

# Parikalpana

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## **Editorial**

Management Research, particularly in reputed b-schools, is now in for serious scrutiny and criticism. The quantum of quality, original research is far below the satisfactory level, in our country. This affects the quality of research journal, seriously. When small time journal publisher-editors are now rushing for the easy mode of e-journals, traditional print-versions of research-journals are getting lesser support and patronage. Mushrooming of e-journals might have helped many young scholars, but that has not uplifted the sagging record of research publication/ contribution from India. We have hardly a dozen of trusted management research journals in India, which come out unfailingly with regular periodicity. In spite of plans and budgets, many b-schools (and research organisations) fail to publish their journals regularly. This happens even with Government-run b-schools. Money or manpower may not be in any deficit there. Perhaps, after the expected reason of “vacuum of quality research”, trust-deficit could be the other avoidable reason; possibly at every quarter.

In the fast lane of digital world, flooded with unfathomable e-resources, it is often a tough job to check the originality of a research paper. Though we now trust a machine (or the software on plagiarism check) for the filtering process, it is certainly a high risk method/ approach. We should trust the “capability” of a machine/ software or our researcher-colleague? A difficult and delicate issue altogether! Reviewers are often requested to exercise personal wisdom and judgment, while critically examining the worth of a research paper, for its publication. There may be some bias, too.

We at ***Parikalpana***, also use both the methods: use of plagiarism-check-software and reviewer/ editorial-board-members’ wisdom. Suggestions are sometimes communicated to the contributors. While thanking all the reviewers and members of the editorial board for their valued academic support, we request all our contributors to have trust on our scrutiny and selection process.

We are happy to inform all our esteem readers and contributors that, the peer-reviewed journal Parikalpana is listed in leading indexing directories like Ulrich, Cabell’s etc. We have also signed an MoU with Ebsco Host Inc (USA), the leading e-resources aggregator of the world for wider access our journal articles.

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***Parikalpana***: researchers’ creative *imagination*; may be an *assumption* or *hypothesis*, a researcher verifies empirically through research.



# A COMPARATIVE STUDY ON MOTIVATIONAL FACTORS OF RURAL AND URBAN CONSUMERS, FOR BUYING MOBILE PHONE IN BARODA DISTRICT

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## ABSTRACT

*Till the late 1990s owning a mobile phone was considered to be a luxury in India. But, in the recent past, it has been observed that the ownership and use of mobile phone has become a necessity, and to some extent a part of life-style in form of a fashion accessory. With the reduction in service charges and the cost of handsets, the number of mobile phone users in India has increased manifold.*

*The key objective of the research study was to identify and compare underlying motivational factors influencing buying of mobile phones in case of urban vis-à-vis rural customers that were conveniently selected from the Vadodara City and its surrounding villages. The researchers have compared and analyzed the buying behaviour of urban, as well as, rural customers on selected criteria viz., price, quality, style, functions, and brand that acts as motivators for both rural and urban customers in buying of mobile phones. This research study is based on exploratory research design that required primary data collected using structured-non disguised questionnaire supported with personal interviewing of the selected urban and rural customers to offer results and put forward findings of the testing of formulated hypotheses by applying suitable tests of significance to offer implications in formulation and modifications of marketing strategies concerning motivational factors influencing buying of mobile phones.*

## Introduction:

According to Census of India term, 'rural area' has been defined as any habitation with a population density less than 400 per

sq. km., where at least 75 percent of the male working population is engaged in agriculture and where exists no municipality or board (Census of India,

2001). Motivation is defined as the process that initiates, guides and maintains goal-oriented behaviors. Motivation is what causes a person to act, whether it is getting a glass of water to reduce thirst or reading a book to gain knowledge as buying a mobile phone for communication or any other activity. Consumer means one who consumes, especially one who acquires goods or services for direct use or ownership rather than for resale or use in production and manufacturing (<http://www.thefreedictionary.com/consumer>).

According to Rural Poverty Report, 2011 released by UN International Fund for Agricultural Development, an adverse impact was observed during 2010 on lives of millions of poor and vulnerable people living in rural areas due to the global economic down-turn. Report stated that population of the developing world is still more rural than urban i.e., considering the

total world population, 3.1 billion people (55 per cent) live in rural areas. Over the past couple of decades, a successful attempt was made to reduce poverty in some parts of the world, there are still about 1.4 billion people living on less than US \$ 1.25 a day. At least 70 per cent of the world's poor people are rural and are children and young people and there is no chance in immediate future to bring a likely change in these facts (Ministry of Rural Development, Government of India-Annual Report, 2010-2011). Many challenges are faced by a marketer attempting to market his product or service in the rural area due to the geographic spread and lower level of population density in the villages in India. The table number 01, provides details about population and village size in India which gives an idea about the diversity and density of village population.

**Table 01 : Rural Population Statistics**

Population	Number of Villages	Percentage of total villages
Less than 200	114267	17.9
200-499	155123	24.3
500-999	159400	25
1000-1999	125758	19.7
2000-4999	69135	10.8
5000-9999	11618	1.8
10000 & above	3064	0.5
Total	636365	100

*Source: Census of India, 2001 (Adapted from Rajesh K Aithal and Arunabha Mukhopadhyay.)*

Such a population diversity and density force the marketer to adopt different marketing strategies. Marketing to rural consumers is not rural marketing but it is

marketing to a rural mindset. In reality, one can find only the 'practice of rural marketing' and there exists very few instances related with understanding the

rural consumers' mindset. The prevailing postulations, generalizations and stereotypes have made us to get the rid of valuable insights likely to be available from research on rural consumers and now it is the time to put extra effort to think rural. (<http://coffeeanddonuts.co.in>).

The fundamental distinction is that rural consumers are different from their urban counterparts and the most well-known reasons are, confined exposure to product and services for rural consumers, lower levels of literacy in rural area and in addition there are differences in availability of occupation in rural areas which has a direct impact on the level of income and flow of income and such a high level of inter-dependency is affecting the dynamics of rural community behavior. Such distinctiveness contributes to make the behavior of rural consumer distinct from the consumer behavior generally observed in urban areas ([www.martrural.com](http://www.martrural.com)).

### **Brief Review of Rural Development in India:**

An attempt is made by the researcher to review rural development in India. It is stated as follows:

Largely independent of the agricultural base, rapid rural non-farm growth is occurring in India considering the transport corridors that link rural areas to major urban areas. According to UN Rural Poverty Report, every additional million rupees (around US \$ 23,000) invested on rural roads in India, has contributed to lift 881 people out of poverty. An attempt made

by Government of India in general and specific efforts made by Ministry of Rural Development, the conditions of the rural population has improved and made the rural population a part of National Economic flow in India. The developmental and initiatives in terms of welfare activities were made since last six years and it is further strengthened during 2010-2011. The ministry of Rural development is responsible for development of welfare activities in rural areas of India that also contributed positively to achieve its mission to correct the developmental imbalances and to accord due priority to development in rural areas by bringing in sustainable and holistic growth through a multi-pronged strategy to reach out to most disadvantaged sections of the society.

The Government has increased budget estimates for rural development which shows its concerns for rural development. To Illustrate, the budget estimates for rural development was increased from Rs. 15,998 crore in 2004-2005 to Rs. 74,270 crore (Budgeted Estimates) and Rs. 73,479 (Revised Estimates) respectively in 2009-2010. During 2010-2011, Budgeted Estimates (BE) plan was revised to Rs. 79,340 crore and Rs. 89,577.5 crore as Revised Estimates. During 2011-2012 the BE Plan provision made is worth Rs. 87,800 cores.

To ensure a minimum level of livelihood security in the rural areas, the Government of India had revised the National Rural Employment Act (NREGA) of 2005, as Mahatma Gandhi National Rural Employment Guarantee Act, in which a total

of Rs. 43,111.27 crore, including opening balance, is available for Mahatma Gandhi NREGA in 201-2011. Under this NREGA program up to December, 2010, Rs. 4.10 crore households were provided with wage employment and 145 people's days have been generated across India; average wage level paid at National Level has increased from Rs. 65 in 2006-2007 to Rs. 99 in 2010-2011; in 2010-2011 the participation of the SC has been 23 per cent, of women has been 50 percent and ST has been 17 percent according to the record. Under the Swarnjayanti Gram Swarozgar Yojna (SGSY) till December, 2010, total 12.81 lakh swarozgaries assisted in 2010-2011 out of which 8.5 lakh (66.35 per cent) were women Swarozgaries.

Under the Indira Awas Yojna (IAY) from 1<sup>st</sup> April, 2010, the ceiling on construction assistance was enhanced to Rs. 45,000 per unit in the plain areas and Rs. 48,500 in hilly/difficult areas and for up-gradation of kuccha house, financial assistance was enhanced to Rs. 15,000 per unit. The result of this program was that in 2010-2011, 14.57 lakhs houses were constructed till December, 2010 and another 26.45 lakh are under construction. The Central Sanitation Program (CRSP) aims at improving the quality of life of the rural poor and to provide privacy to women in rural areas, the Total Sanitation Campaign was restructured and was implemented in 607 districts with the money sanctioned for the same was Rs. 19,626.43 crore. There are many other programmes launched by Government of

India for improving life of rural people such as Mahila Kisan Sashaktikaran Pariyojna (MKSP); Pradhan Mantri Gram Sadak Yojna (PMGSY); National Social Assistance Programme (NSAP); Integrated Watershed Management Programme (IWMP); National Land Records Modernization Programme (NLRMP), and many other and all of these are contributing in improving life of rural population (Ministry of Rural Development, Government of India-Annual Report, 2010-2011).

### **Spending Patterns of Urban, Rural Indian Households:**

With increase in household incomes the expenditure patterns also change in terms of expenditure on durables, health and education, and investment related spending. Considering the income difference between rural and urban India and difference in terms of low, middle and high income states, it is expected that across all the sections of the society the patterns of expenditure and saving habits also change. Households spending more depends on profiles of urban and rural consumers in terms of age of chief earners, their occupation, educational qualifications etc., which demonstrate urban-rural disparity in the ownership profile of consumer durables.

Considering routine and unusual expenditure an average Indian household spends about 75 per cent of its income. Considering an average Indian household, 51.5 per cent incurred their money on

account of rituals and ceremonies; 27 per cent on medical emergencies; 8 per cent on education; 4 per cent on travel.

The rural and urban consumers' spending pattern is different and considering such differences, the marketers in India are interested in increasing sales of their products. To illustrate, considering average spending on food items, urban households spend about Rs. 26,524, where as, the rural households spend, on an average, Rs. 18,266 on food items in a year, and these expenses constitute 45 per cent for urban and 55 per cent of rural consumers' total routine expenditure. Considering annual spending on non-food items the rural households spend less compared to urban households i.e., Rs. 14,788 spent by rural households as compared to Rs. 31,893 spent by urban households. Considering unusual expenditures form total household income average spending in India accounts for 12.2 per cent, which constitute 10.4 per cent spent by urban households and 13.6 per cent spent by rural households. Further, 5.9 percent spent by urban and 3.8 percent by rural households on housing; 8.7 per cent spent by urban and 6.4 per cent spent by rural households on education; the difference between spending of urban and rural households is marginal in the case of transport; 4.7 per cent spent by urban and 4.6 per cent by rural households on health; 7.1 per cent spent by urban and 6.8 per cent by rural households on clothing; 55 per cent spent by rural households and 45 per cent spent by urban households on ceremonies; 4.7

per cent spent by rural consumers and 13 per cent by urban consumers on education; 29 per cent spent by rural households and 25 per cent by urban households on medical emergencies. Key reason for rural families for spending more on medical emergencies as compared to the urban households is due to lack of access to healthcare. Considering the pattern of product ownership rural consumers are given consideration by many marketers and are looking towards growth of sales of their products. Given that rural India today contributes 56 per cent to total national income, 57 per cent to total expenditure and 33 per cent to surplus income, marketers are more than justified in reaching out to rural households. The major undergoing change is observed in terms of product ownership of rural households. To illustrate, all the black and white TV sold in India the rural consumers account for 88.5 per cent; similarly 28.7 per cent of rural consumers own most consumer durables; 38 per cent of rural households possess pressure cooker/pan as compared with 80 per cent of urban consumers; 48 per cent penetration of fans in rural areas and 89 per cent in urban areas; 24 per cent rural households own colour TV as compared to 67 per cent in urban areas; 27 per cent of rural consumers own two wheelers as compared with 55 per cent in urban areas (Rajesh Shukla, 2010).

In case of FMCG products category, the rural consumption drives the growth compared to urban consumptions as given in table number 02.

**Table 02 : Table Showing Growth of Urban – Rural Consumptions for FMCG & Other Selected Product Categories**

Selected Product Categories	ALL INDIA RURAL				ALL INDIA URBAN			
	Volume Growth (%)		Value Growth (%)		Volume Growth (%)		Value Growth (%)	
	2010 over 2009	2011 over 2010	2010 over 2009	2011 over 2010	2010 over 2009	2011 over 2010	2010 over 2009	2011 over 2010
FMCG	-2	10	1	12	2	4	4	7
Personal Care	3	4	8	9	4	3	10	10
Household Care	10	5	8	13	9	3	9	6
Food & Beverages	-4	12	-2	12	1	4	2	6

Source: Samidha Sharma (2012) –Times of India dated 14/01/2012.

As given in table no. 02 the consumption of FMCG and other categories of products showed a volume as well as value wise driving growth for rural consumptions compared to urban consumption, except the urban consumptions showed little higher growth in terms of Personal Care products.

### **A Brief Review of Marketing of Mobile Phones and Related Services in India:**

A brief review of mobile phones current status is given below.

#### **Current Status:**

As reported in the India Monthly Mobile Handsets Market Review of September, 2011 the market for handset witnessed 47 million units in July to September, 2011 and it showed 12.5 per cent growth due to large number of new launches and usual shipments of handsets by vendors. The market of handsets was dipped during April to June, 2011 quarter and then recovered in July to September,

2011. During July to September, 2011 quarter on an average 55.8 per cent of total mobile handset shipments in the country were from dual-SIM and multi-SIM handsets.

According to Monthly Mobile Handsets Market Review of September, 2011 the overall mobile handsets market in India with 30 per cent market share Nokia retained its leadership position followed by 11.6 per cent market share by Samsung holding second position during the month of September 2011. Though Nokia entered late in multi-SIM device category, the company has offered five models by the end of September, 2011. In the first nine months of the year 2011, Smartphone has achieved shipments figure to 7.9 million units and its sales (i.e. unit shipments) crossed 1 million units (<http://voicendata.ciol.com>).

According to India Mobile Online the Total market share size of mobile phones during 2010-11 is Rs 33,171 Crores and market share of different mobile phone

manufacturers, (as given in table no. 03), the Nokia stands 1<sup>st</sup> with 39 per cent and Samsung stands 2<sup>nd</sup> with 17.2 per cent market share.

**Table 03 : Table Showing Mobile Phone Market Share 2010-11**

Company	Market Share in %	Company	Market Share in %	Company	Market Share in %	Company	Market Share in %
Nokia	39.0	LG	05.5	Maxx	02.2	Index	01.3
Samsung	17.2	G'Five	04.0	Sony Ericson	02.1	Others	06.8
Micromax	06.9	Karbonn	03.0	Huawei	01.9	Total	100.0
Blackberry	05.9	Spice	02.8	HTC	01.4		

Source: [www.indiatelecomonline.com](http://www.indiatelecomonline.com)

The below given tables (no. 04 & 05) provides information about shipments of mobile handsets and its growth as well as number of new models launched during July to September, 2011, in September, 2011 the growth of Features phone account for 26.7 per cent whereas Smart

phone accounts for -20.3 per cent. So far as launching of new mobile phones is concerned total 85, 98, and 94 models of feature phones and only 8, 3 and 13 models of Smart-phones were launched in July, August, and September, 2011 respectively.

**Table 04 : Monthly Mobile Shipments of Handsets and Growth Trends in India During July to September – 2011.**

Device Type	July 2011	August 2011	September 2011	Growth July 2011	Growth August 2011	Growth September 2011
	Units in Millions			In %		
Feature Phones	13.72	13.33	16.89	2.9	-2.9	26.7
Smart-phones	0.77	1.27	1.01	-7.7	65.4	-20.3
Total	14.49	14.6	17.90	2.3	0.8	22.6

Source: Cyber Media Research India Monthly Mobile Handsets Market Review, September 2011, 21 December 2011 ([www.cmrindia.com](http://www.cmrindia.com))

**Table 05 : Number of New Mobile Handsets Models Launched in India During July to September - 2011**

Device Type	July 2011	August 2011	September 2011
Feature Phones	85	98	94
Smart-phones	8	3	13
Total	93	101	107

Source: Cyber Media Research India Monthly Mobile Handsets Market Review, September 2011, 21 December 2011 ([www.cmrindia.com](http://www.cmrindia.com))

According to Juxt Consult's study 'India Mobile 2011', while the 'individual' level penetration is up at 34 per cent, tele-density is up at 40 per cent (from 31 per cent last year). Almost 60 per cent of all Indian households are still 'single' mobile user households. User base of active 'multiple SIM' users grew by 20 million (44 per cent) to touch 65 million. Further, Rural India overtakes urban India on the base of both 'users' as well as 'active SIMs', showed higher increases in both 'penetration' & 'tele-density' (as compared to urban India) 218.9 million rural versus 188.4 urban mobile subscriptions. There are 446 million 'active' mobile handsets in use (up 26 per cent from 355 million last year). Average handsets per user have gone down marginally to 1.1 (1.17 last year). 91 per cent mobile users are 'single' active mobile handset users.

