	.410	.168	.122	3.635	Rejected
		2005-06 to 2011-12 (28-Q)	.668	.446	.424	20.901***	Accepted
6.	H2b	FII Gross Sale is a Significant predictor of MF Gross Sale					
	FGS→MGS	2005-06 to 2009-10 (20-Q)	.655	.429	.398	13.538**	Accepted
		2007-08 to 2011-12 (20-Q)	.195	.038	-.015	.715	Rejected
		2005-06 to 2011-12 (28-Q)	.627	.393	.370	16.862***	Accepted
7.	H2c	FII Gross Purchase is a Significant predictor of MF Gross Sale					
	FGP→MGS	2005-06 to 2009-10 (20-Q)	.670	.450	.419	14.700***	Accepted
		2007-08 to 2011-12 (20-Q)	.416	.173	.127	3.774	Rejected
		2005-06 to 2011-12 (28-Q)	.688	.473	.453	23.331***	Accepted
8.	H2d	FII Gross Sale is a Significant predictor of MF Gross Purchase					
	FGS →MGP	2005-06 to 2009-10 (20-Q)	.607	.368	.333	10.486**	Accepted
		2007-08 to 2011-12 (20-Q)	.190	.036	-.017	.676	Rejected
		2005-06 to 2011-12 (28-Q)	.600	.360	.336	14.651***	Accepted
9.	H3	FII Net Investment is a Significant predictor of Exchange Rate					
	FNI→ExR	2005-06 to 2009-10 (20-Q)	.126	.016	-.039	.289	Rejected
		2007-08 to 2011-12 (20-Q)	.051	.003	-.053	.047	Rejected
		2005-06 to 2011-12 (28-Q)	.068	.005	-.034	.121	Rejected
10.	H3a	FII Gross Purchase is a Significant predictor of Exchange Rate					
	FGP→ExR	2005-06 to 2009-10 (20-Q)	.339	.115	.066	2.343	Rejected
		2007-08 to 2011-12 (20-Q)	.215	.046	-.007	.875	Rejected
		2005-06 to 2011-12 (28-Q)	.069	.005	-.033	.125	Rejected

11.	H3b FGS→ExR	FII Gross Sale is a Significant predictor of Exchange Rate					
		2005-06 to 2009-10 (20-Q)	.401	.161	.114	3.449	Rejected
		2007-08 to 2011-12 (20-Q)	.453	.205	.161	4.638*	Accepted
		2005-06 to 2011-12 (28-Q)	.165	.027	-.010	.723	Rejected
12.	H4 FNI→IIP	FII Net Investment is a Significant predictor of Index of Industrial Production					
		2005-06 to 2009-10 (20-Q)	.181	.033	-.021	.611	Rejected
		2007-08 to 2011-12 (20-Q)	.314	.098	.048	1.967	Rejected
		2005-06 to 2011-12 (28-Q)	.350	.123	.089	3.635	Rejected
13.	H4a FGP→IIP	FII Gross Purchase is a Significant predictor of Index of Industrial Production					
		2005-06 to 2009-10 (20-Q)	.649	.421	.389	13.113**	Accepted
		2007-08 to 2011-12 (20-Q)	.420	.176	.131	3.854	Rejected
		2005-06 to 2011-12 (28-Q)	.748	.559	.542	32.985***	Accepted
14.	H4b FGS→IIP	FII Gross Sale is a Significant predictor of Index of Industrial Production					
		2005-06 to 2009-10 (20-Q)	.749	.561	.537	23.027***	Accepted
		2007-08 to 2011-12 (20-Q)	.310	.096	.046	1.912	Rejected
		2005-06 to 2011-12 (28-Q)	.772	.596	.581	38.412***	Accepted

Note: * indicates the variable significant at 5% significance level; ** indicates the variable significant at 1% significance level and *** indicates the variable significant at 0.1% significance level.

Table 1B Multiple Linear Regression (FII as Dependent Variable)

S. No.	Components	Financial Year	R	R ²	Adjusted R ²	F-Value	Hypotheses Accepted/ Rejected
1.	H5 SnX & ExR→ FNI	Combinations of Sensex and Exchange Rate are Significant predictors of FII Net Investment					
		2005-06 to 2009-10 (20-Q)	.635	.403	.333	5.739*	Accepted
		2007-08 to 2011-12 (20-Q)	.728	.530	.475	9.590**	Accepted
		2005-06 to 2011-12 (28-Q)	.626	.392	.344	8.066**	Accepted
2.	H5a SnX & ExR→FGP	Combinations Sensex and Exchange Rate are Significant predictors of FII Gross Purchase					
		2005-06 to 2009-10 (20-Q)	.853	.727	.695	22.670**	Accepted
		2007-08 to 2011-12 (20-Q)	.807	.652	.611	15.910***	Accepted
		2005-06 to 2011-12 (28-Q)	.890	.791	.775	47.450***	Accepted
3.	H5b SnX & ExR → FGS	Combinations Sensex and Exchange Rate are Significant predictors of FII Gross Sale					
		2005-06 to 2009-10 (20-Q)	.793	.629	.585	14.408***	Accepted
		2007-08 to 2011-12 (20-Q)	.672	.452	.388	7.017**	Accepted
		2005-06 to 2011-12 (28-Q)	.813	.661	.634	24.337***	Accepted
4.	H6 SnX & IIP → FNI	Combinations Sensex and Index of Industrial Production are Significant predictors of FII Net Investment					
		2005-06 to 2009-10 (20-Q)	.710	.504	.445	8.626**	Accepted
		2007-08 to 2011-12 (20-Q)	.668	.446	.380	6.833**	Accepted
		2005-06 to 2011-12 (28-Q)	.638	.407	.360	8.595***	Accepted
5.	H6a SnX & IIP→FGP	Combinations Sensex and Index of Industrial Production are Significant predictors of FII Gross Purchase					
		2005-06 to 2009-10 (20-Q)	.857	.734	.702	23.432***	Accepted
		2007-08 to 2011-12 (20-Q)	.806	.650	.609	15.809**	Accepted
		2005-06 to 2011-12 (28-Q)	.893	.797	.781	49.016***	Accepted
6.	H6b SnX & IIP→FGS	Combinations Sensex and Index of Industrial Production are Significant predictors of FII Gross Sale					
		2005-06 to 2009-10 (20-Q)	.837	.700	.665	19.836***	Accepted
		2007-08 to 2011-12 (20-Q)	.620	.385	.312	5.313*	Accepted
		2005-06 to 2011-12 (28-Q)	.841	.708	.685	30.320***	Accepted
7.	H7 MNI, SnX & IIP→	Combinations MF Net Investment, Sensex and Index of Industrial Production are Significant predictors of FII Net Investment					
		2005-06 to 2009-10 (20-Q)	.737	.543	.457	6.334**	Accepted
		2007-08 to 2011-12 (20-Q)	.684	.467	.368	4.681*	Accepted
		2005-06 to 2011-12 (28-Q)	.677	.459	.391	6.787**	Accepted
8.	H7a MNI, SnX & IIP→	Combinations MF Net Investment, Sensex and Index of Industrial Production are Significant predictors of FII Gross Purchase					
		2005-06 to 2009-10 (20-Q)	.860	.740	.692	15.209***	Accepted
		2007-08 to 2011-12 (20-Q)	.808	.652	.587	10.008***	Accepted
		2005-06 to 2011-12 (28-Q)	.893	.798	.772	31.515***	Accepted

9.	H7b	Combinations MF Net Investment, Sensex and Index of Industrial Production are Significant predictors of FII Gross Sale						
		MNI, SnX & IIP →	2005-06 to 2009-10 (20-Q)	.847	.718	.665	13.548***	Accepted
			2007-08 to 2011-12 (20-Q)	.640	.409	.298	3.695*	Accepted
			2005-06 to 2011-12 (28-Q)	.856	.732	.699	21.869***	Accepted
10.	H8	Combinations MF Net Investment, Sensex, Exchange Rate and Index of Industrial Production are Significant predictors of FII Net Investment						
		MNI, SnX, ExR & IIP → FNI	2005-06 to 2009-10 (20-Q)	.799	.638	.542	6.619**	Accepted
			2007-08 to 2011-12 (20-Q)	.785	.616	.514	6.021**	Accepted
			2005-06 to 2011-12 (28-Q)	.749	.560	.484	7.331***	Accepted
11.	H8a	Combinations MF Net Investment, Sensex, Exchange Rate and Index of Industrial Production are Significant predictors of FII Gross Purchase						
		MNI, SnX, ExR & IIP → FGP	2005-06 to 2009-10 (20-Q)	.861	.741	.671	10.702***	Accepted
			2007-08 to 2011-12 (20-Q)	.809	.655	.563	7.114**	Accepted
			2005-06 to 2011-12 (28-Q)	.893	.798	.762	22.651***	Accepted
12.	H8b	Combinations MF Net Investment, Sensex, Exchange Rate and Index of Industrial Production are Significant predictors of FII Gross Sale						
		MNI, SnX, ExR & IIP → FGS	2005-06 to 2009-10 (20-Q)	.881	.776	.716	12.990***	Accepted
			2007-08 to 2011-12 (20-Q)	.731	.535	.410	4.307*	Accepted
			2005-06 to 2011-12 (28-Q)	.887	.786	.749	21.143***	Accepted

Note: * indicates the variable significant at 5% significance level; ** indicates the variable significant at 1% significance level and *** indicates the variable significant at 0.1% significance level

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- (a) Foreign Institutional Investment Data Retrieved from Securities and Exchange Board of India Web site <http://www.sebi.gov.in/sebiweb/investment/statistics.jsp?s=fii>
- (b) Foreign Institutional Investment Data Retrieved from Securities and Exchange Board of India Web site <http://www.sebi.gov.in/sebiweb/investment/FIITrends.jsp>
- (c) Index of Industrial Production Data Retrieved from CMIE Industry Outlook Web site <http://industryoutlook.cmie.com/>
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- (e) Mutual Fund Investment Data Retrieved from Securities and Exchange Board of India Web site <http://www.sebi.gov.in/sebiweb/investment/MFTrends.jsp>
- (f) Sensex Data Retrieved from Bombay Stock Exchange Web site <http://www.bseindia.com/stockinfo/indices.aspx>
- (g) Exchange Rate data Retrieved from Reserve Bank of India Website: <http://www.rbi.org.in/scripts/referenceratearchive.aspx>
- (a) www.sebi.gov.in/
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A Study on Technical Efficiency of Life Insurance Companies Operating in India in the Post Liberalised Regime – A Dynamic Panel Approach

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ABSTRACT

This paper makes use of the window analysis developed by Klopp (1985) to compare the performance of the major life insurance companies operating in India using a two output two input framework. The window approach evaluates firms on the basis of a panel of observations and thus is different from the conventional DEA. In the conventional DEA, technical efficiency for any particular decision-making unit(DMU) is measured by evaluating the DMU in the light of all the DMUs under observation for the time period. The present study encompasses 18 life insurance companies for the period 2007-08 to 2012-13. The results available from the study suggest that there still exists a huge gap between the Life Insurance Corporation (LIC) of India and other life insurance companies in terms of technical efficiency. However, the gap is expected to come down in future as the industry matures with increase in insurance penetration and density levels in our country.

INTRODUCTION

Competition was infused into the insurance business in India as a fall out of the advent of liberalization, privatization and globalization (LPG) policies. The Malhotra Committee Report (1994) recommended the gradual liberalization of insurance business, the separation of non-life and life business and the introduction of capital adequacy and solvency based regulation of the insurance sector. Following the opening up of the insurance sector in end-1999, four new insurance companies (Birla Sun life Insurance Company, ICICI Prudential Life Insurance Company, Max New York Life Insurance Company and HDFC Standard Life Insurance Company Ltd.) commenced their operations in 2000-01. In the next four years, 11 more life insurance companies entered the market. At present there are 24 life insurance companies operating in India.

In the last few years, the life insurance companies operating in India have made steady progress in terms of business growth. In view of the same, it is of interest to make an enquiry about the operating performance of these companies. The present paper seeks to do the same for the period 2007-08 to 2012-13 using the Window analysis developed by Klopp(1985).

The paper proceeds as follows. Section II provides a brief overview of the growth in life insurance business during the reform period. Section III discusses the methodological issues relating to the Window approach. Section IV describes the received literature on the efficiency studies relating to the life insurance sector. Section V discusses the approach of the paper and states the results available from the present study. Finally, Section VI provides the concluding observations.

Key words:

Corporate Social
Responsibility,
Sustainability, Companies
Act, Amendment.

I. The Life Insurance Sector in India

Of late, the Indian life insurance market is drawing intense attention, fuelled in part by the fast expansion of its insurance markets and the fact that this growth potential is now available to all (subject to the regulatory restriction on foreign equity holding). India is the second most populous country of the world with more than one billion population. The economic growth record is strong (more than six per cent during the past one decade). The Growth of the Life Insurance Sector in the Domestic Market

Sale of Life Insurance Policies

Detailed statistics relating to the sale of new life insurance policies are available for the years 2007-08 to 2012-13. During the period, the life insurance companies sold a total of 2915.55 lac policies. Out of these, LIC had a market share of 76.13 per cent (it sold 2219.6 lac policies). The remaining 23.87 per cent of the market went to the private life insurance companies. In 2012-13, the life insurance companies sold a total of 441.87 lacs new policies. Of this, LIC sold 367.82 lac policies (market share 83.24 per cent) while the private sector life insurers sold 74.05 lac new policies (market share of 16.76 per cent).

Table 1 provides the details regarding year to year sale of new life insurance policies.

Table 1: Sale of New Life Insurance Policies (2007-08 to 2012-13)

Insurer	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
LIC(Rs. in lacs)	376.13	359.13	388.63	370.38	357.51	367.82
Growth (in %)	(-1.61)	(-4.52)	(8.21)	(-4.70)	(-3.47)	(2.88)
Private Insurers(Rs. in lacs)	132.62	150.11	143.62	111.14	84.42	74.05
Growth (in %)	(67.40)	(13.19)	(-4.32)	(-22.61)	(-24.04)	(-12.28)
Total(Rs. in lacs)	508.74	509.24	532.25	481.52	441.93	441.87
Growth (in %)	(10.23)	(0.10)	(4.52)	(-9.53)	(-8.22)	(-0.01)

Source: IRDA Annual Reports.

Growth in Premium Income

During the five-year period (2007-08 to 2012-13), the total premium income of the life insurance sector grew from Rs 201351 crore to Rs 287202 crore i.e., a growth of 42.6 per cent (refer Table 2). For the year 2012-13, the relative shares of first year premium (including single premium) and renewal premium were 37.58 per cent and 62.42 per cent respectively.

Table 2: Collection of Life Insurance Premium (2007-08 to 2012-13) (Figures in Rs crore)

Insurer	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
First Year Premium	93712.52	87331.08	109893.91	126398.18	113966.03	107361.08
Renewal Premium	107638.89	134454.39	155553.34	165239.82	173106.08	179841.41
Total	201351.41	221785.47	265447.25	291638.64	287072.11	287202.49

Source: IRDA Annual Reports.

Table 3 provides the details regarding market share of LIC vis-à-vis private sector Insurers for the observed years. During the period under observation, the market share of LIC declined from 74 per cent to 72 per cent.

Table 3 : Premium Market Share of LIC and Private Insurers (2007-08 to 2012-13) (Figures in Rs crore)

Insurer	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
LIC	149789.99	157288.04	186077.31	203473.40	202889.28	208803.58
Private Insurers	51561.42	64497.43	79369.94	88165.24	84182.23	78398.91
All	201351.41	221785.47	265447.25	291638.64	287072.11	287202.49

Source: IRDA Annual Reports.

International Comparison of Performance

In spite of the recent encouraging developments, the life insurance market was extremely under-penetrated. Tables 4 and 5 provide a comparison of Indian insurance penetration and density levels with the global standards for 2007, 2008, 2009, 2010, 2011 and 2012. Note that insurance penetration is defined as a ratio (in per cent) of premium(in USD) to GDP(in USD) and insurance density is defined as a ratio (in per cent) of premium(in USD) to population.

Table 4 : Insurance Penetration: International Comparison

Country/Region	2007	2008	2009	2010	2011	2012
India	4.00	4.00	4.60	4.40	3.40	3.17
World	4.00	4.10	4.00	4.00	3.80	3.70

Source: IRDA Annual Reports.

Table 5 : Insurance Density: International Comparison

Country/Region	2007	2008	2009	2010	2011	2012
India	40.4	41.2	47.7	55.7	49.0	42.7
World	358.1	369.7	341.2	364.3	378	372.6

Source: IRDA Annual Reports

I. Measurement of Efficiency: The Methodological Issues

The performance of productive units is usually assessed in terms of technical efficiency. The concept of technical efficiency so often used in the efficiency/productivity related literature, actually emerged from the writings of T.C. Koopmans and M.J. Farrell. Koopmans (1951), defined technical efficiency in the following manner: A producer is considered technically efficient if (a) an increase in any output requires – (i) a reduction in at least one other output or (ii) an increase in at least one input and if (b) a reduction in any input requires – (i) an increase in at least one other input or (ii) a reduction in at least one output. Because of its Paretian implication, this approach is known as the Pareto- Koopmans efficiency approach. Farrell (1957) laid the foundation for new approaches to efficiency and productivity studies at the micro level, providing invaluable insights on two issues: defining efficiency and

productivity, and the calculation of the benchmark technology and the efficiency measures. The core of the contribution of Farrell comprised the following:

- (i) Introduction of efficiency measures based on radial uniform contractions or expansions from inefficient observations to the frontier,
- (ii) Specification of the production frontier as being the most pessimistic piecewise linear envelopment of the data,
- (iii) Construction of the frontier through solution of the systems of linear equations,

Obeying the two conditions on the unit isoquant:

- (i) that its slope is not positive;
- (ii) that no observed point lies between it and the origin.

The most immediate consequence of the Farrell measure of efficiency has been the decomposition of efficiency into technical efficiency, price (or allocative) efficiency and overall efficiency corresponding to a firm. The radial contraction/expansion connecting inefficient observed points with (unobserved) reference points on the production frontier as the basis for the measures is the hallmark, and due to fundamental duality between Production and cost functions identical measures can also be defined using the latter. Thus, the Farrell approach enabled us to identify at least three efficiency measures:

- (a) **Technical efficiency:** inputs needed at best practice to produce observed outputs relative to observed input quantities, maintaining observed input ratios;
- (b) **Price efficiency:** costs of producing observed output at observed factor prices assuming technical efficiency, relative to minimised costs at the frontier;
- (c) **Overall efficiency:** costs of producing observed output if both technical efficiency and price efficiency are assumed relative to observed costs.

Measurement of Technical Efficiency

In the production approach, measurement of technical efficiency requires construction of production frontier. This is because efficiency is computed by measuring the distance of an observed point from an idealised production frontier. There are, however, two major competing paradigms for the construction of the frontiers: econometric and mathematical programming (DEA/FDH). The present paper uses the DEA approach.

The DEA Approach

Data envelopment analysis (DEA) is a non-parametric linear programming tool generally used for performance evaluation of economic units. The USP of the method is that it requires very few prior assumption on input-output relationship. The DEA method enables extension of the single input-single output technical efficiency measure to the multiple output-multiple input case. In its constant returns to scale form, the DEA methodology was developed by Charnes et al. (1978). Banker et al. (1984) extended the approach to the case of variable returns to scale. The DEA approach constructs the production frontier from piecewise linear stretches resulting in a convex production possibility set.

Estimation of Technical Efficiency in the Radial DEA Model

Let us consider a productive firm which produces a scalar output Y from a bundle of

k inputs $x=(x_1, x_2, \dots, x_k)$. Let (x_i, y_i) be the observed input-output bundle of firm i ($i=1,2, \dots, n$). The technology used by the firm is defined by the production possibility set.

$$PPS = \{(x,y) : y \text{ can be produced from } x\}$$

An input-output combination (x_0, y_0) is feasible if and only if $(x_0, y_0) \in P_s$

In the input oriented approach (input minimisation subject to output constraint), the problem for any particular firm (under variable returns to scale) is:

$$\begin{aligned} & \text{Max } \phi \\ & \text{s.t. } Y_0 \leq \phi Y, \phi \geq 1, 0 \\ & \phi \leq \sum \lambda_j X_j \\ & \text{Technical efficiency} = 1/\phi \end{aligned}$$

Intertemporal DEA: The Window Analysis

In the conventional DEA technical efficiency for any particular decision-making unit (DMU) is measured by evaluating the DMU in the light of all the DMUs under observation for the time period. This process is repeated for subsequent periods. In the case of Window Analysis, the basic idea is to treat each DMU as a different DMU for different time periods. One thus forms a panel of observations out of the DMU specific observations for different years. The panel is moving in nature i.e., as we progress, the observations relating to the initial years are dropped and those of later years are included. Each DMU is evaluated for the panel years against the panel so formed. The USP of this approach is that one can carry out a kind of sensitivity analysis as to how the efficiency scores change when we migrate from one panel to another as well as to consider the trend in efficiency within the panels. In spite of its elegance, the method has not been used in the Indian context so far.

IV. Empirical Efficiency Estimation of Life Insurance Companies: The Received Literature

The initial research papers on the efficiency of US life insurers, mostly focussed on scale economies (e.g., Grace

and Timme, 1992; Yuengert, 1993 and Gardner and Grace, 1993). These studies tend to find evidence of significant scale economies in the industry, although larger firms generally are found to exhibit decreasing returns to scale.

Cummins and Zi (1998) presented a comparative analysis of frontier cost-efficiency methodologies by applying a wide range of econometric and mathematical programming techniques to a dataset consisting of 445 life insurers over the period 1988-1992. The alternative methodologies gave significantly different estimates of efficiency for the insurers included in the sample. The efficiency rankings were quite well-preserved among the econometric methodologies; but the rank correlations were found to be lower between the econometric and mathematical programming categories and between alternative mathematical programming methodologies. Thus, the choice of methodology had a significant effect on the results. Most of the insurers in the sample display either increasing or decreasing returns to scale, and stock and mutual insurers were found to be equally efficient after controlling for firm size.

During the 1980s and 1990s, the US life insurance industry has experienced an unprecedented wave of mergers and acquisitions. Traditionally, the industry has been known for its high-cost distribution system and lack of price competition, but insurers increasingly faced with more intensive competition from non-traditional sources such as banks, mutual funds and investment advisory firms. These non-traditional competitors have captured a major share of the market for asset accumulation products such as annuities and cash value life insurance. The increased competition has narrowed profit margins and motivated insurers to seek ways to reduce costs. The more stringent solvency standards implemented under the risk-based capital system adopted in 1993 also have put pressure on insurers to strengthen their financial statements. Technological advances in sales, pricing, underwriting and policyholder services have forced insurers to become more innovative; and the relatively high fixed costs of the new systems may have affected the minimum efficient scale in the industry.

In view of this, Cummins, Tennyson and Weiss (1998) examined the relationship between mergers and acquisitions efficiency and scale economies in the US life insurance industry. They estimated cost and revenue efficiency over the period 1988-1995 using DEA. The

Malmquist methodology is used to measure changes in efficiency over time. They found that acquired firms achieve greater efficiency gains than firms that have not been involved in mergers or acquisitions. Firms operating with non-decreasing returns to scale and financially vulnerable firms were found to be acquisition targets. Overall, mergers and acquisitions in the life insurance industry was found to have a beneficial effect on efficiency.

Tone and Sahoo (2005) applied new cost-efficiency model to examine the performance of Life Insurance Corporation (LIC) of India. The findings show a significant heterogeneity in the cost-efficiency scores over the course of 19 years. A decline in performance after 1994-95 can be taken as evidence of increasing allocative inefficiencies arising from the huge initial fixed cost undertaken by LIC in modernising its operations. A significant increase in cost-efficiency in 2000-01 is, however, cause for optimism that LIC may now be realising a benefit from such modernisation. This will stand them in good stead in terms of future competition. Results from a sensitivity analysis are in broad agreement with the main findings of this study.

Sinha (2007) assessed total factor productivity growth in the life insurance industry for the period 2003-2005 using Malmquist total factor productivity index. Comparison of technical efficiency scores of the life insurance companies show that the private insurance companies are still way behind the LIC. Since under the assumption of constant returns to scale (CRS), the inefficient firms are penalised more in terms of distance from the best practice frontier. The mean technical efficiency score of the life insurers under CRS is much lower than under variable returns to scale (VRS). For all the observed years, LIC and SBI Life have a technical efficiency score of 1. All other life insurance firms are technically inefficient (technical efficiency score of less than 1). For 2002-03 and 2003-04, excepting LIC all other insurers exhibited increasing returns to scale. For 2004-05, ING Vysya and Max New York Life exhibited decreasing returns to scale. All the life insurers exhibited positive total factor productivity growth. Obviously, the total factor productivity growth rate of the private life insurers is much higher than LIC. Among the private life insurers, Kotak Life exhibited highest total factor productivity growth rate followed by Aviva Life insurance.

Sinha (2007) compared 13 life insurance companies in respect to technical efficiency for the period 2002-03 to 2005-06 using the assurance region approach. In his paper, year to year comparison of mean technical efficiency scores

reveal that mean technical efficiency has improved in 2003-04 relative to 2002-03, remained on the same level in 2004-05 and declined in 2005-06. This is likely because of divergence in the performance across the life insurers. In the last two years, most of the life insurers have exhibited increasing returns to scale.

Sinha and Chatterjee (2009) estimated cost-efficiency of the life insurance companies operating in India for the period 2002-03 to 2006-07 making use of the new cost efficiency approach advanced by Tone (2002). The results suggest an upward trend in cost-efficiency of the observed life insurers between 2002-03 and 2004-05. However, the trend has been reversed for the next two years i.e., 2005-06 and 2006-07. This has been so because of the fact that during the initial years of observation, mean cost efficiency of the private life insurers was rising.

Sinha and Chatterjee(2011) studied the technical efficiency of 11 life insurance companies using window analysis. They used one input and two outputs. Total expenses related to insurance business was taken as the proxy for the inputs used by the life insurers. The production relation, therefore, is: output (operating income, net premium income)=f (total expenses= operating expenses+ commissions paid). The study covered five-year period: 2002-03 to 2006- 2007. They found that there was a huge gap between the LIC and other life insurance companies in terms of technical efficiency. Among the private sector insurance companies, SBI Life Insurance performed much better than the other in-sample insurers. However, they expected that the gap between LIC and the private sector life insurers would narrow down in future with growing market share of the new entrants as this would facilitate the onset of economies of scale.

This study takes cue from the above mentioned study and therefore tries to analyse the technical efficiency of the present 18 life insurance companies using a dynamic panel approach.

V. Approach of the Paper

The present paper seeks to capture the inter-temporal efficiency trend of Indian life insurance companies for 2007-08 to 2012-13 using a two output-two input framework.

Towards this end, the present study makes use of the Window approach developed by Klopp (1985).

Choice of Output/Input

Defining outputs of insurance firms is a challenging task. Most of the life insurance cost studies focussing on economies of scale and scope, used premiums as proxies for outputs (e.g., Grace and Timme, 1992 and Gardner and Grace, 1993). However, some argued that premiums are not the quantity of outputs but the revenue (price times quantity) (Doherty, 1981; Yuengert, 1993).

As such, the outputs of life insurers may be measured by the services they provide to customers. In general, life insurers provide two principal services: risk bearing/ risk pooling services and intermediation services. Life insurers collect premiums and annuity considerations from customers and redistribute most of the funds to those policyholders who sustain losses (the risk bearing/ risk pooling service). Funds are collected in advance of paying benefits and held in reserves until claims are paid (the intermediation service). In view of this, the present paper considers two output indicators: operating income and net premium income=(gross premium earned-reinsurance ceded+reinsurance accepted). We have included premium income as one of the output indicators because in the early years the growth of premium income facilitates the new entrants to consolidate their business. On the other hand, operating income is indicative of the intermediation service rendered by the life insurer.

In this paper, total expenses related to insurance business has been taken as the proxy for the inputs used by the life insurers. The production relation, therefore, is: output (operating income, net premium income)=f (operating expenses,commissions paid). Estimates have been made for the six-year period: 2007-08 to 2012-2013.

Choice of Window Length

Suppose we have m number of DMUs with observations for n periods. Suppose also that k is the length of the window (k d" n). Then the length of the window is determined on the basis of the formula:

$k=(n+1)/2$ when n is odd and $k=(n+1)/2 \pm 1/2$ when n is even.

For a detailed account on this, see Charnes and Cooper (1991).

In the present study $n=6$, so $k=3.5$. Thus, the window length has been taken as 3 for the estimation of technical efficiency.

Data Source

The data relating to input and output used in the paper have been taken from the IRDA Annual Reports. The reports are available on the IRDA website. We have considered 18 insurance companies for the period of study. Taking 2007-08 as the base year, the input and output data pertaining to the subsequent years have been appropriately deflated.

Descriptive Statistics of Outputs/Inputs

Table 6 provide the descriptive statistics of the two outputs (benefits paid and net premium) and two inputs (Operating expenses and Commission expenses).

Table 6 : Descriptive Statistics of Operating Income (Output Indicator) (Figures in Rs lac)

Statistical Measure	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Max	5657299	4299261	11264424	9579923	8442610	11753830
Min	1018	-523277	16831	3975	-43617	5810
Average	404508.5	178207.6	956046.1	665140.9	476724.7	804679.3
SD	1282220	1008683	2537879	2167831	1932143	2660907

Source: Calculated.

Table 7 : Descriptive Statistics of Net Premium Income (Output Indicator) (Figures in Rs lac)

Statistical Measure	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Max	14978999	15728804	18607731	20347340	20288928	20880358
Min	249	15260	25059	24341	22595	20538
Average	1118535	1230024	1464844	1599210	1566700	1565607
SD	3379725	3538012	4180081	4570984	4559521	4700691

Source: Calculated.

Table 8 : Descriptive Statistics of Operating Expenses (Input Indicator) (Figures in Rs lakh)

Statistical Measure	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Max	830932	906429	1224582	1698028	149144012	1670766
Min	1004	3973	3700	3298	390749	4026
Average	113009.9	140817.1	156085.9	177174.1	15835439	168441.9
SD	188091.8	199599.3	267190.1	373325.6	32730608	368359

Source: Calculated.

Table 9 : Descriptive Statistics of Commission Expenses (Input Indicator) (Figures in Rs lakh)

Statistical Measure	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Max	956810	1003324	1211031	1330868	1403563	1476798
Min	4	1545	2368	2208	2220	1880
Average	81413.67	85451.67	99291.44	100165.2	101618.6	105558.2
SD	215156.1	224265.5	270958.2	299318.4	316423.5	333334.3

Source: Calculated.

Insurer-wise Technical Efficiency

Table 10 depicts the insurer-wise technical efficiency scores for each of the observed years. Note that apart from the beginning and closing years, each of the insurers is evaluated multiple times on the basis of the panels formed (2007-08 to 2010-11, 2008-09 to 2011-2012 and 2009-10 to 2012-13). For each insurer, we have three rows of efficiency scores.

The first row presents the efficiency scores for the relative years in the light of the first panel (2007-08 to 2010-11), the second row presents the efficiency scores for the relative years on the basis of the second panel (2008-09 to 2011-12) and so on. The column views in the table enable us to consider the stability of efficiency scores across the panels. On the other hand, the row views enable us to determine the trend in efficiency scores with the same panel.

Table 10 : Insurer-wise technical efficiency

	2008	2009	2010	2011	2012	2013	Average	C-Average
BSL	0.499665	0.456436	0.496726				0.484276	
		0.400346	0.498743	0.540118			0.479735	
			0.498743	0.540118	0.587931		0.542264	
				0.540118	0.587931	0.645051	0.591033	0.524327
ICI	0.665836	0.837191	1				0.834342	
		0.689367	1	1			0.896456	
			1	1	0.728007		0.909336	
				1	0.728007	0.883841	0.870616	0.877687
ING	0.433285	0.488505	0.52994				0.48391	
		0.48416	0.548645	0.486461			0.506422	
			0.57084	0.50724	0.479108		0.519063	
				0.495538	0.473177	0.557769	0.508828	0.504556
LIC	1	1	1				1	
		1	1	1			1	
			1	1	0.94534		0.98178	
				1	0.945348	1	0.981783	0.990891
HDF	0.72755	0.486557	0.591412				0.60184	
		0.419666	0.592264	0.677925			0.563285	
			0.592264	0.677925	0.561329		0.610506	
				0.677925	0.561329	0.770198	0.669817	0.611362
MNY	0.346154	0.368346	0.463009				0.392503	
		0.324208	0.400137	0.425631			0.383325	
			0.400137	0.425631	0.356756		0.394175	
				0.425631	0.356756	0.493455	0.42528	0.398821
REL	0.451884	0.348471	0.486647				0.429001	
		0.297767	0.45248	0.470193			0.406813	
			0.45248	0.470193	0.450653		0.457775	
				0.470193	0.450653	0.560637	0.493827	0.446854
BAJ	0.376722	0.537586	0.71559				0.543299	
		0.471421	0.719424	0.634054			0.6083	
			0.719424	0.634054	0.6195		0.657659	
				0.667081	0.6195	0.8958	0.72746	0.63418
SBI	0.895221	0.896971	1				0.930731	
		0.809034	1	1			0.936345	
			1	1	0.799657		0.933219	
				1	0.799657	0.980206	0.926621	0.931729

KOT	0.499887	0.477699	0.703067				0.560218	
		0.429682	0.617499	0.752297			0.599826	
			0.617499	0.79909	0.896701		0.771097	
				0.791451	0.896701	0.830355	0.839502	0.692661
TAT	0.388594	0.417702	0.494571				0.433622	
		0.378879	0.473234	0.543921			0.465345	
			0.473234	0.551866	0.858385		0.627828	
				0.546392	0.858385	1	0.801592	0.582097
MET	0.244825	0.305818	0.4224				0.324348	
		0.286849	0.407861	0.955305			0.550005	
			0.407861	1	0.781274		0.729712	
				1	0.781274	0.70729	0.829521	0.608396
AVI	0.37751	0.477954	0.547594				0.467686	
		0.443662	0.548996	0.775501			0.589386	
			0.587633	0.829929	0.904693		0.774085	
				0.823561	0.903757	0.755931	0.82775	0.664727
SAH	0.730361	0.528136	0.735625				0.664707	
		0.904826	1	1			0.968275	
			1	1	0.994594		0.998198	
				1	0.874417	0.999999	0.958139	0.89733
SHR	0.946284	0.494677	0.502488				0.647816	
		0.654124	0.587472	0.913086			0.718227	
			0.587472	0.950526	0.677908		0.738635	
				0.908227	0.642258	0.656858	0.735781	0.710115
BHA	0.580495	0.33779	0.383954				0.434079	
		0.432134	0.415063	0.764306			0.537168	
			0.549598	0.964031	0.947732		0.820454	
				0.919492	0.906015	1	0.941836	0.683384
FUT	1	0.349306	0.179454				0.509587	
		0.927565	0.23477	0.342198			0.501511	
			0.256662	0.393585	0.428909		0.359719	
				0.404763	0.410166	0.566171	0.460367	0.457796
IDB	1	0.748932	0.556975				0.768636	
		1	0.672936	0.563583			0.745506	
			0.734422	0.587355	0.567741		0.629839	
				0.560321	0.541451	0.511845	0.537872	0.670463
Average	0.620237	0.553105	0.619023	0.729756	0.692305	0.767523		

Life Insurer-wise Mean Efficiency Scores

In Table 10 we have presented the insurer-wise efficiency scores across and within panels for the different years under study. We now provide the information relating to two kinds of mean efficiency scores: averages through the

window and averages by the years for each of the 18 life insurers. The efficiency averages through the window analysis are provided in Table 11. The efficiency averages by the years are provided in Table 12. See also Figure 1 and 2.

Table 11 : Efficiency Average Through Window

	2008-2009-2010	2009-2010-2011	2010-2011-2012	2011-2012-2013
BSL	0.484276	0.479735	0.542264	0.591033
ICI	0.834342	0.896456	0.909336	0.870616
ING	0.48391	0.506422	0.519063	0.508828
LIC	1	1	0.98178	0.981783
HDF	0.60184	0.563285	0.610506	0.669817
MNY	0.392503	0.383325	0.394175	0.42528
REL	0.429001	0.406813	0.457775	0.493827
BAJ	0.543299	0.6083	0.657659	0.72746
SBI	0.930731	0.936345	0.933219	0.926621
KOT	0.560218	0.599826	0.771097	0.839502
TAT	0.433622	0.465345	0.627828	0.801592
MET	0.324348	0.550005	0.729712	0.829521
AVI	0.467686	0.589386	0.774085	0.82775
SAH	0.664707	0.968275	0.998198	0.958139
SHR	0.647816	0.718227	0.738635	0.735781
BHA	0.434079	0.537168	0.820454	0.941836
FUT	0.509587	0.501511	0.359719	0.460367
IDB	0.768636	0.745506	0.629839	0.537872

Source: Calculated

Table 12 Efficiency Average by Year

	2008	2009	2010	2011	2012	2013
BSL	0.499665	0.428391	0.498071	0.540118	0.587931	0.645051
ICI	0.665836	0.763279	1	1	0.728007	0.883841
ING	0.433285	0.486333	0.549808	0.496413	0.476143	0.557769
LIC	1	1	1	1	0.945344	1
HDF	0.72755	0.453111	0.59198	0.677925	0.561329	0.770198
MNY	0.346154	0.346277	0.421094	0.425631	0.356756	0.493455
REL	0.451884	0.323119	0.463869	0.470193	0.450653	0.560637
BAJ	0.376722	0.504504	0.718146	0.645063	0.6195	0.8958
SBI	0.895221	0.853003	1	1	0.799657	0.980206
KOT	0.499887	0.45369	0.646022	0.780946	0.896701	0.830355
TAT	0.388594	0.398291	0.480346	0.547393	0.858385	1
MET	0.244825	0.296334	0.412708	0.985102	0.781274	0.70729
AVI	0.37751	0.460808	0.561408	0.809664	0.904225	0.755931
SAH	0.730361	0.716481	0.911875	1	0.934505	0.999999
SHR	0.946284	0.574401	0.559144	0.923946	0.660083	0.656858
BHA	0.580495	0.384962	0.449538	0.88261	0.926873	1
FUT	1	0.638436	0.223629	0.380182	0.419537	0.566171
IDB	1	0.874466	0.654778	0.57042	0.554596	0.511845

Source: Calculated

Figure 1 : Technical Efficiency Characteristics of Life Insurers: Average through the Window Analysis

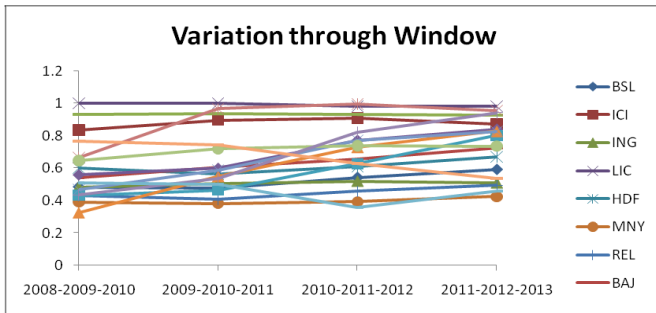
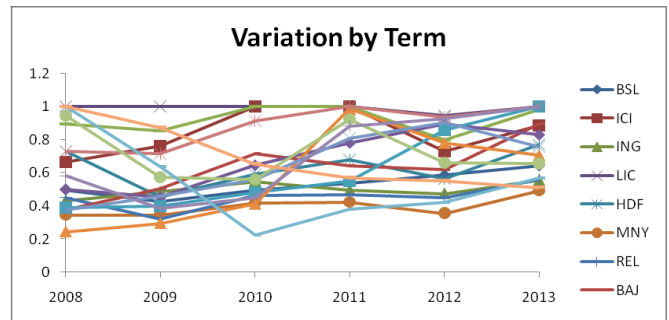


Figure 2 : Technical Efficiency Characteristics of Life Insurers: Average by Years Trends in Mean Technical Efficiency



Tables 13 and 14 present the efficiency averages through the window analysis and the efficiency averages by years. If we consider the averages through the window then we find that the in-sample life insurers have exhibited an upward rising trend. Further inspection reveals that the upward move is due to the new life insurers. LIC exhibited a declining efficiency trend through the window.

If we consider the averages through the years then we find that for the initial three years, overall technical efficiency had exhibited an upward trend but the trend has been reversed in the next two years. Actually, the reversal of the trend is due to the new life insurers.

Table 13 : Technical Efficiency Characteristics of Life Insurers: Average through Window Analysis

Particulars	2007-08 to 2009-2010	2008-09 to 2010-11	2009-10 to 2011-12	2010-11 to 2012-13
LIC	1	1	0.98178	0.981783
Others	0.559447	0.615055	0.674915	0.714461
All	0.583922	0.636441	0.691963	0.729313

Source: Calculated

Table 14 : Technical Efficiency Characteristics of Life Insurers: Average by Years

Particulars	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
LIC	1	1	1	1	0.945344	1
Others	0.597898	0.526817	0.596613	0.713859	0.677421	0.753847
All	0.620237	0.553105	0.619023	0.729756	0.692305	0.767523

Source: Calculated

VI. Concluding Observations

In the present paper we have made use of the window analysis to compare the performance of the major life insurance companies operating in India for the period 2007-2008 to 2012-13 using a two output-two input framework. The results suggest that there still exists a huge gap between the LIC and other life insurance companies in terms of technical efficiency. Among the private sector insurance companies, SBI Life Insurance performed much better than the other in-sample insurers. It is expected that the existing gap between LIC and the private sector life insurers would narrow down in future with growing market share of the new entrants as this would facilitate the onset of economies of scale.

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Asymmetric Stock Beta Behavior: A Quantile Regression Analysis

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ABSTRACT

The research focuses on estimating the asymmetric behavior of stock betas of selected 'Category A' stocks listed at Bombay Stock Exchange (BSE) over the bullish and bearish market states using Quantile Regression Approach. Since the inception of Capital Asset Pricing Model (CAPM) which is considered as the corner-stone in the field of finance, lot of researches have been done with variations in the model. The literature reviews suggests that lot more hidden facts may be revealed if the sample data exhibits heteroskedasticity. The presence of heteroskedasticity makes the data inapt for using simple Ordinary Least Square (OLS) method of regression. The study investigates the effect of the changes in market portfolio returns on selected blue chip companies (19 stocks selected on the basis of market capitalization) listed at Bombay Stock Exchange in lower (0.1 to 0.3), medium (0.4 to 0.6) and higher return ranges (0.7 to 0.9) during the up and down stock market states. The sample data of individual stocks and BSE Sensex has been collected from PROWESS Database of CMIE for the period ranging from January 2005 to December 2012. Due to the skewness and heteroskedasticity of data samples, the quantile regression approach has been employed to avoid estimation bias. It has been found that the individual stock returns are sensitive to the changes of market portfolio returns among various individual stocks' return ranges in different market states. The quantile regression results indicate that the effect of bearish market has a larger impact on lower quantiles of stock returns. For lower return ranges downside stock beta is significantly higher than the upside stock beta for all the stocks. For stocks like BHEL, HDFCB, HUL, ICICIB, INFY, SAIL, WIPRO, NTPC and SIL downside stock beta is more than 2 times the upside stock beta. For stocks like REL and BA downside beta is within the range of 1-2 times the upside stock beta. IOCL is the most volatile stock in the lower return ranges. The results clearly indicate that the returns of 'A' category stocks are more reactive to the negative market returns in the lower quantiles ranging from 0.1 to 0.3. This shows that in the lower quantile range, a small negative force is sufficient enough to make the stock returns fall rapidly or to make it more volatile, whereas they become less reactive to the positive movements in the market portfolio. In the higher quantile range, the stock returns exhibit an opposite behavior. They are more reactive to the positive movements in market portfolio rather than negative movements. The results of the research enable to develop a measure of determining the behavior of investors in their preference towards the blue chip stocks in good and bad times. The results obtained may be used as an input in the portfolio management by identifying the stocks which are underperformers and outperformers in the lower, medium and higher quantile ranges in up and down market states.

INTRODUCTION

This paper focuses on the asymmetric stock beta reaction towards the market portfolio returns in Indian stock market using quantile regression approach. The literature in finance has witnessed a multiple growth of empirical studies testing the validity of CAPM and the stability of beta- a measure of systematic risk. Beta is a measure of a stock's volatility in relation to the market portfolio. Beta of market index has a value of 1. A stock that fluctuates more than the market over time has a beta greater than 1. If a stock moves less than the market, the stock's beta is less than 1. High-beta stocks are considered to be riskier but provide a potential for higher returns; low-beta stocks pose less risk but also lower returns.

Key words:

market portfolio,
asymmetric beta, quantile
regression.

Subsequent to the proposition by **Levy (1974)** to compute separate betas for bull and bear markets, **Fabozzi and Francis (1977)** were the first to formally estimate and test the stability of betas over the bull and bear markets. They defined bull and bear markets in the following three ways: (i) these markets were delineated in accordance with the dates published in the investment textbook; (ii) positive market return was defined as up (bull) market, while the negative market return was defined as down (bear) market and (iii) substantial up and down markets were defined as bull and bear markets respectively, as measured by absolute market returns larger than half of the return standard deviation of the entire sample. These studies found no evidence supporting the beta instability. For the purpose of this research, we adopted (ii) definition i.e. the days on which market return is positive has been considered bull state while the days on which the market return is negative has been defined as bear market. The results thus obtained are more relevant for the investors who trade on daily basis. However, in a subsequent work **Fabozzi and Francis (1978)** concluded that investors like to receive a positive premium for accepting downside risk, while a negative premium was associated with the up market beta, suggesting that downside risk - as measured by the beta corresponding to bear market - may be a more appropriate measure of portfolio risk than the conventional single beta. Motivated by the research of **Fabozzi and Francis (1978)**, **Kim and Zumwalt (1979)** analysed the variation of returns on security and portfolios in up and down markets. They defined the up and down markets in following manner: Up market constituted those months in which the market return exceeded (i) the mean market return, (ii) the mean risk-free rate or (iii) zero. **Chen (1982)** examined the risk return relationship in the up and down markets. Both **Kim- Zumwalt (1979)** and **Chen (1982)** concluded that down market beta is an appropriate measure of portfolio risk rather than single beta. Since the introduction of ARCH/GARCH processes by **Engle (1982)**, testing and modeling time varying volatility of stock returns and time varying beta has gained considerable attention in empirical literature on finance. Several studies have investigated the effect of good and bad news, as measured by positive and negative returns, i.e., leverage effects, on beta. See, for example, **Campbell and Hentschel (1992)**, **Braun, Nelson, and Sunier (1995)** and **Cho and Engle (2000)**. **Bhardwaj and Brooks (1993)**, found that beta vary between bull and bear market.

Distribution of data used in research has a considerable impact on the results. If the data under consideration used to depict a cause and effect relationship is skewed (**Coad and Rao, 2006**) or heteroskedastic (**Choi and Jeong, 2007; Landajo, De Andres and Lorca, 2008**), the conditional mean estimates may be unreliable (**Barnes and Hughes, 2002**). In this study, we focus on the relationship between changes in Stock's Return and Index Returns. The distribution of Index returns exhibit a high degree of non-normality (**Lee, Robinson and Reed, 2008; Jirasakuldech, Campbell and Emekter, 2009**) and excess skewness value (**Young and Graff, 1995; Lu and Mei, 1999; Hutson and Stevenson, 2008**). **Koenker and Hallock (2001)** document that quantile regression can minimize estimated bias generated from skewed sample. Quantile regression, introduced by **Koenker and Bassett (1978)**, is an extension of median regression and is based on the minimization of weighted absolute deviations to estimate conditional quantile functions. In contrast to the resulting estimated coefficients from OLS regression, the quantile regression estimator is robust to extreme values (**Koenker and Bassett, 1978**).

METHODOLOGY

Quantile regression has been successfully applied to many research tasks in economics, and applications include investigations of economics growth theory (**Mello and Perrelli, 2003**), and wealth distribution (**Chernozhukov and Hansen, 2004**). Financial applications include investigation of the relationship of political cycles and the stock market (**Santa-Clara and Valkanov, 2003**), firm performance (**Landajo et al., 2008**) and hedge fund returns (**Meligkotsidou, Vrontos and Vrontos, 2009**).

Database

The research focuses on estimating the asymmetric behavior of stock betas of selected 'Category A' securities listed at BSE. The scrips have been selected on the basis of average annual market capitalization of two years as on June 30, 2012 (Annexure 1). Following the criteria that sample should be a representative sample; we selected first 22 companies in terms of market capitalization as on 30 June 2012. These 22 companies represent more than 50% of the total market capitalization of 'Category A' stocks thus representing the movement in the 'Category A' stocks at BSE. Out of 22 companies selected, the daily continuous

data was available for 19 companies from 1 January 2005 to 31 December 2012. Due to the non-availability of continuous data series three companies namely, Coal India Ltd., MMTC, NMDC Ltd were dropped and hence not considered for the purpose of research.

Data for the purpose of the current research has been gathered from Prowess data base of CMIE. Daily adjusted closing prices have been taken for Sensex and sample stocks listed at BSE for the period of study. Daily stock prices have been converted to daily lognormal returns. The present study uses the logarithmic difference of prices of two successive periods for the calculation of rate of return. If I_t be the closing level of Sensex or the closing price of sample stocks on date t and I_{t-1} be the same for its previous business day, i.e., omitting intervening weekend or stock exchange holidays, then the one day return on the Sensex or sample stocks is calculated as:

$$r_t = \ln(I_t/I_{t-1}) \times 100 \quad (1)$$

where, $\ln(x)$ is the natural logarithm of 'x.'

Empirical Model

The quantile regression estimator can be obtained as the solution to a linear programming problem. Several algorithms for obtaining a solution to this problem have been proposed in the literature. EViews uses a modified version of the Koenker and D'Orey (1987) version of the Barrodale and Roberts (1973) simplex algorithm. Quantile regression estimates have been obtained using E Views7.¹

Asymmetric Beta Model: Effect of good and bad news

Several studies have argued that \hat{a} depends on good news and bad news to market defined as positive and negative market returns respectively. Therefore, following model has been estimated:

Mean Return Equation:

$$R_t = a + \hat{a}_U R_{M^+} I_{Pt} + \hat{a}_D R_{M^-} I_{Nt} + \hat{a}_t \quad \hat{a}_t \sim N(0, \hat{\sigma}_t^2) \quad (2)$$

R_t = Return on security / portfolio

R_M = Return on market portfolio

a = Constant term

\hat{a}_U = Measure of systematic risk when the Market is positive. ie Beta

\hat{a}_D = Measure of systematic risk when the Market is negative. ie Beta

I_{Pt} = Dummy Variable which takes the value 1 when the market is positive or '0' otherwise

I_{Nt} = Dummy Variable which takes the value 1 when the market is negative or '0' otherwise

\hat{a}_t = Residual error

We adopt the following quantile modes for the analysis of individual stock return, considering the following \hat{e}^{th} quantile regression model. The quantile regression equation we employ for our multivariate analysis takes the form:

$$R_t = a^{\hat{e}} + \hat{a}_U^{\hat{e}} R_{M^+} I_{Pt} + \hat{a}_D^{\hat{e}} R_{M^-} I_{Nt} + \hat{a}_t \quad (3)$$

Where

$a^{\hat{e}}$ = Constant or intercept for \hat{e}^{th} quantile (0.1 to 0.9)

$\hat{a}_U^{\hat{e}}$ = Responsiveness of stocks' return to market return in \hat{e}^{th} quantile range. (0.1 to 0.9) when the market is bullish.

$\hat{a}_D^{\hat{e}}$ = Responsiveness of stocks' return to market return in \hat{e}^{th} quantile range. (0.1 to 0.9) when the market is bearish.

Descriptive Statistics, Statistical Analysis and Diagnostic Tests

Descriptive statistics of BSE Sensex and sample companies are presented in table 1.2. Negative skewness in stock returns is induced by asymmetries in the news disclosure policies of firm and market in general. The returns on Sensex, BHEL, INFY, REL, SBI, WIPRO, BA, JSPL and SIL are negatively skewed, implying that the distribution is non-symmetric and large negative returns are more common as compared to positive returns. The sample stock returns and the market returns exhibit the property of excess kurtosis. Value of kurtosis coefficient for stocks like HDFCB, INFY, REL, and JSPL is extremely high (even higher than BSE Sensex) indicating that the stock returns exhibits extreme volatility situations. GARCH model helps to explain this feature of leptokurtosis partially. Looking at the p-values of JB statistics for Sensex and the sample (19) stock returns, the hypothesis of normal distribution is rejected at 1% significance level. The Ljung-Box(LB) Q(1) and Q(12) statistics indicates the serial autocorrelation upto lag 1 and cumulative autocorrelation upto lag 12 respectively. Q(1) and Q(12) are statistically significant (

at 1% and 5%) for Sensex, BHEL, HDFC, HUL, ICICIB, INFY, IOCL, ONGC, SAIL, SBI, WIPRO, JSPL and LNT indicating the serial correlation in the stock return series. Hence, the same should be taken into account while modeling the mean equation. Stocks like HDFCB, ITC, BA, NTPC and TCS do not show a significant Q(1), but have significant Q(12), indicating serial autocorrelation up to lag 12. Q-Statistics is calculated up to 22 lags for Sensex and sample stocks. Table 1.1 shows the division of daily stock return series into different quantiles. For $\hat{\epsilon} = 0.1$ to 0.3 has been considered as lower return range, $\hat{\epsilon} = 0.4$ to 0.6 as medium return range and $\hat{\epsilon} = 0.7$ to 0.9 has been considered as higher return range. It has been observed that for all the sample stocks the stocks returns are negative in its lower return range. The medium return range shows the transitions from negative to positive returns, whereas the returns are positive in its higher quantile range. This shift in the values from lower to higher quantile ranges makes the OLS regression inapt to gauge the effect of variation in stocks returns in different quantile ranges. OLS regression predicts the mean value of dependent variable, but it fails to give the answer to the following questions: Does the stock reacts equally when it is in its lower quantile range or higher quantile range? Is the particular stock more volatile in its lower quantile range or in higher quantile range? Quantile regression enables us to answer these questions.

Quantile Regression Results (Lower Return Ranges):

For lower return ranges (Table 1.4) downside stock beta is significantly higher than the upside stock beta for all the stocks. For stocks like BHEL, HDFCB, HUL, ICICIB, INFY, SAIL, WIPRO, NTPC and SIL downside stock beta is more than 2 times the upside stock beta. For stocks like REL and BA downside beta is within the range of 1-2 times the upside stock beta. IOCL is the most volatile stock in the lower return ranges. The results clearly indicate that the returns of 'A' category stocks are more reactive to the negative market returns in the lower quantiles ranging from 0.1 to 0.3

Quantile Regression Results (Medium Return Ranges):

Mixed results are obtained for medium return ranges (Table 1.5). Stocks like IOCL, SBI, JSPL and SIL persistently exhibits a reactive nature to the negative stock market returns in 0.4, 0.5 and 0.6 quantile ranges.

Quantile Regression Results (Higher Return Ranges):

In the higher quantile range, the stock returns exhibit an opposite behavior. They are more reactive to the positive movements in market portfolio rather than negative movements. For stocks like HDFC upside stock beta is more than 2 times the downside stock beta. For remaining stocks

Table 1.1 Quantiles for Stock Return Series

	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Rbhel	-0.02796	-0.01637	-0.00958	-0.00379	0.00034	0.00505	0.010918	0.019056	0.03167
Rhdfcb	-0.0236	-0.01435	-0.00804	-0.00351	0.00027	0.004006	0.009115	0.015096	0.02589
Rhul	-0.02337	-0.01457	-0.00857	-0.0041	-0.0002	0.00356	0.008254	0.015136	0.024449
Rhdfc	-0.02647	-0.01544	-0.00886	-0.00414	0.000145	0.004682	0.010064	0.017106	0.030307
Ricicib	-0.03266	-0.01932	-0.01112	-0.00515	0.000075	0.005642	0.011854	0.020398	0.035263
Ritc	-0.02335	-0.01354	-0.00772	-0.00334	0	0.004038	0.008837	0.015354	0.025466
Riocl	-0.02628	-0.01491	-0.00859	-0.00404	-0.0001	0.003818	0.00904	0.01584	0.026719
Rinfy	-0.02804	-0.01668	-0.00961	-0.0044	0.00022	0.00494	0.010128	0.017784	0.029949
Rongc	-0.02601	-0.01463	-0.00849	-0.00386	0.0004	0.004658	0.009877	0.016336	0.027786
Rrel	-0.0253	-0.01501	-0.00874	-0.00361	0.0012	0.00534	0.010487	0.016828	0.02718
Rsbil	-0.0271	-0.01647	-0.00906	-0.0041	0.000945	0.005684	0.010931	0.018516	0.028941
Rsail	-0.03547	-0.0219	-0.01239	-0.00613	0	0.006086	0.012804	0.022604	0.03879
Rwipro	-0.03268	-0.0189	-0.01151	-0.00532	0	0.005568	0.011302	0.019424	0.033911
Rtcs	-0.02398	-0.01439	-0.00848	-0.00428	0.000609	0.004502	0.009558	0.015854	0.026527
Rsil	-0.03787	-0.02095	-0.01158	-0.00469	0.000835	0.007232	0.014918	0.024772	0.038754
Rntpc	-0.02155	-0.01266	-0.00777	-0.00373	0	0.003346	0.007755	0.01342	0.023644
Rba	-0.02627	-0.01657	-0.00932	-0.00429	0.000229	0.005143	0.01102	0.018928	0.03021
Rjspl	-0.03048	-0.01812	-0.01024	-0.00433	0.001039	0.006611	0.013046	0.022059	0.036353
Rlnt	-0.02876	-0.01616	-0.00889	-0.00374	0.000737	0.005426	0.010841	0.018564	0.03148

Table 1.2 Descriptive Statistics of Daily Return Data

	Mean	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	p-value	ACF at lag 1	at Lag 1 (Sqr) ACF
RBSE	0.00043	0.1718925	-0.11041415	0.0179235	0.2761815	9.2516	4612.9124	0	0.076	0.207
RBHEL	0.00045	0.2105495	-0.212432	0.0288225	0.0354525	7.9184	2835.3831	0	0.041	0.238
RHDFC	0.00104	0.2045295	-0.11585585	0.0267645	0.5080365	7.3528	2277.8934	0	0.045	0.172
RHDFCB	0.00114	0.23532825	-0.2160224	0.024444	0.2824745	11.9382	9437.3188	0	0	0.375
RHUL	0.00098	0.121819	-0.15215255	0.022155	0.061335	6.4842	1420.5044	0	0.043	0.225
RICICIB	0.00012	0.222654	-0.20529795	0.0333165	0.05423	7.1609	2023.2724	0	0.115	0.303
RINFY	0.00097	0.1595515	-0.2914395	0.0294315	-0.908367	11.8675	9480.1529	0	0.08	0.284
RIOCL	0.00039	0.19574675	-0.1867569	0.026166	0.24012	10.0899	5932.7905	0	0.137	0.33
RITC	0.00047	0.113133	-0.10386915	0.022848	0.071514	6.2014	1199.4558	0	-0.007	0.237
RONGC	0.00078	0.195994	-0.15205905	0.025872	0.2206755	8.5749	3667.1383	0	0.08	0.207
RREL	0.00076	0.20574425	-0.27200085	0.026082	-0.962742	14.7864	16629.7813	0	0.045	0.136
RSAIL	0.00070	0.28277875	-0.17889355	0.0367815	0.4875915	7.9083	2879.2171	0	0.048	0.361
RSBI	0.00084	0.1982085	-0.1493943	0.026292	-0.152627	6.7367	1634.3113	0	0.067	0.281
RWIPRO	0.00086	0.2166125	-0.1896741	0.0348915	0.2272585	8.0194	2971.42	0	0.05	0.366
RBA	0.00015	0.170882	-0.1321529	0.02583	-0.096512	5.7671	502.8386	0	0.03	0.198
RJSPL	0.00081	0.24532575	-0.2866897	0.03549	-0.115652	12.6553	6214.732	0	0.143	0.188
RLNT	0.00192	0.24158475	-0.1090584	0.0273315	0.661548	7.9285	1664.5406	0	0.107	0.212
RNTPC	0.00130	0.13827725	-0.14267165	0.022407	0.103733	8.1305	1742.9772	0	0.01	0.228

Table 1.3: Unit Root Test Statistics

	ADF				PP			
	Level		Lognormal Returns		Level		Lognormal Returns	
	t-Statistic	Prob.*	t-Statistic	Prob.*	Adj. t-Stat	Prob.*	Adj. t-Stat	Prob.*
RBSE	-2.702255	0.267	-50.9769	0	-2.583984	0.2998	-49.9425	0
RBHEL	-2.240281	0.4687	-42.0047	0	-2.425515	0.3786	-51.7562	0
RHDFC	-2.400972	0.4015	-29.1007	0	-2.666804	0.2622	-53.0434	0
RHDFCB	-2.117768	0.5568	-38.9549	0	-1.779115	0.7233	-54.4883	0
RHUL	-2.936474	0.1702	-52.6949	0	-2.597619	0.2934	-52.1958	0
RICICIB	-2.239473	0.4891	-38.4256	0	-2.541564	0.3201	-47.7639	0
RINFY	-2.556411	0.3229	-36.7356	0	-2.410567	0.3864	-49.7926	0
RIOCL	-3.630849	0.0314	-47.9749	0	-3.523991	0.0407	-46.7828	0
RITC	-1.662258	0.7757	-55.2614	0	-1.20897	0.9101	-54.5446	0
RONGC	-4.263008	0.0032	-39.8973	0	-4.093934	0.0074	-49.6715	0
RREL	-2.17352	0.5158	-50.5916	0	-2.299265	0.4462	-51.5572	0
RSAIL	-2.426626	0.378	-51.4567	0	-2.489751	0.3457	-51.3637	0
RSBI	-2.984752	0.1453	-50.4727	0	-2.741544	0.2307	-50.3827	0
RWIPRO	-3.180288	0.0953	-51.3027	0	-2.867592	0.1832	-51.4513	0
RBA	-1.998992	0.6117	-31.4453	0	-1.84022	0.6938	-39.8412	0
RJSPL	-2.326838	0.4311	-35.0452	0	-2.137766	0.5355	-34.8472	0
RLNT	-2.16342	0.5213	-36.3595	0	-2.139584	0.5346	-36.2613	0
RNTPC	-2.752654	0.2263	-40.0781	0	-2.468541	0.3564	-40.4916	0
RSIL	-2.042826	0.5879	-38.0168	0	-2.06242	0.5772	-37.9602	0
RTCS	-1.04535	0.9374	-26.3198	0	-0.806586	0.9643	-39.8153	0
Test critical values:	1% level		-3.9612		5% level		-3.4114	
	10% level		-3.1275					

Table 1.4 Quantile Regression Results											
Dependent Variable: Individual Stock Returns											
S.No	Stock	Theta	Lower Return Ranges								
			0.1			0.2			0.3		
			Value	Sig Value	SE	Value	Sig Value	SE	Value	Sig Value	SE
1	BHEL	Constant	-0.0178	0.0000	0.0010	-0.0105	0.0000	0.0007	-0.0067	0.0000	0.0006
		DHRM	0.6422	0.0000	0.1064	0.7099	0.0000	0.0525	0.8323	0.0000	0.0695
		DLRM	1.5101	0.0000	0.1042	1.2126	0.0000	0.0721	1.0872	0.0000	0.0538
2	HDFC	Constant	-0.0181	0.0000	0.0009	-0.0106	0.0000	0.0008	-0.0069	0.0000	0.0006
		DHRM	0.3173	0.0004	0.0889	0.4077	0.0001	0.1007	0.5863	0.0000	0.0710
		DLRM	1.2120	0.0000	0.0811	1.1226	0.0000	0.0597	0.9260	0.0000	0.0550
3	HDFCB	Constant	-0.0157	0.0000	0.0007	-0.0100	0.0000	0.0007	-0.0065	0.0000	0.0005
		DHRM	0.4255	0.0000	0.0633	0.5254	0.0000	0.0755	0.6448	0.0000	0.0578
		DLRM	1.0258	0.0000	0.0760	0.9352	0.0000	0.0646	0.8597	0.0000	0.0453
4	HUL	Constant	-0.0175	0.0000	0.0007	-0.0108	0.0000	0.0006	-0.0064	0.0000	0.0005
		DHRM	0.4523	0.0000	0.0573	0.4528	0.0000	0.0274	0.4515	0.0000	0.0344
		DLRM	0.9232	0.0000	0.0472	0.8690	0.0000	0.0709	0.8103	0.0000	0.0529
5	ICICIB	Constant	-0.0192	0.0000	0.0011	-0.0118	0.0000	0.0008	-0.0081	0.0000	0.0006
		DHRM	0.7550	0.0000	0.1327	0.9137	0.0000	0.0815	1.0598	0.0000	0.0762
		DLRM	1.6496	0.0000	0.1078	1.4455	0.0000	0.0761	1.3246	0.0000	0.0582
6	INFY	Constant	-0.0171	0.0000	0.0007	-0.0107	0.0000	0.0006	-0.0072	0.0000	0.0005
		DHRM	0.7599	0.0000	0.0300	0.8241	0.0000	0.0602	0.8962	0.0000	0.0542
		DLRM	1.5865	0.0000	0.0899	1.2533	0.0000	0.0767	1.0353	0.0000	0.0611
7	IOCL	Constant	-0.0174	0.0000	0.0012	-0.0100	0.0000	0.0007	-0.0058	0.0000	0.0006
		DHRM	0.0949	0.4573	0.1276	0.1791	0.0042	0.0625	0.2521	0.0001	0.0624
		DLRM	1.1768	0.0000	0.1476	0.9528	0.0000	0.0692	0.8471	0.0000	0.0740
8	ITC	Constant	-0.0146	0.0000	0.0007	-0.0099	0.0000	0.0006	-0.0062	0.0000	0.0004
		DHRM	0.3367	0.0000	0.0806	0.4993	0.0000	0.0651	0.5369	0.0000	0.0303
		DLRM	1.1297	0.0000	0.0764	0.8998	0.0000	0.0523	0.8378	0.0000	0.0552
9	ONGC	Constant	-0.0163	0.0000	0.0008	-0.0098	0.0000	0.0005	-0.0062	0.0000	0.0005
		DHRM	0.4169	0.0000	0.0569	0.4870	0.0000	0.0525	0.6080	0.0000	0.0517
		DLRM	1.2608	0.0000	0.0545	1.0753	0.0000	0.0447	0.9566	0.0000	0.0588
10	REL	Constant	-0.0123	0.0000	0.0005	-0.0079	0.0000	0.0006	-0.0052	0.0000	0.0004
		DHRM	0.8198	0.0000	0.0568	0.8987	0.0000	0.0606	0.9628	0.0000	0.0305
		DLRM	1.4415	0.0000	0.0402	1.2710	0.0000	0.0755	1.1679	0.0000	0.0446
11	SAIL	Constant	-0.0223	0.0000	0.0012	-0.0131	0.0000	0.0007	-0.0087	0.0000	0.0008
		DHRM	0.7279	0.0000	0.1152	0.7843	0.0000	0.0778	0.9160	0.0000	0.0759
		DLRM	1.9238	0.0000	0.1156	1.6378	0.0000	0.0747	1.4822	0.0000	0.0892
12	SBI	Constant	-0.0155	0.0000	0.0008	-0.0091	0.0000	0.0007	-0.0055	0.0000	0.0005
		DHRM	0.7429	0.0000	0.0780	0.7706	0.0000	0.0584	0.8273	0.0000	0.0502
		DLRM	1.4218	0.0000	0.1036	1.2704	0.0000	0.0812	1.1607	0.0000	0.0346
13	WIPRO	Constant	-0.0195	0.0000	0.0011	-0.0117	0.0000	0.0006	-0.0077	0.0000	0.0006
		DHRM	0.8196	0.0000	0.1047	0.8186	0.0000	0.0322	0.8976	0.0000	0.0612
		DLRM	1.9519	0.0000	0.1105	1.5747	0.0000	0.0871	1.3326	0.0000	0.0747
14	BA	Constant	-0.0182	0.0000	0.0011	-0.0119	0.0000	0.0010	-0.0079	0.0000	0.0007
		DHRM	0.5454	0.0000	0.1252	0.7303	0.0000	0.0968	0.7880	0.0000	0.0571
		DLRM	1.0795	0.0000	0.0507	1.0243	0.0000	0.1056	0.8841	0.0000	0.0807
15	JSPL	Constant	-0.0153	0.0000	0.0010	-0.0104	0.0000	0.0010	-0.0070	0.0000	0.0009
		DHRM	0.5278	0.0000	0.0654	0.7276	0.0000	0.1350	0.8926	0.0000	0.0887
		DLRM	1.9898	0.0000	0.2540	1.5825	0.0000	0.1251	1.4314	0.0000	0.0870
16	LNT	Constant	-0.0159	0.0000	-0.0159	-0.0100	0.0000	0.0009	-0.0066	0.0000	0.0007
		DHRM	0.8897	0.0000	0.8897	0.9281	0.0000	0.0890	1.0534	0.0000	0.1061
		DLRM	1.2984	0.0000	1.2984	1.2084	0.0000	0.0848	1.1103	0.0000	0.0463
17	NTPC	Constant	-0.0144	0.0000	0.0009	-0.0092	0.0000	0.0008	-0.0061	0.0000	0.0006
		DHRM	0.4423	0.0000	0.1057	0.5592	0.0000	0.0813	0.6212	0.0000	0.0616