Almost 5 per cent of all mobile handsets in use (22 million) are 'Dual SIM' handsets. 82 per cent of all mobile handsets are claimed to have been bought at below 3,000 price point. (<http://www.indiatechonline.com/juxtconsult-india-mobile-phones-study-2011-545.php>).

### ***Future Growth potential:***

According to Gartner Research the sales of Mobile device in India are estimated to reach 231 million units in the year 2012 from 213 million units sold up to year 2011, which shows a rise of 8.5 per cent. Further, the mobile handset market is expected to

surpass 322 million units' sales by the year 2015, shows a likely steady growth of mobile device market. India is considered to be a vital market for mobile device manufacturers as it accounts for approximately 12 per cent of worldwide sales with 150 manufacturers. Gartner Research also confirmed that considering handset sales in India, after Nokia and Samsung, the G'five, Karbonn Mobile and Micromax stood third, fourth, and fifth, respectively, in the July to September, 2011 quarter. There are more than 870 million mobile users in India and the country is one of the world's fastest-growing cellular markets in subscriber additions. The market, however, is very price-sensitive, with low-cost phones dominating sales. The average selling price of a mobile device is approximately \$45, with 75 per cent of devices sold costing below \$75.

As Indian market is considered as a large sized potential market it has attracted many global mobile device manufacturers because in India the mobile devices are sold independent of cellular connection. If one consider players in the Indian mobile devices market it includes the local and Chinese manufacturers who focus on manufacturing low-cost devices, but there are some manufacturers who have built their capabilities to deliver devices parallel to Smartphone and some manufacturer have even ventured into other global markets. Due to local and Chinese manufacturers' hold on 50 per cent of mobile hand set market, the share of global vendors experienced declining market

share and would continue to face competition from these local and Chinese brands. The competition in the Indian mobile device market is intensified due to the entry of Indian mobile handset players with a focus on low-end, value conscious consumers.

The traditionally stronger, big global players have seen their positions weaken due to the growing influence of local handset players in the low-end segment. Even the middle -range to higher-end market are becoming increasingly competitive due to increasing focus from global players on the Indian market with the launch of competitively priced mobile devices in middle and higher-end markets.

The Indian mobile device market is driven by the lowest call rates in the world and is dominated by low-cost devices, which accounted for 75 per cent of the overall sales in India up to year 2011 (<http://www.eetindia.co.in>)

According to Gartner, mobile penetration in India was about 55.9 percent in the year 2010 and is expected to grow at double-digit rates till the end of 2012 and is projected to increase further to 82 per cent by the year 2014, because increasing focus is on the rural market and on lower handset prices by the service providers. It is further forecasted that total mobile services revenue in India is to exceed US\$ 23 billion by the end of the year 2014 and after China; India is expected to remain the world's second largest wireless market in terms of mobile connections.

Indian mobile services market is going through a state of change due to the arrival of many new players leading to a decrease in price points for the mobile service industry. It is believed that some market consolidation will happen with the launch of 3G services which enables service providers to distinguish themselves on the basis of services offered rather just on prices of the services (<http://www.gartner.com>).

Considering the mobile Internet users in India, An IMRB and IAMAI research shows that the total number of mobile internet users in India in the year 2010 reached at 12.1 million, and it was projected to reach 30 million in 2011. Another report from Boston Consulting Group predicted that there could be as many as 237 million mobile internet users in India by the year 2015. This growth driven by smartphone base, assert telecom operators (Priyanka Joshi, 2012, Business Standard dated 16/01/2012).

### **Review of Literature:**

The Macro Market Analysis & Consumer Research Organization (2004) conducted research study in Mumbai with a requisite sample allocation of 165 respondents to gather current comparative opinions on issues ranging from choice of handset, brand associations, triggers and apprehensions in relation to use of cellular phones. Data collection was done through One-On-One interviews through 'Structured Questionnaire'. Though the scope of findings was limited in nature, it

was certainly an indicator of Nokia's supremacy in the handset market over other players like LG, Samsung, Motorola, Panasonic, Siemens and Reliance. Chi-square analysis showed that the choice of handset (Nokia and other than Nokia) depends on age and gender parameter of the respondent. In case of teenagers, peer group compliance was found to be the major influencing factor for the cell phone purchase (The Macro Market Analysis & Consumer Research Organization, 2004).

Sheetal Singla (2010) conducted exploratory research study with an aim to investigate and understand the behavior of consumers of mobile phones in Ludhiana and the Sangrur and further capture their satisfaction level that is influenced by various technical & non-technical factors.

Respondents were asked to rate 5 mobile phone-motivators (Price, Quality, style, functions, Brand,) by using Stratified Random Sampling method to collect data from 500 respondents from Ludhiana and Sangrur Districts, which includes rural & urban samples. The conclusions of the study was that while price & features are the most influential factors affecting the purchase of a new mobile phone, its audibility, network accessibility, are also regarded as the most important in the choice of the mobile phones. The study has also concluded that 57 per cent of male has given importance to Quality of mobiles followed by price, features, Brand & style of mobiles (Sheetal Singla, 2010).

Across major cities, a survey was conducted in India to determine factors considered by Indian consumers while buying a mobile phone and their findings suggested that the brand of a mobile phone is one of the most important and most people don't consider or care about advice being offered at the mobile phone shop by the sales person. Cost too is an important consideration and goes on to explain why iPhone failed in India. Considering availability of the music facilities in the mobile phones, the quality of multimedia and camera are the important features considered by the consumers for making buying decisions. Unmarried people either a male or female were more likely to be found to buy latest phone models and also take in to consideration the style or looks of the mobile phone (Android Family Browser, accessed on 25/1/2012).

Rajesh K Aithal and Arunabha Mukhopadhyay have made an attempt to understand the underlying issues related to marketing of telecom services in rural areas and also to know the reasons for not attempting to enter on large scale for telecom services by private operators. The issues identified are related with product features of mobile and recharge of services as well as pricing of it, which need to be addressed in order to make rural telecom services a success in rural areas in India. He suggested that for rural telecom operators the innovative approach in product, as well as, the ways in which they tackle the challenges posed by rural

markets provides them the success (Rajesh K Aithal and Arunabha Mukhopadhyay).

Chirag V. Erda (2008) conducted a comparative study for exploring motivational factors for purchase of mobile phone in Jamnagar district and identified that there is no significant difference in consciousness of rural and urban consumers for price and style of mobile phone whereas significant difference exists in terms of quality, functions and brand name of mobile phones. The major sources of information used by rural consumers include friends and mobile phone retailers (Chirag V. Erda, 2008).

### **Research Methodology:**

#### **Research methodology mainly consists of following.**

The researcher has used Exploratory research design to know the motivational factors considered for making purchase decision of mobile phone by rural and urban consumers who were conveniently drawn by applying non-probability sampling design on the basis of convenience sampling method for the collection of the required primary data. By using survey research approach data was collected from the representative sampling units from Baroda city and its surrounding villages who are the users of mobile phones. Data were collected from 360 respondents where 180 respondents were from rural area and another 180 were from urban area. This research required primary data that were collected using structured-

non disguised questionnaire supported with personal interviewing of the selected urban and rural customers. The researcher has made an attempt to put forward the results and findings based on statistical test applied to test the hypothesis offered the implications in formulation and modifications of marketing strategies concerning motivational factors influencing buying of mobile phones.

### **Objectives of the Research Study:**

Marketers today are making an attempt to tap rural markets as it consists of around 60 per cent of India's population and provides ample opportunities as potential consumers for the products and services offered by them. In this research paper an attempt made by the researcher to make a comparative study to explore the motivational factors that are considered by rural and urban consumers for buying mobile phone in view of emergence of vast opportunities provided by rural markets.

The objectives of the research study were (i) to examine the information sources considered by selected rural and urban consumers while buying a mobile phone; (ii) to examine the who played an important role in making buying decisions made by selected rural and urban consumers and (iii) to identify motivational factors considered by selected rural and urban consumers while buying mobile phone as well as to measure their satisfaction/dissatisfaction from their mobile phone.

### Designing of Structured Questionnaire:

In order to study the motivational factors considered by rural and urban consumers while buying Mobile Phone, the structured questionnaire was designed using earlier questionnaires as reference questionnaires viz., Chirag V. Erda (2008) and Macro-Market Analysis & Consumer Research Organization (2004).

The structured questionnaire used neutrally worded questions, and the rural and urban consumers were asked to rate on the Likert Scale on question number 12 consists of questions to be answered on a five point scale, viz., 01 as Extremely unimportant and 5 as Extremely Important.

Similarly, in question number 13 Highly Dissatisfied is represented as 1 and 5

represented Highly Satisfied scale categories. Questionnaire was also verbatim translated in vernacular language to help the urban and rural respondents to better understand and to respond to it.

### Reliability of the Structured Non-disguised Questionnaire:

Reliability test was applied to determine how strongly the opinions of rural and urban consumers were related to each other, and also to compare its composite score. The Cronbach's Alpha score of 0.601 as shown in Table Number 06 showed internal reliability of the scale and reflected the degree of cohesiveness among the given below items (Naresh K. Malhotra, 2007 and Jum C. Nunnally, 1981).

**Table 06 : Table Showing Summary of Indicators and Reliability Alpha Score**

Sr. No.	Grouped Indicator Items	Cronbach's Alpha Coefficient
01	Price of the Mobile	<b>0.601</b>
02	Quality of the Mobile	
03	Style of the Mobile	
04	Functions of the Mobile	
05	Brand Name of the Mobile	

### Data Analysis and Interpretation:

As the present research study is based on primary data from selected respondents from Baroda and its surrounding villages, the researcher has used frequency distribution, mean, and median values for analyzing data as well as the z- test was put to use to test the significant differences in mean values of the rural and urban

customers for selected items (Price, Quality, Style, Functions and Brand name of the Mobile Phone).

### Results & Findings of the Research Study:

An attempt has been made to offer results received based on data analysis through use of SPSS 15.0.

**Demographic Profile of Respondents:**

As given in table No. 07 out of total 180 respondents 69 per cent of the respondents were male and 32 per cent of them were female in urban area and 85 per cent were male and 15 per cent of them were female in rural area; 68 percent of them were below 30 years and 32 per cent of them were above 30 years

in urban area whereas in rural area 64 per cent of them were below 30 years and 36 per cent of them were above 30 years. In urban area 53 per cent of them were under graduate and 47 per cent of them were above graduate whereas in rural area 72 were under graduate and 28 per cent of them were graduate and more than graduate.

**Table 07 : Profile of Selected Urban and Rural Respondents**

Sr. No.	Selected Background Variables of Selected Respondents		City or Rural Area (Number and Percentages of Selected Respondents)		
			Urban Area	Rural Area	Total
01	Gender	Males	124 (68.9)	153 (85.0)	277 (76.9)
		Females	56 (31.1)	27 (15.0)	83 (23.1)
02	Age Group	Below 20	55 (30.6)	36 (20.0)	91 (25.3)
		21 to 30	67 (37.2)	79 (43.9)	146 (40.6)
		31 to 40	29 (16.1)	29 (16.1)	58 (16.1)
		41 to 50	15 (8.3)	24 (13.3)	39 (10.8)
		Over 50	14 (7.8)	12 (6.7)	26 (7.2)
03	Educational Qualification	Under Graduate	96 (53.3)	129 (71.7)	225 (62.5)
		Graduate	46 (25.6)	41 (22.8)	87 (24.2)
		Post-Graduate	29 (16.1)	7 (3.9)	36 (10.0)
		Professional Qualification	7 (3.9)	0 (0.0)	7 (1.9)
		Ph. D.	2 (1.1)	3 (1.7)	5 (1.4)
04	Occupation	Student	87 (48.3)	29 (16.1)	116 (32.2)
		Service	44 (24.4)	42 (23.3)	86 (23.9)
		Business	22 (12.2)	32 (17.8)	54 (15.0)
		Profession	20 (11.1)	0 (0.0)	20 (5.6)
		Agriculture	1 (0.6)	50 (27.8)	51 (14.2)
		House Wife	2 (1.1)	12 (6.7)	14 (3.9)
		Retired	4 (2.2)	0 (0.0)	4 (1.1)
		Religious Activity	0 (0.0)	15 (8.3)	15 (4.2)
05	Monthly Family Income	Up to Rs. 5,000	15 (8.3)	82 (45.6)	97 (26.9)
		Rs. 5,001 to 10,000	42 (23.3)	65 (36.1)	107 (29.7)
		Rs. 10,001 to 20,000	41 (22.8)	21 (11.7)	62 (17.2)
		Above 20,000	82 (45.6)	12 (6.7)	94 (26.1)

So far as occupation of selected respondents is concerned in urban area 48 per cent were student, 24 per cent were from service, 12 were from business, 11 per cent were from profession and another 5 per cent from other occupations, whereas in rural area 28 per cent were from agriculture, 23 per cent were from service, 18 per cent were from business, 16 per cent were students and 15 per cent were engaged in other occupation. Considering monthly family income 68 per cent were earning more than 10,000 and 32 per cent earning lesser than 10,000 in urbanized area, whereas 82 per cent were earning less than 10,000 and only 18 per cent were earning more than 10,000 in rural area.

So far as place of respondents is concerned, out of total 360 respondents, the 50 per cent of respondents belongs to Baroda City and another 50 per cent belongs to total 46 villages in which out of 180 respondents were primarily mainly five villages consists of 48 per cent i.e., 30 (16.7 per cent) belongs to Chandod village, followed by 29 (16.1 per cent) respondents from Changa village, 15 (8.3 per cent) from Naswadi and Akona villages individually; and 13 (7.2 per cent) from Ghodisimel. Rest of the 52 per cent of respondents belongs to other 41 villages.

#### Mobile Phone Used by Respondents:

The detail about mobile phone usage is given in table number 08.

**Table 08 : Table Showing Mobile Phones of Different Brand Used by Respondents**

Sr. No.	Name of the Brand	City or Village		Total
		Urban Area	Rural Area	
		(Number and Percentages)		
01	Nokia	97 (53.9)	93 (51.7)	190 (52.8)
02	Motorola	3 (1.7)	14 (7.8)	17 (4.7)
03	Reliance LG	2 (1.1)	3 (1.7)	5 (1.4)
04	Sony	8 (4.4)	7 (3.9)	15 (4.2)
05	Samsung	40 (22.2)	41 (22.8)	81 (22.5)
06	TATA LG	3 (1.7)	1 (0.6)	4 (1.1)
07	LG	5 (2.8)	4 (2.2)	9 (2.5)
08	Max	5 (2.8)	5 (2.8)	10 (2.8)
09	I Phone	1 (0.6)	0 (0.0)	1 (0.3)
10	Ideos	2 (1.1)	2 (1.1)	4 (1.1)
11	Videocon	2 (1.1)	1 (0.6)	3 (0.8)
12	Blackberry	8 (4.4)	1 (0.6)	9 (2.5)
13	Micromax	3 (1.7)	2 (1.1)	5 (1.4)
14	HTC	1 (0.6)	0 (0.0)	1 (0.3)
15	Chaina	0 (0.0)	6 (3.3)	6 (1.7)
	<b>Total</b>	180 (100.0)	180 (100.0)	360 (100.0)

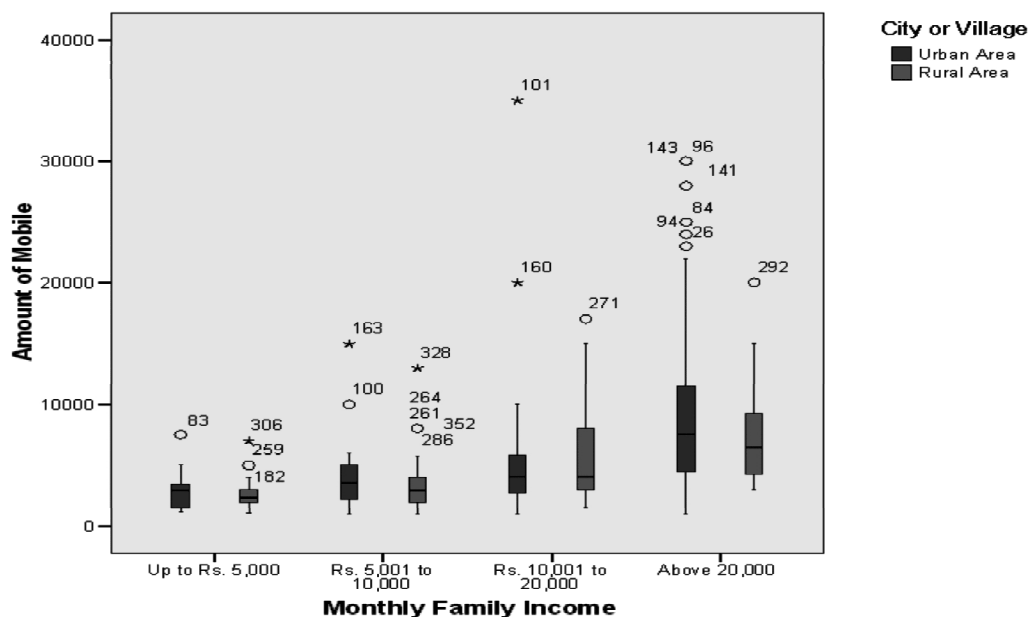
Considering the use of handset by urban respondents, as given in table number 08, Nokia remained the 1<sup>st</sup> preferred with 54 per cent purchased it, followed by Samsung as 2<sup>nd</sup> preferred with 22 per cent of urban respondents and Sony and Blackberry would be 3<sup>rd</sup> preferred with 4 per cent, and balance 16 per cent purchased other mobile phones. In case of rural respondents for first two preference same results was obtained i.e. Nokia would be 1<sup>st</sup> preferred with 52 per cent purchased, Samsung would be

2<sup>nd</sup> preferred with 23 per cent purchased and Motorola would be 3<sup>rd</sup> preferred with 8 per cent purchased, and balance 17 per cent purchased other mobile phones.