Table 1.5 Quantile Regression Results											
Dependent Variable: Individual Stock Returns											
S.No	Stock	Theta	Median Return Ranges								
			0.4			0.5			0.6		
			Value	Sig Value	SE	Value	Sig Value	SE	Value	Sig Value	SE
1	BHEL	Constant	-0.0034	0.0000	0.0005	-0.0008	0.171	0.0006	0.0019	0.001	0.0006
		DHRM	0.8942	0.0000	0.0568	0.9873	0.000	0.0624	1.1152	0.000	0.0619
		DLRM	1.0147	0.0000	0.0492	0.9008	0.000	0.0646	0.7721	0.000	0.0659
2	HDFC	Constant	-0.0036	0.0000	0.0007	-0.0016	0.012	0.0006	0.0017	0.010	0.0007
		DHRM	0.6448	0.0000	0.0787	0.8758	0.000	0.0767	0.9734	0.000	0.0617
		DLRM	0.8070	0.0000	0.0836	0.6502	0.000	0.0700	0.5250	0.000	0.0762
3	HDFCB	Constant	-0.0033	0.0000	0.0005	-0.0008	0.155	0.0006	0.0025	0.000	0.0006
		DHRM	0.6564	0.0000	0.0476	0.7478	0.000	0.0620	0.8308	0.000	0.0642
		DLRM	0.7970	0.0000	0.0366	0.7365	0.000	0.0492	0.6513	0.000	0.0663
4	HUL	Constant	-0.0033	0.0000	0.0006	-0.0003	0.500	0.0005	0.0020	0.000	0.0005
		DHRM	0.4991	0.0000	0.0589	0.5955	0.000	0.0526	0.7268	0.000	0.0675
		DLRM	0.6900	0.0000	0.0545	0.6466	0.000	0.0453	0.5403	0.000	0.0520
5	ICICIB	Constant	-0.0053	0.0000	0.0005	-0.0019	0.004	0.0007	0.0019	0.004	0.0007
		DHRM	1.1716	0.0000	0.0521	1.2561	0.000	0.0732	1.3200	0.000	0.0706
		DLRM	1.1617	0.0000	0.0577	1.0864	0.000	0.0653	1.0125	0.000	0.0678
6	INFY	Constant	-0.0043	0.0000	0.0005	-0.0013	0.011	0.0005	0.0021	0.000	0.0005
		DHRM	0.9599	0.0000	0.0577	1.0556	0.000	0.0482	1.0709	0.000	0.0465
		DLRM	0.9428	0.0000	0.0408	0.8791	0.000	0.0489	0.8297	0.000	0.0505
7	IOCL	Constant	-0.0027	0.0000	0.0006	0.0004	0.520	0.0006	0.0036	0.000	0.0006
		DHRM	0.3170	0.0000	0.0577	0.4120	0.000	0.0623	0.4688	0.000	0.0508
		DLRM	0.6874	0.0000	0.0622	0.6074	0.000	0.0501	0.5445	0.000	0.0505
8	ITC	Constant	-0.0031	0.0000	0.0005	0.0000	0.991	0.0005	0.0028	0.000	0.0005
		DHRM	0.5792	0.0000	0.0453	0.6257	0.000	0.0560	0.7103	0.000	0.0456
		DLRM	0.7725	0.0000	0.0488	0.6625	0.000	0.0680	0.6008	0.000	0.0423
9	ONGC	Constant	-0.0032	0.0000	0.0005	-0.0001	0.852	0.0005	0.0028	0.000	0.0006
		DHRM	0.6414	0.0000	0.0413	0.6558	0.000	0.0459	0.7706	0.000	0.0798
		DLRM	0.8678	0.0000	0.0598	0.7322	0.000	0.0504	0.6861	0.000	0.0466
10	REL	Constant	-0.0031	0.0000	0.0004	-0.0005	0.243	0.0004	0.0023	0.000	0.0005
		DHRM	1.0208	0.0000	0.0539	1.0962	0.000	0.0397	1.0981	0.000	0.0410
		DLRM	1.0819	0.0000	0.0282	1.0594	0.000	0.0361	1.0275	0.000	0.0518
11	SAIL	Constant	-0.0044	0.0000	0.0008	-0.0009	0.231	0.0007	0.0032	0.000	0.0007
		DHRM	1.0150	0.0000	0.0875	1.1371	0.000	0.0736	1.2217	0.000	0.0676
		DLRM	1.3704	0.0000	0.0734	1.1727	0.000	0.0818	1.1065	0.000	0.0581
12	SBI	Constant	-0.0026	0.0000	0.0004	0.0001	0.845	0.0005	0.0028	0.000	0.0005
		DHRM	0.9006	0.0000	0.0464	0.9464	0.000	0.0503	1.0319	0.000	0.0602
		DLRM	1.1438	0.0000	0.0347	1.0877	0.000	0.0446	1.0435	0.000	0.0443
13	WIPRO	Constant	-0.0041	0.0000	0.0006	-0.0011	0.054	0.0006	0.0020	0.004	0.0002
		DHRM	1.0028	0.0000	0.0651	1.1012	0.000	0.0658	1.2498	0.000	0.0302
		DLRM	1.2272	0.0000	0.0467	1.1079	0.000	0.0680	1.0151	0.000	0.0045
14	BA	Constant	-0.0044	0.0000	0.0007	-0.0006	0.396	0.0007	0.0026	0.000	0.0007
		DHRM	0.8268	0.0000	0.0641	0.8686	0.000	0.0665	0.9206	0.000	0.0665
		DLRM	0.8127	0.0000	0.0661	0.7757	0.000	0.0555	0.7314	0.000	0.0508
15	JSPL	Constant	-0.0026	0.0003	0.0007	0.0009	0.368	0.0010	0.0041	0.000	0.0008
		DHRM	0.9115	0.0000	0.0461	0.9963	0.000	0.0979	1.1068	0.000	0.0757
		DLRM	1.3170	0.0000	0.0860	1.2255	0.000	0.1007	1.0977	0.000	0.0756
16	LNT	Constant	-0.0034	0.0000	0.0006	-0.0011	0.070	0.0006	0.0020	0.001	0.0006
		DHRM	1.1024	0.0000	0.0612	1.2126	0.000	0.0636	1.2233	0.000	0.0525
		DLRM	1.0906	0.0000	0.0405	1.0240	0.000	0.0623	0.9899	0.000	0.0477
17	NTPC	Constant	-0.0037	0.0000	0.0005	-0.0005	0.348	0.0006	0.0018	0.001	0.0005
		DHRM	0.6463	0.0000	0.0496	0.6760	0.000	0.0517	0.7449	0.000	0.0350
		DLRM	0.7271	0.0000	0.0326	0.6829	0.000	0.0587	0.6451	0.000	0.0532
18	SIL	Constant	-0.0033	0.0007	0.0010	0.0004	0.615	0.0009	0.0048	0.000	0.0010
		DHRM	1.1222	0.0000	0.1102	1.2155	0.000	0.0822	1.2303	0.000	0.0974
19	TCS	Constant	-0.0039	0.0000	0.0006	-0.0018	0.022	0.0008	0.0014	0.062	0.0007
		DHRM	0.8324	0.0000	0.0487	0.9237	0.000	0.0855	1.0054	0.000	0.0785
		DLRM	0.8191	0.0000	0.0701	0.7272	0.000	0.0835	0.6425	0.000	0.0560

Table 1.6 Quantile Regression Results											
Dependent Variable: Individual Stock Returns											
S.No	Stock	Theta	Higher Return Ranges								
			0.7			0.8			0.9		
			Value	Sig Value	SE	Value	Sig Value	SE	Value	Sig Value	SE
1	BHEL	Constant	0.0062	0.0000	0.0006	0.0121	0.0000	0.0007	0.0207	0.0000	0.0013
		DHRM	1.1847	0.0000	0.0325	1.2911	0.0000	0.0765	1.4369	0.0000	0.1070
		DLRM	0.7259	0.0000	0.0501	0.7656	0.0000	0.0518	0.7169	0.0000	0.1021
2	HDFC	Constant	0.0056	0.0000	0.0007	0.0114	0.0000	0.0008	0.0194	0.0000	0.0010
		DHRM	1.0774	0.0000	0.0740	1.2035	0.0000	0.0753	1.4451	0.0000	0.1110
		DLRM	0.4132	0.0000	0.0647	0.4266	0.0000	0.0627	0.3755	0.0000	0.0779
3	HDFCB	Constant	0.0062	0.0000	0.0005	0.0101	0.0000	0.0007	0.0167	0.0000	0.0009
		DHRM	0.9247	0.0000	0.0336	1.0590	0.0000	0.0624	1.3299	0.0000	0.1569
		DLRM	0.5824	0.0000	0.0453	0.5032	0.0000	0.0743	0.5024	0.0000	0.0768
4	HUL	Constant	0.0048	0.0000	0.0006	0.0092	0.0000	0.0007	0.0167	0.0000	0.0009
		DHRM	0.8252	0.0000	0.0719	0.9246	0.0000	0.0536	1.0249	0.0000	0.0915
		DLRM	0.4599	0.0000	0.0522	0.3876	0.0000	0.0763	0.2699	0.0000	0.0551
5	ICICIB	Constant	0.0060	0.0000	0.0006	0.0119	0.0000	0.0009	0.0211	0.0000	0.0012
		DHRM	1.4274	0.0000	0.0649	1.5306	0.0000	0.0845	1.6520	0.0000	0.1191
		DLRM	0.8933	0.0000	0.0594	0.8630	0.0000	0.0740	0.7430	0.0000	0.0965
6	INFY	Constant	0.0049	0.0000	0.0006	0.0093	0.0000	0.0007	0.0164	0.0000	0.0011
		DHRM	1.1730	0.0000	0.0680	1.3575	0.0000	0.0999	1.7053	0.0000	0.1471
		DLRM	0.7250	0.0000	0.0532	0.6451	0.0000	0.0664	0.6010	0.0000	0.0905
7	IOCL	Constant	0.0080	0.0000	0.0007	0.0137	0.0000	0.0007	0.0233	0.0000	0.0012
		DHRM	0.5355	0.0000	0.0755	0.5946	0.0000	0.0491	0.7582	0.0000	0.1173
		DLRM	0.5324	0.0000	0.0542	0.4964	0.0000	0.0646	0.4743	0.0000	0.0951
8	ITC	Constant	0.0060	0.0000	0.0005	0.0095	0.0000	0.0007	0.0173	0.0000	0.0009
		DHRM	0.7775	0.0000	0.0699	0.9578	0.0000	0.0676	1.0678	0.0000	0.0503
		DLRM	0.5546	0.0000	0.0398	0.4513	0.0000	0.0638	0.3746	0.0000	0.0685
9	ONGC	Constant	0.0065	0.0000	0.0005	0.0109	0.0000	0.0008	0.0195	0.0000	0.0011
		DHRM	0.8947	0.0000	0.0343	0.9394	0.0000	0.0599	1.1078	0.0000	0.0893
		DLRM	0.6465	0.0000	0.0448	0.5706	0.0000	0.1017	0.4275	0.0000	0.0850
10	REL	Constant	0.0051	0.0000	0.0086	0.0086	0.0000	0.0006	0.0144	0.0000	0.0007
		DHRM	1.1652	0.0000	1.2168	1.2168	0.0000	0.0648	1.3065	0.0000	0.0702
		DLRM	0.9726	0.0000	0.9209	0.9209	0.0000	0.0540	0.8584	0.0000	0.0650
11	SAIL	Constant	0.0082	0.0000	0.0008	0.0152	0.0000	0.0009	0.0268	0.0000	0.0015
		DHRM	1.3210	0.0000	0.0801	1.4252	0.0000	0.0957	1.7062	0.0000	0.1338
		DLRM	1.0704	0.0000	0.0591	1.0632	0.0000	0.0542	1.0227	0.0000	0.1620
12	SBI	Constant	0.0061	0.0000	0.0005	0.0101	0.0000	0.0007	0.0187	0.0000	0.0011
		DHRM	1.1338	0.0000	0.0402	1.2390	0.0000	0.0634	1.3083	0.0000	0.1095
		DLRM	0.9952	0.0000	0.0527	0.8747	0.0000	0.0746	0.8558	0.0000	0.0792
13	WIPRO	Constant	0.0067	0.0000	0.0007	0.0111	0.0000	0.0008	0.0195	0.0000	0.0014
		DHRM	1.3309	0.0000	0.0741	1.5703	0.0000	0.0962	1.9330	0.0000	0.1575
		DLRM	0.9827	0.0000	0.0663	0.8345	0.0000	0.0582	0.7798	0.0000	0.1647
14	BA	Constant	0.0077	0.0000	0.0008	0.0129	0.0000	0.0011	0.0201	0.0000	0.0013
		DHRM	0.9458	0.0000	0.0386	1.0378	0.0000	0.0901	1.0397	0.0000	0.0983
		DLRM	0.7525	0.0000	0.0513	0.7361	0.0000	0.0954	0.6094	0.0000	0.0996
15	JSPL	Constant	0.0084	0.0000	0.0009	0.0138	0.0000	0.0015	0.0246	0.0000	0.0017
		DHRM	1.1883	0.0000	0.0892	1.3001	0.0000	0.1542	1.5408	0.0000	0.1436
		DLRM	1.0805	0.0000	0.0706	0.9318	0.0000	0.1388	0.8266	0.0000	0.1350
16	LNT	Constant	0.0052	0.0000	0.0007	0.0094	0.0000	0.0007	0.0183	0.0000	0.0012
		DHRM	1.2753	0.0000	0.0628	1.3325	0.0000	0.0280	1.2919	0.0000	0.0274
		DLRM	0.9880	0.0000	0.0474	0.9872	0.0000	0.0543	1.0062	0.0000	0.0988
17	NTPC	Constant	0.0050	0.0000	0.0007	0.0080	0.0000	0.0008	0.0155	0.0000	0.0012
		DHRM	0.8152	0.0000	0.0786	1.0027	0.0000	0.0890	1.0749	0.0000	0.0657
		DLRM	0.6613	0.0000	0.0607	0.5345	0.0000	0.0563	0.5709	0.0000	0.0886
18	SIL	Constant	0.0093	0.0000	0.0010	0.0158	0.0000	0.0013	0.0275	0.0000	0.0022
		DHRM	1.4294	0.0000	0.0882	1.4782	0.0000	0.0836	1.5075	0.0000	0.2989
19	TCS	Constant	0.0046	0.0000	0.0007	0.0088	0.0000	0.0008	0.0149	0.0000	0.0011
		DHRM	1.0517	0.0000	0.0641	1.1319	0.0000	0.0944	1.2932	0.0000	0.0962
		DLRM	0.6186	0.0000	0.0515	0.6057	0.0000	0.0550	0.4684	0.0001	0.1167

Table 1.7 OLS Regression Results					
S.No	Stock	Dependent Variable: Individual Stock Returns			
			Value	Sig Value	SE
1	BHEL	Constant	0.0002	0.7580	0.0006
		DHRM	1.0500	0.0000	0.0418
		DLRM	0.9850	0.0000	0.0389
2	HDFC	Constant	-0.0006	0.3333	0.0006
		DHRM	0.9028	0.0000	0.0424
		DLRM	0.6882	0.0000	0.0395
3	HDFCB	Constant	0.0000	0.9992	0.0005
		DHRM	0.8397	0.0000	0.0373
		DLRM	0.7432	0.0000	0.0347
4	HUL	Constant	-0.0003	0.4916	0.0005
		DHRM	0.6568	0.0000	0.0354
		DLRM	0.6284	0.0000	0.0330
5	ICICIB	Constant	-0.0001	0.8698	0.0006
		DHRM	1.2228	0.0000	0.0482
		DLRM	1.1364	0.0000	0.0449
6	INFY	Constant	-0.0007	0.2559	0.0006
		DHRM	1.0860	0.0000	0.0427
		DLRM	0.9882	0.0000	0.0398
7	IOCL	Constant	0.0019	0.0013	0.0006
		DHRM	0.4524	0.0000	0.0444
		DLRM	0.7404	0.0000	0.0413
8	ITC	Constant	0.0008	0.0801	0.0005
		DHRM	0.6502	0.0000	0.0360
		DLRM	0.7172	0.0000	0.0335
9	ONGC	Constant	0.0013	0.0170	0.0005
		DHRM	0.7049	0.0000	0.0405
		DLRM	0.8599	0.0000	0.0377
10	REL	Constant	0.0005	0.2443	0.0004
		DHRM	1.0731	0.0000	0.0319
		DLRM	1.1227	0.0000	0.0297
11	SAIL	Constant	0.0017	0.0243	0.0007
		DHRM	1.1324	0.0000	0.0544
		DLRM	1.3619	0.0000	0.0506
12	SBI	Constant	0.0009	0.0472	0.0005
		DHRM	0.9864	0.0000	0.0348
		DLRM	1.0810	0.0000	0.0324
13	WIPRO	Constant	0.0001	0.9028	0.0007
		DHRM	1.1797	0.0000	0.0508
		DLRM	1.2581	0.0000	0.0473
14	BA	Constant	0.0000	0.9842	0.0007
		DHRM	0.8630	0.0000	0.0465
		DLRM	0.8286	0.0000	0.0460
15	JSPL	Constant	0.0034	0.0002	0.0009
		DHRM	1.0303	0.0000	0.0619
		DLRM	1.3998	0.0000	0.0612
16	LNT	Constant	-0.0002	0.6750	0.0006
		DHRM	1.1831	0.0000	0.0398
		DLRM	1.0598	0.0000	0.0394
17	NTPC	Constant	0.0002	0.7024	0.0006
		DHRM	0.7506	0.0000	0.0391
		DLRM	0.7906	0.0000	0.0387
18	SIL	Constant	0.0022	0.0100	0.0009
		DHRM	1.1859	0.0000	0.0594
		DLRM	1.5170	0.0000	0.0587
19	TCS	Constant	-0.0006	0.3205	0.0006
		DHRM	0.9198	0.0000	0.0421
		DLRM	0.7861	0.0000	0.0417

upside stock beta is within the range of 1-2 times the downside stock beta.

Inter Quantile Responsiveness of Stock Returns

Quantile Process coefficients for different stock returns (Annexure- 3) shows the behavior of Upside stock beta and downside stock beta. Upside stock beta for individual shows a positive relationship whereas a negative relationship for downside stock beta. Wald test for quantile coefficient diagnosis are significant for all the stocks. This suggests that the behavior of stock betas differ over the various quantile ranges for both the upside and downside markets. Examination of quantile process coefficients for different stock returns reveals the asymmetric behavior of stock betas in bullish and bearish market states, moreover the beta values not only differs with market states but also changes significantly from lower to higher return ranges of the stock itself.

Final Remarks

The results of our study are found to be significant and interesting. The study performs a two way analysis of the asymmetric behavior of the stock betas – (i) The Stock betas are not symmetric, they differ significantly over the bullish and bearish market states. (ii) The stock betas are not symmetric for the different quantiles of the dependent variable itself ie. the individual stock return series. It infers that if the stock return lies in its lower quartile range where it is generating negative returns, it becomes more volatile and reacts more aggressively to the bearish market moves as compared to the bullish market moves. Whereas, if the stock return lies in its higher quantile range, generating positive returns it tends to react more positively to the bullish market moves as compared to bearish market moves. The results have implications for the investors who are engaged in day-trading of Group 'A' stocks. Understanding the interquantile behavior of stock return over different market states may help the portfolio managers in identifying the under performers and over performers and thus, results may prove to be useful in hedging the risk arising out of the asymmetric behavior of stock return in the inter quantile ranges.

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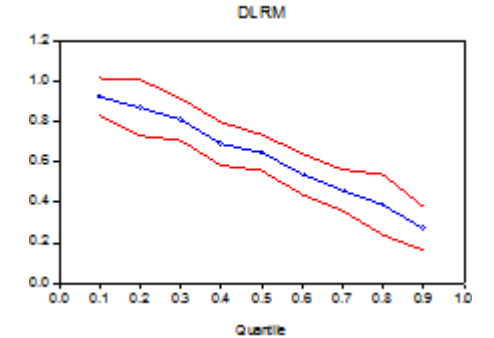
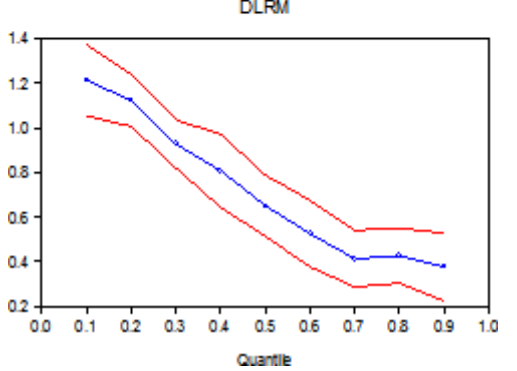
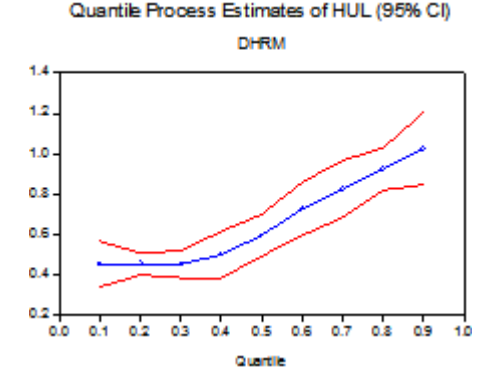
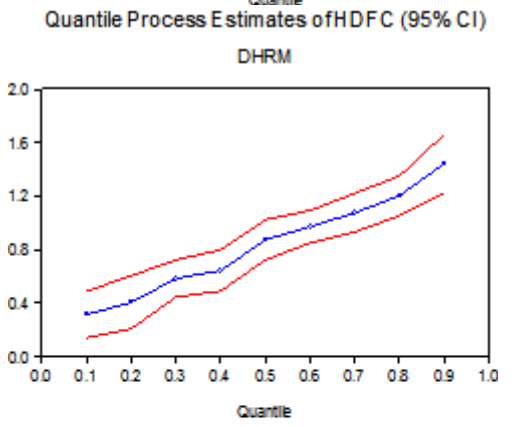
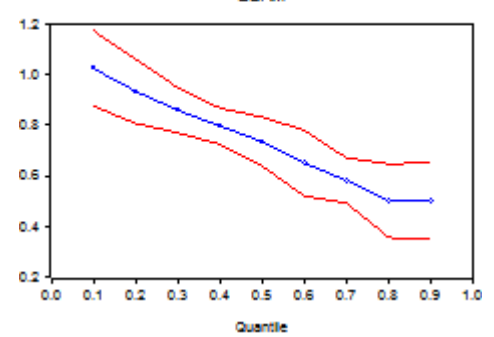
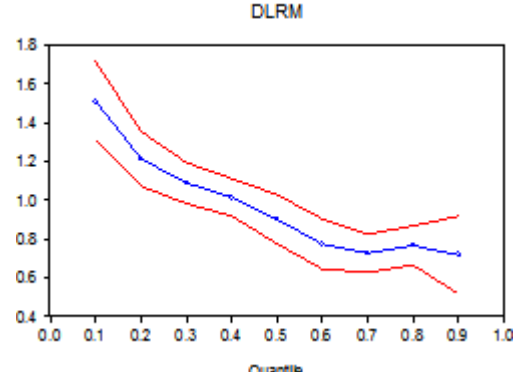
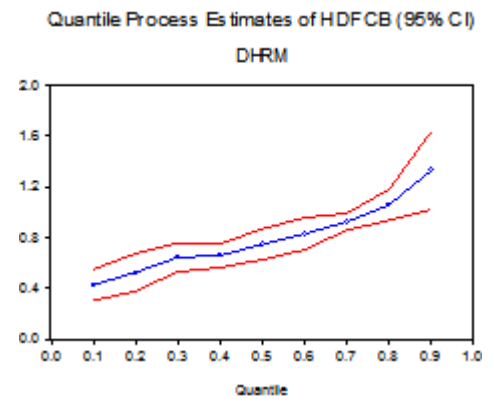
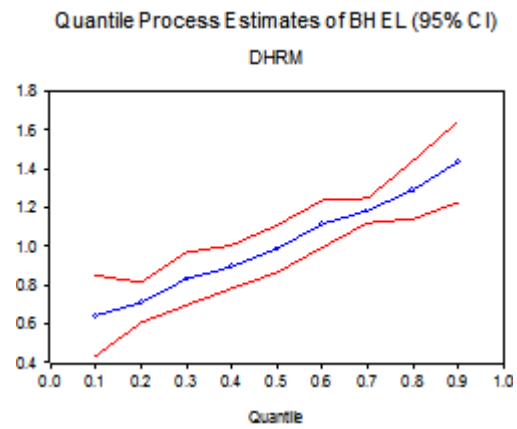
Annexure 1. : Sample Selection

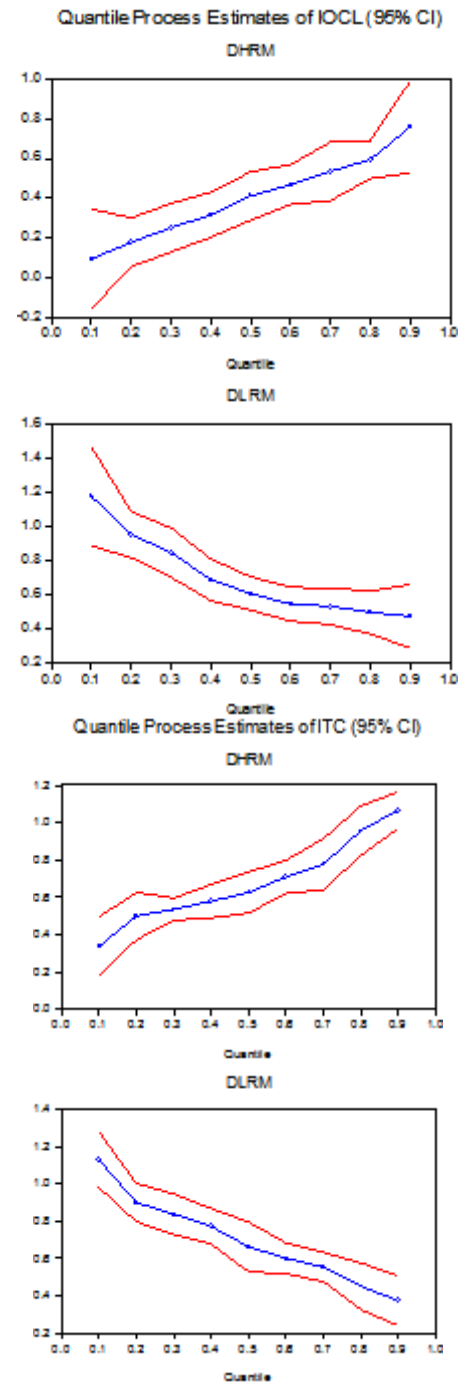
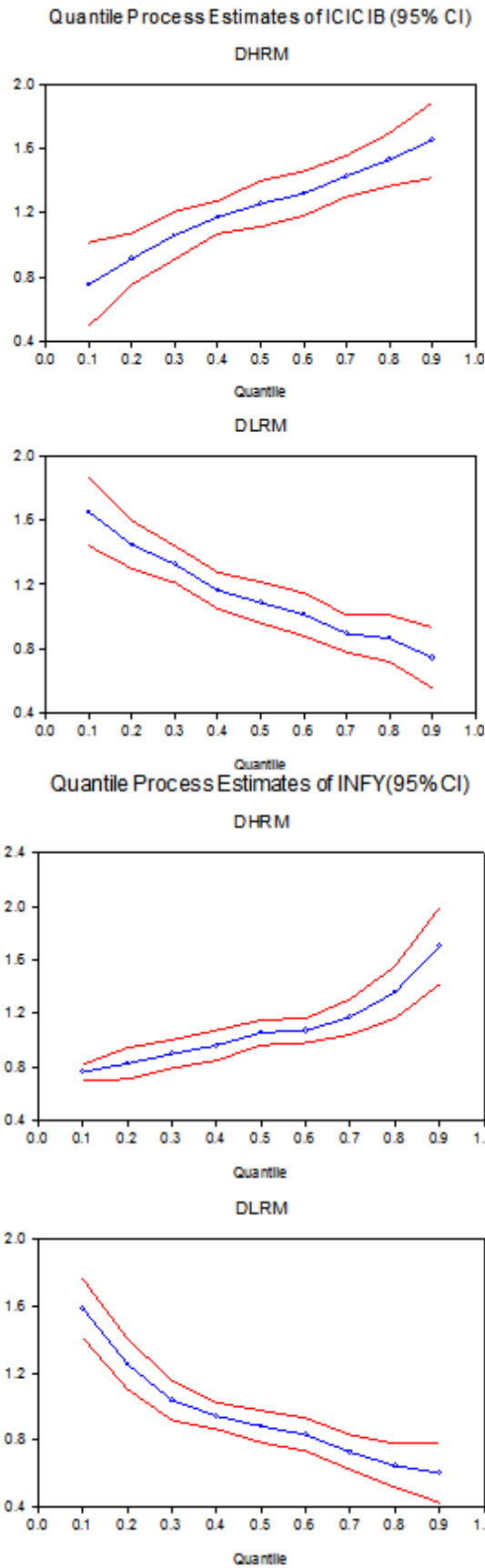
S. No	Company Name	Market Capitalization (crore)	Cumm. % Share	Industry
1	Reliance Industries Ltd.	331363.715	6.04%	Integrated Oil & Gas
2	Oil & Natural Gas Corpn. Ltd.	252670.200	10.64%	Exploration & Production
3	Coal India Ltd.	216511.110	14.59%	Coal and Mining
4	Tata Consultancy Services Ltd.	168583.565	17.66%	IT Consulting & Software
5	N T P C Ltd.	164140.975	20.66%	Power
6	Infosys Ltd.	155655.590	23.49%	IT Consulting & Software
7	State Bank Of India	152823.575	26.28%	Banks
8	M M T C Ltd.	137990.755	28.79%	Automobiles-4 wheelers
9	BhartiAirtel Ltd.	127523.935	31.12%	Telecom Services
10	N M D C Ltd.	124811.620	33.39%	Coal and Mining
11	I T C Ltd.	114067.535	35.47%	Cigarettes,Tobacco Products
12	Bharat Heavy Electricals Ltd.	112109.200	37.51%	Electrical equipment
13	I C I C I Bank Ltd.	107955.035	39.48%	Banks
14	Larsen & Toubro Ltd.	102098.680	41.34%	Construction & Engineering
15	Wipro Ltd.	99210.445	43.15%	Computers- Software
16	H D F C Bank Ltd.	90056.820	44.79%	Banks
17	Housing Development Finance Corpn. Ltd.	86338.235	46.37%	Housing Finance
18	Indian Oil Corpn. Ltd.	81089.985	47.84%	Exploration & Production
19	Steel Authority Of India Ltd.	77767.695	49.26%	Steel and Steel Products
20	Jindal Steel & Power Ltd.	60752.945	50.37%	Steel and Steel Products
21	Sterlite Industries (India) Ltd.	60191.905	51.47%	Minerals and Mining
22	Hindustan Unilever Ltd.	59318.925	52.55%	FMCG