### Income Versus Amount Spent on Mobile Phone by Rural, Urban Consumers:

The spending behaviour of rural and urban consumers in buying mobile phone considering their income is given in Graph - 01.

**Graph 01 : Income Versus Amount Spent on Mobile Phone**



It becomes evident from graph number 01 that amount spent on mobile phone will be more by both rural and urban consumer if their income is high. It means higher the

earnings of rural and urban people higher the spending on mobile handsets with little variations in terms of proportion of income spent by urban and rural consumers.

**Table 09 : Table Showing Sources of Information Used by Respondents for Buying Mobile Phones:**

Sr. No.	Name of the Information Sources Used by respondents	City or Village		Total
		Urban Area	Rural Area	
		(Number and Percentages)		
01	News Paper	12 (6.7)	43 (23.9)	55 (15.3)
02	TV	15 (8.3)	37 (20.6)	52 (14.4)
03	Internet	19 (10.6)	20 (11.1)	39 (10.8)
04	Mobile Phone Retailer	83 (46.1)	40 (22.2)	123 (34.2)
05	Magazines	2 (1.1)	8 (4.4)	10 (10.0)
06	Radio	6 (3.3)	16 (8.9)	22 (6.1)
07	Friends	43 (23.9)	16 (8.9)	59 (16.4)
	Total	180 (100.0)	180 (100.0)	360 (100.0)

As given in the table number 09, the preference showed by rural consumers for sources of information used for collecting information about mobile purchase is for three major sources i.e., 24 per cent of respondents showed preference for Newspapers followed by 22 per cent for Mobile Phone Retailer and 21 per cent for Television. Whereas, the preference showed by urban consumers relates to two major sources i.e., 46 per cent of respondents showed preference for Mobile Phone Retailer, followed by 24 per cent for Friends, and 11 per cent for internet.

In order to determine whether significant difference exists in terms of Sources of Information Used for Buying a Mobile Phone by Rural and Urban Consumers, the researcher has applied z test to test the below given Null Hypothesis.

**H<sub>0</sub> - 01:** There is no significant difference in the mean score of Sources of Information Used for Buying a Mobile Phone by Rural and Urban Consumers drawn from Baroda city and its surrounding villages. (The results of Z test is given in Table number 12).

In case of Hypothesis 01, we reject the null hypothesis as the critical value (1.96) is less than calculated value (2.251). It means there is a significant difference in the mean score of Sources of Information Used for Buying a Mobile Phone by Rural and Urban Consumers drawn from Baroda city and its surrounding villages.

### **Influence on Buying Decisions of Selected Respondents:**

An attempt has been made by the researcher to find out who played an important role in buying decisions of Mobile phone and findings are given in table No. 10.

**Table 10 : Table Showing the Influencer in Making Purchase Decision of Mobile Phone**

Sr. No.	Influencer in Making Buying Decision	City or Village		Total
		Urban Area	Rural Area	
		(Number and Percentages)		
01	Self Decision	98 (54.4)	81 (45.0)	179 (49.7)
02	Family Members	51 (28.3)	63 (35.0)	114 (31.7)
03	Friends	22 (12.2)	21 (11.7)	43 (11.9)
04	Mobile Phone Retailer	9 (5.0)	15 (8.3)	24 (6.7)
	Total	180 (100.0)	180 (100.0)	360 (100.0)

As given in the table number 10, the major influence in the buying decision of rural consumer was related with Self decisions-45 per cent followed by influence of Family members-35 per cent; Friends-12 per cent and mobile phone retailers-8 per cent. In case of urban consumers the major influence in buying decision was related with Self decisions -55 per cent followed by influence of Family members-28 per cent; Friends-12 per cent and mobile phone retailers-5 per cent.

### Motivating Factors in Buying Decisions:

The analysis of motivation factors is given in Table-11.

As given in Table number 11, price is an important consideration for 92 per cent and less important for 8 per cent of rural consumers whereas, in case of urban consumers price is important consideration for 72 per cent and less important for 28 per cent. 90 per cent of urban consumers and 76 per cent of rural consumers give importance to quality of products whereas quality is less important for 10 per cent of urban and 24 per cent of rural consumers.

**Table 11 : Table Showing Factors Motivating Respondents for Buying Mobile Phone**

Selected Criteria	Rural Area					Urban Area					Total				
	(Number and Percentages)														
	ENI	NI	SIM	IM	EIM	ENI	NI	SIM	IM	EIM	ENI	NI	SIM	IM	EIM
Price	0	3	11	21	145	11	5	34	66	64	11	8	45	87	209
	(0.0)	(1.7)	(6.1)	(11.7)	(80.6)	(6.1)	(2.8)	(18.9)	(36.7)	(35.6)	(3.1)	(2.2)	(12.5)	(24.2)	(58.1)
Quality	0	16	28	92	44	1	4	14	41	120	1	20	42	133	164
	(0.0)	(8.9)	(15.6)	(51.1)	(24.4)	(0.6)	(2.2)	(7.8)	(22.8)	(66.7)	(0.3)	(5.6)	(11.7)	(36.9)	(45.6)
Style	1	20	71	31	57	10	15	44	57	54	11	35	115	88	111
	(0.6)	(11.1)	(39.4)	(17.2)	(31.7)	(5.6)	(8.3)	(24.4)	(31.7)	(30.0)	(3.1)	(9.7)	(31.9)	(24.4)	(30.8)
Functions	0	27	32	64	57	6	9	26	46	93	6	36	58	110	150
	(0.0)	(15.0)	(17.8)	(35.6)	(31.7)	(3.3)	(5.0)	(14.4)	(25.6)	(51.7)	(1.7)	(10.0)	(16.1)	(30.6)	(41.7)
Brand	15	19	27	46	73	7	8	30	58	77	22	27	57	104	150
	(8.3)	(10.6)	(15.0)	(25.6)	(40.6)	(3.9)	(4.4)	(16.7)	(32.2)	(42.8)	(6.1)	(7.5)	(5.8)	(28.9)	(41.7)

ENI= Extremely Not Important; NI= Not Important; SIM= Some What Important; IM = Important; EIM= Extremely Important

**H<sub>0</sub>: - 02:** There is no significant difference in the mean score of price consciousness of selected rural and urban consumers drawn from Baroda city and its surrounding villages.

**H<sub>0</sub>: -06:** There is no significant difference in the mean score of importance given to brand name of mobile phone by selected rural and urban consumers drawn from Baroda city and its surrounding villages.

**Table 12 : Table Showing the Results of Z Test (Two Tailed) Considering Motivational Factors for Buying Mobile Phone**

[illegible]

As given in the Table - 12 the results of Hypothesis testing are interpreted as follow.

In case of Hypothesis 02 we reject the null hypothesis because the critical value (1.96) is less than calculated value (8.176). It means there is a significant difference in the mean score of price consciousness of selected rural and urban consumers drawn from Baroda and its surrounding villages.

In case of Hypothesis 03 since the calculated value (7.13) is more than critical value (1.96) we reject the null hypothesis. It means there is a significant difference in the mean score of quality consciousness of selected rural and urban consumers drawn from Baroda and its surrounding villages.

In case of Hypothesis 04 the calculated value (0.345) is less than critical value (1.96) and therefore we fail to reject the null hypothesis. It means there no

significant difference in the mean score of importance of style (look) of the mobile phone to selected rural and urban consumers drawn from Baroda and its surrounding villages.

In case of Hypothesis 05 we reject the null hypothesis because the critical value (1.96) is less than calculated value (2.97). It means there is a significant difference in the mean score of importance of functions of mobile phone to selected rural and urban consumers drawn from Baroda and its surrounding villages.

In case of Hypothesis 06 since the calculated value (2.156) is more than critical value (1.96) we reject the null hypothesis. It means there is a significant difference in the mean score of importance given to brand name of mobile phone by selected rural and urban consumers drawn from Baroda and its surrounding villages.

**Table 13 : Table Showing the Overall Satisfaction with Performance of Mobile Phone**

Selected Criteria	Satisfaction/ Dissatisfaction	City or Village		Total
		Urban Area	Rural Area	
		(Number and Percentages)		
Overall Satisfaction with Performance of Mobile Phone	Highly Dis-satisfied	24 (6.7)	0 (0.0)	24 (6.7)
	Dis-satisfied	1 (0.3)	0 (0.3)	1 (0.3)
	Somewhat Satisfied	4 (1.1)	7 (1.9)	11 (3.1)
	Satisfied	132 (36.7)	40 (11.1)	172 (47.8)
	Highly Satisfied	19 (5.3)	133 (36.9)	152 (42.2)
Total		180 (50.0)	180 (50.0)	360 (100.0)

As given in table number 13 overall satisfaction from performance of their mobile phones, 96 per cent of rural consumers and 83 per cent of urban

consumers have expressed their satisfaction whereas 17 percent of urban and 4 percent of rural consumers expressed their dissatisfaction.

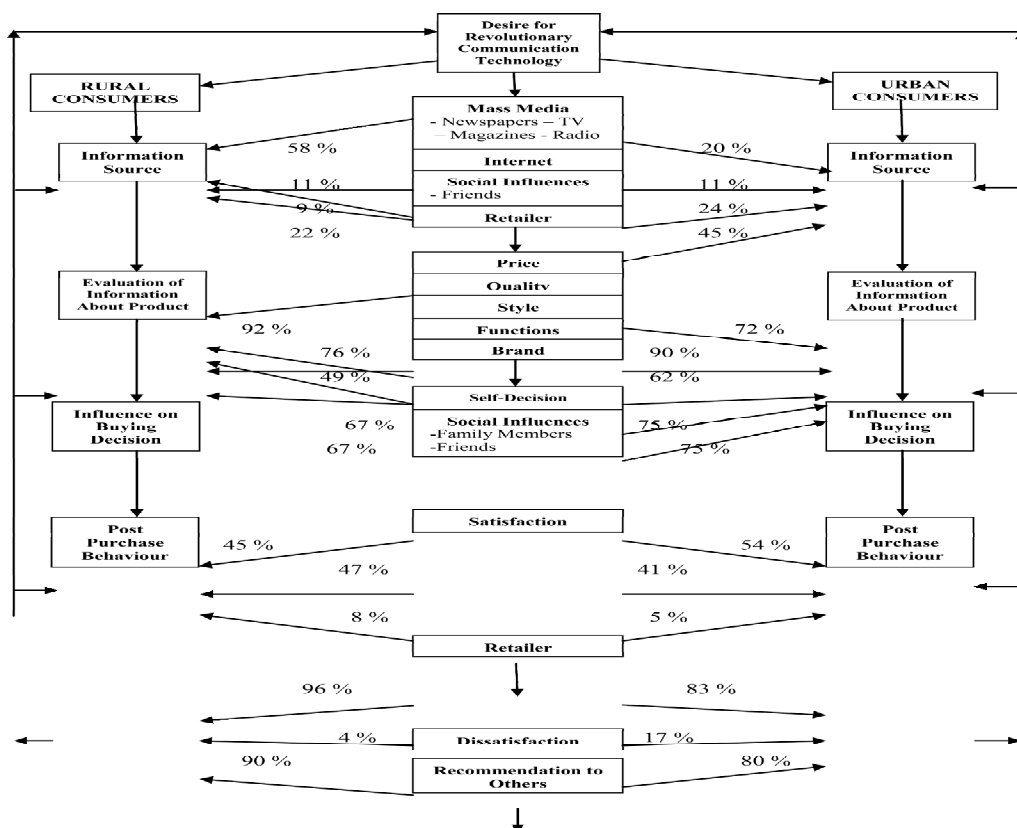
**Table 14 : Tables Showing the Intension of Selected Respondents to Recommend Mobile to Others**

Selected Criteria	Yes / No	City or Village		Total
		Urban Area	Rural Area	
		(Number and Percentages)		
Recommendations of Mobile to Others	Yes	144 (40.0)	163 (45.3)	307 (85.3)
	No	36 (10.0)	17 (4.7)	53 (14.7)
Total		180 (50.0)	180 (50.0)	360 (100.0)

Considering the intension of selected respondents to recommend the mobile phone to others (as given in table number 14) 91 per cent of rural consumers and 80 per cent of urban consumers have expressed their positive intension whereas,

20 percent of urban and 9 percent of rural consumers expressed their disagreement to give recommendations to others.

The results and findings of the research study are summarized and graphically presented in the figure number 01.

**Figure 01 : Behavior of Urban and Rural Consumers in Buying Mobile Phone (Percentages of Respondents)**

The figure number 01 shows the comparison of urban and rural consumers' behavior in terms of buying mobile phone. It shows the behavior of selected respondents in terms of information sources used for collecting information about mobile phone, the evaluation behavior considering the price, quality, style, functions and brand of mobile phones, the influencer on buying decision of rural and urban consumers and their post purchase behavior.

### **Limitations of the Research Study:**

Though this study presents important and useful contributions to the literature in marketing of mobile phone, various issues in making the use of these findings needs to be addressed. Relatively, small sample size restricts the generalizability of the results. Considering the demographic variables the allocation of selected respondents is disproportionate and there is no reason to presume difference based on demographic disparity while generalizing the results. The findings can be applied only to the selected respondents of selected villages and care must be taken while applying the same to other groups of customers. In spite of its limitations, this study points out an interesting direction for future research by replicating the study with more representative sample and future research study can be conducted by focusing on collecting detailed information about the price, quality, style, functions and brand preferences of consumers.

### **Discussions and Implications of the Research Study:**

Considering the managerial standpoint, the present research study offers valuable insights for managers to expand and cover the under penetrated mobile handset, as well as, its related services market. The research study revealed that due to availability of variety of sources of information consumers are not only able to take self-decisions for buying mobile phone of their choice but at the same time the opinion of family members and friends also play an important role. While developing communication programme the marketer need, to address the self-concept of people to support their self decisions, as well as, to incorporate the effect of social relations in making choice. The marketers of mobile phones and advertisers should pay more attention to the way advertising messages are crafted and ensure that it should be based on understandable language for both rural and urban consumers and must be executed considering the media habits of rural and urban consumers.

The study shows that people of rural area are more price conscious compared to urban consumers due to the limitations of income and occupational opportunities (supported by the facts that 28 per cent of selected respondents in rural areas belongs to agriculture and 82 per cent of selected respondents earn less than 10,000 in a month). Quality consciousness is high among the urban consumers compared to

rural consumers and therefore the mobile phone needs to be designed differently for rural consumers considering their high price consciousness and relatively less quality consciousness for mobile handsets. Consumers buy the branded mobile phones taking in to consideration the assurance about its functions and consistent performance. By considering the kind of difference in terms of importance given by urban and rural segments the marketers of mobile phones can make alterations related to functions of handsets and will be able to make the brand more popular among different segments of users of mobile phones.