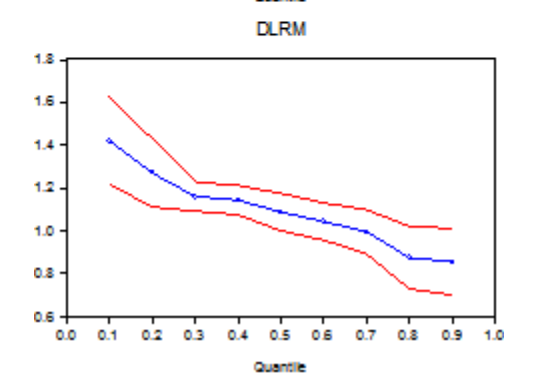
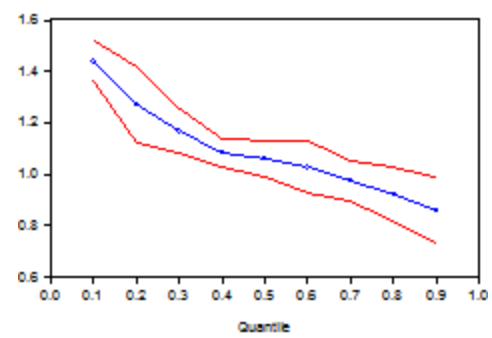
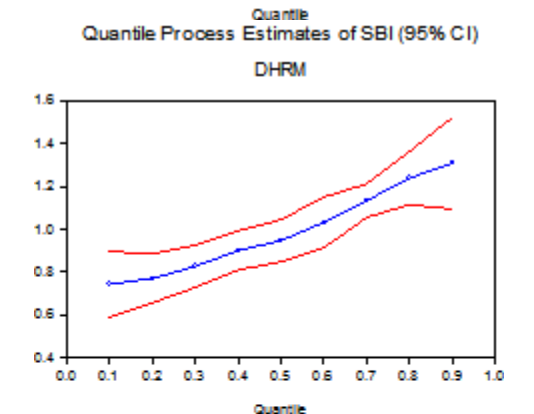
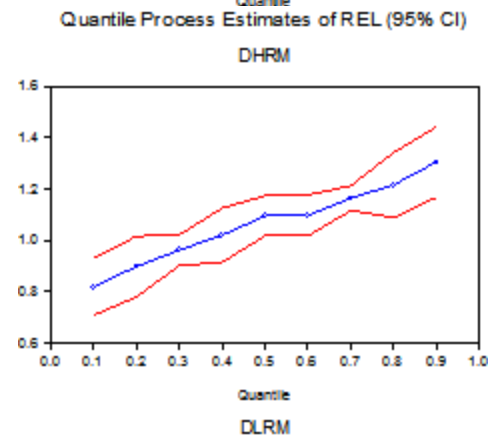
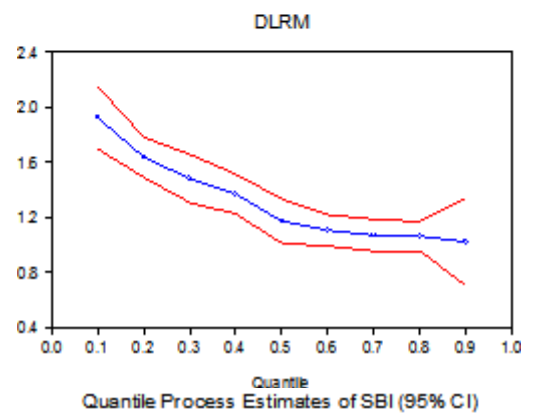
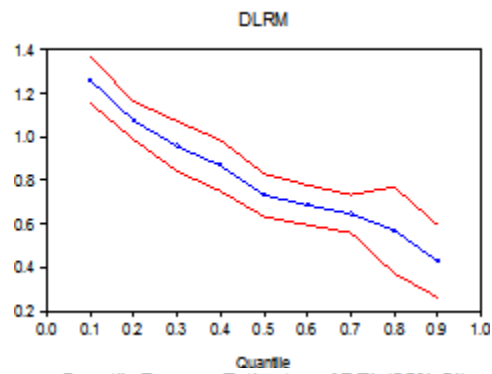
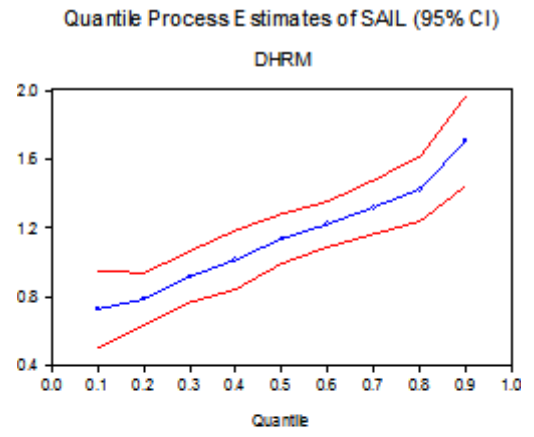
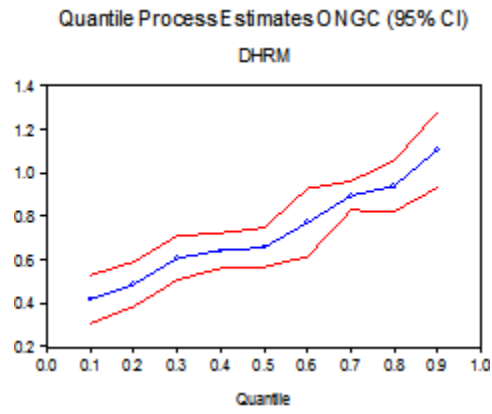
Annexure 2

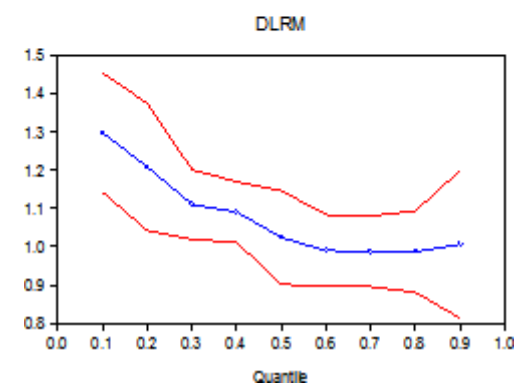
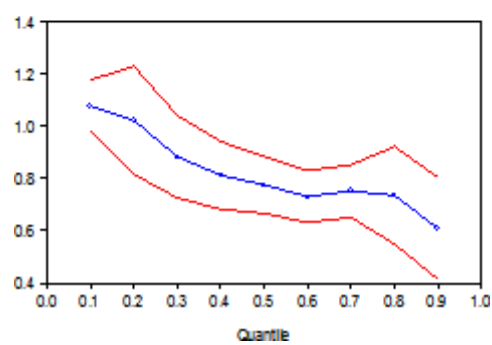
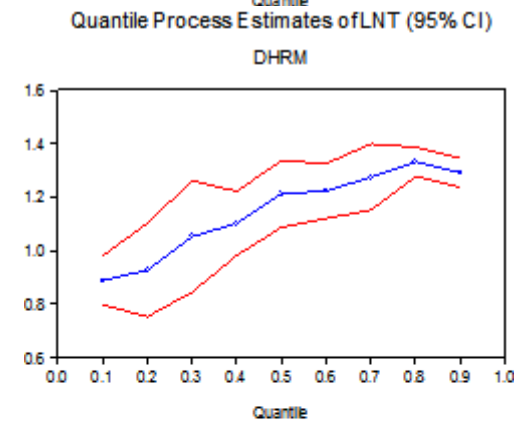
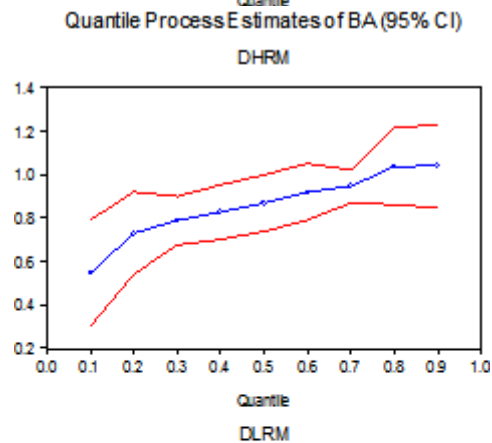
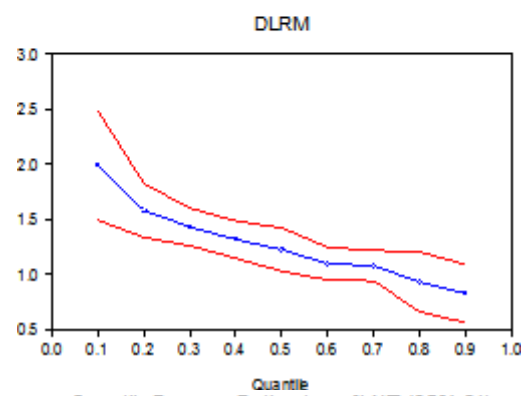
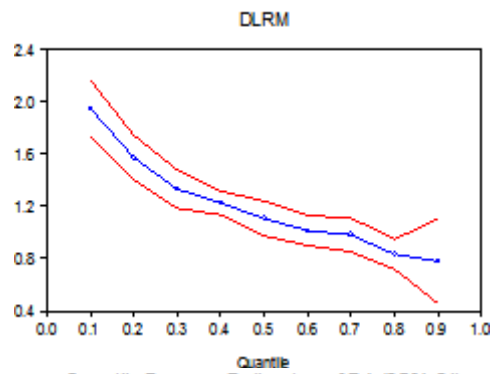
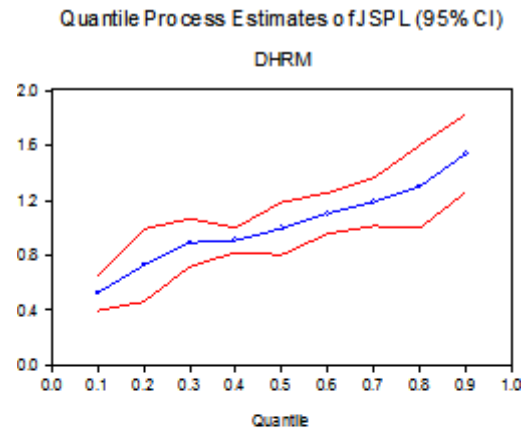
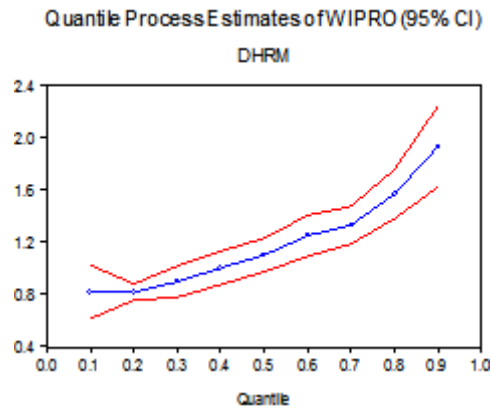
<i>Abbreviations</i>	
Company Symbol	Company Name
BA	Bharti Airtel Ltd.
BHEL	Bharat Heavy Electricals Ltd.
BSE	Bombay Stock Exchange
HDFC	Housing Development Finance Corporation Ltd.
HDFCB	HDFC Bank Ltd.
HUL	Hindustan Unilever Limited
ICICIB	ICICI Bank Ltd.
INFY	Infosys Ltd.
IOCL	Indian Oil Corporation Ltd.
ITC	ITC
JSPL	Jindal Steel and Plant Ltd.
LNT	Larsen & Tubro Ltd.
NTPC	National Thermal Power Corporation Ltd.
ONGC	Oil and Natural Gas Corporation Ltd.
SAIL	Steel Authority of India Ltd.
SBI	State Bank of India Ltd.
SEBI	The Securities and Exchange Board of India
SIL	Sterlite Industries Ltd.
TCS	Tata Consultancy Services Ltd.
WIPRO	Wipro Ltd.

Annexure 3

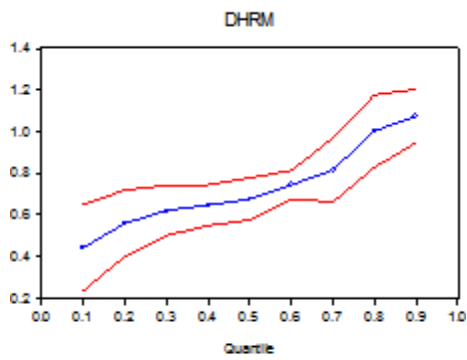




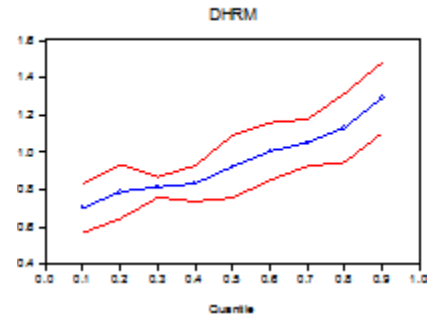




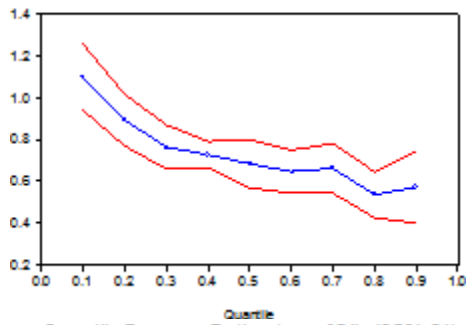
Quantile Process Estimates of NTPC (95% CI)



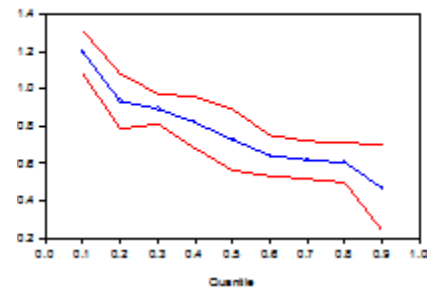
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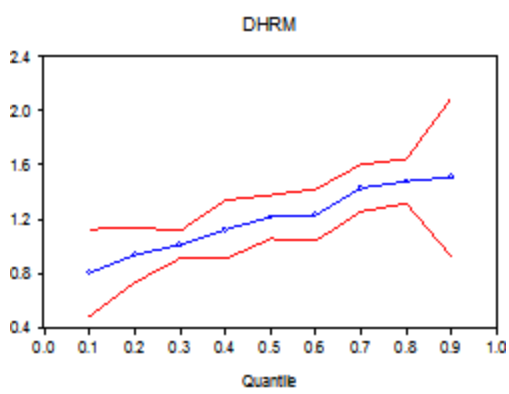
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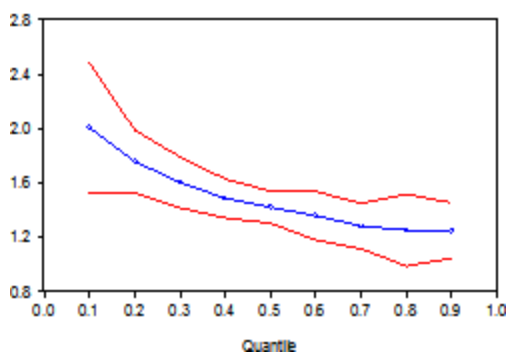
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Quantile Process Estimates of SIL (95% CI)



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DLRM

Capital Inflows and Outflows of India: A Study on Present Globalization Era

Arvind Kumar and Shreya Sheel

ABSTRACT

The Indian Government has reviewed policy to attract more Foreign direct investment and these policy measures enhance the inflows and out flows of capital. One of the most prominent and remarkable feature of today's world is the exponential growth of FDI in the developed and developing countries. This paper discuss the major components of capital inflow, routes of FDI, GDP growth of India, performance of External sectors, trends and pattern of FDI. The paper also focuses on emerging market economies in global context and macroeconomic challenges of India. India is one of the most attractive destinations for foreign companies to sell their products and also manufacture them to be sold elsewhere and the only route this potential can be fully exploited is by providing stability in policies and making it easier for FDI to find a long-term home in India. The paper explores sectoral distribution, Trade balance, capital Inflows, portfolio investment, FIIs etc. yearly in graphical presentation.

INTRODUCTION

Foreign capital is playing major role for every national economy, regardless of its level of development. It is necessary to support sustainable development for the developed countries and it is used to enhance accumulation and rate of investments to generate conditions for demanding economic growth of developing countries. The important factor of economic growth and development is a capital formation. The Capital inflows allow the receiver country to invest and consume more than it produce when the marginal productivity of capital within its borders is higher than the capital-rich countries all over the world. Capital inflows provide the facility of achievement of the millennium development goals (MDGs) and national economic, empowerment and development strategy (NEEDs). Foreign direct investment (FDI) plays a complementary role in overall capital formation by filling the gap of between domestic saving and investment, because capital formation is most important determinant of economic growth. In the relation with trade openness, FDI and economic growth has been emerging as a long been disputable question mark. Capital flows are in the forms of portfolio and foreign direct investment is like an engine for globalization and also a catalyst agent for economic development for developing countries. FDI is highly beneficial for developing countries like India. Empirically, studies suggests that FDI triggers technology spillovers, assists human capital formation, contributes to International trade integration, helps to create more competitive business atmosphere and develop the enterprises.

Capital flow take us to second facet of global imbalances return of lumpy and volatility. It affects a broad range of economic factors such as exchange rates, interest rates, foreign exchange reserves, domestic monetary conditions as well as savings and investments. Some basic pragmatic effects of capital inflows are; real exchange rate appreciation, stock market and real estate boom, reserve accumulation, monetary extension as well as effects on production and consumption. The role of exchange rates a prime lever for redressal of external imbalances-global rebalancing will require deficit economies to

Key words:

FDI, Emerging markets Economies, Economic Growth, Capital Inflows and Capital Outflows.

save more and consume less. They need to depend for growth more on external demand which calls for real depreciation of their currencies.

Capital inflows

These are necessary for macroeconomic stability as capital inflows affect a wide range of macroeconomic variables such as exchange rates, interest rates, foreign exchange reserves, domestic monetary conditions as well as saving and investments. The composition of capital Inflows can have an important effect on an economy's vulnerability to a financial crisis. A capital net inflow of real or financial capital into a country, in the form of increased purchases of domestic assets by foreigners and or reduced holdings of foreign assets by domestic residents, recorded as a positive or a credit in the balance of capital account. Inflows of capital are usually thought as drivers of economic growth and investment that help to finance current account imbalances. However, these flows are also a source of financial vulnerabilities and macroeconomic imbalances. India has yet to comprehend its full potential as a world leading global economy. The rapid economic growth that India has witnessed since the mid-1990s was ushered in by much-needed reforms. After being criticized by economists for its low rate of growth, India finally earned a place among the world's leading emerging markets. Further reform could lead it to greater success among the BRICS (Brazil, Russia, India, China and South Africa).

Capital outflow

It is an economic term describing capital flowing out/ leaving of a particular nation's economy. Out flowing capital can be caused by any number of economic or political reasons but can often originate from instability in globe. Regardless, capital out flowing is basically perceived as always undesirable and many countries create laws and regulations to restrict the movement of capital out of the borders of nations (called capital controls). While this can assist in short term growth, often, it causes more economic problems than it helps.

1. Huge capital outflow is usually a symbol of a greater problem.

2. Countries with outflow restrictions can find it harder to attract foreign capital inflows because firms cannot achieve their aim if an opportunity goes over. The Firm won't be able to recover much more of their investment if it is not done in proper way.
3. The Governments set up capital controls unavoidably to send a signal to its citizens that something might be wrong with our economy, even if the laws and rules are simply a precautionary measure to protect nation economy.

Capital flows contribute in filling the resourceful gap in country like India where the domestic savings are not enough to finance investment. Argentina experienced phase of uncontrollable and sudden capital outflows, In the 1990s after its currency suffer dramatic pressure to adjust in light of the fixed exchange rate, leading to a recession stage. Modern macro-economists often cite the country as a classic example of the difficulties of developing fledgling economies.

The capital is withdrawn from the country and may end up in another country or back in the investor's home country. Some countries implement capital controls to curb capital outflows. These type of capital controls are not actually a solution because they can scare off investors who want control over their assets and can give the impression that something goes wrong with the country's economy or government that is yet widely unknown about this.

LITERATURE REVIEW

There are number of studies dealing with the determinants of capital inflows and outflows into emerging market economies. Many studies have examined and recognized internal and external factors/ push and pull factors that cause capital flows in emerging market economies, including developing Asian economies. The literature also focuses on the determinants of different types of capital flows – Direct investment, Indirect Investment, portfolio investment, Debt flow and other investment patterns.

Velde Dirk Willem, (2001) in his study "Government Policies Towards Inward Foreign Direct Investment In Developing Countries: Implications For Human Capital Formation And Income Inequality, it was organized by OECD development centre, we found that study is basically based on the Government policy option of host country towards policy makers to attract foreign capital and

influence TNC behavior by focusing on human capital formation and income inequality. The study examines the effects of FDI policy on human capital formation and income inequality, the relationship among three relevant factors FDI Policy, TNC behavior and market for skill all based on perception of positive effects of FDI (growth, technology, skill upgradation, capital) generally balance its negative effect (income, inequality, degradation, profit repatriation). The analysis shows that FDI policy affects the supply of demand and bargaining position of skilled and unskilled workers which is crucial in determining implications for income inequality.

Kohli Renu (2001), "Capital flows and their macroeconomic effects in India" The study explains the capital inflows and macroeconomic aggregate, policy implication, Trends and composition of capital flows. The paper suggests that capital inflow of foreign capital during this period has resulted in real exchange rates appreciation and has had a significant impact on domestic money supply. To the issues related to capital inflows and outflows are significant for India as it slowly open its capital account as part of its broader financial liberalization plan. This study attempts three things first is, it documents style in movement, and composition of capital flows into India in a comparative perspective. Second is it examines the impact of these factors flows upon the key macro economic variables in the economy as well as the policy response of the Indian authorities and last one is implication for economic policy.

Sumanjeet (2009), "Foreign Capital Flows into India: Compositions, Regulations, Issues and Policy Options" the study reveals the large flow in global flow in early 1990s and also expresses its views regarding the foreign capital like it has significant position for every nation in any case of its level of development. The author talks about the capital flows, which are facilitating the achievement of MDGS and NEEDS, both are contributing a significant role in emerging markets. The study analyzes the net capital flow, global instability, and Asian net equity flow to emerging markets. The study covers the issues and challenges of capital flow of India.

Mohan Rakesh (2009) "Capital flows to India" the study basically based on capital flows to India. This paper defines the various aspects of capital flows to India and their policy implications. The study analyzes the trends the magnitude and compositions. It touches the historical background of the study and also evaluates the management of capital inflows and their policy implication

for the conduct of monetary and exchange rate policies. The study recognizes the recent measures towards liberalization of capital outflows of India. The issues and challenges behind the management of capital flows is a complex process encompassing a spectrum of policy choices, which inter alia include the appropriate level of reserves, monetary policy objectives related to liquidity management, and the maintenance of healthy financial market conditions with financial stability.

Singh Jasbir, (2012) the research study "Role of Foreign Direct Investment in India: An Analytical Study" says that FDI is one of the major tools of attracting international economic integration in any economy and it is also an important tool to solve the problem of developing countries which are facing deficit of saving. The study bridges the gap between saving and investment. It analyzes the FDI and FII trends after economic reform, and also focus on various routes of FDI flow.

Fernando Arias et al. (2013), "Do the different types of capital flows respond to the same fundamentals and in the same degree? Recent evidence for emerging markets" the study basically based on international macroeconomic context and capital flows to Emerging market. The study introduced the three phases of International capital flows to emerging market economies; first phase (2008) describes the Lehman brothers' bankruptcy. This was featured by vast capital inflows to emerging markets which creates environment of credit boom and asset price valuation. Second phase states the financial collapse of Lehman brothers, was characterized by a significant and reversion of capital inflows to the emerging market. Third phase was ended in the mid of 2009 to 2011, distinguished for capital flow behavior similar to the first phase.

Ananchotikul and Zhang (2014) Portfolio Flows, Global Risk Aversion and Asset Prices in Emerging Markets, The study defines the role of portfolio flows to emerging market has become volatile. The paper finds out that their short run dynamic are driven by the push factor and examine cross border flows and global risk aversion assets volatility in emerging market. For analyzing these flows the author dynamic conditional correlation (DCC) and multivariate GARCH framework to predict the portfolios impact.

Hernández Marco A. et al. (2015) in his research study "Estimating Capital Flows to Emerging Market Economies with Heterogeneous Panels" shows that Capital flows are basically work as a driver of economic growth and investment that provide aid to finance current account

imbalances. He suggests the suitable models (AMG Model and FE-DK Model) for evaluating direct investments. The AMG Model is very successful in recognizing significant factors of Inflow and FE-DK model for better fit. The result shows by this model that due to different functional category of foreign capital that responds differently to macroeconomic variable because of push or pull factor this may be cause counterintuitive results. The study also reveals that either domestic or foreign shocks do have an impact on the behavior of capital flow.

OBJECTIVE OF STUDY

- To assess the Capital inflow and outflows of India
- To recognize information and role of foreign direct investment in India
- To review the role of FDI in Emerging Market Economies in the Global Context
- To identify the challenges and barriers of FDI

RESEARCH METHODOLOGY

The proposed research work is based on descriptive and analytical research. Data had been collected through the entire relevant secondary sources like publication of RBI, Department of Industry Policy and Promotion, World Bank, UNCTAD, IMF etc., various Government Publication, other published book and journal related to Capital flows, Foreign Direct investment plans and strategy, Commercial magazine, Newspapers, various research papers and internet.

EMERGING MARKET ECONOMIES IN THE GLOBAL CONTEXT

Post economic reforms, there has been major change in policies of India and attitude towards foreign investment. Resulted, the condition of distrust and suspicion of the past has demoted to the background and its place has been taken over by a new found faith in its ability to encourage growth and development. As we all know that India has started its march on the way of economic liberalization wherein foreign capital has been accepted as a crucial component in hastening economic growth.

Most of the emerging market currency crises are accompanied by “sudden stops” of capital inflows in an economy. The three principal forms of FDI in India are joint ventures, acquisition of assets in a country and Greenfield ventures. The important segment of foreign investment is FDI which refers to investment made across national borders to acquire equity directly from a company which results in creations of fresh assets and productive capacity of another country. In another words, we can say that FDI is which includes investment of foreign assets into domestic structures, equipment and organizations. It may give advantage to the government and companies in particular and country in general such as overcoming tariff barriers, increasing global competition, acceleration in development of technology, boost to economy activity, access to latest technology , bridging the current account deficit and supplementing domestic savings for large infrastructure investments.

FDI is permitted in nations by the financial collaboration, by joint ventures and technical collaboration, by capital market, by private placement issues or preferential allotment issues whereas FDI is not permitted in the some field/ Industries like Arms and ammunitions, Railway transport, Coal and lignite, Atomic energy and Mining of iron, manganese, chrome, gypsum, gold, diamond, copper, zinc and sulphur. By keeping in view the growing requirements of foreign capital in India, Indian government has come up with many policies and liberalized regulations to manage foreign capital in India.

According to The International Monetary Fund, FDI is defined as “Investment that is made to acquire lasting interest in an enterprise operating in an economy other than that of investor. The investor’s purpose is being to have an effective voice in the management of enterprise.” In 2011, the result of global survey conducted by Ernst and young has put India on the fourth rank of the most favorable destination after china, central Europe and Western Europe on the basis of prospects of various business locations. India has been put ahead of U.S.A and Russia. The IMF identifies two risks: one that affects advanced nations and the other emerging economies. The sovereign risk crisis which has already erupted in Europe is also threatening other advanced countries with high fiscal deficits and rising debt levels. Emerging economies experiencing a high-speed growth recovery are receiving, once again, large capital inflows from advanced countries that undertook huge liquidity expansion in response to

the financial crisis. This has led to a rise in the prices of both goods and assets in emerging economies, besides exerting upward pressure on their exchange rates. The impact on India is particularly significant.

MAJOR COMPONENT OF CAPITAL FLOWS

Figure 1



Capital flows having features like equity- (that is, FDI and FPI) are presumed to be more stable and less prone to reversals. FDI yields more benefits than other types of Financial Flows because it comes with more direct control of management. In national and international accounting standards, FDI is defined as an involving equity stake of 10% or more. FPI is different from FDI in that it lacks the element of lasting interest and control. The third type of foreign investment debt flows, consisting of bank loans and bonds, are regarded as more volatile.

FOREIGN DIRECT INVESTMENT FLOW

According to IMF report year 1993, "FDI is defined as an investment made by an investor of one country to acquire an assets in another country with the intent to manage that asset." The IMF definition of FDI includes as many as following elements: equity, capital, reinvested earning of

foreign companies, inter- company debt transactions including short term and long term loans, overseas commercial borrowings, non cash acquisition of equity, investment made by foreign venture capital investors, earning data of indirectly held FDI enterprises, control premium, non competition fees so on.

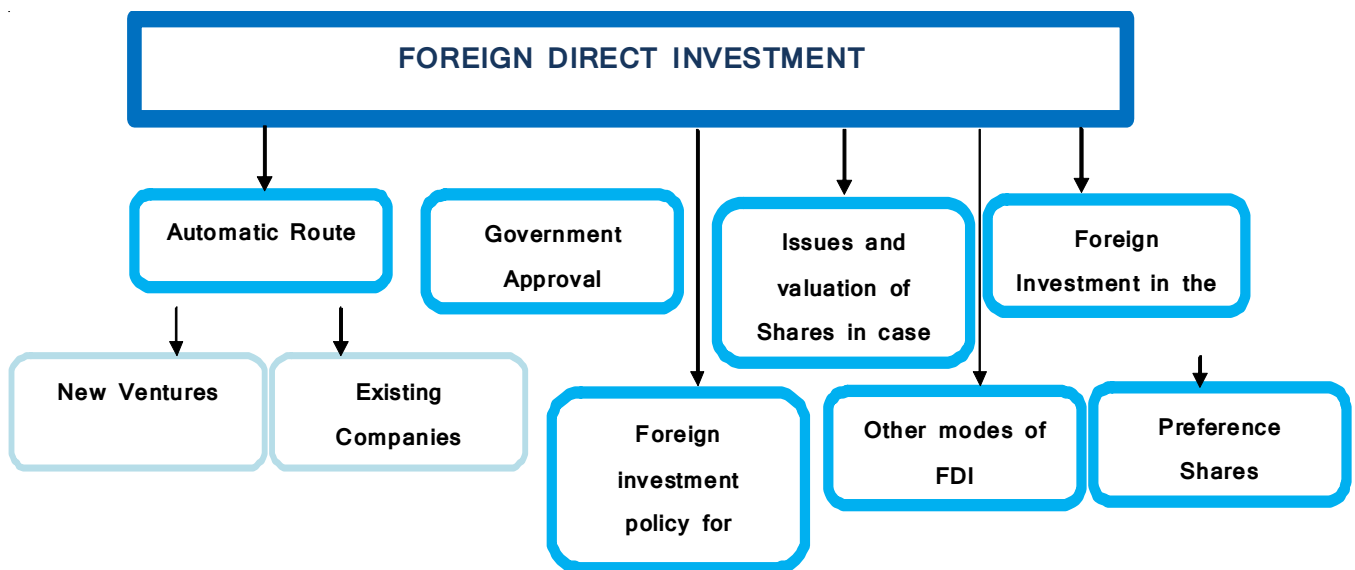
Foreign direct investment is broadly considered as the most stable form of capital flows, both during normal and crisis periods. It consists mainly of fixed assets and it is highly illiquid and difficult to sell during crises.

Automatic Route:

Under the Automatic Route FDI is permitted in all sectors up to the sectoral caps except in certain sectors where investment is prohibited. Investments not permitted under the automatic route require approval from Foreign Investment Promotion Board. The remittance receipt has to be reported to RBI within 30 days from the date of funds received and the issue of shares has to be reported to RBI within 30 days from the date of issue by the investee company.

- i) According to the *New ventures*: All Items/ activities for FDI's /NRIs/OCBs investment upto 100% in the automatic route excepts the following:
 - 1) The item requiring an industrial license under the Industries development regulation Act 1951 and an industrial license in terms of the locational policy also stated by Government under the New Industrial policy of 1991

Figure 2



- 2) More than 24% in the equity capital of units manufacturing items reserved for small scale industries as a foreign investment
- ii) The foreign collaborators have a previous venture in India for all stated proposal. The modalities prescribed in Press note no. 18 dated 14/12/1998 series may apply to such cases.
- iii) All proposals related to the acquisition of shares in an existing Indian company in favour of foreign/NRI/OCB investor.
- iv) All proposal falling out notified sectoral policy/ caps or under sectors in which FDI is not permitted
- v) **Public Sector Undertakings and Export Promotion Zones:** These terms are also from automatic routes. Investment under this automatic route may continue to be ruled by notified sectoral policy, equity and RBI will make sure compliance of the same. The National Industrial Classification section 1987 may remain applicable for description of proposals/ activities related to FDI/NRI/OCBs etc.