The research study highlighted the fact that the buyers perception about price, quality, functions and brand name of mobile phone is not same and it really compels the marketers of mobile phone to not only understand the requirements of urban and rural consumers based on their demographic profile but also, to formulate different marketing mix strategies for them. Though the perception about style or look of the mobile phone found similar but marketer should not forget the fact that differences exist between urban and rural consumers, and from time to time such preference may change, which helps in designing more suitable models for different segments of the society.

Dissatisfaction among the small number of consumers will definitely have adverse impact on future market of the product considering the chances of influencing buying decisions of others through word

of mouth. Continuous monitoring of dissatisfaction by marketer of different mobile phone will aid in adding the features which minimize the dissatisfaction and retain their customers for their replacement demand for handsets.

The buyer's intension not to recommend to others, reflect either their level of dissatisfaction from use experience of mobile phone or it tells about the strong desire to make a change in their mobile phone which might be due to other better options available in the market with more facilities and additional features. Constant watch and possible adaptations based on innovations in the market in the form of new models will help to meet the desire of buyer and attracting and retaining consumers by the marketers.

For many companies the Rural market has become important despite the fact that there was little information and lack of standard in terms of marketing of products and services in rural environment where many facilities and infrastructure to offer their products are limited in nature. It must be perceived that in an enjoyable and pleasant shopping environment, services related with mobile phones and quality of handsets enhances the value perception of using mobile phones and will further improve perceived usefulness and perceived ease of using mobile phones and services among rural consumers. There is no doubt about the availability of immense opportunities in rural market, only the need is to develop specific marketing strategies, as well as, action plans considering the

complex set of factors affecting the rural consumer behavior. Marketing strategies related with mobile phones, as well as, its services, such as, various promotional schemes attached with buying handsets and promotional vouchers and discount offers related with services must be relevant to target group. Innovative companies get quick success by incorporating the complex set of factors that influence buying behavior of rural consumers through integrated marketing approach.

### **Concluding Remarks:**

The most important consideration about rural market is that no matter how good the service provided to the people and no matter how good cell phone is qualitatively, there are still places where cell phone would not work or would not be available. Companies should divert their attention to rural areas to cater to the rural market as Indian market has still not reached to its saturation level, but it has to still make inroads in rural areas. Government should make an attempt to provide the companies secured environment so that the marketer get attracted to invest in rural India to serve some of the village requirements in order to provide better buying experience to rural consumers. Companies need to formulate integrated marketing strategies and action plans in such a way that they are able to get favourable consumer's response.

The Shopping environment plays important role in determining buying behaviour. The major difference in shopping behavior and

consumption pattern of the urban and rural communities observed because of the urban- rural inequality in market, as well as customer characteristics. In India, a sizeable number of people migrate from rural to urban in search of job opportunities, work, education, marriage and personal reasons. From the marketing perspective, migration leads to new market opportunities. And so, marketers have to come out with appropriate strategies to attract and retain migrants. Now a days even rural consumers consider certain aspects while shopping.

The reason behind shopping consciousness is that the consumers want to enjoy shopping environment, to satisfy their price and quality conscious, and want to compare different shops to enrich their buying experience. They expect shopping to be recreational, price worthy, and buyer oriented. They are not happy with poor shopping environment, if any. These aspects describe the fact that rural consumers should be given importance and a better shopping environment will help in carrying their consciousness about quality, functions and brand name at higher level.

As the international mobile technology is meeting the goal of continuous advancement at a greater pace, the need for formulating and employing better and improved product development strategies, promotional methods in terms of advertising message, suitable media usage supported with suitable promotional schemes become necessary to gain consumer trust in the brand before

consumers are likely to respond to company offers.

A better understanding of various Indian perspectives of buying behaviour needs to be considered not only for developing, redesigning, altering and improving products and services provided by mobile phone manufacturer, but also in formulating

and changing marketing strategies by the marketers, viz., price quality relationship; store loyalty: brand equity, customer loyalty, positioning and repositioning, attitude towards marketing and consumerism, economic access; and; physical access of products, infrastructure facilities, and quality of retail outlet.

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## **Integrated Handloom Cluster Development In Odisha: A case analysis of Bargarh Cluster**

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### **Abstract**

*Handloom in the state of Odisha is promoted under the 'Integrated Handloom Cluster Development Programme', sponsored by Development Commissioner for Handlooms, Government of India. The programme is implemented by Boyanika, Department of Textiles & Handloom, Government of Odisha, Bhubaneswar. There are four such clusters in the western part of the state. Among these four, Bargarh Handloom Cluster is one which has nearly 5000 working looms with annual production of INR 250 mn and produces exclusive variety of Sambalpuri Ikat (tie & dye) cotton sarees, dress materials for ladies & gents, bed covers etc, in its Attabira, Bargarh, Bijepur & Sohela blocks.*

*The dynamic process for creation of competitive advantage of the cluster is discussed in this paper by using Michael E. Porter's Diamond model. It highlights six broad factors such as, factor conditions (resources); Demand conditions (market scenario); Related and supporting industries (supplier of raw materials & inputs); Firm strategy, structure and rivalry (enterprise system & practices); Government (support from concerned departments & offices); Chance events (contingent issues) for a thorough understanding of the cluster. This diagnostic study helps in explaining the value chain, the structure & composition, systems & practices, operations & management, and economy & socio-cultural attributes of the cluster. Data collected from the authorities of handloom community enterprises, self-help groups, weavers' cooperative societies, supporting government departments, non-government organizations, developmental agencies, and weavers have been used for qualitative analyses.*

*The paper culminates with unique findings such a multiplicity & uncoordinated developmental efforts, depletion of knowledge worker base, insufficient measures for protection of traditional art & craft, insufficient training need identification, industry fragmentation etc. as areas of importance. It has significant scope for future research in the perspective of preservation of the traditional knowledge & dissemination, and measures for well coordinated socio-economic development of the weaving community and industry.*

**Key words:** Handloom, competitive advantage, community enterprises, knowledge worker, traditional knowledge

## 1. Introduction

*Cluster & Clustering:* A combination of similar objects is known as a *Cluster*; however, these objects are dissimilar from other objects belonging to other clusters. This a process of organizing objects into groups that are some way similar to each other. When interconnected business, suppliers and associated institutions in a particular are concentrated geographically is known as a Business Cluster. The main aim of a cluster is to make a group of companies competent enough in the National and the Global market. In urban studies, the term agglomeration is used. Clusters are also very important aspects of Strategic Management. Michael E. Porter, a Harvard Business School Professor is regarded as pioneer in the concept of business and industrial cluster, mostly focusing on the strategic management side of it. Michael E. Porter, a Harvard Business School Professor is a leading authority on company strategy and is also regarded as the pioneer in the concept of business and industrial cluster. Govt. of India through its various policies and schemes has been fostering growth of micro, small and medium enterprises (MSME) across different economic sectors in the areas of various human and non-human resources as factors of production and marketing. The employment and socio economic development of India depends a lot on these strategic policies. With the active involvement of different ministries,

departments along with the help of domestic and world bodies in both merchandise and service sector industries, the Gov. of India has successfully initiated the cluster development program. The estimation of modern small scale enterprises runs to the tune of 400, and that of rural and artisan- based cluster to 2000, which together contribute to an approximate value of 60% of manufactured exports of the nation. Together a product or product range along with its geographical location is known as a Cluster, however a particular sector or industry is not referred to as cluster and it also encompass certain sequential steps. Promotion of handloom sector is done through a cluster development approach under directives from central ministry of textiles through the handloom development commissioner. The present paper deals with one of such handloom clusters in India located in the western part of the state of Odisha known as Bargarh Cluster with an approximate turnover of INR 250 million through its four major blocks having nearly 5000 working looms. Current statistical reports claim that more than 30% of total weavers of Odisha are living under poverty line. The 11th Five Year plan (2007-1012) has broad policy measures for handloom promotion, as it is second largest employment generating sector after agriculture and accounts for a major part of the national economy.

## 2.0 Cluster: Conceptual explanation

### 2.1 Literature Review on 'Cluster' & 'Cluster Development'

"A business cluster is a geographic concentration of interconnected businesses, suppliers, and associated institutions in a particular field. Clusters are considered to increase the productivity with which companies can compete, nationally and globally" (Source: Wikipedia). Today's 'technological parks' were referred to as 'industrial districts' by economist Marshall, a century back. However, he did not mention the concept of 'cluster' in his theories and models. 'Cluster' as a term was first used by Czumanski (1971, 1979). Harvard Professor, Michael E. Porter's 'Cluster thinking' concept came as late as 1998. He showed interdependence among firms within an industrial cluster in a geographical boundary. Rosenfeld (1995) highlights economic development, led by innovation in such clusters which are governed by inter-firm trust and complimentary resource sharing. (Rosenfeld, 1997) refers firms with interdependence, business transactions, and communication those have physical proximity to one another as cluster. (Dimitrova et al., 2007) find the linkage of industry cluster with other clusters for resources or services. Though clusters can come out in many ways, they can grow only when nurtured with active resources. Need based firms form cluster to meet their various

requirements and by that competitive dimensions change which can guide formation of other clusters. This was found by (Wolfe and Gertler, 2004). Clusters are "geographic concentrations of interconnected companies and institutions in a particular field" (Porter, 1998, p. 78). Zelbst, Frazier and Sower (2010) infer that Porter's views suggest conceptual possibility of clusters within clusters. (Cumbers and MacKinnon, 2004) don't regard a cluster as self-sufficient and opine that to be a part of a cluster agglomeration or mix. Many researchers (Pouder and St John, 1996; Gilbert et al., 2008; So`vell et al., 2008; McCann and Folta, 2008; Herruzo et al., 2008) have examined clusters on various perspectives such as economic, geographic, competition, innovation and knowledge management, specialization and complementariness.

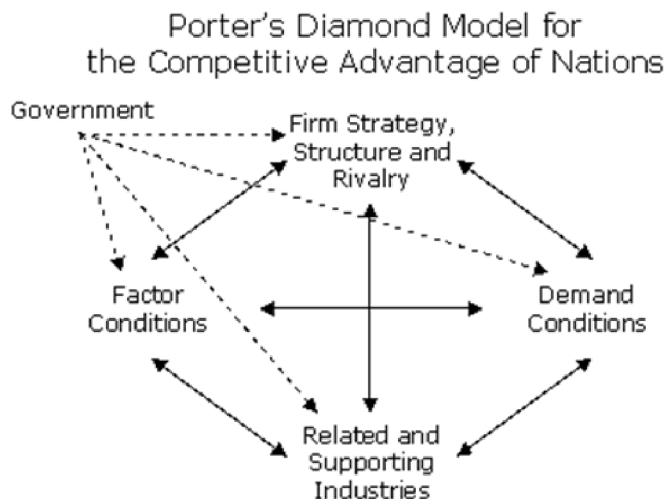
Porter (1998) is of the opinion that clustering approach creates increased division of labour and innovation among firms, which are within one or nearby geographic concentration. "Laws of successful clustering can be reverse engineered in order to imitate the success stories" (European Commission Report, 2002, p. 16). According to (UNIDO, 2000) report, cluster is formed by flock of enterprises located in same section or geographical area, and they are engaged in dealing in (producing and selling) similar or complementary items. They meet similar macro factors and give rise to

traders and ancillary enterprises, thereby helping a holistic development in technology, management and other financial issues. As per (Preissl and Solimene, 2003), industrial district is synonymous to cluster, though comparatively they are more oriented toward geographical richness of input. However, clusters optimize competitiveness among firms.

According to Porter (2003), clusters can be local industry; resource dependent; and traded industry type. In the first type, services clusters are majorly found in health, utilities, and retail etc., meant for ultimate local consumption. Resource Dependent Clusters are tied to the immobile resource, and any manufacturing associated with this cluster type is therefore directly related to the resource. Traded Industry Clusters is characterized by manufacturing that is exported away from the area. In such a case, the factors of production and other resources are non-stationary. Such areas try to sell products beyond their territory and even beyond national frontiers. Competitive considerations such as labor resources are viewed primarily in local area of operation. This paper discusses handloom cluster as a Traded Industry Cluster in line with Porter's explanation & its sectoral & geographical concentration explained as per UNIDO and describes competitive conditions of the chosen cluster.

## 2.2 Porter's Diamond Model & 'Cluster'

Michael E. Porter, Professor of Harvard Business School is an authority in the area of Strategic Management. Competitive Advantage, Generic Strategies, Five Forces Model, Value Chain, Competitive Strategy, and Cluster Development for Organizations, Regions, and Nations are few of his areas of contribution. Porter's cluster analysis approach for industries basically looks at economic development and competence building of regions and nations. Similarly, Porter's Diamond model is an economic model (Book: The Competitive Advantage of Nations), where it is explained that why few industries gain competitiveness in few particular locations. This model helps one understand competitive position of a region and nation amidst global competition, with focus on factors such as land, location, natural resources, labor and local population size as bases of competitive advantage. However, as per Porter, sustained industrial growth can't be built on such factors, as their abundance undermines competitive advantage. This theory has been explained by Porter through concept of Cluster, which means groups of international firms, suppliers, related industries, and institution that arise in a particular location. *Analysis:* In a cluster of industries, competitiveness of one company depends on performance of other companies, factors in value chain, customer-client relation, and local or regional contexts.



Porter's Diamond Model  
(Source: [www.valuebasedmanagement.net](http://www.valuebasedmanagement.net))

As a result of a historical analysis, the phenomenon categorizes six broad factors to constitute Porter's Diamond model for study of competitiveness e.g., i) *Factor conditions* (human, physical, knowledge & capital resources), ii) *Demand conditions* (sophisticated home market's pressure on company for faster innovation than competitors), iii) *Related and supporting industries* (for cost-effective inputs & process up-gradation required for other companies in chain to innovate and internationalize), iv) *Firm strategy, structure and rivalry* (ways of creation of companies, their goal-setting & management for competitiveness and success), v) *Government* (influencer of above four determinants, demand & supply conditions, and competition at different levels), vi) *Chance events* (occurrences outside of firm's control which create discontinuities).

Factor endowment theory of international trade includes governs that nations create their own human and technological resources. Factor up gradation and deployment is more important than its stock. Adversities such as labor & raw materials shortages force firms to innovate new methods leading to national comparative advantage. For larger market of a domestically produced item, more attention is given for competitive advantage and exporting the item. More demanding local market creates national advantage, and helps anticipate global trends. When the local ancillary industry is supportive, it helps the firms in the core business, it becomes more capable of managing cost and innovativeness. This is more evident, especially when suppliers are strong global competitors. Firm strategy, structure and rivalry are affected by local conditions. In long run

more local rivalry compels firms to innovate and improve beyond the advantage of low factor costs. Factor disadvantages along with sufficient rivalry can only compel firms to innovate. Higher rivalry and competition gives rise to thrust on uniqueness and specialization of factors. 'Government' is one prime element in Porter's model that encourages firms to raise their performance. It also balances demand and supply of specialized factors, and advanced products, It imposes anti-trust rules to maintain healthy competition among players in the cluster.

### **2.3 Indian SME Clusters:**

Geographically present micro and/or small and medium enterprises (MSME) faced with common external factors are together known as a Cluster. The geographical location and service/product by the MSME identifies a Cluster. Institutions undertake inclusive development of cluster based local area in transient economies. According to Porter's cluster theory the government/economic development body need to create a viable hub of economic activity in specific industrial sector by concentrating the businesses, suppliers, researchers, and additional related people or entities. Although the history of handloom in India may be more than a century old, the policies for the small scale industries sphere were formulated hardly half-a-century ago and they are rich in details and insights, although may be poor in practice (Bala Subrahmanya, 1998). In

current cluster development approaches India's policies for technology upgradation, and marketing promotional measures in mid seventies are viewed as novel ideas. According to estimates the manufacturing employment of the Small-scale industry can reach upto 80% by the turn of the century, 2000-01. The employment of the industry has risen upto 35 million people from around 4 million persons employed in the small scale industries in 1973-74. The production of fabric has risen up to 60,996 million sq. meters in FY 2011 from 52,665 million sq. meter in FY 20007. Even the growth of the industrial sector as a whole is less than this sector (Government of India, 1997; SIDBI, 2002; Singhania, 2003). The major responsibility of this drastic change in statistics goes to the development of numerous clusters within the small scale industry sector. More than half of exports from India comes from modern small scale enterprises, and rural & artisan based clusters. India has certain known clusters e.g. Ludhiana (knitwear), Surat and Mumbai (Gems & Jewellery), Chennai, Agra and Kolkata (leather) etc. Small-Scale Industry (SSI) which has a contribution of 40% to the country's industrial output and 35% to direct exports, is the major reason for industrial development of India. Numerous clusters within its ambit, have been in existent for decades and few for even centuries. 350 SSI clusters, and approximately 2000 rural and artisan based clusters are in existence in India according to a survey of UNIDO. Apart from contributing 60%

to the manufacturing export, they also play a significant role in employment generation. However, majority of Indian clusters in handicrafts sector are very small employing highly skilled workers whose skills cannot be matched at any other place in the world e.g. Paithani sarees cluster in Maharashtra. The total SSI sector (registered and unregistered) in India comprised 1,05,21,190 units out of which over 44 lakh (42.26%) were SSIs and the remaining 61 lakh (57.74%) were Small Scale Service and Business Enterprises (SSSBEs), this is as per the findings of the third census on SSI conducted in 2002-03 (2001-02 position). About 55% of total SSI units were located in rural India.

*Developmental issues:* Despite every conscious promotional interventions and with such a nice growth rate and resources, there has been a major setbacks like receiving of timely credit assistance in adequate measures and a low level technology employed for production has resulted the dispersion of production and has made it unorganized, the scales of production are at a lower ebb, they lacked in quality standards, preference to be small is rampant, they have also faced problems relating to marketing and the multifarious approach by various promotional agencies involved highlighted the need for collaborative efforts for reaping the desired developmental goals. UNIDO's Cluster Development Programme (CDP) has

assigned various task to few chosen firm communities and associated institutions. The tasks include implementation of cluster support initiative in selected pilot clusters, assisting institutions at centre and local level in modernizing and restructuring the cluster which in turn contributes to overall performance and collective efficiency of SME. UNIDO acts as a catalyst, for the pilot clusters to bring about necessary qualitative changes at the cluster level. UNIDO customises its methodology to the Indian settings so that it can be shared with the partner institutions for replication.

### **3.0 Handloom Clusters**

#### **3.1 Indian Scenario:**

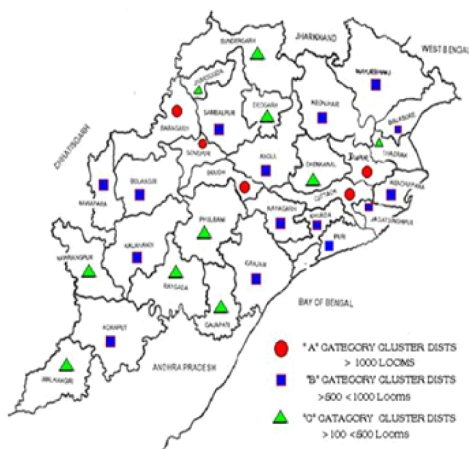
In the midst of this technological age of livelihood handloom has always remained an important option. It has also saved the traditional skill that has passed from generation to generation. The unique hand-woven skill of creating exquisite fabrics has helped handloom to survive this automated world. The entire 4.60 million handlooms of the world is concentrated in the South east part of Asia, out of which the majority is with India with 3.9 million handlooms. The contribution of Indian textile industry towards industrial production, country's GDP and country's export earnings is 14%, 4% and 17% respectively. The total handloom production in India was about 60,996 million square meters during FY 2011 from 52,665 million square meters in FY 2007. With the change of the global

textile scenario the production base is rapidly shifting to the developing nations. The merchandising and marketing of handloom products both at domestic and international level is done with the help of Development Commissioner (Handlooms), under MoT, GoI. There are exclusive range of products like silk saree from Varanasi, scarf from Barabanki, home furnishing from Bijnore, shawls from Kullu, Ikat saree from Sonepur and Bargarh, cotton saree from Chanderi etc. According to estimates 85% of the world installed capacity is with India. Many policies were formulated by the Govt. of India in the past decade to enhance the handloom cluster like: **New textile policy (NTXP- 2000)** gives direction and focus on strategic thrust areas such as manufacture and export, dominance in domestic market, product up-gradation and diversification, traditional knowledge, human resource skills, use of IT, quality standards, financial assistance, and entrepreneurship etc.; **Technology Mission on Cotton (TMC- 2000)** was introduced in the 10<sup>th</sup> Five Year plan(2002-2007) and which was further extended to the 11<sup>th</sup> Five Year Plan to accomplish targets, which was majorly made to address the concerns around cotton production; **National Jute Policy 2005** was introduced to develop the Jute industry and ensure high quality production and maximum employment; **Jute Technology Mission (JTM- 2006)** aimed at improving production volume

of quality jute fiber, making the infrastructure stronger, and maintaining supply of quality raw material etc. The Ministry of Textiles is responsible for policy formulation, planning, development, export promotion and trade regulation in the textile sector. It gives special emphasis to the development of handlooms, in terms of improving the usage of technology, providing policy support for modernization etc. It has Secretary, Joint Secretaries, Economic Advisor; and Development Commissioners for Handlooms & Handicrafts, Textile, and Jute. Handloom Export Promotion Council (HEPC) - a statutory body of MoT, GoI promotes exports of all handloom products and has multifarious objectives for holistic development of handloom sector. Some of the programs launched during the last few years are DDHPY, NCTD, NCDPD, IHDS, NCUTE, and other cluster based development Strategy.

### 3.2 Scenario in Odisha:

Department of Textiles and Handloom of the Government of Odisha has major activities for promotion of Handloom, Sericulture, Spinning mills, Power looms and Apparel sectors. The Directorate of Textiles executes plans and programs in this field as formulated by the GOO. The Department has identified and published the following list of important handloom centres and their products in its website [www.orissa.gov.in](http://www.orissa.gov.in).



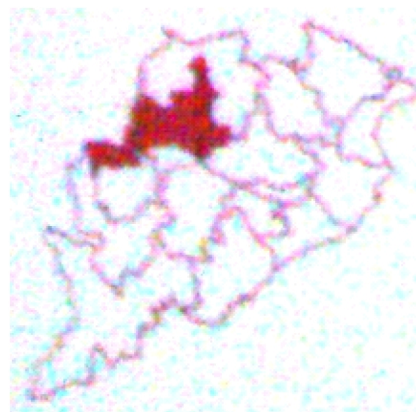
CENTERS	PRODUCTS NAME
BARGARH	BED COVER, DRESS MATERIALS, COTTON TIE & DYE SAREE, SILK SAREE, COARSE COTTON SAREE & OTHERS
SONEPUR	SILK BOMKAI SAREE, TIE & DYE COTTON SAREE, FURNISHING & SILK TIE & DYE SAREE
NUAPATNA	SILK KHANDUA SAREE, CALIGRAPHY TASSAR SAREE & FURNISHING, COARSE COTTON SAREE & OTHERS
JAGATSINGHPUR	FINE COUNT COTTON SAREE
KOTPAD	VEGETABLE DYE SAREE & SCARF, COARSE COTTON SAREE & OTHERS
NAYURBHANJ	TASSAR SAREE & FURNISHING, COARSE COTTON SAREE & OTHERS
GOPALPUR	
FAKIRPUR	
MANKIDIA	
BERHAMPUR	SILK SAREE, COARSE COTTON SAREE & OTHERS
KALAHANDI	HABASPURI SAREE, COARSE COTTON SAREE & OTHERS
BOLANGIR	TIE & DYE COTTON SAREE & FURNISHINGS, SILK TIE & DYE SAREE, COARSE COTTON SAREE & OTHERS
NAYAGARH	COARSE COTTON SAREE & OTHERS
PURI	
GAJAPATI	
RAYAGADA	
NAWARANGPUR	
NAWAPADA	
MALKANGIRI	
DHENKANAL	
KENDRAPA	
BHADRAK	
SUNDERGARH	
SAMBALPUR	

Handloom Map of Odisha & Important Handloom Centres with products.

Source: [www.orissa.gov.in/textiles/hl\\_centre.htm](http://www.orissa.gov.in/textiles/hl_centre.htm)

Cluster development approach focuses on how viable societies, NGOs, other small and medium entrepreneurs can actively participate in overall development of handloom sector. A total of 72 clusters have been identified in the State for development of Handloom, out of which 38 are important clusters. Bargarh, Cuttack, Subarnapur (or Sonapur), and Jajpur are Category-A Clusters. The department envisions a shift in paradigm. The transition planned is from Weavers' Cooperative Society (WCS) arrangement to Cluster Development Approach. During the 11<sup>th</sup> Five year plan (2007/08 – 2011/12), several new schemes have been implemented by state and central governments for holistic development of handloom clusters.

*Handloom Clusters in western Odisha:* In western part of the state Odisha, there are nearly seven districts such as Bargarh, Sambalpur, Subarnapur (Sonapur), Bolangir, Nuapada, Boudh, and Jharsuguda where large concentrations of weaving communities live. Among all, Bargarh district is Category-A, and has eight clusters in it (highest in the state) with a huge concentration of weavers and weavers' cooperatives. It is followed by district Sonapur (new name is Subarnapur) with four clusters- the second largest in the state. There are many development projects and schemes of government extended to this CE through office of Joint Director and Assistant Director of Textiles, Bargarh under Directorate of Textiles, Government of Odisha.



Map of Bargarh District

Source: [www.mapsofindia.com](http://www.mapsofindia.com)

Presently, more than 30% of the total weavers of Odisha are below poverty line. The handlooms in Odisha are located in a decentralized manner and almost 85% of the weavers' household own a single loom only, while less than 1% have more than 4 looms. It is estimated that at least 61% of total handloom production in Odisha moves through master weavers. During the 11<sup>th</sup> FY plan (2007/08 – 2011/ 12), till end of year 2009, a large number of employment was generated in this sector. This plan brought out many schemes for sustainable socio-economic development of weavers. It also encompasses cluster development projects implementation in three mega and twenty-three mini clusters in Odisha.

#### 4.0 Cluster Description

##### 4.1 Cluster-based Development Rationality:

Development of efficient technology-production-market linkages ensures the

sustainability of a sector. But due to the unorganization and dispersion of skilled and knowledge labours and high fragmentation of the industry the scale of operations at unit level is low. To make a cluster, it is important to have a sectoral and geographical concentration of household and SSEs is looked for by its product and place. Innovative design of new production system is accordingly laid down. Specialized raw material suppliers, components and machinery suppliers, skilled and knowledgeable manpower and other external economic factors affect a lot to a cluster. Other specialized technical, administrative and financial services, inter-firm cooperation, public-private cooperation for innovation and learning are also developed by its help. To keep the credibility in quality control and standardization, clusters operate through establishment of common service facility. Various institutions and enterprises (public and private, national and international)

flourish in the inbound, operation and outbound sides of primary activities; and technology, infrastructure, human resources and administration sides of support activities in the cluster value chain.

## 4.2 Bargarh Cluster

Bargarh Cluster is famous for intricate tie and dye (Ikat) design sarees popularly known as *Sambalpuri Saree*. This cluster has four blocks and 7158 looms in total in all those blocks (Source: Zonal Handloom office, 2004). In nearly three hundred villages in the cluster, there are more than five thousand looms. Product-mix of the cluster includes all major daily used items like home furnishings, dress, sarees etc. and are widely marketed in the state and outside.

*Location:* Bargarh a district situated in western part of Odisha with its district headquarter town, Bargarh 380 km far from state capital, 50 km from Sambalpur. The town is on National Highway 6 (Mumbai - Kolkata), with nearest airport being at Raipur –the capital city of adjacent state Chhatisgarh. The primary weaving community is popularly known as ‘Bhulia’, economically classified under OBC. They were migrant skilled workers of 14<sup>th</sup> century and during 16<sup>th</sup> century they scattered to nearby district i.e., Bargarh. Non-traditional, less skilled weavers of the cluster are from Schedule Caste and Schedule Tribes, which in total accounts for 60% of population. Vat chemical colors/ dyes substituted the natural vegetable colors in mid 1940s. In

early 1960s, twisted cotton mercerized yarn was introduced in the cluster.

After the co-operative society *Sambalpuri Bastralaya* got established followed by ADT office in 1962 in Bargarh town, the cluster gained pace of progress. Odisha Weavers Co-Operative Spinning Mill started at an adjacent village Tora, in 1971 to provide major raw material input i.e., yarn. Declining activities of Odisha State Handloom Development Corporation (OSHDC) at Bargarh gave rise to induction of production agents, private entrepreneurs, master weavers, and traders in early 1990s. Number of active co-operative societies gradually reduced because of subsidies and different support from government and other apex bodies subsequently shrank. Other reasons were, closing down of corporation entrusted with developmental roles, closure of mills for spinning which were available in local vicinity. The escalations of yarn prices and management irregularities of internal affairs of primary societies were among other reasons.

*Core Cluster Actors:* i) Master Weavers: around 87 numbers of enterprising weavers who only weave but also support other weavers by providing raw materials and buying back finished handloom items, mostly sarees. They give color combination, technical guidance, and graph as per required design & sometimes also supply required accessories. It is estimated that 40% of weavers in the cluster are weaving under master weavers, 36% under co-

operative, and 24% as independent weavers. ii) Weavers: about 9000 weavers are engaged through 5102 working looms in the cluster iii) Institutions: 19 PWCS, and 138 Self help groups are there in the cluster iv) Tie-dye makers: around 206 numbers of weavers produce tie-dye (warp/weft thread) and sell to other weavers in the cluster v) National /State Awardees: the cluster has around sixteen and ten numbers of high skilled weavers, who have received honor from central and state Government respectively. They work as weavers or Master weavers vi) Traders: purchase fabrics, sell in their shops, and supply to big cities. About 24 cloth shops in the cluster deal with local handloom products.

### 4.3 Competitive Advantage of Bargarh Cluster

#### 4.3.1 Bargarh Cluster

*Factor Conditions-* The major cluster players consists of Master weavers, weavers, tie & dye makers, awardees, skilled labours, traders The different major cluster and unique contribution towards economic factors of production. It has five common facility centers (2 managed by co-operative sector, 3 by SHGs) for sizing work during monsoon, warping and dyeing. *Demand Conditions-* 10 kms from Bargarh at village Balijori there is a big weekly market which helps the cluster to market the local handloom products. With the help of sale outlets and local traders, the village Balijori offers good marketing platform for sell of local handloom cloths. Sambalpuri Bastralay which is the primary

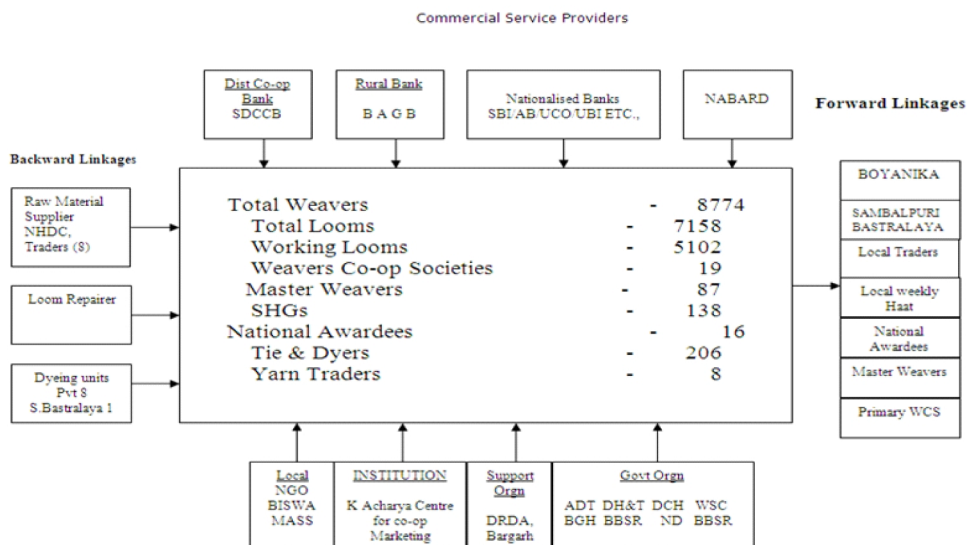
weavers cooperative society functions from town Bargarh with the help of its wide array of sales outlets in the state & outside. Timely shipment of products to far of market places is facilitated with the help of good transportation and communication modes through roads and as well as train. *Related and Supporting Industries-* The Raw Material Bank (RMB) of Bargarh not only supports its own cluster but a lot of other major handloom clusters of the state are also dependent on it. With 8 nos. of big suppliers of raw material e.g. cotton, silk, dye and chemicals etc which they directly procure from the manufacturers and a spinning mill with 5000 spindles capacity, the cluster also has a firm that supplies minor accessories to weavers after purchasing from out of state manufacturers, and major accessories on placing order. With the help of the local carpenters even the weavers arrange the small accessories like dobby, charkha, natei etc. *Firm Strategy, Structure, and Rivalry-* With the help of a strong market base, direct market linkages with big buyers, quality raw materials sourcing and storage, effective credit system, design developments, good quality of dyeing strategies like diversification of products, protection of intellectual properties, induction of higher technology etc are being implemented. *Government and Chance-* Department of Textiles and Handlooms, Government of Odisha, Joint Director of Textiles and Assistant Director of Textiles at Bargarh, WCS, Apex Co-operative Organization (Boyanika), Weavers

Service Center at Bhubaneswar, National Handloom Development Corporation, District Rural Development Agency, Padmashree K. A. Center for Co-operative Management at Bargarh, Textile Committee at Bhubaneswar, Institute of Textile Technology at Cuttack, Indian Institute of Handloom Technology at Bargarh, NABARD, Nationalized Banks, Sambalpur District Co-operative Central Bank at Bargarh, Bolangir Anchalika Gramya Bank etc., are few of the major government ministries, departments and agencies that play a crucial role in the cluster development. *Business Development Service Providers*- Loom mechanic, design and dyeing Consultant, dyeing units, dye traders, reputed artist-cum-designers, master weavers / traders are the various business service providers present in the cluster. With an annual rate of 20% economic turnaround of Odisha due to rapid industrialization, there is a migration of skilled weavers to industrial workforce. This results in a loss of knowledge worker base. Odisha being a socio economically backward state having 48% (17 millions) of the state population below poverty line and a large portion being scheduled tribes, the literacy level is below the national average and in such a situation handloom sector plays a vital role for rural economy.