Existing Companies: The companies which are proposing to initiate foreign equity.

- i) By the NRI/OCB/Foreign Investor, Increased equity level must results from the expansion of the equity base of the existing company without the acquisition of existing shares.
- ii) The remitted money may be in foreign currency
- iii) The proposed programme may be in the sectors under automatic route or else the proposal would need the government approval through Foreign Investment Promotion Board.

Government Approval

The government approval is necessary through FIPB process and all automatic route features consists in this approval. They have to fulfill the condition of automatic routes.

Foreign Investment in Small Scale Sector

Foreign investment under this the small sector policy equity holding by other units including foreign equity in small scale under taking is permissible up to 24%.

Foreign Investment policy for Trading Activities

- iv) This policy can be approved by the automatic route of upto 51% foreign equity and beyond this can be approved by the government by the Foreign Investment Promotion Board.

Convertible bond (FCCB): The foreign investment through GDR/ADR/Foreign currency.

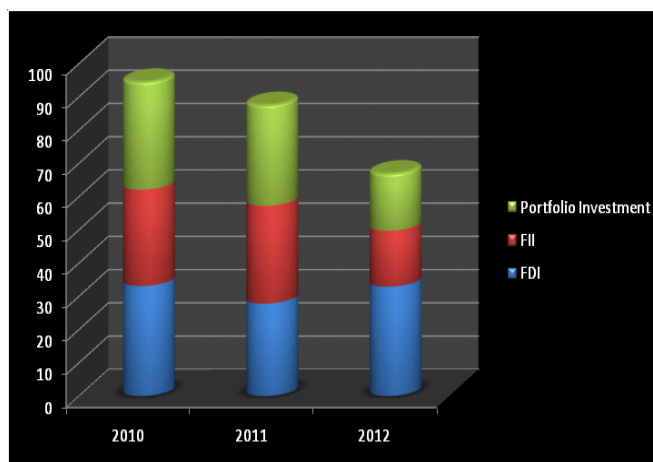
This type of convertible bonds is treated as like FDI. Indian companies allow increasing equity capital in the international market through the issue of GDR/ADR/Foreign currency.

Foreign technology collaboration permitted either through the automatic route under delegated powers implemented by the RBI or through the government.

For setting up of Industrial park/ industrial model town/ SEZ in the country there is proposal of 100% FDI is permitted under automatic route.

Capital Flow of India

Figure 3



Source:(RBI Bulletin 2012)

PORTFOLIO FLOWS

In recent years, portfolio flows to emerging markets have become increasingly large and volatile. Portfolio flows consists of both bond and equity investments. Portfolio investors can sell their stocks or bonds more easily and quickly than FDI and these flows are often considered as a latest of the various major types of capital flows. Portfolio flows are also more susceptible to informational problems and herding behavior. Portfolio flows also render the stock markets more volatile through increased linkages between

the local and foreign financial markets. The Portfolio investments are formed mainly by equity and debt securities.

PRIVATE LOANS FLOWS

Private loans consist of all types of bank loans and other sector loans including loans to finance trade, mortgages, financial leases, repurchase agreements, etc. They have been a relatively neglected category.

MACROECONOMIC CHALLENGES OF INDIA

The global financial crisis affected virtually every economy in the world and India was no exception but we recovered earlier than even other emerging economies. At the time of crisis growth decrease by 6.7% in 2008-09, but very soon it was recovered by two year 2009-10 the growth averaged 9% which compares favorably with the average growth of 9.5% in the three year before the crisis. In 2011-12 the growth moderated with 6.2% and in the year 2012-13 it was 5% approximately.

In the year 2015, India is becoming one of the fastest-growing big emerging market economies in the world. The Indian economy is reviving, helped by positive policy actions that have improved confidence and by lower global oil prices, says the IMF in its annual assessment of the Indian economy. If India needs to revitalize the investment cycle and accelerate structural reforms, to be continued on this trend. The Indian economy is the bright spot in the global landscape. **“Growth numbers are now much higher and the current account deficit is comfortable, in part due to the fall in gold imports and lower oil prices,”** said Paul Cashin, IMF Mission Chief for India.

The IMF forecasts growth will strengthen to 7.2% in 2014-15 and increase with 7.5% in 2015-16, driven by stronger

investment following improvements to the business climate. “These GDP revisions portray a more elastic performance of the services and manufacturing sectors of the economy.” while public and private consumption look stronger, he added, investment activity continues to be held back by structural and supply-side constraints.

The Table 1 depicts GDP of selected countries year wise. After calculating Mean, Rank, SD, Skewness, Kurtosis and T-test the result whatever I have found explained over here. The Data of 2010-13 shows that the mean of each selected countries are calculated and with the help of rank we have decided the rank of each selected countries. China is having the 1st rank with 8.9 mean, India is having 2nd rank with 7.0 Mean and so on. The data reveals the variation of each countries by evaluating Standard Deviation of countries the SD shows that in the year 2010-2013 India GDP growth varies with every year mostly with the having 7.0 Mean and Japan also having similar variation as like India with 2.2 but its mean is 2.9 which is very less. So we can say that India’s SD is very much fluctuating each year according to its capital flows or growth. In the selected countries some countries are negatively skewed and some are positively skewed. Negatively skewed are Australia with -0.2, South Africa -1.2, UK with -0.8, and US with -0.6 and Positively skewed are India with 1.3, China with 0.7 and Japan with 0.2 having positive skewness. The results of T-Test explores that two countries like Japan and UK are having insignificant relationship and other countries like China, India, Australia, South Africa and U.S having significant relationship with variables.

The Table 2 depicts that performance of external sector is playing very significant role in the growth of any country. According to the RBI Publication the several products are mentioned above with their data year wise. The Trade of Balance of India shows negative results with -109.6 in 2010, -118.6 in 2011 and -184.8 in 2012. The FDI inflows between (2010-2012) are in 2010 it was 17.9 suddenly

Table 1 : Gross Domestic Product (GDP) Growth of Selected Countries

Country	2010	2011	2012	2013	Mean	Rank	SD	Skewness	Kurtosis	T-test	Sig.
India	10.1	6.8	4.9	6.0	7.0	2	2.2	1.3	2.0	6.2	0.0
Australia	2.5	2.1	3.3	3.0	2.7	4	0.5	-0.2	-2.2	10.3	0.0
China	10.4	9.2	7.8	8.2	8.9	1	1.2	0.7	-1.0	15.3	0.0
Japan	4.5	-0.8	2.2	1.2	1.8	6	2.2	0.2	0.5	1.6	0.2
South Africa	2.9	3.1	2.6	3.0	2.9	3	0.2	-1.2	1.5	26.8	0.0
UK	1.8	0.8	-0.4	1.1	0.8	7	0.9	-0.8	1.3	1.8	0.2
US	2.4	1.8	2.2	2.1	2.1	5	0.3	-0.6	0.9	17.0	0.0

inflows decreased by 11.9 in 2011 and again it stand with 22.1 in 2012.

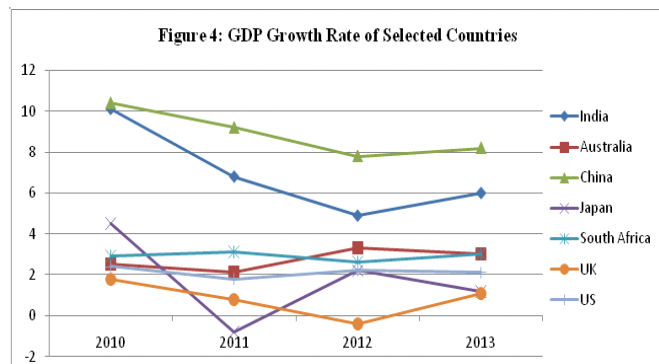


Table 2 : External Sector

SECTORS	FY 2010	FY 2011	FY 2012P
Exports	-3.5	40.5	21.3
Manufacturing goods	115.2	158.0	186.8
Petroleum product	28.2	41.5	55.6
Agriculture and allied product	17.7	24.2	37.4
Import	-5.0	28.2	32.4
Petroleum and crude product	87.1	105.9	154.9
Non Petroleum Items	201.2	263.8	334.5
Trade balance	-109.6	-118.6	-184.8
Current Account	-38.2	-45.9	-78.2
Invisibles	80	84.6	111.6
Capital accounts	51.6	59.0	65.3
FDI Inflows	33.1	27.8	32.9
Portfolio investment	32.4	30.3	17.2
FII	29	29.4	16.8
External commercial Borrowing	2	12.5	10.3
Total Forex reserves	279.1	304.8	294.4
External Debt	261	306.0	345.8

Source: (RBI Report)

The Portfolio Investment results shows the decreasing trend every year like in 2010 it was 32.4, 2011 it was 30.3 and 2012 it was drastically decreased by 17.2. The results of FII somewhat similar in 2010 and 2011 with the value of 29 and 29.4 having no major difference, we can say very slightly increment have been shown here and after that in 2012 major decline have been shown here with the 16.8. The External debt of country is in 2010 with 261, 2011 with 306 and 2012 with 345.8. The data explores that the external debt of India is in increasing trend flow on the back of sharp enhancement in the long term debt, especially NRI deposits, reflecting the impact of fresh FCNR (Foreign currency Non Resident). India is potentially strong country to defend with its external debts. The external debt is good

for the country till the extent limit but it is liability and we think liability is not good for any country, it increase debt servicing problems and creates the faces of crisis for country.

CONCLUSION

FDI plays an important role in enhancing the growth of any economy. It is a necessary for creation of Jobs, expansion of existing manufacturing industries and the development of new units. FDI has a wide spread impact on a country not only economically but also socially. It generates big opportunities for local manufacturer. FDI has created jobs in every field manufacturing, telecommunication, advertising, media, and above all services. Perhaps the biggest beneficiary of the FDI is the Indian Consumer. India is the 7th largest country located in South Asia, and the 2nd most populated country in the world. India has long been known for the diversity of its culture, for the inclusiveness of its people and for the convergence of geography. Although, India was improved with 14th position in 2011 from 16th position in 2010. The Trend of FDI is growing in remarkable speed. On the basis of above graphical presentation we can say that India is becoming most prominent economy and maintaining its place as good destination for investments

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An Analysis of Investment Pattern of Public Sector Non-Life Insurance Companies During Post Reform Period

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ABSTRACT

Insurance companies in India are among the largest institutional investors in the world. The investment operations of insurance companies are very crucial as they help to generate the reserves which are essential to settle insurance claims. Thus such operations need to be handled in a judicious manner, so that they generate the maximum yields, combined with liquidity and safety. It has been the constant endeavor of the non-life public sector insurance companies to provide security to fund providers as far as possible and to channelize the saving mobilized for the welfare of the people at large. Insurance companies in India are required to invest in four broad categories and IRDA has prescribed prudential limits for each category. The investment of non-life public sector insurance companies is governed by the Insurance Act 1938, Insurance Regulatory and Development Authority Act 1999 (IRDA), and guidelines and instructions issued by the government of India from time to time. Every insurer shall invest and keep invested at all the times his total assets in the manner set by the IRDA. Therefore an attempt has been made in this paper to understand the investment pattern of non life insurance companies during post reform period, to study the investment pattern of non life insurance companies in the light of IRDA regulations and to make a comparative analysis of investment pattern of public sector non life insurance companies.

INTRODUCTION

General insurance is a long duration contract which generates investible surplus which is invested keeping in view the safety and security of the funds, spread over different categories, industry and regions so as to serve larger economy and social interests by optimizing yield. One of the objectives of nationalization of general insurance industry was channelizing of its fund for the benefits of the community at large. It has been the constant endeavor of the non-life public sector insurance companies to provide security to fund providers as far as possible and to channelize the saving mobilized for the welfare of the people at large. A major portion of fund is invested in schemes, which provide the people of the country amenities like drinking water, sewerage, electricity and shelter. As non-life public sector insurance companies are investing money in various sectors, it is important to analyze the investment pattern in the light of IRDA regulations. Hence, present paper analyzes the investment pattern of public sector non-life insurance companies.

Key words:

Investment pattern, IRDA Regulations, liquidity and safety of fund, maximum return, non-life insurance companies.

REVIEW OF LITERATURE

Verma (2000), in her thesis, evaluated the performance of the GIC and its subsidiary companies over the years, throwing light on the profitable effects of the various insurance sector reforms on the future development of General Insurance in the country. The study found that the GIC along with its subsidiaries has emerged not only as a strong insurance institution but also as influential institutional investors in the financial market of India due to large amount of funds at its disposal. The study suggested that GIC

should bring reform in pricing the General Insurance contracts and use information technology for better management, customer service, efficiency and competitiveness.

Rudolf (2001), in his paper examined the key factors and latest trends determining profitability in the major non-life insurance markets. The study focused on the non-life insurance markets of the group of seven countries (G7) mainly for the period 1996 to 2000. The study found that underwriting results and investment yields are negatively correlated. The research suggested that due to uncertain prospects for investment results, the insurers must focus on underwriting results to achieve greater profitability.

Lai and Limpaphayom (2003), in their study examined the relation between organizational structure and firm performance in the Japanese non-life insurance industry. The results indicated that the stock companies that belong to one of the six horizontal Keiretsu groups have lower expense and lower levels of free cash flow than independent stock and mutual insurance companies. Keiretsu insurers also have higher profitability and higher loss ratios than independent insurers. There was also evidence that mutual insurers have higher levels of free cash flows, higher investment incomes and lower financial leverage than their stock counterparts. Overall, empirical evidence suggested that each structure has its own comparative advantage.

Banerjee (2004), in his article, "Insurance Regulation in India and Future Directions," concluded that the insurance industry will face greater competition from other

financial service providers along all aspects of their value chain. Insurers for instance, with their significant and growing asset base, shall have to develop asset management capabilities and expertise on par with professional fund managers, otherwise they will face pressure to farm out their funds for professional management.

Festus (2011), in his study, "Achieving Competitive Advantage in Insurance Industry: The Impact of Marketing Innovation and Creativity", concluded that creativity and innovation in providing new and innovative services is an important factor in order to satisfy the clients need and that creativity and innovation in pricing and promotion and innovation and creativity in distribution, technological innovation are crucial in attracting new clients.

OBJECTIVES OF THE STUDY

- To understand the investment pattern of public sector non life insurance companies during post reform period.
- To analyze the investment pattern of public sector non-life insurance companies in the light of IRDA regulations.
- To make a comparative analysis of investment pattern of public sector non life insurance companies.

Table 1.1 : Composition of Investment as Per IRDA

(i)	Government Securities	Not less than 20% of Investment Assets
(ii)	Government Securities or Other Approved Securities	Not less than 30% of Investment Assets (Incl. (i) above)
(iii)	Investment as specified in Section 27B of insurance Act 1938 and Schedule II subject to Exposure/Prudential Norms Specified in Regulation 5. A. Approved investment and other investment. Other investment specified under 27B(3) of the Act subject to Exposure Prudential Norms. B. Housing and Loans to State Government for Housing and Firefighting equipment C. Investment in Infrastructure	Not exceeding 55% Not exceeding 25% Not less than 5% Not less than 10%

Source: Insurance Regulatory and Development Authority (Investment) (Fourth Amendment) Regulatory, 2008.

Composition of investment as per IRDA

The investment of non-life public sector insurance companies is governed by the Insurance Act 1938, Insurance Regulatory and Development Authority Act 1999 (IRDA), and guidelines and instructions issued by the government of India from time to time. Every insurer shall invest and keep invested at all the times his total assets in the manner set by the IRDA. The composition of investment as per IRDA regulation has been shown in Table 1.1.

1.1 Investment Pattern of Selected Public Sector Non-Life Insurance Companies

The analysis of investment pattern has been done in order to see whether the investments of public sector non-life insurance companies have been as per IRDA regulations or not. To analyze the investment pattern percentage of the amount of investment in each category has been calculated for the study period. The pattern of investment for all the selected public sector non-life insurance companies has been evaluated as below.

1.1.1 Investment Pattern of New India Assurance Company Limited (NIACL)

The investment pattern of New India Assurance Company Ltd. has been given in Table 1.2

It is evident from Table 1.2 that the percentage share of investment in government securities and other approved securities was 29.87 in 2001-02, which increased to its highest level, 33.66 in 2002-03. In 2003-04 it decreased to 26.84 but rose to 27.37 in the very next year. In 2005-06 it decreased to 21.58 but increased to 23.75 in 2007-08. In 2007-08 it decreased to 19.19 but increased to 25.76 in 2008-09. In 2009-10 it decreased to 16.87 and in 2010-11 to 16.45. In 2011-12 it increased to 19.07 and reached to 19.65 in 2013-14. The percentage share of investment in government securities and other approved securities in NIACL was between 16.45% and 33.66% during the study period. The highest percentage share of investment has been observed 33.66% in 2002-03 and the lowest percentage share of investment has been observed 16.45 in 2010-11. Further it has been observed that there was less than 30%

Table 1.2 : Investment Pattern of New India Assurance Company Ltd

Years	Government Securities	Infrastructure and Social Sector	Investment Subject to Exposure Norms	Housing Sector	Other than Approved Investment
2001-02	29.87	-	70.13	-	-
2002-03	33.66	1.10	60.28	0.20	5.84
2003-04	26.84	1.72	66.08	-	5.16
2004-05	27.37	3.88	62.32	0.92	5.52
2005-06	21.58	3.69	68.95	1.50	4.28
2006-07	23.75	6.07	62.54	2.90	4.68
2007-08	19.19	7.24	67.71	3.09	2.83
2008-09	25.76	10.03	59.15	3.58	2.35
2009-10	16.87	6.84	72.47	2.05	1.35
2010-11	16.45	6.15	73.07	3.12	1.22
2011-12	19.07	6.36	69.84	3.69	1.03
2012-13	19.37	6.20	70.2	3.22	1.01
2013-14	19.65	6.15	70.1	3.18	0.92

Source: Annual reports of respective insurance companies from 2001-02 to 2013-14.

investment in government securities and other approved securities throughout the study period except the year 2002-03. Hence, it can be concluded that the NIACL has not satisfied the norm of not less than 30% investment in government securities and other approved securities in all the years of the study period except the year 2002-03.

Share of investment in infrastructure and social sector was nil in 2001-02 which showed an upward trend during the next seven years and reached to its highest level 10.03 in 2008-09. In 2009-10 it decreased to 6.84 and in 2010-11 to 6.15. In 2011-12 it decreased to 6.36, in 2012-13 to 6.20 and finally to 6.15 in 2013-14. The percentage share of investment in infrastructure and social sector lies between nil and 10.03 during the study period. Looking at the figure of percentage share of investment in infrastructure and social sector, it can be concluded that the NIACL has not satisfied the investment norm of 10% in all the years of the study period except the year 2008-09.

The percentage share of investment governed by prudential/ exposure norm was 70.13 in 2001-02, which

decreased to 60.28 in 2002-03. In 2003-04 it increased to 66.08 but decreased to 62.32 in the very next year. In 2005-06 it increased to 68.95 but dropped to 62.54 in 2006-07. In 2007-08 it rose to 67.71 but dropped to its lowest level, 59.15 in the next year. In 2009-10 it increased to 72.47 and in 2010-11 further increased to its highest level, 73.07. In 2011-12 it finally decreased to 69.84. In 2012-13 it increased to 70.2 and decreased slightly to 70.1 in 2013-14. The percentage share of investment governed by prudential/ exposure norm was between 59.15 and 73.07 during the study period. Hence it can be concluded that the company has not satisfied the investment nor of not exceeding 55% during all the years of the study period.

In 2001-02 the percentage share of investment in housing sector was nil. In 2002-03 it was 0.20 percent. In 2003-04 it was again nil. In 2004-05 it was 0.92 which showed an upward trend during the next four years and reached to 3.58 in 2008-09. In 2009-10 it decreased to 2.05 but thereafter showed an upward trend during next two years and reached to its highest level, 3.69 in 2011-12. Thereafter

Table 1.3 : Investment Pattern of Oriental Insurance Company Ltd

Years	Government Securities	Infrastructure and Social Sector	Investment Subject to Exposure Norms	Housing Sector	Other than Approved Investment
2001-02	26.91	7.18	59.82	-	6.10
2002-03	31.92	8.42	52.46	-	7.21
2003-04	25.79	7.01	61.27	-	6.51
2004-05	25.58	6.63	59.86	-	7.93
2005-06	19.60	5.72	66.90	-	7.79
2006-07	23.22	7.51	63.49	-	5.78
2007-08	20.60	7.12	67.52	-	4.75
2008-09	28.07	11.57	57.85	-	2.51
2009-10	19.41	14.93	63.24	-	2.42
2010-11	20.43	13.07	63.14	-	3.36
2011-12	22.62	12.23	62.56	-	.59
2012-13	22.70	12.12	62.50	-	2.68
2013-14	22.93	11.90	62.35	-	2.82

Source: Annual reports of respective insurance companies from 2001-02 to 2013-14.

it decreased to 3.18 in 2013-14. The percentage share of investment in housing sector was between nil and 3.69 during the study period. Hence it can be concluded that the NIACL has not satisfied the investment norm of not less than 5% in all the years of the study period.

The percentage share of investment in other than approved investment was nil in 2001-02. In 2002-03 it increased to 5.84. In 2003-04 it decreased to 5.16 but increased to 5.52 in the next year. In 2005-06 it decreased to 4.28 but increased to 4.67 in 2006-07. Thereafter it showed decreasing trend during the last seven years and reached to 0.92 in 2013-14. The percentage share of investment in other than approved investment lies between nil and 5.84 during the study period. Hence it can be concluded that NIACL has satisfied the investment norm of not exceeding 25% throughout the study period.

1.1.2 Investment Pattern of Oriental Insurance Company Limited (OICL)

The investment pattern of Oriental Insurance Company Limited has been enumerated in Table 1.3.

Table 1.3 reveals that the percentage share of investment in government securities and other approved securities in OICL was 26.91 in 2001-02. In 2002-03 it increased to 31.92 but thereafter showed downward trend for the next three years and reached to 19.60 in 2005-06. In 2006-07 it increased to 23.22 but decreased to 20.60 in the next year. In 2008-09 it increased to 28.07 which dropped to 19.41 in the next year. In 2010-11 it increased to 20.43, in 2011-12 it increased to 22.62, in 2012-13 it increased to 22.70 and finally to 22.93 in 2013-14.

The percentage share of investment in government securities and other approved securities was between 19.41 and 31.92 during the period of study. It was highest 31.92 in 2003-04 and touched its lowest level, 19.41 in 2009-10. Hence it can be concluded OICL has not satisfied the investment norm of not less than 30% in government securities and other approved securities for all the years of the study period except the year 2002-03.

The percentage share of investment in infrastructure and social sector was 7.18 in 2001-02, which increased to 8.42 in 2002-03. Thereafter it recorded downward trend for the next three years and reached to 5.72 in 2005-06. In 2006-07, it increased to 7.51 and in 2007-08, it decreased slightly to 7.12. In 2008-09 it increased to 11.57 and in 2009-10 it touched its highest level, 14.93. In 2010-11 it decreased slightly to 13.07 in 2011-12 it further decreased to 12.23. in

2012-13 it decreased to 12.12 and finally to 11.90 in 2013-14. The percentage share of investment in infrastructure and social sector lies between 5.72 and 14.93 during the period of study. By looking at the figures of percentage share of investment in government securities and other approved securities it can be concluded that the OICL has satisfied the investment norm of not less than 10% only once for the study period during last four year. In 2001-02 the percentage share of investment governed by prudential/exposure norm in OICL was 59.82 percent which decreased to 52.46 in the next year. In 2003-04 it increased to 61.27 which decreased to 59.86 in 2004-05. In 2005-06 it increased to 66.90 which decreased to 63.49 in the next year. In 2007-08 it increased to 67.52 but thereafter showed decreasing trend for the last six years of the study period and reached to 62.35 in 2013-14. The percentage share of investment governed by prudential/exposure norm OICL was between 52.46 and 67.52 during the study period. It was observed highest, 67.52 in 2007-08 and it was observed lowest, 52.46 in 2002-03. Hence it can be concluded that OICL has satisfied the investment norm of not exceeding 55% only once in 2002-03 during the study period as the percentage of investment was greater than 55% for rest of the years.

OICL has not made any investment in the housing sector during the period of study. Hence it can be concluded that the OICL has not satisfied the investment norm of not less than 5% in housing sector for all the years of the study period.

The percentage share of investment in other than approved investment was 6.10 in 2001-02 which rose to 7.21 in the next year. In 2003-04 it decreased to 6.51 which rose to 7.93 in the next year. Thereafter it registered downward trend for the next five years and reached to its lowest level 2.42 in 2009-10. In 2010-11 it increased to 3.36 but dropped to 2.59 in 2011-12. It increased to 2.68 in 2012-13 and finally to 2.82 in 2013-14. The percentage share of investment in other than approved investment was recorded between 2.42 and 7.93 during the study period. Hence it can be concluded that the OICL has satisfied the investment norm of not exceeding 25% in all the years of the study period.

1.1.3 Investment Pattern of United India Insurance Company Limited (UIICL)

The investment pattern of United India Insurance Company Limited has been shown in Table 1.4.

It is clear from Table 1.4 that the percentage share of investment in government securities and other approved

securities in UIICL was 34.79 in 2001-02 which increased to 39.75 in 2002-03. Thereafter it showed downward trend for next five years and reached to 22.42 in 2007-08. In 2008-09 it increased to 28.21 but decreased to 21.67 in the next year. In 2010-11 it increased to 23.50 and in 2011-12 it further increased to 25.20. In 2012-13 it dropped to 24.67 and in 2013-14 it further dropped to 24.60. The percentage share of investment in government securities and other approved securities was between 21.67 and 39.35 during the study period. It was highest, 39.35 in 2002-03 and touched its lowest level, 21.67 in 2009-10. Hence it can be concluded that the UIICL has satisfied the investment norm of not less than 30% only during the first four years of the study period.

Percentage share of investment in infrastructure and social sector was 12.35 in 2001-02 which increased to 13.99 in the next year. Thereafter it showed decreasing trend for the next four years and reached to 6.28 in 2007-08. From 2008-09 onwards it witnessed an upward trend during last six years and reached to its highest level, 23.92 in

2013-14. Percentage share of investment in infrastructure and social sector in UIICL was between 6.28 and 23.92 during the study period. Looking the figures of percentage share of investment, it can be concluded that the UIICL has satisfied the investment norm of not less than 10% during the first two years and during the last four years of the study period.

In 2001-02, the percentage share of investment subject to prudential/exposure norm was 44.32 in UIICL. In 2002-03 it dropped to 35.86 but thereafter it showed an upward trend for next three years and reached to 60.25 in 2005-06. In 2006-07 it decreased to 57.19 but increased to its highest level, 63.13 in the very next year. In 2008-09 it decreased to 48.83 but increased to 53.97 in 2009-10. Thereafter it decreased during last two years and reached to 49.03 in 2011-12. In 2013-13 it decreased to 48.52 and in 2013-14 it further decreased to 48.44. The percentage share of investment subject to prudential/exposure norm was between 35.86 and 63.13 during the study period. Hence it can be concluded that the UIICL has satisfied the

Table 1.4 : Investment Pattern of United India Insurance Company Ltd

Years	Government Securities	Infrastructure and Social Sector	Investment Subject to Exposure Norms	Housing Sector	Other than Approved Investment
2001-02	34.79	12.35	44.22	-	8.65
2002-03	39.35	13.99	35.86	-	10.80
2003-04	32.44	8.73	49.23	-	9.60
2004-05	31.89	8.56	51.60	-	7.76
2005-06	26.32	7.23	60.25	-	6.20
2006-07	26.11	6.88	57.19	-	9.72
2007-08	22.42	6.28	63.13	-	8.17
2008-09	28.21	17.15	48.83	-	5.80
2009-10	21.67	20.55	53.97	-	3.80
2010-11	23.50	21.29	52.60	-	2.60
2011-12	25.20	22.59	49.03	-	3.17
2012-13	24.67	22.72	48.52	-	2.09
2013-14	24.60	23.92	48.44	-	3.04

Source: Annual reports of respective insurance companies from 2001-02 to 2013-14.

investment norm of not exceeding 55% in all the years except three years i.e. 2005-06, 2006-07 and 2007-08.

UIICL has not made any investment in housing sector throughout the study period. Hence it can be concluded that UIICL has not satisfied the investment norm of not less than 5% in housing sector in all the years of the study period.

Percentage share of investment in other than approved investment was 8.65 in 2001-02 which increased to 10.80 in 2002-03. Thereafter it recorded decreasing trend for the next three years and reached to 6.20 in 2005-06. In 2006-07 it increased to 9.72 but thereafter it again showed decreasing trend for the next four years and reached to 2.60 in 2010-11. In 2011-12 it rose to 3.17 and reached to its lowest level 2.09 in 2012-13. In 2013-14 it rose to 3.04. Percentage share of investment in other than approved investment was less than 25% in all the years of the study

period. Hence it can be concluded that the UIICL has satisfied the investment norm of not exceeding 25% in all the years of the study period.

1.1.4 Investment Pattern of National Insurance Company Limited (NICTL)

The investment pattern of National Insurance Company Limited has been depicted in Table 1.5.

It is evident from Table 1.5 that the percentage share of investment in government securities and other approved securities was 24.52 in 2001-02, which decreased to 23.82 in 2002-03. In 2003-04 it increased to 25.82 but thereafter decreased during next two years and reached to 17.17 in 2005-06. In 2006-07 it increased to 18.68 but decreased to 15.76 in the next year. In 2008-09 it increased again to 21.23 but decreased to 16.32 in 2009-10. Thereafter it

Table 1.5 :Investment Pattern of National Insurance Company Ltd.

Years	Government Securities	Infrastructure and Social Sector	Investment Subject to Exposure Norms	Housing Sector	Other than Approved Investment
2001-02	24.52	6.04	64.36	-	5.08
2002-03	23.82	6.85	65.15	-	4.18
2003-04	25.82	5.90	63.21	-	5.12
2004-05	21.66	8.03	65.88	-	4.43
2005-06	17.17	6.51	73.11	-	2.60
2006-07	18.68	7.80	70.90	-	2.48
2007-08	15.76	6.84	75.62	-	1.78
2008-09	21.23	9.36	67.86	-	1.54
2009-10	16.32	6.43	76.54	-	0.71
2010-11	18.77	7.78	73.20	-	0.25
2011-12	20.87	9.48	69.43	-	0.23
2012-13	20.43	9.32	70.04	-	0.21
2013-14	20.68	8.92	70.20	-	0.20

Source: Annual reports of respective insurance companies from 2001-02 to 2013-14.

showed increasing trend during last two years and reached to 20.87 in 2011-12. In 2012-13 it dropped to 20.13 but increased to 20.68 in 2013-14. As per IRDA guidelines investment in government securities and other approved securities should not be less than 30%. But in NICL it was between 15.76% and 25.82% during the study period. It was highest, 25.82 in 2003-04 and it touched its lowest level 15.76 in 2007-08. Hence it can be concluded that the NICL has not satisfied the investment norm of not less than 30% in all the years of the study period.

The percentage share of investment in infrastructure and social sector was 6.04 in 2001-02, which rose to 6.85 in the next year. In 2003-04 it decreased to 5.90 but increased to 8.03 in 2004-05. In 2005-06 it dropped to 6.51 but increased to 7.80 in the next year. In 2007-08 it again dropped to 6.84 which increased to 9.36 in 2008-09. In 2009-10 it decreased to 6.43 but thereafter it showed increasing during last two years and reached to its highest level, 9.48 in 2011-12. In 2012-13 it decreased to 9.32 and in 2013-14 to 8.92. As per IRDA guidelines investment in infrastructure and social sector should not be less than 10%. But in NICL it was

between 5.90% and 9.48% during the study period. Hence it can be concluded that NICL has not satisfied the investment norm of not less than 10% in the years of study period.

The percentage share of investment subject to prudential/exposure norm was 64.36 in 2001-02, which increased to 65.15 in the next year. In 2003-04 it decreased to 63.21 but increased during next two years and reached to 73.11 in 2005-06. In 2006-07 it dropped to 70.90 but rose to 75.62 in the next year. In 2008-09 it decreased to 67.86 but increased to 76.54 in 2009-10. Thereafter it showed decreasing trend during next two years and reached to 69.43 in 2011-12. In 2012-13 it increased to 70.04 and in 2013-14 it increased to 70.20. As per IRDA guidelines investment subject to prudential/exposure norm should not be exceeding 55%. But in NICL it was between 63.21% and 76.54% during the study period. Hence it can be concluded that the NICL has not satisfied the investment norm of not exceeding 55% throughout the study period

Table 1.6 : Investment in Government Securities and Other Approved Securities Public Sector Non-Life Insurance Companies (Percentage)

Years	NIACL	OICL	UIICL	NICL
2001-02	29.87	26.91	34.79	24.52
2002-03	33.66	31.92	39.35	23.82
2003-04	26.84	25.79	32.44	25.82
2004-05	27.37	25.58	31.89	21.66
2005-06	21.58	19.60	26.32	17.17
2006-07	23.75	23.22	26.11	18.68
2007-08	19.19	20.60	22.42	15.76
2008-09	25.76	28.07	28.21	21.23
2009-10	16.87	19.41	21.67	16.32
2010-11	16.45	20.43	23.50	18.77
2011-12	19.07	22.62	25.20	20.87
2012-13	19.37	22.70	24.67	20.43
2013-14	19.65	22.93	24.60	20.68
Mean	23.03	23.83	27.78	20.44

Source: Annual Report of Respective Company from 2001-02 to 2013-14

NICL has not made any investment in the housing sector during the period of study. Hence it can be concluded that the NICL has not satisfied the investment norm of not less than 5% in housing sector for all the years of the study period.