#### 4.3.2 Role of UNIDO

UNIDO along with the UK Department for International Development (DFID) is playing an important role in the cluster development project in Odisha by

implementing a cluster development initiative during 2005-2008 aiming at transferring the knowledge, skills and tools necessary. Due to lack of income and access to resources, four pilot clusters were provided direct assistance under this initiative, and they were also characterized by risk, social exclusion, disempowerment, financial illiteracy and gender inequality. Government of Odisha and Departments of Handicrafts and Cottage Industries, Handlooms and Industry, were able to take full ownership of the approach with the assistance of UNIDO. With the help of the cluster cells there has been an increase in the mobilization of the share of funds for project implementation, large pool of trained personnel run cluster development initiatives in collaboration with local NGOs, officers regularly review the projects, suggest improvements and provide feedback, potential loss of competences is prevented, and a process of equitable and inclusive economic growth is triggered. The Cluster Development Programme (CDP) of central government with its flexible and holistic approach helps the weavers to sustain a growth and diversify as needed in an emerging market. Besides, government assisted schemes such as work-shed-cum-housing, health package to weavers, Bunakar Bima Yojana, interest subsidy to Primary Weavers Co-operative Society (PWCS) by loans from NABARD are implemented in the state. Ministry of Textiles has already set up National Institute of Fashion Technology in state capital of Odisha.



(Bargarh Handloom Cluster, Source: Diagnostic Study of Bargarh Handloom Cluster By S K Meher, CDE, Orissa State Handloom W.C.S Ltd., Bhubaneswar; URL: [www.clustercollaboration.eu](http://www.clustercollaboration.eu))

#### 4.4 SWOT Analysis

**Strengths-** The Bargarh cluster has branches of all leading Banks and some micro finance institutions, raw materials on credit, government supports to cooperative institutions and self help groups, strong local market, good number of sales outlets and local traders, go down of largest PWCS Sambalpuri Bastralaya, good consumer base, better connection with major metros and other nearby cities by road and train, simple & home based production system, oldest and finest tie-dye manufacturing, ethnic products with high demand at National level, unique designs, short production cycle, easy and plenty availability of raw materials etc.

**Weakness-** poor credit history, lack of cash, reduced profit margin due to bulk

purchase of inputs and defaulting weavers, more dependent on government support, high cost of fabrics, lack of up to date market awareness, unhealthy competition among traders/master weavers on price, poor share in the National and International markets, limited product varieties, less inclination towards product diversification, time consuming weaving process, low productivity, traditional looms and little scope for improvement, lack of spinning units in neighborhood areas higher cost of sourcing, lack of qualitative dyeing, loose packed dye of inferior quality, lack of scientific testing of raw material, end products, and equipment, lack of CAD/CAM unit and IT facilities, inadequate design and dyeing professionals, inadequate common facility centers etc.

*Opportunity-* The State government initiatives to revive cooperative structure, more capital inflow from government and banks to the cluster through SHGs, increasing customer demand for cotton fabrics and ethnic products across world, untapped potential market, scope of participation in exhibitions and trade fairs, skill up gradation through training on technology and marketing, government initiatives for introduction of dress code in educational institutions, online marketing scope, scope for product diversification, new production equipment and technology, bulk purchase of raw materials for cost reduction, training on dyeing/designing, setting up of common facility centers etc. *Threats-* low margins for tiny entrepreneurs, high number of defaulters weavers and reluctance for further finance, more inclination for subsidies, lack of feasibility for production of low cost and plain materials, unprecedented change in lady consumer preference for fashionable products, relatively higher price of products compared to similar items of other clusters, lack of interest of new generation members in weaver families towards weaving occupation, heavy fluctuation in yarn price, low productivity that affects long term sustainability etc.

### **5. Recommendation & Conclusion**

A central agency can be appointed to monitor the cluster performance and address the issues of the cluster as there is a lack of coordination among different

cluster stakeholders which has in turn become a major bottleneck in the development of the cluster. However still there are major areas of concern for the cluster like, certain infrastructural deficit in terms of modern equipment for faster and mechanized ancillary production process, IT based technology for design and production planning, common facility centers for mass storage and distribution, timely availability of all requisites at optimum cost, implementation of regulated price mechanism, management skill development, traditional knowledge repository building and strategic knowledge management, customer and marketing skill building, marketing information system, unduplicated role clarity and responsibility of all cluster stakeholders, professional environment, prominent involvement of co-operative institutions in the entire value chain, training need identification and bridging the skill-gap, modernization of existing resources without diluting ethnicity of the product, creation of international market and promotion, policy initiative for discouraging change of occupation from weaving to industrial labor etc. Along with the above, the multiplicity and uncoordinated developmental efforts, depletion of knowledge worker base, insufficient measures for protection of traditional art and craft, insufficient training need identification, industry fragmentation etc. are other major areas of concern for the planning, executing and monitoring agencies in the cluster.

This paper has significant scope for future research in the respective cluster for holistic development of the community involved

in it in general and for preservation of the traditional knowledge its dissemination in specific.

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## Stock Splits and Price Behaviour: Indian Evidence

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### Abstract:

*Stock market has its own marvels. Fundamental and technical analyses on one hand, help market participants to be predicatively able, On the other hand, random walk theory stresses upon wondering nature of stock prices. It is always an area of interest for researchers to map the impact of publically available information on stock prices and to find the median point between these two extremes.*

*In this context, this study attempts to analyze the impact of stock split made by BSE – 100 companies on their share prices. The researchers used phenomenon of excess return to map such impact. Excess returns were computed by taking two different models (Market Beta Model and CAPM) for two windows of before and after the event time. Then, the significance of differences was mapped by using paired T-test.*

*From the investors' view point, stock split in straight line does not result into gain. In this regard, the attempt is made to address the question whether stocks are able to generate excess returns ensuing to stock split.*

**Key Words:** Stock Split, Excess Returns, Market Beta Model, CAPM

**Introduction:** The key to make money in stock market is to understand the behaviour of the price movement, know the factors that affect the behaviour of the stock price. In line with this, all the types of investors, at all times try to know the future trend of the stock price that helps them to decide their strategy. Many experts have succeeded in developing different models for analyzing such price

patterns. Fundamental Analysis, Technical Analysis and Efficient Market Hypothesis are major tools of price related research, and the efforts for such model development, still continue.

Stock market does not allow its participant to predict price movements perfectly, even by using scientific tools of analysis. This leads to a speculation in the market. Rational investors and analysts

have tried to identify the stock price movements, but the movements always remain mysterious. The market participants are trying to time the market to get the positive return of their investment. Fundamental Analysis and Technical Analysis are the two-armed tools for the by participants.

On one hand, Fundamental and Technical analyses try to facilitate forecasting in the market for its participants; Random Walk Theory contradicts it, by accepting dominance of erratic market psychology or animal spirit of the market which does not follow any rules.

**Random Walk Theory :** French Mathematician, Louis Bachelier, in 1900, gave new dimension for analyzing stock prices, by writing a paper, which concluded that stock price fluctuations are random and does not follow any regular pattern. This gave a formal origin to Random Walk Theory. Further, in 1953, Maurice Kendall, set a proposition that stock price series is too wondering to identify any predictable patterns, which disturbed the economists. Kendall's support to Bachelier's conclusion, woke up the economists and provoke them to reverse these studies. This gave birth to the Efficient Market Hypothesis, which talks about different types of market reacting differently to the information, which may enable participant to anticipate the price movements up to some extent.

Efficient Market Hypothesis scrutinizes swiftness in following three different forms:

Weak Form of Market Efficiency which talks about the market where current prices reflect only past prices and the traded volumes. Semi-strong Form of Market Efficiency which underlines the type of market efficiency which discounts past prices, traded volumes and all those information which are publicly available, as well and Strong Form of Market Efficiency narrate a kind of market which takes into account past prices, traded volumes, all publicity available information and some inside information as well.

**Informational Efficiency:** Informational Efficiency is mainly described by immediate reaction of the market to new information. If the information is negative, the participants of the market will take immediate decision to clear the long position by selling the stock as early as possible, which will let the stock down. Vice versa in case of positive information, where participants will try to enter in to the stock as rapidly as they can to gain from the effect of the information. This is the major characteristic of the informational efficient market. This makes it clear that markets are informational efficient. It becomes very interesting to analyze the degree of the impact of such information on stock prices.

**Literature Review:** Notable study conducted by Millar and Fielitz (1973) mentioned that the effect of stock splits and stock dividends on the market price of common shares continues to be controversial. Even though, they accepted

that historically, stock split and stock dividend increases the stock prices before the period of distribution, they gave a sound logic mentioning that stock split and stock dividend do not affect the firm. They said that due to stock split and stock dividend production efficiency is not affected since the assets were unaffected, and long-term debt and its interest charge and preferred stock and its dividend were not affected. Hence, trading on the equity and financial leverage is not changed, and finally, total equity and pro rata ownership of original shareholders remain unchanged. Thus, no reason is evident for the market value of the firm to be influenced solely by a split or stock dividend. In this study their sample was 79 stock splits and 43 stock dividends for the period of three years to undergo the study.

Grinhlatt, Masulis, and Titman (1984) examined the behavior of expected returns around announcement dates and ex-dates for stock distributions exceeding ten percent. They found the results for the period 1967 to 1976 for the European capital markets and found an average abnormal return of 1.1 per cent.

Ohlson and Penman (1985) attempted to observe the impact of size of stock split with stock returns. They documented that, for stock splits larger than two-for-one (one hundred percent), the volatility of stock returns after the ex-split date is significantly higher than the presplit volatility. But, in such kind of events the standard deviation of daily returns was

significantly higher. It was of the order of twenty-eight to thirty-five percent and persists for, as long as, a full year after the ex-date. Even more interesting is their finding that there is no (permanent) change in the variance of returns at the announcement date. They investigated several potential explanations for this “aberration” but were unable to find a satisfactory answer.

Sloan (1987) investigated the behavior of stock prices around Ex-dates of stock split and stock dividends in Australia. He has taken a sample of 89 observations from 1974 to 1985. He observed statistically significant positive abnormal returns in the five days prior to the Ex-day. His results were considerably distinguished from the results of majority of the studies undertaken in U.S.

Liljeblom (1989) analyzed the informational impact of the announcement of stock dividends and stock splits for stocks listed on the Stockholm Stock Exchange. This study was based on daily individual stock returns and daily returns on a value-weighted market index for all stocks listed on the StSE during the time period 1977—85. Returns were measured by logarithmic price differences adjusted for cash dividends, stock dividends and rights issues. His sample consisted of 84 announcements during the period. He concluded that significant positive price reactions were observed in the case of stock dividend or stocks split announcements

Downen (1990) has put forward the hypothesis that, Stock Split and Stock Dividends should result in a shift along with a new demand to the new price levels which can be proportional to the old price levels. The initial sample consisted of 500 firms listed on New York and American Stock Exchanges which had stock splits or stock dividends of 10 percentage or greater. The study covered 100 firms each during the period of 1980 to 1984. He has taken excess returns as a function of information effect and quantity of shares. The conclusion of the study clear that the excess returns were associated with size of the stock split.

Conroy and Harris (1999) in their research paper on role of share price on stock split have very precisely cited, "Managers appear to design splits to return their company's stock price to the price level achieved after the last split. Moreover, when managers announce a split factor to achieve an even lower price than in the last split, both investors and analysts interpret this as a signal of especially positive information." They had taken companies on NYSE for the period of 1963 to 1996 which included over 4000 stock split events. They analyzed three day abnormal returns around the event which were averaged at 2.18 percentage.

Yosef and Brown (1977) studied the behavior of stock returns for 219 stock splits for 20 years between 1945 and 1965. They found that these stocks have

generated around 30 to 59 per cent abnormal returns before splits' announcement. This means that the decision of the firm to split their stocks after abnormal and unanticipated positive developments results into increase in stock prices. Many researchers found presence of positive abnormal returns around the event of stock split declaration (Ikenberry, Rankine and Stice in 1996, Mukherji, Kim and Walker in 1997, Ikenberry and Ramnath in 2002 etc.). This clearly provides strong evidence for the Semi-strong Markets.

The deliberation regarding role of stock splits in behavioral sciences originated with the studies of Ikenberry, Rankine and Stice (1996) and Desai and Jain (1997). They reported a significant positive price drift during the period of one year after the stock splits' announcements. Their inferences were very inconsistent with the semi-strong efficient markets paradigm that Daniel, Hirshleifer and Subrahmanyam (1998) and Barberis, Shleifer and Vishny (1998) have put forward. Their behavioral theories were received strong supported by the studies of Ikenberry and Ramnath (2002) and Byun and Rozeff (2003).

**Research Methodology:** The research is aiming to map the impact of stock splits on stock prices and hence testing informational efficiency in Indian context. In this context the research took sample of BSE – 100 stocks. The aim of this

study is further made specific by keeping only those securities in sample which remained as a part of BSE – 100 for the entire study period (from 2004 to 2009). In this process, the sample curtailed down to 49 stocks. During the study period there were 13 companies which have announced stock split.

In order to map the informational efficiency, the impact of stock split on stock prices were analyzed for short-term, as well as, for long-term. Here the short-term refers to 3 days before and after the announcement and long-term refers to the time frame up to ex-date of the said issue.

The researchers applied the phenomena of excess returns, which is the difference between actual returns and expected returns. Expected returns were calculated by using the following two models.

MODEL – 1 (Market Beta Model)

**Expected Return = Market Return \* Beta of the Security**

MODEL – 2 (The CAPM Approach)

**Expected Return = Risk free Return + (Market Return – Risk-free Return) \* Beta of the Security**

Risk free returns were taken at 5 percent. The relevant data is sourced through *Prowess* database of CMIE (Centre for Monitoring Indian Economy) and [www.moneycontrol.com](http://www.moneycontrol.com). As the data set is of before/after type, Paired T test is used to measure the significance of differences.

**Stock Splits and its Impact on Price Behaviour:** Splitting the equity share reduces the face value and hence, market price of the particular security adjusts down. This generally attracts investors to trade in the said security. With high trading interest, more number of investors will be able to participate in the stock, which increases liquidity of the share in the market.

**Table 1 Stock Splits (Date Sheet)**

No.	Company Name	Announcement Date	Old FV	New FV	Ex-Split Date
1	A B B Ltd.	16-02-2007	10	2	28-06-2007
2	Ambuja Cements Ltd.	20-04-2005	10	2	20-06-2005
3	Ashok Leyland Ltd.	2/2/2004	10	1	28-06-2004
4	Bharat Forge Ltd.	2/3/2005	10	2	20-07-2005
5	<b>Bharti Airtel Ltd. *</b>	<b>29-04-2009</b>	<b>10</b>	<b>5</b>	<b>24-07-2009</b>
6	Cipla Ltd.	23-03-2004	10	2	11/5/2004
7	Hindalco Industries Ltd.	12/7/2005	10	1	30-08-2005
8	<b>H D F C Ltd. *</b>	3/5/2010	10	2	18-08-2010
9	I T C Ltd.	17-06-2005	10	1	21-09-2005
10	Indian Hotels Co. Ltd.	27-07-2006	10	1	27-10-2006
11	Ranbaxy Laboratories Ltd.	28-04-2005	10	5	25-07-2005
12	Siemens Ltd.	27-01-2006	10	2	13-06-2006
13	United Phosphorus Ltd.	22-07-2005	10	2	27-09-2005

\* data not available

Indian companies seemed to be less inclined towards splitting up equities. Out of the 49 sample companies, 13 companies mentioned in the above table, have split their equities during the research period. Out of these 13 events, 7 splits (ABB, Ambuja, Bharat Forge, Cipla, HDFC, Siemens and United Phosphorus) have slashed prices by 80 percentage (10:2), 4

splits (Ashok Leyland, Hindalco, ITC and Indian Hotels) cut down prices by 90 percentage (10:1) and 2 splits (Bharti Airtel and Ranbaxy) have sliced prices by 50 percentage (10:5). Researchers could not find any specific industry taking lead in announcing splits, which means that stock splits announcement across industries, varies.

**Table 2 Excess Returns - Stock Split (Model - 1)**

No.	Company Name	Return in %	
		Before the announcement	After the announcement
1	A B B Ltd.	1.78	2.32
2	Ambuja Cements Ltd.	6.44	0.73
3	Ashok Leyland Ltd.	-0.99	6.17
4	Bharat Forge Ltd.	4.39	4.78
5	Cipla Ltd.	4.69	-2.69
6	Hindalco Industries Ltd.	-1.31	1.26
7	Indian Hotels Co. Ltd.	3.92	-2.28
8	I T C Ltd.	-1.91	0.53
9	Ranbaxy Laboratories Ltd.	-3.15	5.81
10	Siemens Ltd.	-0.56	-1.12
11	United Phosphorus Ltd.	0.43	-3.39

Excess returns caused due to stock split shows positive trend in this study, which denotes considerable movements around the event. However, the figures of excess returns were surprising, where only 1 sample company (i.e., Siemens) showed negative excess returns before as well as after the announcement. 3 sample companies (i.e., ABB, Ambuja and Bharat Forge) demonstrated positive excess returns before and after

the splits announcement. 4 sample companies (Ashok Leyland, Hindalco, ITC, and Ranbaxy) exhibited negative excess returns before the announcement which have turned positive after the event. Rest of the 3 sample companies (Cipla, Indian Hotels and United Phosphorus), which have given positive excess returns before the announcement, gave negative excess returns after the event.

**Table 3 : Paired Samples Statistics**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Model1before	1.2482	11	3.17654	0.95776
	Model1After	1.1018	11	3.38059	1.01929

**Table 4 Paired Samples Correlations**

		N	Correlation	Sig.
Pair 1	Model1before & Model1After	11	-0.324	0.331

**Table 5 Paired Samples Test**

		Paired Differences					T	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		Mean	Std. Error Mean
		Lower	Upper	Lower	Upper	Lower	Upper	Upper
Pair 1	Model1before - Model1After	0.1463	5.33599	1.60886	-3.43841	3.73113	0.091	0.929

Table 3 enumerates descriptive statistics of excess returns before and after the stock split announcements, as per the model – 1. Here, the average excess returns before the announcement was 1.25 percent with a standard deviation of 3.18, and after the announcement it was 1.10 percent with standard deviation of 3.38.

Table 4 represents correlation coefficient between excess returns before and after

the announcement. It shows that there is a negative correlation (-0.324) between excess returns before and after the announcement.

The above calculations make researchers to accept the null hypothesis and reject the alternate. This means that there were not any significant differences found, in the average excess returns before and after the stock split announcement. (Table 5)

**Table 6 Excess Returns - Stock Split (Model - 2)**

No.	Company Name	Returns in %	
		Before the Announcement	After the Announcement
1	A B B Ltd.	1.43	1.97
2	Ambuja Cements Ltd.	5.34	-0.37
3	Ashok Leyland Ltd.	-0.14	7.02
4	Bharat Forge Ltd.	4.34	4.73
5	Cipla Ltd.	2.24	-5.14
6	Hindalco Industries Ltd.	0.34	2.91
7	Indian Hotels Co. Ltd.	4.12	-2.08
8	I T C Ltd.	-4.56	-2.12
9	Ranbaxy Laboratories Ltd.	-4.15	4.81
10	Siemens Ltd.	-0.21	-0.77
11	United Phosphorus Ltd.	0.58	-3.24

While applying model – 2, again 3 sample companies (ABB, Bharat Forge and Hindalco) have shown positive excess returns before and after the stock split. There were 2 sample companies (ITC & Siemens) exhibiting negative excess returns before and after the event. 4 sample companies' (Ambuja, Cipla, Indian Hotels and United Phosphorus) excess returns turned negative after the announcement, which were positive

before the event. Moreover, 2 sample companies (Ashok Leyland and Ranbaxy) have reciprocated their excess returns from negative to positive.

Splits have largely resulted into market volatility around the scrip, but have not contributed in generating excess returns. Researchers can confer this as there is a mix trend showing almost equal negative and positive excess returns after the event.

**Table 7 Paired Samples Statistics**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Model2before	0.8482	11	3.19384	0.96298
	Model2After	0.7018	11	3.84952	1.16067

**Table 8 Paired Samples Correlations**

		N	Correlation	Sig.
Pair 1	Model2bef & Model2Aft	11	-0.140	0.680

**Table 9 Paired Samples Test**

		Paired Differences					T	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		Mean	Std. Error Mean
		Lower	Upper	Lower	Upper	Lower	Upper	Upper
Pair 1	Model2 before Model2 After	0.1463	5.33599	1.60886	-3.43841	3.73113	0.091	0.929

The average excess returns before the stock split announcement, as per model – 2, was 0.84 percent with standard deviation of 3.19. After the announcement, average excess returns were 0.70 percent with standard deviation of 3.85. (Table 7)

Correlation coefficient between excess returns before and after the announcement,

as suggested by Table 8, was negative i.e. -0.14.

Model – 2 has given almost similar results as model – 1. Here also, the researchers accept null hypothesis to conclude that there is no significant difference in the excess returns before and after the splits announcement. (Table 9)

**Table 10 Excess Returns - Stock Split (Ex-date)**

No.	Company Name	Returns in %	
		Model 1	Model 2
1	A B B Ltd.	35.02	34.67
2	Ambuja Cements Ltd.	-3.55	-4.65
3	Ashok Leyland Ltd.	16.94	17.79
4	Bharat Forge Ltd.	9.08	9.03
5	Cipla Ltd.	11.46	9.01
6	Hindalco Industries Ltd.	7.19	8.84
7	Indian Hotels Co. Ltd.	2.15	2.35
8	I T C Ltd.	25.22	22.57
9	Ranbaxy Laboratories Ltd.	60.59	59.59
10	Siemens Ltd.	-4.21	-3.86
11	United Phosphorus Ltd.	-23.38	-23.23

The tentative time period between announcement of split and split ex-date varies from 1.5 months to 5 months for the sample events, averaging around 3 months. While mapping the returns of securities during these time period, the researchers found significantly positive as well as significantly negative excess returns. 8 companies (ABB, Ashok Leyland, Bharat Forge, Cipla, Hindalco, Indian Hotels, ITC and Ranbaxy) showed positive excess returns during this time period, while 3 companies (Ambuja, Siemens and United Phosphorus) displayed negative excess returns, applying model 1 as well as model 2. The highest positive excess return is shown by Ranbaxy Laboratories which is 60 percent and 59 percent respectively (model 1 and model 2), while United Phosphorus has shown highest negative excess returns (i.e. -23 percent) as per both the models.

In a few observations, researchers found the quantum of excess returns to be

substantially higher on positive, as well as, negative direction. The researchers found that the traders are more stock specific in responding to this information.

**Conclusion:** The study can be concluded with the observation that looking to the investors' view point, stock split does not offer any direct monetary benefits. However, it makes the stock more attractive for common investors to trade in, as the market prices of the securities are adjusted down according to the split ratio. This is the main reason why there was no significant difference in the excess returns, before and after the splits announcement.

The reasoning from the companies' view point for splitting down their stock can be the lower market prices after splitting the stock. It is obvious that the investor wanting to trade with few thousands of rupees will never trade the stocks with more than thousand rupees of price. So, in order to create trading interest the

companies go for splitting down their stocks, which results into higher volatility but not a significantly higher return for investors.

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## Work - Life Balance by Women Faculty Members: The Conundrum Within

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### **Abstract**

*The hectic job demands have made it indispensable for working people to strike the right chord between work and life. In the present times, the pressure of work is insurmountable even in the educational sector. The women Faculty members find it extremely difficult to discharge the myriad dimensions of work and life effectively. This leaves no space to pursue self fulfilling interests and everyday is a scuffle juggling between multitude of work in the professional arena and home front. This paper makes an attempt to study the work-life balance of women Faculty members — whether it exists or otherwise. The study is made from the four life quadrants comprising work life balance: Work, Family, Friends and Self. The overall job satisfaction and work related stress level is also studied with reference to work-life balance. The study reveals that a significant category of the respondents find it difficult to balance work and life. The stress level at work is high which causes a chain effect (ill health, depression, fatigue) in personal life.*

**Key- words:** *Work-Life balance, Work, Family, Friends and Self*

### **Introduction:**

‘Work-life balance’ is a means of tackling the problem of increasing amounts of stress in the work-place as people try to juggle a wide range of factors in their life/work environment. The search for work-life balance is a process in which people seek to change things in accordance with changes in their own priorities (Una Byrne, 2005). Work–life research is

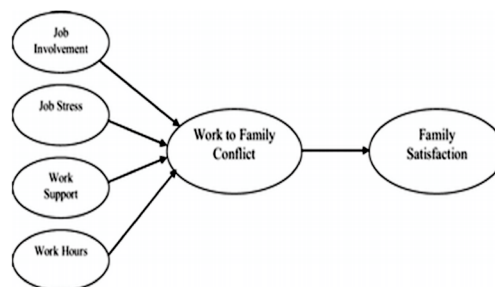
interdisciplinary, spanning the boundaries of disciplines such as sociology, psychology, organisational behaviour, human development, labor economics, industrial relations, management, demography, and women’s studies (Drago and Kashian 2003). The most consistent family characteristic predicting imbalance is being a parent. The most consistent work characteristic predicting imbalance is hours

worked (Tausig Mark, Fenwick, Rudy 2001). Since women retain responsibility for home and child care regardless of their employment status (Higgins, Duxbury, & Lee, 1992; Kahne, 1985; Lero *et al*, 1993), it has been suggested that part-time work offers the “best of both worlds”, enabling women to pursue career interests while still being able to afford time to spend with their families (Duffy *et al*, 1989; Kahne, 1992). Part-time work was associated with lower work-to-family interference, better time management ability, and greater life satisfaction while role overload, family-to-work interference, and family time management, however, were dependent on job type (Christopher *et al* 2000). Conversely, the concept of part time work does not coagulate with the teaching in a full-time academic course, hence, an invariable juggle for women Faculty members to reduce friction between work-family interference. As many organisations and employees seek ways to better manage the tensions between work and other life demands, there has been a growing body of research examining work–family and work–life issues (Byron 2005; Greenhaus and Powell 2006). However, the degree of work-life research in the education field has not been significant. The trials of globalization have immensely increased the job demands in the education sector especially in management education. The number of women teaching employees is constantly more than the male counterpart in most of the management educational institutes. The

time for job involvement of a woman Faculty goes far beyond the stipulated duty hours. This makes it challenging for a woman Faculty member to balance both work and life sincerely.

### **Literature review:**

The hectic job requirements of the present day may undermine women’s and men’s attempt to live self fulfilling lives. The work-life discourse reflects the individualism, achievement orientation, and instrumental rationality that is fundamental to modern bureaucratic thought and action and such discourse may further entrench people in the work/life imbalance that they are trying to escape. (Paula J. Caproni, 2004). In a study by Frone *et al* – *Testing a model of work-family interface*, it was observed that Job involvement, Job stress, Work support and Work hours give rise to work-family conflict. If these work domain specific variables are balanced, work-family conflict will be minimum leading to family satisfaction.



*Figure 1: Work -to- family cross domain model based on Frone et al (1992)*

Continuing the study, Frone *et al* observed that Family conflict, Family stress, Family support and Family hours lead to Family

– work conflict. If these family domain specific variables are balanced, family to work conflict would be minimum, which will lead to job satisfaction.

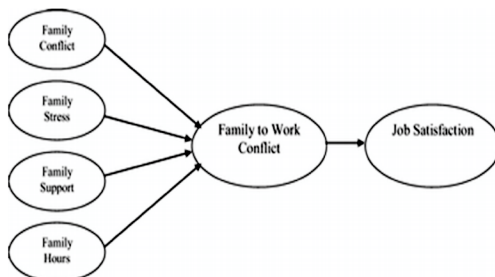


Figure 2: Family-to-work cross domain model based on Frone et al (1992)

Flexible workers – those who work reduced hours and those who work remotely record higher job satisfaction, organizational commitment and work intensification (Clare Kelliher and Deirdre Anderson, 2010). However, for true work life balance to occur, employees need to be responsible to adopt certain behavior which would help them balance work and the other aspect of their life (e.g., family, friends and self). Companies with a long-term strategy on work-life balance will recognize this and provide employees with training which addresses personal shortfalls they might have that keep them from achieving work-life balance. (Sunil Joshi, Cristina Pruna *et al*, 2002). Work Life balance is important because both the employer and the employees can benefit if work-life balance is maintained across all levels in the organisation (Una Byrne, 2005). The location of work-life balance and flexibility debates within a gender-neutral context can in practice result in

maintaining or encouraging gendered practices within organizations (Smithson, J. and Stokoe, E. H., 2005).

**Statement of the Problem:** Taking a cue from the aforementioned studies, a need was felt to study the pattern of work-life balance amongst women faculty members in management institutes as this area has been largely left untouched. This study focuses on the work-life balance of women Faculty members using a self assessment tool. It also attempts to study the relationship such as Directors/HODs, Professors, Associate Professors and Assistant Professors with reference to job satisfaction and work stress across the four categories of employees designed for the study.

**Research Design:** This study is based on primary sources of data. The data has been collected by the distribution of a close ended questionnaire to 200 respondents (married female teachers) across 8 management institutes in Pune. To know about the levels of job satisfaction and work stress level, Likert scale questions have been asked. Many of them were personally interviewed in a semi-structured format to draw conclusion on their work-life balance. Questions covered demographic factors like age group, designation, highest qualification, years in teaching, family size and one way travel time to work place. Questions were also asked from areas of job demand, task demand, work hours, time for self and social interaction. The sample was selectively chosen to exclude women

Faculty members with less than one year of teaching experience from the ambit of this study. A minimum of one year incubation period is considered to be necessary to understand the working of any organization. Excluding samples with less than one year of teaching experience thereby would help in better reinforcing the opinion of the chosen sample regarding work-life balance. The questions have

been designed from four life quadrants comprising work-life balance: Work, Family, Friends and Self. The data has been analysed using descriptive statistics and chi-square test with the help of SPSS package. To compare the difference in mean amongst different categories of the sample, Kruskal Wallis test has been used as the number of unpaired samples is 4 ( $k=4$ ).

### **Profile of the Respondents:**

The demographic characteristics of the interview sample gathered are summarized below:

<b>Parameters</b>	<b>No. of Respondents (%)</b>
<b>Age group:</b>	
25-30	47 (23.5%)
31-40	96 (48%)
41-50	25 (12.5%)
51 and above	32(16%)
<b>Designation:</b>	
Assistant Professor	104(52%)
Associate Professor	74(37%)
Professor	17(8.5%)
Director/HOD	5(2.5%)
<b>Highest qualification:</b>	
Post Graduate	152(76%)
Post Graduate with NET/SET	22(11%)
PhD	26(13%)
<b>Years in teaching:</b>	
1-5 years	58(29%)
6-10 years	76(38%)
11-20 years	38(19%)
Above 20 years	28(14%)
<b>Family Size:</b>	
4 members	118 (59%)
5 members	45 (22.5%)
6 members	37 (18.5%)
<b>Travelling time (one way):</b>	
Less than 15 mins	22(11%)
15 - 45 mins	139(69.5%)
Above 45 mins	39(19.5%)

The analysis of the profile indicates that the age group of 31-40 years constitutes the largest group amongst the respondents. It accounted for 48 percent of the sample size followed by 23.5 percent amongst the age group of 25-30 years. 52 percent of the respondents were in the category of Assistant Professor followed by 37 percent in the Associate Professor, 8.5 percent in the category of Professor. 2.5 percent had the designation of Director/HOD which was the least sample size.

Classification based on qualification revealed that post graduates constituted the maximum 76 percent of the sample size followed by PhD constituting 13 percent of the sample. 38 percent of the people were grouped in having 6-10 years of teaching experience followed by 29 percent within 1-5 years. Only 14 percent had teaching experience above 20 years.

Further, the classification based on travel time taken to the work place shows that 11 percent takes less than 15 minutes while 69.5 percent took in between 15- 45 minutes which was the maximum. 59 percent of the respondents have 4 members in their family, 22.5 percent have 5 members and 18.5 percent have 6 members in their family.