In 2001-02, the percentage share of investment in other than approved investment was 5.08 which dropped to 4.18 in the next year. In 2003-04 it increased to its highest level, 5.12 but thereafter it registered downward trend for rest of the years of the study period and reached to its lowest level of 0.20% in 2013-14. As per IRDA guidelines the percentage share of investment in other than approved investment should not be exceeding 25%. Hence it can be concluded that the NICL has satisfied the investment norm of not exceeding 25% in all the years of the study period.

1.2 Comparative Analysis of Investment Pattern of Public Sector Non-Life Insurance Companies

Here, an attempt has been made to present comparative analyses of all the four selected public sector Non-life insurance companies on different aspects of investment patterns in the light of IRDA regulations.

1.2.1 Investment In Government Securities And Other Approved Securities

As per IRDA guidelines, general insurance companies are required to satisfy the investment norm of not less than 30% investment in government securities and other approved securities. The percentage share of investment in government securities and other approved securities has been calculated and shown in Table 1.6.

It is evident from Table 1.6 that average investment in government securities and other approved securities was highest in UIICL followed by OICL, NIACL and NICL respectively. Further, it can be concluded that the average investment in government securities and other approved securities is less than the IRDA guidelines of not less than

30% in all the companies under study.

ANALYSIS OF VARIANCE (ANOVA)

The statement of null hypothesis and alternative hypothesis are given as under:

H_0 = the percentage share of investment in government securities and other approved securities did not differ significantly between the companies and between the years.

H_1 = the percentage share of investment in government securities and other approved securities differ significantly between the companies and between the years.

It is evident from the Table 1.7 that there was significant difference in the percentage share of investment in government securities and other approved securities between the companies as the calculated value of 'F' (90.53) was significantly higher than the table value (2.92) for $i_1 = 03$ and $i_2 = 30$ at 5% level of significance. Hence null hypothesis has been rejected and alternative hypothesis has been accepted

Similarly there was significant difference in the percentage share of investment in government securities and other approved securities between the years as the calculated value of 'F' (61.29) was significantly higher than the table value (2.16) for $i_1 = 03$ and $i_2 = 30$ at 5% level of significance. Hence null hypothesis has been rejected and alternative hypothesis has been accepted.

1.2.2 Investment in Infrastructure and Social Sector

As per IRDA guidelines general insurance companies are required to invest in infrastructure and social sector not less than 10% of their total investment. The percentage share of investment in infrastructure and social sector has been calculated and shown in Table 1.8.

Table 1.7: ANOVA- Percentage Share of Investment in Government Securities and Other Approved Securities

Source of Variation	Sum of Squares	Degree of Freedom	Mean Square	'F' Ratio	Table Value
Between Companies	350.33	03	116.78	90.53	2.92
Between Years	790.73	10	79.07	61.29	2.16
Residual	38.83	30	1.29		
Total	1179.89	43			

It is evident from the Table 1.8 that the average percentage share of investment in infrastructure and social sector was highest in UIICL followed by OICL, NICL and NIACL respectively. UIICL was the only company where the average percentage share of investment in infrastructure and social sector was greater than the investment norm of not less than 10%.

Analysis of Variance (ANOVA)

The statement of null hypothesis and alternative hypothesis are given as under:

H_0 = the percentage share of investment in infrastructure and social sector did not differ significantly between the companies and between the years.

H_1 = the percentage share of investment in infrastructure and social sector differ significantly between the companies and between the years.

It is evident from the Table 1.9 that there was significant difference in the percentage share of investment in infrastructure and social sector between the companies as the calculated value of 'F' (15.84) was significantly higher than the table value (2.92) for $i_1=03$ and $i_2=30$ at 5% level of significance. Hence, null hypothesis has been rejected and alternative hypothesis has been accepted

Table 1.8 : Investment in Infrastructure and Social Sector Public Sector Non-Life Insurance Companies(Percentage)

Years	NIACL	OICL	UIICL	NICL
2001-02	-	7.18	12.35	6.04
2002-03	1.10	8.42	13.99	6.85
2003-04	1.72	7.01	8.73	5.90
2004-05	3.88	6.63	8.56	8.03
2005-06	3.69	5.72	7.23	6.51
2006-07	6.07	7.51	6.88	7.80
2007-08	7.24	7.12	6.28	6.84
2008-09	10.03	11.57	17.15	9.36
2009-10	6.84	14.93	20.55	6.43
2010-11	6.15	13.07	21.29	7.78
2011-12	6.36	12.23	22.59	9.48
2012-13	6.2	12.12	22.72	9.32
2013-14	6.15	11.90	23.92	8.92
Mean	5.03	9.65	14.79	7.64

Source: Annual Report of Respective Company from 2001-02 to 2013-14

Table 1.9 : ANOVA- Percentage Share of Investment in Infrastructure and Social Sector

Source of Variation	Sum of Squares	Degree of Freedom	Mean Square	'F' Ratio	Table Value
Between Companies	413.97	03	137.99	15.84	2.92
Between Years	333.04	10	33.30	3.82	2.16
Residual	261.39	30	8.71		
Total	1008.40	43			

Similarly there was significant difference in the percentage share of investment in infrastructure and social sector between the years as the calculated value of $F = 3.82$ was greater than the table value (2.16) for $i_1 = 03$ and $i_2 = 30$ at 5% level of significance. Hence null hypothesis has been rejected and alternative hypothesis has been accepted.

1.2.2 Investment Subject to Prudential/Exposure Norms

As per IRDA guidelines investment subject to prudential/exposure norm should not be exceeding 55% in general insurance companies. Percentage share of investment subject to prudential/exposure norm has been calculated and shown in the Table 1.10.

It is clear from Table 1.10 that the average percentage share of investment subject to prudential/exposure norm was highest in NICTL followed by NIACL, OICL and UIICL respectively.

All the companies have higher average percentage share of investment subject to prudential/exposure norm than

the IRDA norm of not exceeding 55% except UIICL where it was 50.99 during the period of study.

ANALYSIS OF VARIANCE (ANOVA)

The statement of null hypothesis and alternative hypothesis are given as under:

H_0 = the percentage share of investment subject to prudential/exposure norm did not differ significantly between the companies and between the years.

H_1 = the percentage share of investment subject to prudential/exposure norm differ significantly between the companies and between the years.

It is evident from the Table 1.11 that there was significant difference in the percentage share of investment subject to prudential/exposure norm between the companies as the calculated value of 'F' (55.87) was significantly higher than the table value (2.92) for $i_1 = 03$ and $i_2 = 30$ at 5% level of significance. Hence null hypothesis has been rejected and alternative hypothesis has been accepted

Table 1.10 : Investment Subject to Prudential/Exposure Norms Public Sector Non-Life Insurance Companies (Percentage)

Years	NIACL	OICL	UIICL	NICTL
2001-02	70.13	59.82	44.22	64.36
2002-03	60.28	52.46	35.86	65.15
2003-04	66.08	61.27	49.23	63.21
2004-05	62.32	59.86	51.60	65.88
2005-06	68.95	66.90	60.25	73.11
2006-07	62.54	63.49	57.19	70.90
2007-08	67.71	67.52	63.13	75.62
2008-09	59.15	57.85	48.83	67.86
2009-10	72.47	63.24	53.97	76.54
2010-11	73.07	63.14	52.60	73.20
2011-12	69.84	62.56	49.03	69.43
2012-13	70.2	62.50	48.52	70.40
2013-14	70.10	63.35	48.44	70.20
Mean	67.14	61.77	50.99	69.68

Source: Annual Report of Respective Company from 2001-02 to 2013-14

Similarly there was significant difference in the percentage share of investment subject to prudential/exposure norm between the years as the calculated value of 'F' (6.60) was greater than the table value (2.16) for $i_1=03$ and $i_2=30$ at 5% level of significance. Hence null hypothesis has been rejected and alternative hypothesis has been accepted.

1.2.4 Other than Approved Investment

Percentage share of investment in other than approved investment should not be exceeding 25% as per IRDA guidelines. Percentage share of investment in other than approved investment has been calculated and shown in the following Table.

It is clear from Table 1.12 that the average percentage share of investment in other than approved investment was highest in UIICL followed by OICL, NIACL and NICL

respectively. All the companies have satisfied the investment norm of not exceeding 25% in all the years of the study period as the percentage share of investment in other than approved investment was less than 25% in all the companies during the period of study.

Further it can be concluded that all the companies have the tendency to reduce the investment in other than approved investment.

ANALYSIS OF VARIANCE (ANOVA)

The statement of null hypothesis and alternative hypothesis are given as under:

H_0 = the percentage share of investment in other than approved investment did not differ significantly between the companies and between the years.

Table 1.11 : ANOVA- Percentage Share of Investment Subject to Prudential/Exposure Norm

Source of Variation	Sum of Squares	Degree of Freedom	Mean Square	'F' Ratio	Table Value
Between Companies	2086.62	03	695.54	55.87	2.92
Between Years	821.45	10	82.15	6.60	2.16
Residual	373.46	30	12.45		
Total	3281.53	43			

Table 1.12 : Other than Approved Investment Public Sector Non-Life Insurance Companies (Percentage)

Years	NIACL	OICL	UIICL	NICL
2001-02	-	6.10	8.65	5.08
2002-03	5.84	7.21	10.80	4.18
2003-04	5.16	6.51	9.60	5.12
2004-05	5.52	7.93	7.76	4.43
2005-06	4.28	7.79	6.20	2.60
2006-07	4.68	5.78	9.72	2.48
2007-08	2.83	4.75	8.17	1.78
2008-09	2.35	2.51	5.80	1.54
2009-10	1.35	2.42	3.80	0.71
2010-11	1.22	3.36	2.60	0.25
2011-12	1.03	2.59	3.17	0.23
2012-13	1.01	2.68	2.09	0.21
2013-14	0.92	2.82	3.04	0.20
Mean	2.78	4.80	6.26	2.23

Source: Annual Report of Respective Company from 2001-02 to 2013-14

H_1 = the percentage share of investment in other than approved investment differ significantly between the companies and between the years.

It is evident from the Table 5.13 that there was significant difference in the percentage share of investment in other than approved investment between the companies as the calculated value of 'F' (22.97) was significantly higher than the table value (2.92) for $i_1=03$ and $i_2=30$ at 5% level of significance. Hence, null hypothesis has been rejected and alternative hypothesis has been accepted.

Similarly there was significant difference in the percentage share of investment in other than approved investment between the years as the calculated value of 'F' (8.60) was greater than the table value (2.16) for $i_1=03$ and $i_2=30$ at 5% level of significance. Hence, null hypothesis has been rejected and alternative hypothesis has been accepted.

CONCLUSION

In this chapter an attempt has been made to see whether the investment of public sector non-life insurance companies have been as per IRDA regulations or not. To analyze the investment pattern, percentage of the amount of investment on each category has been calculated for the study period. On the basis of above analysis it has been concluded that average percentage share of investment in government securities and other approved securities was highest in UIICL followed by OICL, NIACL and NICL respectively. Further it can be concluded that that the average investment in government securities and other approved securities was less than the IRDA guidelines of not less than 30% in all the four companies during the study period. Average percentage share of investment in infrastructure and social sector was highest in UIICL followed by OICL, NICL and NIACL respectively. UIICL

was the only company where the average percentage share of investment in infrastructure and social sector was greater than the investment norm of not less than 10%. Average percentage share of investment subject to prudential/exposure norm was highest in NICL followed by NIACL, OICL and UIICL respectively. All the companies have higher average percentage share of investment subject to prudential/exposure norm than the IRDA norm of not exceeding 55% except UIICL. Average percentage of share of investment in other than approved investment was highest in UIICL followed by OICL, NIACL and NICL respectively. All the companies have satisfied the investment norm of not exceeding 25% in all the years of the study period. Further it can be concluded that NIACL is the only company which has made investment in housing sector but it has also not satisfied the investment norm of IRDA of not less than 5% investment in housing sector during all the years of the study period. So we can conclude that none of the public sector company has strict compliance with the IRDA regulation regarding the investment pattern during the study period.

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Table 1.13 : ANOVA- Other Than Approved Investment

Source of Variation	Sum of Squares	Degree of Freedom	Mean Square	'F' Ratio	Table Value
Between Companies	133.05	03	44.35	22.97	2.92
Between Years	165.89	10	16.59	8.60	2.16
Residual	57.98	30	1.93		
Total	356.92	43			

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Technical and Scale Efficiency of Microfinance Institutions in India: A Study

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ABSTRACT

Microfinance Institutions essentially cater to the financial needs of the under banked small borrowers. This paper attempts to gauge the productive efficiency of these institutions for financial intermediation using Data Envelopment Analysis (DEA). Based on in-depth study of 20 microfinance institutions for 2007-2013 period, it deciphers efficiency both in terms of technical and financial in relative to the constant as well as variable returns to scale. The empirical findings revealed that these institutions were deficient on vital aspects of efficiency. It is also noticed that Sanghamithra Rural Financial Services and Star Microfin Service Society (SMSS) pools apart from the rest as its efficiency was far higher than the sample average. As regards variable returns to scale, the study noted sample micro finance institutions deficient to the extent of 40 percent indicating that technical efficiency deficient was primarily caused by poor financial intermediation for input resource allocation and far below optimum operation of these institutions. In view of this, the study opines that these institutions needed to reduce operation cost and focus more on revenue magnification thus to increase the productive efficiency of the employees.

INTRODUCTION

Microfinance institutions are imperative sources of finance to the underprivileged and inhibited people who are not reached by formal financial institutions. These institutions provide wide- range of services such as deposits, loans, and payment and insurance services to the poor and low income households. The services offered by microfinance institutions have experienced tremendous growth in recent years. Efficient functioning of these institutions is crucial for their long-term sustainability. Studies have been conducted in the country to illustrate the most of microfinance institutions are not financially sustainable as it does not envelop operating cost. This brings in question about the performance of these institutions especially on their efficient use of public funds received from the government and the donor organization. This study aims to evaluate the technical efficiency of microfinance institutions in India as a provider of financial services to the poor and the low income households.

LITERATURE REVIEW

Hassan and Sanchez (2009) investigated the technical and scale efficiencies of microfinance institutions (MFIs) using DEA in three regions and found that technical efficiencies were higher for formal Microfinance institutions than non-formal Microfinance institutions. Furthermore, South Asian MFIs have higher technical efficiency than Latin America and MENA MFIs. It was concluded that the source of inefficiency in these countries was pure technical rather than the scale signifying that MFIs were either slaying resources or were not producing outputs (making enough loans and getting more borrowers). **Haq et al. (2010)** analysed the efficiencies of 39 Microfinance institutions of Africa, Asia, and Latin America and concluded that the non-governmental microfinance institutions under production approach were more

Key words:

Variable returns to scale,
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efficiency, Constant returns
to scale

efficient. These different approaches tend to give them conflicting results. **Massod and Ahmad (2010)** estimated the efficiency of forty Indian microfinance institutions for the period 2005-2008 using the stochastic frontier model. It was found that mean efficiency of MFIs was low (34 percent) but it increased over the period of study. **Ahmad (2011)** analysed the efficiency of microfinance institutions in Pakistan using non parametric Data Envelopment Analysis during the period 2003 - 2009. It found that three MFIs lies on the efficiency frontier in the year 2003 under both constant returns to scale and variable returns to scale assumptions. In 2009, four microfinance institutions were efficient under constant returns to scale and nine were efficient under variable returns to scale assumptions. **Oteng -Abayie et al. (2011)** using a Cobb-Douglas stochastic frontier model investigated the economic efficiency of 137 Microfinance institutions in Ghana for 2007-2010. It was found that the MFIs were producing at constant cost to size with overall average economic efficiency for the group of MFIs to the extent of 56.29 percent. Further it is also revealed that management practices and differences in the procedural capacities (both in portfolio quality and training) were the main source of inefficiencies in the microfinance sector of Ghana. The age and saving indicators of outreach and productivity and cost per borrower were found to be significant determinants of economic efficiency.

Servin et al. (2012) examined technical efficiency of microfinance institutions in Latin America using stochastic frontier analysis taking sample of 315 Microfinance institutions for the period 2003-2009. The results revealed that non -governmental organization and cooperative/credit unions have much lower inter -firm and intra-firms technical efficiencies than the non-bank financial intermediaries. It was also found that NGOs and Cooperative credit unions were less efficient than mutual NBFIs and Banks. It was suggested that increased regulation and competition was needed to curtail inefficiencies of non-shareholder MFIs.

Kabedea and Berhanu (2013) investigated the efficiency of microfinance institutions (MFIs) in extending monetary services to the poor by comparing their cost efficiency with that of commercial banks (CBs) in Ethiopia during the period 2001-08. It was found that the MFIs were, on average, 33.5% less efficient compared with commercial banks mainly due to their smaller size, focus on outreach activities and the reliance on non-commercial sources of funds. The larger MFIs were found to have higher cost

efficiency scores comparable with that of the most efficient banks.

RESEARCH METHODOLOGY

The present study attempts to review the financial and technical efficiency of MFIs under varied assumptions to identify key success factor for the efficient operations of the microfinance institutions in India.

DATA COLLECTION

Data used in the study were obtained from Microfinance Information Exchange Market Network (www.mixmarket.org). Microfinance Information Exchange (MIX) provides objective, qualified and relevant performance information on microfinance institutions (MFIs), funders, networks and service providers dedicated to serving the financial sector needs for low-income clients. In the present study, a total twenty microfinance institutions (out of total 155 microfinance institutions presenting their data to Microfinance Information Exchange in the year 2014) have been selected depending upon the availability of data for seven successive years 2007-2013.

HYPOTHESES

- H₀₁ Technical efficiency of sampled Microfinance Institution has not significantly improved during the study period.
- H₀₂ Scale efficiency of sampled Microfinance Institutions has not significantly improved during the study period.

METHODOLOGICAL INPUTS

For the purpose of present study, the production approach to measure technical efficiency of microfinance institutions has been considered. The result outcomes thus obtained have been analysed in terms of Data Envelopment Analysis(DEA). DEA model based on output is used to estimate the production efficiency of selected MFIs in India. Efficiency scores were estimated basing on Charnes, Cooper and Rhodes model (Charnes et al., 1978) and Banker, Charnes and Cooper model (Banker et al., 1984) in order to

capture efficiency scores under constant returns to scale, variable returns to scale and scale efficiency. The efficiency score ranges from 0 to 1. Microfinance institution with efficiency score of one are the efficient ones and the best performers among others, whereas Microfinance institutions with less than one efficiency score were inefficient that call for improvement in their resource allocation in order to be on the efficient frontier line.

Assume that there are n Microfinance institutions (MFI_0), and each institution has m inputs to produce s outputs. This model measures the relative efficiency ratio of a given institution (h_0) by the sum of its weighted outputs to the sum of its weighted inputs. It can be formulated as follows:

$$\text{Max } h_0 = \frac{\sum_r^s = 1u_r y_{r0}}{\sum_i^m = 1v_i x_{i0}} \quad (1)$$

Subject to

$$\frac{\sum_r^s = 1u_r y_{rj}}{\sum_i^m = 1v_i x_{ij}} \leq, j = 1, 2, \dots, j_k, \dots, n \quad (2)$$

$$u_r \geq \epsilon, r = 1, 2, \dots, s \quad (3)$$

$$v_i \geq \epsilon, i = 1, 2, \dots, m \quad (4)$$

wherein:

- h_0 is the relative efficiency of a Microfinance Institutions,
- m is the number of inputs,
- u_r is the weight to be determined for output,
- S is the number of outputs,
- n is the number of Microfinance Institutions,
- y_{r0} is the value of output r for a Microfinance Institution,
- ϵ is the small positive value.

The relative efficiency of h_0 of one microfinance institutions 0, is defined as a ratio of the weighted sum of their outputs and the weighted sums of their inputs. As for the decision-making 0, for which a maximum in objective function(1) is sought, the condition (2) is true, meaning that it is obviously $0 < h_0 < 1$, for each microfinance institution. The weight v_i and u_r show the importance of each input and output and is determined in the model so that each

microfinance institution is efficient much as possible. Given that the condition (2) is true for every microfinance institution, it means that each of them lies on the efficient frontier or beyond it. If $\text{Max } h_0 = 1$ implies that efficiency is being achieved so it is considered that the microfinance institution is efficient. Efficiency is not achieved for and for microfinance institution (DMU_0) is not efficient, if it is possible to expand any of its output without reducing any of its inputs and without reducing any other output (output orientation) or if it is possible to reduce any of its input without reducing any output and without expanding some other inputs (input orientation).

The overall technical efficiency (OTE) from Charnes, Cooper and Rhodes model (1978) can be decomposed into pure technical efficiency (PTE) and scale efficiency (SE). The pure technical efficiency can be obtained from Banker, Charnes and Cooper model (1984). Scale efficiency can be measured for an institution by using Charnes, Cooper and Rhodes (1978) and Banker, Charnes and Cooper model (1984) as follow:

$$SE = OPE / PTE$$

If the ratio is equal to one then a microfinance institution is scale efficient. On the other hand if, the ratio is less than one then a MFI is scale inefficient.

The input and output variables selected for the DEA model for sampled Microfinance Institutions are explained here with:

a) Input variables

1. **Personnel (in numbers)** - Total number of employees at the end of period who were actively employed by the MFI as a corporate entity.
2. **Operating Expenses to loan portfolio** - Is calculated by dividing all expenses related to the operation of the institution (including all the administrative and salary expenses, depreciation and board fees) by the period average gross portfolio during the relevant period.
3. **Cost per Borrower**: It measures the MFI effectiveness in cost reduction given the number of borrowers being served. This implies the role of cost reduction in improving financial sustainability. It is calculated by dividing all operational expenses by the average number of active borrowers.

b) Output variables

1. **Financial Revenue/Assets:** Financial Revenue / Average Total Assets
2. **Gross Loan Portfolio** –It comprises the entire outstanding loan for all borrowers viz., current, delinquent and restructure loans but not the loans that have been written off.
3. **Borrowers A/C (Loan Accounts) per employee:** Is calculated by dividing the number of active borrowers of an institution by the total number of staff.

The technical efficiency is calculated by assuming both the constant returns to scale (CRS) and the variable returns to scale (VRS). The descriptive statistics of all inputs and output variables used has been presented in the following table-1

As the study has considered microfinance institutions as lender (the producer) of loans to the client, it is imperative

that minimum inputs must be employed so as to get maximum outputs. Above table shows that on average basis, all the outputs have increased over the years as a result of less employed inputs. The gross loan portfolio has increased more than six fold (from 91.46 crore to 743.27 crore) during the study period. Similarly financial revenue to assets ratio has also increased from 0.180 percent to 0.184 percent. As far as inputs are considered operating expense loan portfolio has decreased from 12.62 percent to 9.98 percent which is a good indicator for microfinance institutions. Similar trend was observed in relation to the cost per borrower as it increased to Rs.578 in 2013 from Rs. 586 in 2007 which means cost for providing loans to borrowers has come down by 0.18 percent. Even average number of employees also increased from 690 to 2609 during the study period which indicates that the outreach level of selected microfinance institutions in serving the ever increasing number of borrowers during the study period.

Table : 1 Descriptive statistics on the Efficiency Parameters (Inputs and Outputs) for Sample MFIs 2007-13.

Input/output	Summary Statistics	Year						
		2007	2008	2009	2010	2011	2012	2013
a) Operating expense/loan portfolio	Average	12.62	10.1	9.86	9.86	9.54	10.98	9.98
	Std. Dev	11.87	6.26	5.56	5.82	4	3.83	3.55
	Min	3.01	0.8	1.16	2.53	3.95	4.07	4.01
	Max	59.31	30.52	21.98	27.7	16.78	15.7	17.32
b) Cost per borrower	Average	586	533	548	603	635	692	578
	Std. Dev	524	387	347	338	284	264	326
	Min	143	40	79	154	228	279	9
	Max	2572	1757	1408	1422	1181	1152	1137
c) Total number of staff members	Average	690	1260	1887	2657	3128	2781	2609
	Std. Dev	729	1585	2902	4715	5163	4031	34671
	Min	82	84	106	104	92	62	58
	Max	2363	6425	12814	21154	22733	16194	11450
d) Financial revenue	Average	0.180	0.199	0.210	0.212	0.221	0.193	0.184
	Std. Dev	0.06	0.08	0.06	0.04	0.06	0.05	0.047
	Min	0.07	0.06	0.01	0.11	0.1	0.03	0.08
	Max	0.27	0.42	0.3	0.28	0.36	0.26	0.24
e) Gross loan portfolio (crore)	Average	91.46	163.5	311.2	538.4	625.06	613.3	743.27
	Std. Dev	108.1	256.4	581.3	1005	1064.79	959.3	1136.2
	Min	7.5	13.6	4.6	21.2	19.6	18.7	16.8
	Max	399.6	1051	2456	4321	4110.7	3730	4420.8
f) Borrowers per staff member	Average	333	290	282	296	307	302	302
	Std. Dev	321	283	198	152	182	162	182
	Min	77	76	63	92	84	57	23
	Max	1275	1429	1020	848	960	852	868

Source: Study results obtained using SPSS, 2007-13

i) Efficiency Parameters under the Constant Returns to Scale (CRS) Assumption

The results of technical efficiency parameters for the selected microfinance institutions are presented in table-2 and 3 respectively. It should be noted that the technical efficiency estimates represents all optimal values based on the assumption of constant returns to scale (CCR model) for the industry and as well as for specific microfinance institution during the period of 2007-2013 and are reported below in table-2.

Result reported in table-2 revealed that average technical efficiency of the MFIs during the study period ranges from 0.69 (69%) in 2007 to 0.629 (62.9%) with an overall mean efficiency of 0.604 (60.4%). This means that the sampled Indian MFIs had increase their output by 39.6 percent at the existing level of inputs. Besides that, the average computed variance of 0.233 showed that there was a wide dispersion in terms of technical efficiency among the MFIs. Year wise, the MFIs could improve their output by 31 percent (2007), 43.5 percent (2008), 41.9 percent (2009), 43.1 percent (2010), 40.6 percent (2011), 39.5 percent (2012), and 37.1 percent (2013) respectively. More importantly, the yearly technical efficiency analysis reveals that four MFIs in 2007, 2008 & 2013 i.e. 20 percent Microfinance institutions were efficient while in 2009, 2010 & 2011 the efficiency percentage was 15 percent (only 3 MFIs). Moreover, the efficiency percentage in the year 2012 was found to be 10 percent (only 1 MFI).

Turning to specific microfinance institutions, the results show that there seem to be much variation in efficiency level among the MFIs. For the year 2007 only four (Bandhan, Shree KshetraDharmasthala Rural Development Project, Star Microfin Service Society and SanghamithraRural Financial Services) out of 20 MFIs were found fully efficient, with efficiency score of 1(100%). Similar trend was seen in 2008 where four MFIs were efficient (MMFL, BISWA, Star Microfin Service Society,

SanghamithraRural Financial Services). However in 2009-2011 period, only 3 institutions were noticed efficient. In 2009, BISWA and SanghamithraRural Financial Services and Star Microfin Service Society were efficient whereas in 2010 and 2011 MMFL, SanghamithraRural Financial Services and Star Microfin Service Society were efficient. In the subsequent years two (SanghamithraRural Financial Services and Star Microfin Service Society) and four MFIs (BISWA, SMSS, SU and Sanghamithra) were found to be fully efficient in the years 2012 and 2013 respectively. Overall, SanghamithraRural Financial Services and Star Microfin Service Society were the most efficient microfinance in all the seven years with efficiency score of 1.0 followed by MMFL and BISWA with an average technical efficiency of 0.840 and 0.742, respectively. On the other hand, with an average technical efficiency of 0.309 (Ujjivan), 0.363(SKS) and 0.412 (ESAF) respectively score fairly well on the efficiency parameters during the study period. The analysis revealed that the inefficiencies of studied Microfinance institutions were primarily of technical nature.

In table-3 relative efficiency score of MFIs under CCR model were given during the study period. In 2007 and 2008 four MFIs were operating to the optimum level and have scored 1 (100%). Star Microfin Service Society and Sanghamithra Rural Financial Services were efficient in both the studied years whereas BISWA and Bandhan were efficient in 2007 and 2008, respectively. However, from 2009-2012, only three MFIs were operating at the best frontier and were efficient and scored 1(100%). In 2013, again four MFIs namely (BISWA, Sanghamithra Rural Financial Services, Star Microfin Service Society and Sahara Utsarga) were on the efficient frontier. It was found from the analysis that Sanghamithra and Star Microfin Service Society were the most efficient MFIs under CCR model followed by MMFL (0.840) and BISWA (0.742). On the other hand, Ujjivan (0.309) and SKS (0.363) were found to be the least efficient under identical assumptions.

Table 2: Study results on Efficiency Parameter Scores under the Constant Returns to Scale during the study period, 2007-13.

Years	2007	2008	2009	2010	2011	2012	2013	Average
Number of MFIs	20	20	20	20	20	20	20	20
Number of efficient MFIs (CRS)	4	4	3	3	3	2	4	3
Average of efficiency value (M)	0.69	0.56	0.58	0.56	0.59	0.60	0.62	0.60
Average inefficiency value (1-M)/M	0.44	0.76	0.72	0.75	0.68	0.65	0.58	0.66
Efficiency Variance	0.05	0.07	0.06	0.04	0.04	0.04	0.05	0.05
Percentage of efficient MFIs	20.0	20.0	15.0	15.0	15.0	10.0	20.0	16.0

Source: Study Results based on DEA

Table 3 : Relative efficiency of MFIs under CRS model during the study period, 2007-13.

MFI	2007	2008	2009	2010	2011	2012	2013	Average
Bandhan	1.00	0.45	0.43	0.51	0.69	1.00	0.98	0.73
BWDA finance	0.82	0.64	0.63	0.65	0.65	0.65	0.37	0.63
ESAF	0.56	0.39	0.34	0.37	0.36	0.43	0.43	0.41
SKS	0.49	0.25	0.25	0.35	0.48	0.32	0.36	0.36
Ujjivan	0.28	0.19	0.25	0.30	0.32	0.36	0.44	0.30
Adhikar	0.94	0.62	0.73	0.58	0.50	0.72	0.83	0.70
SHARE	0.43	0.31	0.48	0.45	0.74	0.37	0.51	0.47
GFSPL	0.64	0.35	0.51	0.51	0.36	0.36	0.56	0.47
Asomi	0.44	0.54	0.22	0.45	0.66	0.74	0.55	0.51
MMFL	0.75	1.00	0.88	1.00	1.00	0.66	0.58	0.84
BISWA	0.71	1.00	1.00	0.49	0.51	0.47	1.00	0.74
Gram Utthan	0.78	0.75	0.80	0.62	0.53	0.47	0.34	0.61
Sanghamithra	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
SKDRP	1.00	0.28	0.42	0.47	0.50	0.69	0.61	0.57
VFS	0.76	0.47	0.56	0.38	0.62	0.51	0.40	0.53
SU	0.87	0.78	0.58	0.65	0.52	0.53	1.00	0.70
SMSS	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Gramavidyal	0.44	0.38	0.40	0.43	0.45	0.51	0.40	0.43
Cashpor MC	0.36	0.38	0.44	0.48	0.44	0.68	0.59	0.48
RGVN	0.48	0.46	0.56	0.60	0.47	0.55	0.55	0.53
Average	0.69	0.56	0.58	0.56	0.59	0.60	0.62	0.60

Source: Study results based on DEA

It is also evident from the results that the efficiency of the sample appears to have increased significantly over the period under review with differentiating rate. The average inefficiency has been decreasing significantly from 76.9 percent to 58.9 percent (2008-2013) except from 2007-08 where the inefficiency level of MFIs has increased by 44 percent to 76.9 percent (Table-2). However, the result implies that MFIs could possibly increase their output by about 39.6% (100%-60.4%) with the existing level of inputs through efficient utilization of selected inputs (Table-2).

ii) Efficiency Result under the Variable Returns to Scale

The results of technical efficiency under the assumptions of variable returns to scale (VRS) for the selected microfinance institutions are presented in table-4&5 respectively.

Meanwhile the outputs oriented under the variable returns to scale (BCC model) results are provided in table-4 for the sample and table-5 for specific microfinance institutions under study. The result showed that selected MFIs experienced moderate level of technical efficiency along with substantial improvement over the study period. Annual average technical efficiency scores by the MFIs ranges from 0.83 (2007) to 0.91 (2013) with an overall sample mean of 0.86.

Table 4 : Summary Statistics on Efficiency Parameter Scores under the Variable Returns to Scale during the Study Period 2007-13.

Years	2007	2008	2009	2010	2011	2012	2013	Average
Number of MFIs	20	20	20	20	20	20	20	20
Number of efficient MFIs (VRS)	7	6	9	7	8	8	11	8
Mean Efficiency	0.83	0.75	0.92	0.87	0.85	0.89	0.91	0.86
Average inefficiency(1-M)/M	0.19	0.31	0.08	0.13	0.16	0.11	0.01	0.14
Efficiency Variance	0.02	0.03	0.01	0.01	0.02	0.01	0.01	0.02
Percentage Efficient MFI	35.0	30.0	45.0	35.0	40.0	40.0	55.0	40.0

Source: Study Results based on DEA

Table 5 : Relative Efficiency of MFIs in the Variable Returns to Scale model during the study period, 2007-13

MFI	2007	2008	2009	2010	2011	2012	2013	Average
Bandhan	1.00	0.64	1.00	0.85	0.89	1.00	1.00	0.91
BWDA finance	1.00	0.77	0.79	0.75	0.77	0.83	0.67	0.79
ESAF	0.808	0.68	0.93	0.80	0.76	1.00	1.00	0.85
SKS	0.74	0.57	0.92	0.98	0.90	0.64	0.82	0.80
Ujjivan	0.62	0.64	0.80	1.00	0.76	0.85	0.98	0.81
Adhikar	1.00	1.00	1.00	0.75	0.84	0.88	0.96	0.92
SHARE	0.60	0.57	1.00	1.00	1.00	0.58	0.68	0.77
GFSP	0.96	0.87	0.96	0.85	0.74	0.83	1.00	0.89
Asomi	0.46	0.73	1.00	0.75	1.00	1.00	1.00	0.85
MMFL	1.00	1.00	1.00	1.00	1.00	0.94	0.95	0.98
BISWA	0.71	1.00	1.00	0.85	0.78	0.91	1.00	0.89
Gram Utthan	0.79	0.86	0.95	0.72	0.78	0.69	0.60	0.77
Sanghamithra	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
SKDRP	1.00	0.44	0.57	0.63	0.51	0.69	0.73	0.65
VFS	0.99	0.57	0.81	0.82	1.00	1.00	0.95	0.88
SU	0.90	1.00	0.92	1.00	1.00	1.00	1.00	0.97
SMSS	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GramaVidyal	0.82	0.39	1.00	1.00	1.00	1.00	1.00	0.88
Cashpor MC	0.71	0.70	0.92	0.95	0.84	1.00	1.00	0.87
RGVN	0.59	0.70	0.86	0.82	0.56	0.98	1.00	0.79
Average	0.83	0.75	0.92	0.87	0.85	0.89	0.91	0.86

Source: Study results obtained using DEA

However, the result suggested that there is substantial scope for selected Indian MFIs to improve their efficiency performance of the operations that hardly require any additional financial resources. The same can be improved by 13.3 percent on the average during the study period, 2007-13. More specifically; MFIs could improve their efficiency approx. by 17 percent (2007), 25 percent (2008), 8 percent (2009), 13 percent (2010), 15 percent (2011), 11 percent (2012), and 9 percent (2013) respectively during the study period under consideration.

Further, during the study period, only about 40% of the MFIs were operating with optimal scale of operation. Majority of the Microfinance institutions were still inefficient that can improve their performance by using their resources inputs more competently. Considering specific results, for the first year of analysis (2007) seven MFIs out of 20 were operating at the best frontier and were efficient and have scored 1(100%). These include Bandhan, BWDA Finance, Adhikar, MMFL, Sanghamithra, Shree Kshetra Dharmasthala Rural Development Project and SMSS. However, in year (2008) only six MFIs (Adhikar, MMFL, BISWA, Sanghamithra Rural Financial Services, Sahara Utsarga, and Star Microfin Service Society) operated with efficient scoring 1(100%). In the year 2009, the number of efficient MFIs increased to 9 (Bandhan, Adhikar, Share, Asomi, MMFL, BISWA, Sanghamithra Rural Financial

Services, Star Microfin Service society and GramaVidyal). In 2010, the number of efficient microfinance institution number has come down to seven (Ujjivan, Share, MMFL, Sanghamithra Rural Financial Services, SU, Star Microfin Service Society, and the GramaVidyal). In 2011 and 2012, number of efficient MFIs were eight whereas in the year 2013, the same has increased to eleven (Bandhan, ESAF, GFSP, Sahara Utsarga, Star Microfin Service Society, RGVN, Sanghamithra Rural Financial Services, Asomi, GramaVidyal and Cashpor MC). In nutshell, the result of the analysis showed that during the study period, Sanghamithra Rural Financial Services and Star Microfin Service Society were the most efficient MFIs under BCC model followed by GramaVidyal and MMFL. On the other hand Shree Kshetra Dharmasthala Rural Development Project (0.65) and BWDA finance (0.79) and RGVN (0.79) were found to be the least efficient MFIs during the study period under similar assumptions.

iii) Scale efficiency of Sample MFIs

Technical efficiency can further be examined by decomposing it into pure technical efficiency and scale efficiency. Calculation of scale efficiency assumes that the technical efficiency is resolute under both constant returns to scale and variable returns to scale. If there is a variation in the scores of technical efficiency under constant and

variable returns to scale for acertainmicrofinance institutions, the difference indicated that an institution is scale unproductive (inefficient) and is obtained as:

Scale efficiency: TCRS/TVRS

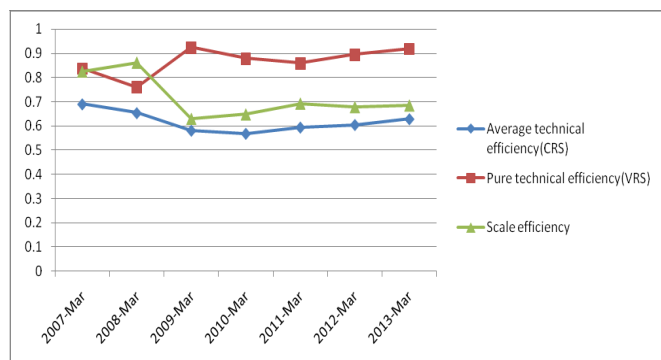
The annual average technical, pure technical and scale efficiencies of selected MFIs are reported in table-6.

Table 6 : Annual Average Technical, Pure Technical and Scale Efficiencies of Sampled the MFIs during the study period, 2007-13

YEAR	Average Technical Efficiency (CRS)	Pure Technical Efficiency (VRS)	Scale efficiency
2007	0.69	0.83	0.82
2008	0.65	0.75	0.86
2009	0.58	0.92	0.62
2010	0.56	0.87	0.64
2011	0.59	0.85	0.69
2012	0.60	0.89	0.67
2013	0.62	0.91	0.68
Overall average	0.61	0.86	0.71

Source: Study results obtained using DEA framework, during study period, 2007-13.

Figure 1 : Average Efficiencies of MFIs under CRS and VRS model, and the Scale Efficiency during study period, 2007-13



The overall technical efficiency of selected MFIs over the period was noticed 61.7 percent. The pure efficiency on average basis was found 86.7 percent and the scale efficiency 71.6 percent. It can be seen in table 6 after decomposing the technical efficiency into pure and scale efficiency, pure technical efficiency was higher than the scale efficiency for most of the study period. This implies that the technical inefficiency is mainly due to the scale inefficiency rather than the pure technical inefficiency. In other words, the relatively lower scale inefficiency in

comparison to pure technical efficiency suggests that inefficiencies were mostly due to inappropriate size of institutions (scale inefficiencies) rather than the inadequate management practices followed in selected microfinance institutions. However, it should be noted that scale inefficiency is as equally prevalent as pure technical inefficiency in the MFIs as a whole. The scale efficiency is beneath the pure technical efficiency from 2009-2013 (figure-1) due to which most of the selected Microfinance institutions were considered technically inefficient.

CONCLUSION

Present study analysed the technical, pure technical and scale efficiencies of Indian Microfinance institutions using 7 year data for 20 microfinance institutions. The study used Data envelopment analysis model and the output oriented approach to figure out efficiency score under the constant as well as the variable returns to scale. Efficiency performance of individual MFIs shows that Sanghamithra Rural Financial Services and Star Microfin Service Society were only the best performing institutions under both the constant returns and variable returns to scale approaches. The average technical efficiency score were 0.69, 0.653, 0.581, 0.568, 0.594, 0.605 and 0.629 under constant returns to scale for each of the study period, respectively thus indicating high level of inefficiency more than 30 percent in the study period under review. While the average variable returns to scale efficiency was noticed to be 0.839, 0.759, 0.924, 0.878, 0.858, 0.893 and 0.919, respectively which was relatively better than CCR implying there by that only 20 percent inefficiency was discovered in operations during the study period. The average level of inefficiency under variable returns to scale was found to be less than 40% in almost all the study years and scale efficiency was higher than the pure technical efficiency. Most of the inefficiencies in Microfinance institutions were found to be contributed by the either inappropriate allocation of inputs or operating at inappropriate scale as the average efficiency score was higher under scale efficiency as compared to pure technical efficiency as the most of the institutions were found to operate under decreasing returns to scale. Based on these findings, it is recommended that the sampled MFIs should reduce their operating cost, increases financial resources and better utilise their personnel in order to improve production efficiency so as to magnify efforts to outreach activities to serve the under priveleged and the poor. The results also have an important policy implication that in order to improve the efficiency of the MFIs, there is need to enhance

the managerial skills and improve technology by imparting training apart from increased resource allocation.

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Retailing at Bottom of the Pyramid: An Empirical Research in Himachal Pradesh

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ABSTRACT

Government of India liberalized Foreign Direct Investment (FDI) norms in retailing (both in single-brand and multi-brand) to attract foreign capital, technology transfer and to provide better opportunities to domestic producers and favorable marketing environment to its citizens. Liberalization of the retailing norms has attracted many foreign players in this side of the global market place. Urban customers have already shown over whelming response to organized retailing and shopping patterns in rural India have also shown a paradigm shift from price-driven to quality-driven approach. Therefore this is the high time to analyze whether customers of real (rural) India are ready to adapt the changing environment of retailing or not? And what do they consider while shopping? To analyze these objectives, the present study is undertaken. Multistage random sampling is used to collect data from the customers of District Kangra of Himachal Pradesh. Data is collected from 240 rural customers through schedule method. The research results in the form of strategies to tap and explore the latent opportunities in the untapped market of India.

INTRODUCTION

Faster economic growth, increase in per capita income, growing purchasing power, consumerism and brand proliferation has changed the face of the Indian retail sector. Due to large chunk of trysumers in India, and increase in consumer awareness, consumer tends to experiment with the global brands (Bhattacharya 2012). This change in the attitude of Indian consumers has made Indian retail sector a hot cake in the global market. According to A.T. Kearney's Annual Global Retail Development Index (GRDI) for the year 2012, India has been placed at fifth rank (after Brazil, Chile, China and Uruguay) on the basis of retail investment attractiveness. Retail sector in India has attracted a good number of global retailers and domestic corporate houses to invest in this sector. Retail sector in India is expected to grow almost to \$660 billion by 2015. Considering all the above factors and attitude of the global investors, recently Government of India liberalized Foreign Direct Investment (FDI) norms in retailing (both in single and multi-brand). The objectives of this move are to attract foreign capital, technology and to provide better opportunities for domestic producers and favorable marketing environment to its citizens. Foreign investors have to be brought at least \$100 million FDI after this move of government (The Economic Times).

Retailing in India presently contributes about 10 percent of India's gross domestic product (GDP) and 7% of employment (Kalhan2007). India has the highest retail density in the world but only 5-6 percent of the retail outlets are organized (licensed retailers) (Mukherjee and Patel 2005). Most of the Indian retail stores are mom and pops or local 'kirana' kind of stores (unorganized retail) and serving one of the large chunks of the world. Because of recent measures of government and growth of this sector, the value of the organized retail is expected to grow more than two times in next four years to a Rs. 1,000 billion industry, attracting big global players like Wal-Mart, Tesco, and Carrefour (Outlook, October 16, 2006). According to new rules of FDI in multi-brand retailing,

Key words:

Rural India, organized retailing, bottom of the pyramid, FDI, and rural retailers

foreign investors are bound to invest at least 50 percent in 'backend infrastructure' within three years of the first tranche of FDI and shall procure 30 percent of the produces from Indian small industries (DIPP). These conditions of government may restrict the foreign players to invest in the country in initial stage but future of this initiative of government and behaviour of foreign investors will heavily rely on the participation and attitude of the people of India. Urban consumers have positively responded to organized retailing but it is the consumers of real (rural) India who represent more than 70 percent of population; holds the key to success. Not only large population but 56 per cent of India's income, 64 per cent of its expenditure and 33 per cent of its savings come from rural India (Krishnamacharyulu and Ramakrishnan, 2011). Consumption patterns in rural India have also shown a paradigm shift from price-driven to quality-driven product (CII). Therefore this is the high time to analyze whether customers of real (rural) India are ready to adapt the changing environment of retailing or not? To analyze the rural consumer behaviour towards organized retailing Himachal Pradesh (H.P.); a hilly terrain is selected which is a pure rural market and somewhere people of H.P. are showing urban orientation due to variety of factors.

Himachal Pradesh is an attractive market for global as well as domestic investors because literacy rate (83.78%) is high in this hilly terrain as compared to national average of 74.04 % which may helpful in designing the promotional strategies. Growing per capita income i.e. around 60,000 (Economic survey of H.P.) provides a very good sign for the future of organized retailing in the state. Area of the state (55673 sq. kms.) is also an attraction and it can be efficiently served through innovative distribution system.

Table 1: Himachal Pradesh at a Glance

Districts	Area (Sq.Kms.)	Population	Density (Per Sq. Kms.)	Literacy rate (%)
Bilaspur	1167	381956	327	84.6
Chamba	6522	519080	80	72.2
Hamirpur	1118	454768	407	88.2
Kangra	5739	1510075	263	85.7
Kinnaur	6401	84121	13	80
Kullu	5503	437903	80	79.4
Lahaul-Spiti	13841	31564	2	76.8
Mandi	3950	999777	253	81.5
Shimla	5131	814010	159	83.6
Sirmaur	2825	529855	188	78.8
Solan	1936	580320	300	83.7
Una	1540	521173	338	86.5
H.P.	55673	6856509	123	83.78

Source: Census 2011

REVIEW OF LITERATURE

Andrew and Calderwood (2007) reviewed dynamic forms of rural retailing, by location, that have innovated through a mixture of actions leading to growth, adaptation, diversification and differentiation. The research found that market towns have used growth and differentiation opportunities as strategic foci and innovative village shops have applied strategies that seek to counter their structural weaknesses, harness the community and yield new revenue streams.

Nath (2013) has reported a broad picture of Indian retail market and the proposed benefits and drawbacks of new norms in multi brand retail. Faster growth of an economy, high disposable income, and rapid urbanization are the factors for growth in retailing sector as per this research. According to this study increase in physical capital stock, integrated back end supply chain efficiency, consumer well-being, competition, Inflation control, better remunerative prices for farmers, access to global markets, revenue generation are some of the benefits. loss of employment, problems involved in contracts, their terms and conditions, stricter norms, increase in real estate cost, less coverage, inadequate complementary infrastructure are the areas of concerns highlighted in the study.

Kalhan (2007) reported the impact of FDI in retail on traditional retailing of India in this study. The study stated that FDI in organized retail will adversely affect the market of shopkeeper who deals in unbranded good/commodities. The research further highlighted that the problem of unemployment will aggravate further because the gap between jobs lost and job creation will be huge.

Adonova (2003) reported the differences in the behavior of traditional retailers in adopting e-commerce. The study stated that internet is a low-cost selling technology that needs substantial customers' acceptance and a specific business model in order to be a viable alternative to traditional retailing.

Fenny et. al. (1996) highlighted the history of development in Thai retailing from a traditional and backward industry into one that by the turn of the century may be as modern and vibrant as any in the world. The research further described the diversity of Thai retailing and explained the historical development, and outlines the differences between retailing in provincial Thailand and in Bangkok.

Sharma (2005) analyzed the report of ICRIER and highlighted the experiences of Thailand and Indonesia. Study reported that there are high chances of farmers facing exclusion from supply chain due to stringent quality standard and specifications.

Kumar et. al. (2008) Conducted an empirical study on Indian food retailing Industry and reported that liberalizing the norms will increase tax revenue, employment, shortening of supply chain , creative destruction of middleman, increase farm and non-farm income, positive impact on Indian software Industry. Cooperatives can play a very significant role in bargaining between farmers and the contractor instead of exploitative middle man was the suggestion of the study.

Voyce (2007) highlighted that Indian retail market is the fastest growing retail market in the world. He further stated that malls are like social ‘fortresses’ which separates middle class consumer from the rest of the consumer. Study further stated that retail sector will lead to conversion of mill land into malls and this opening up of market will lead to phenomena of local divide while global unite.

Economic and political weekly (2007) argued that economic liberalization on one hand had lead to excellence and efficiency, and squalor and misery on another hand. Report further stated that the Walmartisation is a warning for the small traders and businessman, but in the process of growth and liberalization large retailers and small traders had to coexist but in such a manner that livelihood of latter are not jeopardize.

Krishnamacharyulu and Ramakrishnan (2011) suggested the guiding principles to succeed in rural market of India. The study identified few factor like affordable prices, adaptive merchandises etc. as key to success in rural market.

Most of the above studies/articles have analyzed the impact, pros and cons of FDI on Indian markets, and highlighted the experiences of global markets. There are very few studies especially in rural India, which have covered customer part, who decides the success. This is the most important consideration, which has governed the choice of the research work. Though the study is confined to Himachal Pradesh, is obviously has relevance and significance in designing of retailing strategies for rural markets of India.

OBJECTIVES

This paper is intended to achieve the following objectives:

- To understand the retail buying behavior of customers at bottom of the pyramid
- To examine the various aspects of organized retailing from rural perspective
- To identify major challenges for retailing in rural India
- To provide both local and foreign retailers with suggestions to tap the untapped rural market of India

RESEARCH METHODOLOGY

The research paper is mainly based on primary data collected from rural customers of Himachal Pradesh. In order to meet the objectives of the study multistage random sampling is used. In the first stage district Kangra is selected randomly which is the largest district of the state. At the second stage, out of the fifteen developmental blocks, four developmental blocks are selected on random basis. In the third stage, two gram panchayats are selected randomly from each block and from each panchayat 30 customers are selected randomly to collect data. Data is collected with the help of schedule method to maintain the accuracy of data (CR Kothari). Data is collected on various parameters like rural customers’ perception, expectations, and attitude towards organized retailing.

Before analyzing data, reliability of the data is checked with the help of Cronbach’s Alpha. Collected data is analyzed with the help of descriptive statistics and ANOVA. Factor analysis is used to identify the factors with significant relevance from rural retailing perspective.

RELIABILITY ANALYSIS

Reliability coefficients are calculated for all the variables using SPSS software and the Cronbach’s reliability coefficient value is as given below:

Table 2: Cronbach’s Alpha Values for all the measures

Description	No. of Items	Cronbach's Alpha
Rural customers’ perception and attitude towards organised retailing	24	.68

Source: Reliability Analysis in SPSS

The reliability value from the above table indicates that the reliability coefficient Cronbach's alpha for all the items of the schedule is nearer to 0.7; indicates good reliability (Chawla & Sondhi 2011). The Cronbach's alpha values nearer to .6 or more are considered appropriate for research instrument validation (Nunnally 1978).

Factor Analysis

Factor analysis is applied to identify the underlying factors of the various measures of study. Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test of Sphericity supported the eligibility of data for applying factor analysis (Table 3).

Table 3: KMO and Bartlett's Test: Measures-Wise

Description		Rural Customers' Behaviour
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.736
Bartlett's Test of Sphericity	Approx. Chi-Square	1992.064
	df	276
	Sig.	.000

Source: Reliability Analysis in SPSS

Application of factor analysis using principal component as extraction method on statements measuring bottom of the pyramid customers' attitude and perceptions towards organized retailing gave seven factor solution. Sixty five percent variance explained was taken as the method for deciding number of factors. Details of each factor containing respective statements are given in the table 4 along with factors loading.

Table 4: Factor Profiling "Ruralites Behaviour"

Factor No.	Factor Name	Statements	Factors Loading
1	Merchandises and Location Traffic	Shopping from stores where brand choice is available	0.783
		Prefer quality products	0.702
		looking for parking facility	0.665
		prefer branded products	0.545
		purchases from stores where shopping require less times	0.542
		Traffic as a problem to access store	0.431
2	Price sensitivity and Sellers' influence	price affect purchases	0.710
		looking for discount and bonus	0.701
		purchase low price but quality product	0.643
		shopping from known sellers	0.561
		price comparison during shopping	0.536
3	Modern outlook and congeniality	Modern outlook attraction	0.807
		Internal decoration influence on purchases	0.608
		variety assortment are available	0.561
		looking multi facility in one store	0.550
		prefer simple billing system	0.467
4	Accessibility	shopping from easy accessible stores	0.837
		prefer stores which requires less time to reach	0.796
5	Crowd influence	Prefer crowd free location	0.810
		effect of In- store crowd	0.688
6	Customised services and class of customers	expect personal attention	0.759
		influence of class of people visit to store	0.626
7	Influence of credit facility and sellers' information	consider seller Information for shopping	0.892
		looking for credit facility	0.271

Source: Factor analysis in SPSS

RESULTS AND FINDINGS

Following tables show the results of descriptive statistics (t-test and mean) and ANOVA at 95% level of significance. Results indicate that various factors are considered by the ruralites while deciding retail store as well as making shopping. Though there is significant difference as far accessibility of store is concerned, females customers do take into consideration the accessibility of store while making shopping decision. This may be due to reason that the shopping time has high opportunity cost. Similarly both the genders place the personal attention and class of customer which visit the same store on positive side. This indicates that the stores which provide them personal attention while shopping and the class of customer which comes to that store does have impact on their shopping and store selection. Male and female both are price sensitive and preferring branded merchandises. Indicative point to make strategies for rural markets according to the present study is that rural customers are not much attracted by the modern outlook of the store. (Table 5)

Results in table 6 indicate that the overall customers from all walks of occupation have different opinion on almost all the factors. Agriculturists give less importance to quality of merchandise and traffic. Agriculturists along with laborers’ are more price sensitive and their shopping is also influenced by known sellers. These two classes of customers are not that much influenced by modern outlook of the store. Agriculturists and others (dependent on other) customers do consider the fact of accessibility into consideration while thinking about shopping from a particular store. Almost all occupation customers want that personal attention should be given to them and they

prefer those stores where the same class of customer visit. Agriculturists shopping are also influenced by credit facility given by sellers; this may be because of the seasonal income. They also consider sellers’ information during their shopping.

Table 7 exhibits the results of age wise analysis. There is a significant difference between all age groups customers with respect to identified factors of the study like the retail pricing & sellers influence, outlook of the store, and credit facilities. Customers of more than 40 years of age do consider location traffic and merchandises before selecting a particular retail store. Senior citizen of rural areas are very much price sensitive and they prefer to shop with known retailers and also consider distance of the store for their shopping. Ruralites always look for personal attention during their shopping and prefer those stores where they get credit facility. These results clearly indicate that trysumers of this part of market do not compare much between various factors identified in the present study.

Education-wise results (table 8) indicate that illiterate and semi-literate rural customers’ shopping is majorly influenced by merchandises available in the store and traffic on the way to that store. Graduates and highly educated customers do not bother much about the traffic, if they get the desired merchandise. Illiterate customers are very much price conscious and prefer to shop with known retailers. Rural customers, especially illiterates are not much influenced by trendy look of the store. Stores accessibility plays a crucial part in deciding the store in this part of the market, this may be because of the challenging geographical conditions of the area.

Table 5: Gender-wise Analysis

Description	Gender	Frequency	Mean	Levene Statistic (Sig. Value)	t-Statistic	Sig. Value
Merchandises and Location Traffic	Male	143	3.50	0.933	1.045	0.297
	Female	97	3.39			
Price sensitivity and Sellers' influence	Male	143	3.81	0.232	0.326	0.745
	Female	97	3.78			
Modern outlook and Congeniality	Male	143	3.33	0.317	0.711	0.478
	Female	97	3.26			
Accessibility*	Male	143	3.78	0.168	-2.275	0.024
	Female	97	4.08			
Crowd influence	Male	143	3.47	0.228	1.015	0.311
	Female	97	3.35			
Customised services and class of customers	Male	143	3.37	0.614	-1.758	0.080
	Female	97	3.58			
Influence of credit facility and sellers' information	Male	143	3.30	0.069	-0.610	0.543
	Female	97	3.37			

Source: Field survey

Note: *Significant at 5%

Table 6: Occupation-wise Analysis

Description	Occupation	Frequency	Mean	Overall Mean	Levene Statistic (Sig. Value)	F-Statistic/ Brown Forsythe* (Sig. Value)	Sig. Value
Merchandises and Location Traffic**	Agriculturist	24	2.690	3.440	0.010	7.637*	0.000
	self-Employed	54	3.370				
	Labour	29	3.420				
	Service	45	3.680				
	Others	88	3.540				
Price sensitivity and Sellers' influence**	Agriculturist	24	4.290	3.810	0.000	5.815*	0.000
	self-Employed	54	3.840				
	Labour	29	4.050				
	Service	45	3.660				
	Others	88	3.690				
Modern outlook and Congeniality**	Agriculturist	24	2.620	3.290	0.008	11.386*	0.000
	self-Employed	54	3.310				
	Labour	29	2.860				
	Service	45	3.550				
	Others	88	3.440				
Accessibility**	Agriculturist	24	4.400	3.880	0.038	8.657*	0.000
	self-Employed	54	3.770				
	Labour	29	3.260				
	Service	45	3.550				
	Others	88	4.180				
Crowd influence**	Agriculturist	24	3.230	3.400	0.112	2.675	0.033
	self-Employed	54	3.410				
	Labour	29	3.800				
	Service	45	3.120				
	Others	88	3.440				
Customised services and class of customers	Agriculturist	24	3.280	3.450	0.022	0.768*	0.548
	self-Employed	54	3.540				
	Labour	29	3.640				
	Service	45	3.340				
	Others	88	3.430				
Influence of credit facility and sellers' information**	Agriculturist	24	4.230	3.320	0.064	7.394	0.000
	self-Employed	54	3.260				
	Labour	29	3.300				
	Service	45	3.090				
	Others	88	3.260				

Source: Field survey

Note: *Brown Forsythe value **Significant at 5%

RESEARCH IMPLICATIONS

The purpose of the study was to see whether organized retailing will succeed in rural markets of India or not? And what do rural customers consider while shopping. The present study suggests the following measures to both domestic retailers and foreign players to tap this untapped market of India.

- The hilly state of Himachal Pradesh is gearing itself for new environment of retailing and the customers are ready to adapt the changing shopping environment. This may be because of urban orientation and high literacy rate. To tap this

untapped and unexplored market and to succeed in this part of the country, retailers have to adaptive according to rural environment.

- The results suggest that most of the rural customers are price sensitive; the price can be a game changer for the existing retailers and the new entrants. Those who shall be able to provide good quality products and services at cheaper cost shall win. This point highlights that the innovation, ways to reduce extra costs etc. need to be undertaken so that prices does not flicker much. The non-price competition can be intense; accordingly strategies need to be undertaken.

Table 7: Age-wise Analysis

Description	Age	Frequency	Mean	Overall Mean	Levene Statistic (Sig. Value)	F-Statistic/ Brown Forsythe* (Sig. Value)	Sig. Value
Merchandises and Location Traffic	Up to 30	77	3.580	3.440	0.017	2.373*	0.055
	30-40	41	3.500				
	40-50	61	3.410				
	50-60	35	3.370				
	Above 60	26	3.020				
Price sensitivity and seller influence**	Up to 30	77	3.650	3.810	0.241	2.590	0.037
	30-40	41	3.760				
	40-50	61	3.900				
	50-60	35	3.890				
	Above 60	26	4.100				
Modern outlook and Congeniality**	Up to 30	77	3.550	3.290	0.354	6.370	0.000
	30-40	41	3.420				
	40-50	61	3.170				
	50-60	35	3.080				
	Above 60	26	2.810				
Accessibility	Up to 30	77	3.960	3.880	0.169	2.321	0.058
	30-40	41	3.870				
	40-50	61	3.740				
	50-60	35	3.620				
	Above 60	26	4.340				
Crowd influence**	Up to 30	77	3.330	3.390	0.457	3.891	0.005
	30-40	41	3.300				
	40-50	61	3.290				
	50-60	35	3.390				
	Above 60	26	4.070				
Customer services and class of customers	Up to 30	77	3.470	3.450	0.000	2.390*	0.054
	30-40	41	3.240				
	40-50	61	3.700				
	50-60	35	3.160				
	Above 60	26	3.450				
Influence of credit facility and sellers' information**	Up to 30	77	3.180	3.320	0.001	6.908*	0.000
	30-40	41	3.280				
	40-50	61	3.260				
	50-60	35	3.210				
	Above 60	26	4.160				

Source:Field Survey

Note: * Brown Forsythe value **Significant at 5% level of significance

- Accessibility to stores provides a new vista for everyone. Existing stores/shops have competitive advantages as they are located nearby only, and these shopkeepers are known to almost each and every one, but the new entrants have to ensure that the stores or mall need to be opens at such places which do not take much time to reach or do not have accessibility problems. Retailers have to consider the time cost factor while designing their retail strategies.
- Rural customers are rooted to grass and they generally resist changes and modernization, therefore the concept of fancy stores and modern

outlook of store may not work in rural India. So instead of investing money on these affairs, shopkeepers can invest in technology or gadgets, which make billing smooth, reduce in-store queues etc.

- It was seen that the availability of credit facility and sellers information does impact the buyer's behaviour. The retailers need to take clue that some kind of mechanism can be devised to give products on credit, may be on bulk purchases or to loyal rural customers, as most of them are daily wage earners. Sellers' information also plays vital role in this part of the world. The salesperson can be trained and sensitized in dealing with rural customers; full

Table 8: Education-wise Analysis

Description	Education	Frequency	Mean	Overall Mean	Levene Statistic (Sig. Value)	F-Statistic/ Brown Forsythe* (Sig. Value)	Sig. Value
Merchandises and Location Traffic**	Illiterate	42	2.92	3.440	0.114	14.525	0.000
	Up to Matric	51	3.22				
	10+2	27	3.22				
	Graduate	81	3.68				
	Higher	39	3.91				
Price sensitivity and seller influence**	Illiterate	42	4.16	3.810	0.214	6.821	0.000
	Up to Matric	51	3.99				
	10+2	27	3.70				
	Graduate	81	3.71				
	Higher	39	3.49				
Modern outlook and Congeniality**	Illiterate	42	2.69	3.290	0.160	16.207	0.000
	Up to Matric	51	3.04				
	10+2	27	3.22				
	Graduate	81	3.57				
	Higher	39	3.69				
Accessibility	Illiterate	42	3.74	3.880	0.010	0.951*	0.436
	Up to Matric	51	3.84				
	10+2	27	3.67				
	Graduate	81	4.00				
	Higher	39	3.99				
Crowd influence**	Illiterate	42	3.63	3.400	0.879	4.128	0.003
	Up to Matric	51	3.67				
	10+2	27	3.26				
	Graduate	81	3.12				
	Higher	39	3.46				
Customised services and class of customers	Illiterate	42	3.24	3.450	0.049	1.061*	0.377
	Up to Matric	51	3.56				
	10+2	27	3.63				
	Graduate	81	3.44				
	Higher	39	3.43				
Influence of credit facility and sellers' information**	Illiterate	42	3.70	3.320	0.021	8.795*	0.000
	Up to Matric	51	3.73				
	10+2	27	3.00				
	Graduate	81	3.12				
	Higher	39	3.00				

Source: Field Survey

Note: *Brown Forsythe value **Significant at 5%

information of new products should be given to customer as word of mouth is the biggest source of communication in hilly/rural areas. Retailers can also employ local salesperson to catch more and more customers.

- The retailers can undertake the task of displaying the products to make rural customers aware about the products/services.
- The discounts and offers can be used as the tool to lure the customers.

- Provision of better quality of goods and quality services within the stores can go long way in retaining the trysumers.

CONCLUSION

Increasing buying power, media explosion, changing media habits, and high literacy rate make Indian rural market a lucrative market place for both domestic and foreign retailers. To encash the latent opportunities available in this unexplored and untapped market, the retailers need

to change and to adapt according to the market profile. The present study shows that the rural market is no more an orthodox market as rural people are accepting the suitable modern means of retailing. To succeed in the rural market place, deep understanding of behavioural variables of rural customers is a must. Without this no retailer can design adaptive integrated marketing strategies. According to present study, hot segments for organized retailing are trysumers, well-educated and service class people of rural India. The key factors to succeed in rural retailing are easy accessibility, semi-modern outlook of the store, local sales person, customized services and credit facility to attract more and more rural customers.

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The Pattern of Gross Domestic Saving and Capital Formation in India

M. Yadagiri and G. Srinivas

ABSTRACT

This study aims to examine the pattern of Gross Domestic Saving, Gross Capital Formation with reference to household sector, private corporate sector and public sector. Gross Domestic Savings are increased by 321 per cent. Whereas, the contribution of household sector increased by 255 per cent but the private corporate sector contribution increased by 550 per cent. The contribution of public sector is very meager and its share in Gross Domestic Savings has not been stable and has exhibited wide fluctuations. The private sector Gross Capital Formation is increased by 382 per cent whereas, the public sector Gross Capital Formation is increased by 294 per cent during the period under review. The rates of Standard deviation which measure the absolute variability in the rate and indicate that Inventory Formation with 13.9 per cent as highest variable or least inconsistency when compared to 11.9 per cent of Gross Capital Formation and 12.5 per cent of Inventory Formation.

INTRODUCTION

The relationship between saving and capital formation plays an important role in national income accounting. Saving represents that part of disposable income that is not spent on final consumption of goods and services. Capital formation measures an amount of money spent to buy capital goods for future expansion of production capacity. Thus, the savings withdraws some amount of money from the financial system, while capital formation injects some amount of money into the financial system. The most important source of saving in India has been the Household Sector. However the share of the Household Sector in Gross Domestic Savings has not been stable and has exhibited wide fluctuations. The Central Statistical Organisation (CSO) estimates that there is a dramatic increase in India's saving rate since 2003-04. According to CSO estimations the domestic saving rate was fluctuating around 22 to 26 Per cent for Nine years from 1994-95 to 2002-03 made a sudden jump from 26 Per cent in 2002-03 to 29 Per cent in 2003-04 and further 33 Per cent in 2005-06, 35 Per cent in 2006-07 and 37 Per cent in 2007-08 (the highest level achieved so far). It stood at 31 Per cent in 2011-12. According to 12th Five year plan, two factors such as; the big improvement in Government finance and the improvement in the levels of retained earnings of the private corporate sector were responsible for raising the domestic saving rate in the period up to 2007-08.

Capital Formation is in addition to productive capacity and the backbone of the economy of any country. The concept of Capital Formation is understood in two ways viz., 'Gross' and 'Net'. With reference to corporate sector, Gross Capital Formation is defined as the 'sum of Gross Fixed Asset Formation¹ and Inventory Formation² while Net Capital Formation is defined as 'the sum of Net Fixed Asset Formation³ and Inventory Formation', representing additions to Net Fixed Assets and Inventories. The difference between the two concepts is due to the fact that, whereas, fixed asset formation is considered on 'gross' basis in the case of Gross Capital Formation, it is considered on a 'net' basis after adjusting depreciation and revaluation of assets in the case of Net

Key words:

Gross Domestic Saving,
Household Sector, Private
Sector, Public Sector,
Capital Formation, Gross
Fixed Asset Formation,
Inventory Formation

Capital Formation can be observed in terms of an annual rate commonly known as "Rate of Gross or Net Capital Formation", instead of the absolute amount. The rate of Capital Formation is the rate of annual change in the amount of Capital Formation, Gross/Net, and is computed by expressing such amount of a year as a percentage of its immediate preceding year amount and deducting 100 from it. For the purpose of this study we have preferred the concept of Gross Capital Formation to Net Capital Formation.

REVIEW OF LITERATURE

Never in past, has the role of the corporate sector in India been as crucial and exciting as of today. Since the reform and liberalization process in the economy influencing for increased role of the market economy thereby interacting the performance of the corporate sector in India. While the literature on the various aspects of the Indian corporate sector has been on increasing trend but the research literature and even the statistical information on Capital Formation is scanty. Besides, the various institutional studies, there were some studies made by the individual researchers. Many of these studies related to the few dominant aspects such as the Corporate Capitalization, in India, Financial trends in the Indian corporate sector, Capital Formation in India, Capital Formation and its financing in India, corporate Finance in India, capital Budgeting in corporate sector etc., several studies, seminars, symposia and meetings have been conducted on the growth and performance of the Indian Corporate Sector.

Braj kishore (1981) has made study on "corporate capitalization in India". The most obvious conclusion of his study is that the financial risk of firms has remained invariant over the twenty three year period of the study, so that finance managers would have to "decide upon their sources of finance with a given stable long - term capital structure in a way that their cost of capital is minimized and/or the structure of their assets and liabilities synchronized. V. Gangadhar (1988) has made study on "Financial trends in the Indian corporate sector". In his study he has examined the inter-plan differences in the financial trends, industry wise and size-wise financial trends were also examined for their diversities considering only medium and large public and private Limited companies. In order to study gross Capital Formation, the rates and not absolute amounts of Capital Formation were used. G. Prasad (1985) has made a study on the trends in

Capital Formation, profitability and financing of the private corporate sector in India during 1960-61 to 1984-85. The aim of the study is to observe the growth and working of the private corporate sector in India. Finally the study has suggested suitable policy measures for the consideration of the economic makers at the national level which helped to improve the resources position of the private corporate sector in India. Himanshu Joshi (2007) has made a study on "The Role of Domestic Savings and Foreign Capital Flows in Capital Formation in India" and he concluded that the role of savings in capital formation in India brings forth the finding that whilst the long-run steady state relationship between capital formation and various components of savings and the capital account balance has remained stable, the role of capital account in maintaining the momentum of capital acquisition by restoring the balance between savings and capital investment has been not ably significant. Achintya Ray (2008) has made a study on "A Time Series Analysis of Long Term Capital Formation in India", he analyzed the effects of economic liberalization on the capital formation in the Indian economy. He studied the three major forms of capital formation such as; Gross Fixed Capital Formation, Gross Domestic Capital Formation, and Net Domestic Capital Formation. All the measures of capital formation have strongly positive time trends. His study reveals that there may be not statistically significant impact of economic liberalization on capital formation in India. Lagged values are of most importance while determining the current values of capital formation.

OBJECTIVES OF THE STUDY

The study specified the following objectives to find the pattern of Gross Domestic Savings and rates of Capital Formation and its components.

- i) To examine the sector-wise Gross Domestic Savings, Gross Fixed Capital Formation and Gross Domestic Capital Formation.
- ii) To analyze the Gross Capital Formation in the Indian Corporate Sector represented by Large Public Limited Companies.
- iii) To study the pattern of Gross Capital Formation during X-Plan and XI-Plan periods.
- iv) To determine the consistency in the rates of Gross Capital Formation and its components.
- v) To find out the statistical trends by using second degree parabola to the rates of Gross Capital Formation, Gross Fixed Asset Formation and Inventory Formation.

SCOPE OF THE STUDY

The present study includes the analysis of the Gross Domestic Savings, Corporate Capital Formation and its financing. It covers the pattern of Capital Formation, diversities and financing impact in the components of Capital Formation. The period of study was confined to the years between 2002-03 and 2011-12. The Tenth Five year plan starting year 2002-03 is considered as the beginning year of the study and it is confined up to 2011-12, because the year 2011-12 was the last year of the Eleventh Five Year Plan period.

METHODOLOGY

The study is based on the Gross Domestic Savings, Gross Fixed Capital Formation, Gross Domestic Capital Formation of Household Sector, Private Sector and Public Sector. The study represented by the Large Public Limited Companies is made with the help of the rates of Gross Capital, Gross Fixed Assets and Inventory Formation. These rates are computed by using annual rate of change. The inter - plan diversities in the rates of Capital Formation along with its components are studied by calculating

Arithmetic mean for the rates of different plan periods. The consistency or otherwise variability in the Gross Capital Formation and its components is studied by statistical trends - second degree parabola has been used to analyze the influence of constants 'b' and 'c' on 'a'.

SOURCE OF DATA

The study is made with the financial data compiled by the Finances Division of the Department of Statistics of the Reserve Bank of India in relation to the Non-Financial Large Public Limited companies in India and published from time to time in the various issues of the Reserve Bank of India Bulletins under the title of "Finances of Large Public Limited Companies".

ANALYSIS AND FINDINGS

1. Gross Domestic Savings and Gross Domestic Capital Formation

Now, it is proposed to examine the sector-wise Gross Domestic Savings, Gross Fixed Capital Formation and Gross Domestic Capital Formation. The Table - I provides the relevant data from the year 2002-03 to 2011-12.

Table 1: Gross Domestic Savings and Gross Domestic Capital Formation (Rs. In Crore)

Years	Gross Domestic Savings				Gross Fixed Capital Formation			Gross Domestic Capital Formation			
	Household Sector	Private Corporate Sector	Public Sector	Total	Public Sector	Private Sector	Total	Public Sector	Private Sector	Valua bles	Total
2002-03	564161 (22.3)	99217 (3.9)	-7148 (-0.3)	656230 (25.9)	168143 (6.6)	432977 (17.1)	601120 (23.8)	163403 (6.5)	455917 (18.0)	13957 (0.6)	633277 (25.0)
2003-04	657587 (23.2)	129816 (4.6)	36372 (1.3)	823775 (29.0)	190806 (6.7)	506672 (17.9)	697478 (24.6)	187730 (6.6)	530415 (18.7)	24572 (0.9)	742717 (26.2)
2004-05	763685 (23.6)	212519 (6.6)	74499 (2.3)	1050703 (32.4)	224108 (6.9)	706920 (21.8)	931028 (28.7)	240580 (7.4)	770598 (23.8)	41054 (1.3)	1052231 (32.5)
2005-06	868988 (23.5)	277208 (7.5)	88955 (2.4)	1235151 (33.4)	271342 (7.3)	848950 (23.0)	1120292 (30.3)	293350 (7.9)	931331 (25.2)	41392 (1.1)	1266073 (34.3)
2006-07	994396 (23.2)	338584 (7.9)	152929 (3.6)	1485909 (34.6)	339617 (7.9)	1004157 (23.4)	1343774 (31.3)	356556 (8.3)	1134319 (26.4)	49709 (1.2)	1540583 (35.9)
2007-08	1118347 (22.4)	469023 (9.4)	248962 (5.0)	1836332 (36.8)	401326 (8.0)	1240347 (24.9)	1641673 (32.9)	441923 (8.9)	1401284 (28.1)	53592 (1.1)	1896799 (38.0)
2008-09	1330872 (23.6)	417467 (7.4)	54280 (1.0)	1802619 (32.0)	480698 (8.5)	1340401 (23.8)	1821099 (32.3)	163403 (6.5)	455917 (18.0)	13957 (0.6)	633277 (25.0)
2009-10 (3R)	1630799 (25.2)	540955 (8.4)	10585 (0.2)	2182339 (33.7)	543883 (8.4)	1511889 (23.3)	2055772 (31.7)	187730 (6.6)	530415 (18.7)	24572 (0.9)	742717 (26.2)
2010-11 (2R)	1832901 (23.5)	619370 (7.9)	199662 (2.6)	2651933 (34.0)	606245 (7.8)	1868220 (24.0)	2474465 (31.7)	240580 (7.4)	770598 (23.8)	41054 (1.3)	1052231 (32.5)
2011-12 (1R)	2003720 (22.3)	644473 (7.2)	117097 (1.3)	2765290 (30.8)	662698 (7.4)	2086374 (23.2)	2749072 (30.6)	293350 (7.9)	931331 (25.2)	41392 (1.1)	1266073 (34.3)

Source: Central Statistics Organization.

Note: 1R: 1st Revised Estimates: 2R :2nd Revised Estimates: 3R:3rd Revised Estimates: Base Year: 2004-2005.

Figures in brackets are per cent of GDP at Current Market Prices.

The data of the Table -I reveals that the major Gross Domestic Savings are generated from the household sector and private corporate sector. The total Gross Domestic Savings are drastically increasing year by year. During the period under review the total Gross Domestic Savings are increased by 321 per cent. Whereas, the contribution of household sector increased by 255 per cent but the private corporate sector contribution increased by 550 per cent. The contribution of public sector is very meager and the share of public sector in Gross Domestic Savings has not been stable and has exhibited wide fluctuations during the period of the study. One of the major causes of meager contribution of the public sector saving is due to the sale of government stakes in some of the public sector undertakings. It shows that the private corporate sector is only dominating to

contribute the Gross Domestic Savings in the country. Expansion of banking services in the rural areas, growth in financial institutions, good performance by the mutual funds, rise in the income level, private sector insurance schemes are the main factors have contributed to the increase in the financial saving in the private sector.

The Gross Fixed Capital Formation was rose sharply from Rs. 6, 01,120 Crores in the year 2002-03 to Rs. 27, 49,072 Crores in the year 2011-12. It clearly reflects that the private sector Gross Capital Formation is much higher than the public sector. The private sector Gross Capital Formation is increased by 382 per cent whereas the public sector Gross Capital Formation is 294 per cent during the period under review.

Generally, Gross Domestic Capital Formation is composed of two components such as: Gross Domestic Savings and Capital Inflow. The total Gross Domestic Capital Formation has shown a sustained increase and reached from Rs. 6, 33,277 Crores in the year 2002-03 to Rs. 31, 81,423 Crores in the year 2011-12 which was increased by 402 per cent. It also observed that the share of public sector in Gross Domestic Capital Formation has been gradually increased. With the continuation of the economic reforms there was a deliberate shift in favour of private sector thus the private sector share was much higher than the public sector. The increasing in the rate of capital formation in the private corporate sector can be attributed to increase in the rate of capital formation in machinery and equipments.

2. Gross Capital Formation an Aggregate Analysis

It is proposed to analyze Gross Capital Formation in the Indian Corporate Sector represented by Large Public

Limited Companies. Table - II presents the rates of Gross Capital Formation, Gross Assets Formation and Inventory Formation.

Table II: Rates of Gross Capital, Gross Fixed Assets and Inventory Formation (Per cent)

Year	No. of Companies	Gross Capital Formation	Gross Fixed Assets Formation	Inventory Formation
2002-03	964	27.1	27.1	26.6
2003-04	1064	8.3	8.1	9.8
2004-05	1431	30.4	29.6	35.2
2005-06	1526	38.6	37.3	47.4
2006-07	1526	17.7	15.8	27.3
2007-08	1752	37.7	35.2	49.5
2008-09	2072	39.0	43.9	16.7
2009-10	2072	11.9	10.8	17.8
2010-11	2657	27.7	26.3	34.6
2011-12	2657	11.2	11.0	12.4
Average	1772	25.0	24.5	27.7
Increase (Times)	-	-58.7	-59.4	-53.4

Source: Various Issues of RBI Bulletins.

Gross Capital Formation

It is evident from the data of the Table - II the rate of Gross Capital Formation was highest at 39.0 per cent in 2008-09 during the entire period of the study as against its lowest rate at 8.3 per cent in the year 2003-04. Relatively higher rates of Gross Capital Formation was observed in the years 2004-05 at 30.4 per cent, 2005-06 at 38.6 per cent, and 2007-08 at 37.7 per cent.

During the period under review, the rates of Gross Capital Formation have fluctuated exhibiting major diversities from year to year. The emerging trends in the rates were a steep decline to 11.2 per cent in the year 2011-12 from 39.0 per cent in the year 2008-09. The rate of Gross Capital Formation was gradually increased and reached to 39.4 per cent in the year 2008-09. Thereafter, a clear declining trend was continuously observed, but which witnessed a trend of declines during 2008-09 to 2011-12. But in the year 2007-08 the abnormal increase in Gross Capital Formation was observed. Thus, it can be said that no clear cut trend in rates of Gross Capital Formation were emerged. Since these were fluctuated significantly from time to time on account of significant changes in the growth rates of Gross Fixed Assets and Inventory Formation. However, the growth rate of Gross Capital Formation declined by 58.7 times in the year 2011-12 when compared with the year 2002-03.

Gross Fixed Assets Formation

The rates of Gross Fixed Assets Formation reveal that it was highest at 43.9 per cent in the year 2008-09 as against a lowest rate of 8.1 per cent in the year 2003-04. The rates of Gross Fixed Assets Formation have shown an increase at 29.6 per cent and 37.3 per cent in 2004-05 and 2005-06 respectively. Then after a significant decline was evident in the year 2006-07, at 15.8 per cent and after it is witnessing a steep increase and reached to 43.9 per cent in the year 2008-09, then after a declining trend was evident from 2009-10 to 2011-12.

The possible reason for highest Gross Fixed Assets Formation in 2008-09 was due to a steep increase in Plant and Machinery as compared to its preceding years. The low rates in 2003-04, 2009-10 and 2011-12 were mainly on account of reduction in the investment of Gross Fixed Assets including Plant and Machinery than its preceding years. The rate of Gross Fixed Assets Formation is declined by 59.4 times in the year 2011-12 when compared with the year 2002-03.

Inventory Formation

The rates of Inventory Formation reveal that it was highest at 47.4 per cent in the year 2005-06 followed by 49.5 per cent in the year 2007-08. Significantly low rates of inventory were observed at 9.8 per cent in the year 2003-04 and 12.4 per cent in the year 2011-12. This was mainly on account of decumulation of inventory due to increased sales volume coupled with minimization of inventory levels. The pattern in the rates of Inventory Formation does not give a clear cut trend of neither a growth nor a decline, since it has exhibited a mixed trend, reflecting a steep fall from 49.5 per cent in the year 2007-08 to 16.7 per cent in the year 2008-09, similarly from 34.6 per cent in the year 2010-11 to 12.4 per cent in the year 2011-12. Therefore, it can be concluded that the rates of Inventory Formation has shown more inconsistency, since these were fluctuated between 9.8 per cent and 49.5 per cent during the period under review. The rate of Inventory Formation is declined by 53.4 times in the year 2011-12 when compared with the year 2002-03.

3. Plan-wise comparison of Gross Capital Formation

Now, it is proposed to analyze the pattern of Gross Capital Formation during the X-Plan and XI Plan periods. The entire period of the study is ranging from 2002-03 to 2011-

12. The rates of Gross Capital Formation accordingly, grouped into two different plan periods. Their averages were obtained and presented in the Table - III.

Table 3 : Plan Period-wise Rates of Gross Capital, Gross Fixed Assets, and Inventory Formation

Rates of Capital Formation and its Components	Plan Periods		Increase (Times)
	X - Plan Period (2002-07)	XI - Plan Period (2007-12)	
Gross capital Formation	24.5	25.5	4.1
Gross Fixed Asset Formation	23.6	25.4	7.6
Inventory Formation	29.2	26.2	-10.3

Source: Various Issues of RBI Bulletins.

The data of the plan period-wise rates of Gross Capital, Gross Fixed Assets and Inventory Formation is evident that the highest rate of Gross Capital Formation was observed in the XI- Plan period of 2007-12 at 25.5 per cent, whereas 24.5 per cent in the X- Plan Period this i.e., 2002-07. It is increased by 4.1 times during the XI - Plan period when compared with the X - Plan period.

The study of factors influencing higher or lower rates of Gross Capital Formation is made by examining its two components i.e., Gross Fixed Assets Formation and Inventory Formation. The Gross Fixed Assets Formation has accounted for highest rate at 25.4 per cent during the XI - Plan period of 2007-12 whereas the Inventory Formation has accounted at highest rate of 29.2 per cent during the X - Plan period of 2002-07 and it was lowest at 26.2 per cent during the XI- Plan period of 2007-12. It is evident that the Gross Fixed Assets Formation is increased by 7.6 times, whereas, the Inventory Formation is declined by 10.3 times during the XI - Plan period when compared with the X - Plan period. The declining trend in the inventory rates indicates a pragmatic approach of the corporate sector to reduce accumulation of inventory so as to minimize the cost of financing and maintaining them.

The Plan period-wise analysis of components of Gross Capital Formation reveals that the Inventory Formation has shown a significant impact for low/high rates of Gross Capital Formation during the X and XI- Plan periods. The highest rate of Gross Fixed Assets Formation has shown a positive impact of increase in Gross Capital Formation, since the lower rate of Gross Fixed Assets Formation has shown major impact to pull down the rate of Gross Capital Formation.

4. Consistency in the Rates of Gross Capital Formation and its Components

The technique of co-efficient of variation has been used in order to observe and comment upon the variability of the individual rates around their average alternatively consistency or otherwise, in the case of Gross Capital Formation and its two components viz., Gross Fixed Assets Formation and Inventory Formation. The co-efficient of variation have been calculated for the rates of Gross Capital Formation, Gross Fixed Assets Formation and Inventory Formation for Large Public Limited Companies. The Table - IV presents the Arithmetic Mean, Standard Deviation and Co-efficient of Variation.

Table IV: Rates of Gross Capital Formation, Gross Fixed Assets Formation and Inventory Formation - Arithmetic Means, Standard Deviations and Co - Efficients of Variations (Per cent per annum)

Statistical Measures	Gross Capital Formation	Gross Fixed Assets Formation	Inventory Formation
X	25.1	24.5	27.7
S.D.	11.9	12.5	13.9
C.V.	45.2	48.4	49.5

The study of the data reveals that the average rates of Inventory Formation were highest at 27.7 per cent as compared to 25.1 per cent and 24.5 per cent of Gross Capital and Gross Fixed Assets Formation respectively during the period under review.

The rates of standard deviation - which measure the absolute variability in the rates, indicate that Inventory Formation with 13.9 per cent has highest variable or least inconsistency when compared to 11.9 per cent of Gross Capital Formation and 12.5 per cent of Inventory Formation. Such variability in Inventory Formation may be causing for less consistency in the rates of Gross Capital Formation as compare to the impact of the variability of Gross Fixed Assets Formation.

In order to make it more clear, the co-efficient of variation - a relative measure or variability - is used to analyze and present the consistency in the rates. The rates of co-efficient of variation have also reflected similar pattern as in the case of the rates of Standard Deviation. This shows a highest variability of 49.5 per cent in the rates of Inventory Formation as against relatively lower variable rates at 45.2 per cent and 48.4 per cent of Gross Capital Formation and Gross Fixed Assets Formation respectively. Hence, on the basis of the analysis of the rates of Standard Deviation

and Co-efficient of Variation we can point out that the rates of Inventory Formation with highest variability have shown greater impact in the variability of Gross Capital Formation during the period under review.

5. Statistical Trends - Non Linear Trend - Second Degree Parabola - to the Rates of Gross Capital Formation, Gross Fixed Assets Formation and Inventory Formation

Next we propose to examine the Statistical Trends - Second Degree Parabola to the rates of Gross Capital Formation, Gross Fixed Assets Formation and Inventory Formation in the Indian Large Corporate Sector during 2002-03 to 2011-12. For this purpose we have fitted Non-linear trend equations - Second Degree Parabola i.e.

$Y_c = a + b + cx^2$ for the following rates:

- i) Gross Capital Formation.
- ii) Gross Fixed Assets Formation.
- iii) Inventory Formation.

The "a" value in each of the trend equation signifies the average trend value origin, the "b" value signifies the slope of the trend or the amount of change in "Y" value for a given of "X" and "C" value signifies acceleration or deceleration in the trend. The Table - V presents the trend equations of Second Degree Parabola.

Table V : Trend Equations (Second Degree Parabola) for the Rates of Gross Capital Formation, Gross Fixed Assets Formation and Inventory Formation (Per cent)

Trend Equation	$Y_c = a + bx + cx^2$
Gross Capital Formation	$Y_c = 34.48 - 0.24x - 0.29x^2$
Gross Fixed Assets Formation	$Y_c = 30.45 - 0.22x - 0.18x^2$
Inventory Formation	$Y_c = 34.65 - 0.33x - 0.21x^2$

Note: Origin 2007-08: Time Unit 1 year: Y_c = Rates of Capital Formation and its components.

The data pertaining to the trend values for the rates of Gross Capital Formation, Gross Fixed Assets Formation and Inventory Formation reveals the following:

If we consider the "a" values - the average - pertaining to the rates of Gross Capital Formation and its components, we find that the Inventory Formation is at 34.65 per cent higher than that of Gross Capital Formation and Gross Fixed Assets Formation. As between the rates of Gross Capital Formation and Gross Fixed Assets Formation, the former is lowest at 30.45 per cent as compared to the latter 34.48 per cent.

If we compare the “b” value – the amount of change – we find that there was a negative – the decreasing – trend in all the rates. But it was lowest at 0.33 per cent, 0.24 per cent and 0.22 per cent in case of Inventory Formation, Gross Capital Formation and Gross Fixed Assets Formation respectively. On the basis of the amount of change we conclude that the Inventory Formation and Gross Capital Formation were declining at relatively higher than that of Gross Fixed Assets Formation.

A comparative study of “c” value – an acceleration/ deceleration in trend value – can point out that there was deceleration in the growth rates of Inventory Formation, Gross Capital Formation and Gross Fixed Assets Formation at 0.21 per cent, 0.29 per cent and 0.18 per cent respectively during the period under review. However, it is interesting to note that the Gross Capital Formation and Gross Fixed Assets Formation were decreasing almost at a similar rate of 0.2 per cent. Thus, the study of trend analysis to the Gross Capital Formation and its two components reveals that the Gross Capital Formation, Gross Fixed Assets Formation and Inventory Formation were growing with an increasing rate from year to year.

CONCLUSION

The major Gross Domestic Savings are generated from the Household Sector and Private Corporate Sector and their share has been drastically increasing year by year. The contribution of Public Sector is very meager and its share has not been stable and has exhibited wide fluctuations. Actually, there is ample scope for generating saving in the Public Sector. Therefore, the Government should extend the net of income tax to the Corporate Agriculture, luxury articles should be taxed heavily, loopholes in the tax collection must be plugged to check widespread tax evasion and a rational administered price policy should evolve. All these measures are helpful in mobilizing the sufficient amount of savings in the Public Sector.

The study of trend analysis to the Gross Capital Formation and its two components reveals that the Gross Capital Formation, Gross Fixed Assets Formation and Inventory Formation were growing an increasing rate from year to year. The highest rate of Gross Capital Formation was mainly due to a steep increase in the Gross Fixed Assets Formation. It indicates that the Indian industries have been going for expansion and modernization by resorting to mergers, consolidation and diversifications. This will help

for industrial growth, thereby increase in output followed by generation of employment, exploring the new market areas, etc. The process of Capital Formation involves three distinct interdependent activities of savings, finance and investment. Thus, there is a need to create the awareness among the people about the relationship between the savings, finance and investment. The highest rate of Gross Fixed Assets Formation has shown a positive impact of increase in Gross Capital Formation and lower rate of Gross Fixed Assets Formation has shown major impact to pull down the rate of Gross Capital Formation. Therefore, the Government should encourage the Large Public Limited Companies for the highest rate of Gross Fixed Assets Formation.

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Minutes of the Executive Committee Meeting of the Indian Commerce Association (ICA) held on July 12, 2015 at 10.30 a.m. at Dhanwate National College, Nagpur, Maharashtra, India.

A meeting of the Executive Committee of the Indian Commerce Association was held on July 12, 2015 at 10.30 a.m. at Dhanwate National College, Nagpur, Maharashtra, under the Chairmanship of Professor Jayant K. Parida, President, ICA. Following members were present:

1. Prof. Jayant Kumar Parida - (in-the-Chair)
2. Prof. M. Ram Chandra Gowda
3. Dr. Anant M. Deshmukh
4. Prof. M. Muniraju
5. Prof. H. K. Singh
6. Dr. Debabrata Mitra
7. Dr. Ran Singh Dhaliwal
8. Dr. M. K. Singh
9. Dr. Shashank Bhushan Lall
10. Dr. Gurcharan Singh
11. Prof. G. P. Prasain
12. Dr. Laxman Kisan Karangale
13. Dr. M. Shivalinge Gowda
14. Dr. Pushkar Nath
15. Dr. Sanjay Kr. Sinha
16. Prof. H. Venkateshwarlu
17. Dr. T. P. Mahhu Nair
18. Dr. Ajay Kr. Singh
19. Prof. B. P. Singh
20. Dr. T. A. Shiware
21. Dr. B. B. Taywade
22. Prof. M. B. Shukla
23. Prof. B. Ramesh
24. Dr. Shiv Shankar Mishra
25. Dr. Balwinder Singh (Secretary)

The President of ICA welcomed all the members of the Executive Committee of ICA and requested the Secretary to proceed with the Agenda of the meeting.

The following decisions were taken in the meeting of Executive Committee of ICA unanimously:

Item 1. Confirmed the minutes of the Executive Committee meeting of the ICA held on December 26, 2014 at Bhubaneswar.

The action taken report (ATR) was presented by the Secretary. Under matters arising out of Minutes Professor Ran Singh Dhaliwal requested all the members to supply information regarding history of ICA. He was authorized by ICA to write letters to all the EC members and Past Presidents of ICA regarding the same. He was advised to collect the material lying at the residence of Late Prof. Om Prakash, Jaipur, including the Speeches of Past Presidents Published by Prof. Om Prakash.

Item 2: RESOLVED to approve the "Saurabh Shiware Memorial Young Researcher Award" along with the rules drafted by the Committee headed by Professor J. K. Parida.

Item 3: The house appreciated the efforts made by Dr. Ajay Kr. Singh and the entire Team of ICA for the allotment of Land measuring 1000 Sq. mts. (Plot no. 33 B) at Knowledge Park I, Greater NOIDA

Dr. Ajay informed the steps taken so far in the allotment of land and the payments made so far including allotment money. The size of the plot is 25 meters by 40 meters which is at a prime location in Knowledge Park I near Pari Chowk. It was further resolved to get the possession of land and construct the boundary wall. After the possession of land, foundation stone laying ceremony will be organized by ICA and all EC members will be part of the organizing team of the event.

Item 4: The Secretary informed about the sequence of events which took place in Ahmedabad regarding the hosting of 68th All India Commerce Conference of ICA with the concerned persons at the helm of affairs in the host Institution and also apprised the members about the conditions put by the host organization which was not

acceptable to the Office Bearers of ICA present at Ahmedabad. Then Office Bearers of ICA explored the possibility of hosting the 68th AICC of ICA at Vinoba Bhave University, Hazaribag, Jharkhand, by visiting that place and holding discussion with the Vice Chancellor, proposed Conference Secretary Prof. M. K. Singh, and their Team members. After examining the facilities available with regard to accommodation, transport, Auditorium, Halls for Technical Sessions, enthusiasm amongst the Team members of Conference Secretary, etc., the Office Bearers decided to allow VBU to be the host Institution for 68th AICC of ICA. The EC resolved to approve the decision taken by the Office Bearers. The Conference Secretary Professor M. K. Singh, apprised all the members about the progress made in inviting top dignitaries for the Conference, booking the accommodation, and other steps taken by him to ensure the smooth conduct of the Conference at Hazaribag. He also promised that proper transportation arrangements will be made at the nearest airport i.e., Ranchi, and nearest railway stations, i.e., Koderma, Ranchi, and Dhanbad. The EC appreciated the efforts made by the new Conference Secretary and also for taking the call in the emergency situation created due to the denial of Ahmedabad host Institution.

It was further resolved that in the future if the Conference is given to any private Institution then the proposal must be signed/endorsed by the Chairman of the Trust also which will be applicable from the hosting of 69th AICC of ICA.

Item 5: The Chairman of the Committee for the Electoral Reforms in terms of the restructuring the post of Office Bearers, State Chapters, protocol during the Conference, and related matters, Professor J. K. Parida informed about the progress made so far by the Committee and also considered the suggestions made by the members of EC to further fine tune the report and present in the next meeting of EC for discussion.

RESOLVED further to have one signatory in the following two accounts:

1. "Indian Journal of Commerce" bank account maintained at Lucknow will be signed only by Prof. H. K. Singh, Managing Editor of IJC and Treasurer.
2. "Indian Commerce Association" bank account in Oriental Bank of Commerce, Amritsar will be signed only by Dr. Balwinder Singh, Secretary, ICA.

RESOLVED further that other bank accounts of ICA will continue to be operated jointly by Treasurer and any one of the following signatories:

- (a) President
- (b) Secretary

Item 6: RESOLVED to confer the Honorary Membership of ICA to Shri Achyut Samanta, Chairman of KIIT Group of Institutions in recognition of his services to the society.

Item 7: RESOLVED to approve the recommendations of the Committee headed by Prof. Eresi regarding the operational model for offering short – term programmes under the auspices of Indian Business Academy. It should be ensured that the short – term programmes should align with the Indian guidelines of UGC so that the participants are eligible to earn appropriate API score after attending such programmes.

Item 8: The matter related to raising the fund for the construction of building of ICA was discussed at length and it was felt that each member of ICA should contribute for making it happen.

RESOLVED to request all the life members of ICA to contribute Rs.1000/- latest by September 30, 2015, failing which they will be required to deposit Rs.1000/- along with Rs.1500/ delegate fee for attending the Annual Conference of ICA. Further resolved that all the EC members will be donating Rs.5000/- in the name of "Indian Commerce Association" for the Corpus fund to be used for the construction of building of ICA, latest by September 30, 2015.

Item 9: RESOLVED to authorize the Managing Editor Professor H. K. Singh, to nominate members on the Editorial Board of Indian Journal of Commerce, both from India and abroad. Further resolved that the option of receiving the hard/soft copy of Indian Journal of Commerce be given to the existing and new members of ICA. EC members were requested to help the Managing Editor in updating and pruning the list of Life Members. The house appreciated the efforts made by the Managing Editor Professor H. K. Singh in face lifting the quality of the journal.

Item 10: RESOLVED to approve the list of 87 new members of ICA added after Dec. 20, 2014 to July 12, 2015 as reported by the Secretary Dr. Balwinder Singh.

Item 11: Under any other item with the permission of the Chair, following decisions were taken unanimously:

- (i) Report presented by Dr. B. B. Taywade regarding the Accreditation Council of ICA was presented and it was RESOLVED to take necessary steps to create "Indian Business Accreditation Council" (IBAC) as an autonomous body for which corpus fund will be created by seeking donations of Rs. 1,00,000/ each from 100 existing Life Members of ICA who will be called as Founding Promoters of IBAC. Some members of EC offered to be part of the first 100 Founding Promoters of IBAC. 80G benefit of Income Tax Act will be available to all such donors.
- (ii) RESOLVED to approve in principle the proposal of hosting the EC meeting at Gaeddu College of Business Studies, Bhutan.
- (iii) The proposal of creating quota for women in the EC and Office Bearers of ICA was discussed and was not approved.

(iv) RESOLVED to approve the proposal by the Conference Secretary Professor M. K. Singh to organize Professor C. D. Singh Memorial Lecture at the 68th AICC of ICA to be delivered by a suitable person selected by Prof. M. K. Singh.

(v) RESOLVED to invite/nominate proposals for topics and the names of Chair and Co-Chair persons for different Technical Sessions, Seminar Session, MM Shah Session, to be held during 69th AICC of ICA throughout the year on website of ICA till the Annual General Body meeting at 68th AICC of ICA.

The chairman thanked all the members.

The meeting ended with a vote of thanks to the chair.

Dr. Balwinder Singh
Secretary - ICA

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