Distance and traffic is a major time consuming factor in city like Pune and almost in all big cities across India which is affecting the mental and physical capacity of the commuters. This question was asked with the intention to find the average time the respondents spent on travelling and whether it affected their work-life balance. 89 percent of respondents categorically mentioned that travelling time did come in their way of work - life balance

### **Result and discussion:**

<b>Table1 : Designation and maximum time spent on Job demand</b>					
<b>Designation</b>	<b>Lecture Preparation</b>	<b>Teaching</b>	<b>Examination related work</b>	<b>Student's project related work</b>	<b>Total</b>
Assistant Professor	42 (40.39%)	29 (27.88%)	17 (16.35%)	16 (15.38%)	104
Associate Professor	15 (20.27%)	41(55.41%)	10 (13.51%)	8 (10.81%)	74
Professor	2 (11.77%)	9(52.94%)	4 (23.53%)	2 (11.76%)	17
Director/HOD	1 (20%)	4(80%)	0(0%)	0 (0%)	5
<b>Total</b>	60	83	31	26	200
<b>df</b>		<b>9</b>			
<b>p</b>		<b>0.010034</b>			

Source: Primary data

Firstly, an attempt has been made to check whether designation influenced the maximum time spent on job demand and whether it affected their work life

balance. From Table 1, it is observed that most respondents in the designation of Assistant Professor spent maximum time in preparation for lecture. The

majority respondents in the designation of Associate Professor, Professor and Director/HOD spent maximum time of job demand in teaching. The time spent for students' project related work scored lowest amongst all categories of the sample. Using chi-square test, the

$p$ -value of 0.010034 reveals that the association between designation and maximum time spent on job demand is statistically significant as the  $p$  value is less than 0.05. This affects the work life balance of majority of the respondents.

<b>Table2 : Designation and maximum time spent on task demand</b>					
<b>Designation</b>	<b>Designing / upgradation of course / syllabus</b>	<b>Administrative work</b>	<b>Students grooming</b>	<b>Event Management</b>	<b>Total</b>
Assistant Professor	10 (9.62%)	52 (50%)	14 (13.46%)	28 (26.92%)	104
Associate Professor	21(28.38%)	14(18.92%)	30 (40.54%)	9(12.16%)	74
Professor	8(47.06%)	2 (11.77%)	6 (35.29%)	1(5.88%)	17
Director/HOD	0 (0%)	5 (100%)	0(0%)	0(0%)	5
<b>Total</b>	39	73	50	38	200
<b>df</b>		9			
<b><math>p</math></b>		0.0000032			

Source: Primary data

Table 2 reflects the position of designation and maximum time spent on task demand. Respondents in the Assistant Professor and Director/HOD level spent maximum time in Administrative work. Associate Professors spent maximum time on students grooming and Professors spent

maximum time for designing or upgradation of syllabus. Using chi-square test, the  $p$  value of 0.0000032 reveals that the association between designation and maximum time spent on task demand is extremely significant as the  $p$  value is very much less than 0.05.

<b>Table 3 : Designation and Actual work hours being more than Official working hours</b>					
<b>Designation</b>	<b>Once a month</b>	<b>Once a fortnight</b>	<b>Once a week</b>	<b>Thrice a week</b>	<b>Total</b>
Assistant Professor	4 (3.85%)	18 (17.31%)	58 (55.77%)	24 (23.07%)	104
Associate Professor	17 (22.97%)	6 (8.11%)	37 (50%)	14 (18.92%)	74
Professor	12 (70.59%)	5 (29.41%)	0 (0%)	0 (0%)	17
Director/HOD	0 (0%)	0 (0%)	0 (0%)	5 (100%)	5
<b>Total</b>	33	29	95	43	200
<b>df</b>		9			
<b><math>p</math></b>		0.0000001			

Source: Primary data

From Table 3 it is observed that quite frequently the employees have to continue working by extending the official work timings. 55.77 percent of the people in the category of Assistant Professor and 50 percent of the Associate Professors stay back once a week to complete the task at hand. 100 percent of the directors/

HODs have to put up thrice a week for completion of task at work. Using chi-square test, the calculated  $p$  value of 0.0000001 shows that the association between designation and the need to extend duty hours is extremely significant. This has a significant impact on maintaining a work-life balance.

**Table 4 : Age and Time spent on discharge of family responsibilities**

Age group	Elder care	Child care / support	Household chores	Social Life	Total
25-30	5 (10.64%)	11 (23.40%)	26 (55.32%)	5 (10.64%)	47
31-40	14 (14.58%)	36 (37.5%)	38 (39.58%)	8 (8.34%)	96
41-50	2 (8%)	3 (12%)	8 (32%)	12 (48%)	25
51 & Above	3 (9.37%)	5 (15.63%)	13 (40.63%)	11 (34.37%)	32
<b>Total</b>	24	55	85	36	200
<b>df</b>		9			
<b><math>p</math></b>		0.0000577			

Source: Primary data

From Table 4 an analysis is drawn between the various age groups and the time devoted for discharge of various family responsibilities. The  $p$  value of 0.0000577 reflects that there is a strong significance between them. Time spent for

discharge of household chores received the highest response in all the age groups. This task makes it more significant for the working women teaching professionals to optimize work-life balance else it is a cause for high stress.

**Table 5 : Age and Demand for social interaction with the work group**

Age group	Official functions	Family Functions	Weekend get-together	Total
25-30	28 (59.57%)	8 (17.02%)	11 (23.41%)	47
31-40	36 (37.50%)	22 (22.92%)	38 (39.58%)	96
41-50	9 (36%)	10 (40%)	6 (24%)	25
51 & Above	9 (28.13%)	9 (28.13%)	14 (43.74%)	32
<b>Total</b>	82	49	69	200
<b>df</b>		6		
<b><math>p</math></b>		0.036134		

Source: Primary data

**Table 6 : Designation and Demand for social interaction with the work group**

Designation	Official function	Family Function	Weekend get-together	Total
Assistant Professor	63 (60.58%)	26 (25%)	15 (14.42%)	104
Associate Professor	41 (55.41%)	21 (28.38%)	12 (16.21%)	74
Professor	8 (47.06%)	7 (41.18%)	2 (11.76%)	17
Director/HOD	5 (100%)	0 (0%)	0 (0%)	5
<b>Total</b>	117	54	29	200
<b>df</b>		6		
<b><math>p</math></b>		0.44190		

Source: Primary data

Social interaction with the work group is an understood compulsion at the work place. It is observed from Table 5 that the majority respondents in the age group of 25-30 attended official functions compulsively while those in the age group of 31-40 spent more time with the work group in weekend get-togethers. The respondents in the category of 41-50 had maximum social interaction with the work group in family functions while responses in the category of 51 and above the age group spent more time in weekend get-togethers. Using chi-square test, the  $p$  value arrived at was 0.036134 which shows that the association between age

and demand for social interaction with the work group is statistically significant.

Parallel to it, an association is attempted to be drawn between the designation and demand for social interaction with the work group. It is observed from Table 6 that majority of the respondents across various groups interacted with the work group more at the official functions. But the  $p$ -value of 0.44190 reveals that there is no significant relationship between designation and demand for social interaction with the work group. This is perhaps because of the dynamics of the human nature.

**Table 7 : Designation and maximum time availability for own self**

Designation	Physical exercise	Knowledge progression	Spiritual growth	Entertainment	None	Total
Assistant Professor	21 (20.19%)	36 (34.62%)	9 (8.65%)	11 (10.58%)	27(25.96%)	104
Associate Professor	9 (12.16%)	29 (39.19%)	16 (21.62%)	6 (8.11%)	14(18.92%)	74
Professor	4 (23.53%)	8 (47.06%)	3 (17.65%)	2 (11.76%)	0 (0%)	17
Director/HOD	1 (20%)	4 (80%)	0 (0%)	0 (0%)	0 (0%)	5
<b>Total</b>	35	77	28	19	41	200
<b>df</b>			12			
<b><math>p</math></b>			0.115789			

Source: Primary data

The variety of job and task demand and the extended working hours do not leave sufficient time for spending for oneself. Table 7 tries to establish the linkage between designation and maximum time availability for one self. Responses reveal that all categories of respondent spent maximum time for knowledge progression. This is perhaps because of the job demand. However, the calculated  $p$ -value reveals that there is no

statistically significant relationship between designation and maximum time available for self. The time one will make available for oneself will depend on human nature which is again dependent on one's culture, upbringing, social/ financial condition and perspective towards life. Hence, there is no significant association between designation and time available for own self.

**Table 8 : Time made available for academic progression**

Parameter	Rank
Reading	1
Research Activities	2
Article Writing	3
Book Writing	4
Consultancy	5

Source: Primary data

Table 8 shows the ranking of the chosen parameters/activities, which the respondents undertook for academic progression. Reading ranked first as it is a prerequisite for the teaching profession. Work-Life imbalance did not come in the way of continuous academic progression through reading as this activity has to be undertaken to make effective classroom delivery. Research Activities, Article Writing, Book Writing and Consultancy

were subsequent to Reading. Undertaking such activities are also the demands of the profession. Yet, the respondents viewed that the stressful working hours and the pressures of household chores did not leave much time to pursue these activities. Providing Consultancy services is also lucrative in addition to professional requirement. Still respondents opined that they were unable to spare time because of family commitments.

**Table 9 : Comparison of mean scores of employees on overall job satisfaction and stress level**

Particulars	Assistant Prof		Associate Prof		Professor		Director/HOD		H Value	df	p value
	Mean	Sd	Mean	Sd	Mean	Sd	Mean	Sd			
Overall job satisfaction <sup>a</sup>	235	0.368	126.18	0.288	21.06	0.23	5	0	109.3	3	<0.0001
Work stress	278	0.313	209.2	0.318	61.6	0.34	15	1.655	47.93	3	<0.0001

<sup>a</sup> This scale was reverse coded i.e. 1 = Very Satisfied, therefore a lower mean score represents a higher degree of job satisfaction and vice versa.

Table 9 shows that no category of respondents explained highest level of job satisfaction. However, the job satisfaction level was maximum amongst the category of Directors/HODs. The mode value of overall job satisfaction was reported as 'satisfied' across the levels of Assistant Professor, Associate Professor and Professor. The level of work related stress

was the highest amongst the Directors/HODs. The work related stress exists for all the respondents.

The *p* value being tiny in both the cases, it is clear evidence that the population medians are different. As the *p* value is less than 0.005, it shows that there is a statistical significance between atleast two of the sub-groups.

**Conclusion and Recommendation:** The study reveals that in most cases women Faculty members find difficulty in balancing work and life. The pressures of work demand come into the personal lives of the women Faculty members and they find it difficult to unwind at home. Some of the respondents also opined that they carry home related stress to work. We find that imbalance in work-life has had a tough impact on the physical and mental health of the respondents.

The study confirms that the four life quadrants are strongly influencing the work-life balance. Any corrective action has therefore to be from these four quadrants. As such the recommendations are made keeping in focus these quadrants.

In order to ensure a healthy work environment and enable the women Faculty members to have a balance with work and life, the **employers** can provide the following facilities to their women faculty members.

**Flexi-timing** – As most of the respondents agreed that the actual working hours exceeded the official working hours, having a flexi-timing or staggered timing would enable the women faculty members to invest time for discharge of household responsibilities.

**Reduced Physical Attendance** - Demographic factor in terms of time spent in commuting to work can be addressed by permitting the women faculty members to work from home. The physical presence at work place can be reduced

to 4 days and balance 2 days, they can perform the job required from home i.e. Telecommuting by conducting Live Virtual Classes. Also project and research work can be allowed to be done from home during the balance 2 days.

**Employee Assistance Program** – The employers providing facilities to assist the employees in their personal work is an incentive towards enabling work-life balance for them. If a designated person in the work place is allocated for running errands like payment of bills, school fees and doing bank related work, the employees will be able to focus time and energy in the task at hand.

**Maternity and Paternity Leave** – It is found that the employers generally provide three months with pay maternity leave subject to the years spent in the organization. Educational institutes as yet are not providing paternity leave. Hence, women find it difficult to get time from their spouse during the initial days of child rearing. As most people have a nuclear family set up, a longer duration of paid maternity and paternity leave needs to be provided. Provision of paternity leave will facilitate women faculty members for sharing of their child rearing responsibilities with their spouses. Such a measure will facilitate women to concentrate on their family responsibilities prior to joining back work.

**Use of Technology** - Teaching is an intellectual occupation and if a person is away from it for a longer time, academic

excellence would be reduced. Hence, extended maternity leave can be combined with facilities like Telecommuting, Job-sharing and conducting of Live Virtual Classes by the women Faculty members during the leave period. Enabling a Faculty to work from home will certainly help in meeting the organizational goals and her involvement in the job will be a personal motivation. Such measures can possibly enhance the quality of work-life balance of the women Faculty members.

The ‘**Self**’ quadrant from the domain of work-life balance is exclusively dependent on the individual herself. To have equilibrium between work and life, the women Faculty members must design their day to day activities without taking undue strain. Finding time for regular physical exercise and pranayam will certainly help the women faculty members to keep them fit both physically and mentally. Prioritizing the work at hand and developing the ability to say ‘No’, when required is a must for a balanced life. Teaching is a creative profession where whole hearted involvement defines a good teacher. Nevertheless, achieving success at the work place is not satisfying if done at the cost of ignoring family and life. Hence, it is crucial to find time for oneself at the end of the day and indulge in self-rewarding vocation.

Support from ‘**family**’ quadrant is the *sine quo non* for an effective work-life balance. Many respondents replied that elder care, child care and completing the

household chores were their defined role at home. This left no time for own self. Consequently the spouse and other family members should sustain the women faculty members at the home front by sharing work.

The personal social life quadrant comprising of ‘**friends and relatives**’ also have a key role to play in the life of women Faculty members. The moral support provided by friends and relatives and the recognition received from them will certainly enhance the performance of the women Faculty members on both the family and work place front. It will also help to balance the work life. The nuclear family set up makes it inevitable for them to depend on friends and relatives as an extended support system. A persistent support from this quarter will ensure a happy balance of work and life for the working women Faculty members.

To sum up, the educational world with its multifarious activities and myriad environmental factors assume great importance in terms of nation building. The contention of women Faculty members having a judicious balance of work and life is of paramount implication as they are involved in grooming the future leaders. Sincere involvement from every life quadrant of ‘work and life’ would assist to bridge the juxtaposed dimensions of work and life to enable the women Faculty members for having a enriching and balanced life.

## Appendix

### Items for overall job satisfaction and stress scales.

#### *Overall Job Satisfaction*

How satisfied are you with your organized class sessions?

How satisfied are you in using concrete examples to illustrate critical information?

How satisfied are you in the enhancement of the knowledge level of the students?

*(The endpoints for this five-point Likert scale were VS–VD = very satisfied – very dissatisfied)*

#### *Work Related Stress*

I worry about problems after work.

I find it difficult to relax after work.

I feel exhausted after work.

I feel like quitting the job to take care of the family.

I feel like concentrating more on my job to meet my career goals.

*The endpoints for this four-point scale were Never – All of the time)*

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# Review of Finances: Union Government of India

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## Abstract

*The fiscal outcome of this first four years of the current five year plan got deviated from the path of fiscal consolidation following the stimulus packages / booster doses injected to the economy to reduce the impact of world economic crisis. Strategic increase in the expenditure along with reduction in the tax revenue collection increased the fiscal deficit in this medium run. Gradually India had begun the process of fiscal consolidation from the year 2010 on ward with a partial withdrawal of the stimulus measures. The policy stance is to continue to facilitate growth momentum to achieve pre crisis growth targets and simultaneously to address long term fiscal sustainability. In the backdrop of this policy stance the present paper analyses the finances of The Union Government of India.*

## Introduction:

India witnessed a number of important developments during the recent past. The country entered a higher growth trajectory recording 9.4% in Gross Domestic Product (GDP) growth on an average, breaking the history of the past. Besides the cyclical effects of global up swing, India's growth story underpinned a number of factors which are real sources of strength. Significant increase in the savings and investment rates coupled with supporting industrial sector, huge inflow of capital in the form of FDI and FII, indicate the capacity of Indian Economy to lead the country on growth trajectory to achieve sustained economic expansion.

A sharp decline in GDP growth rate to 6.7 % in 2008-09 caused by global downturn and deficient Southwest Monsoon carved the path of expansionary fiscal policy by the Government of India. Along with the fiscal stimulus packages, deliberate reduction in the tax rate, extension of tax exemptions, enhancement of the drawback rates for exports ,additional allocations under the plan for Centrally

Sponsored Schemes like NREGS, and implementation of the recommendations of the Sixth Central Pay Commission by the centre acted as determinant forces to the rise in fiscal burden. Resultantly, India's Fiscal Deficit (FD) increased from the end of 2007-08, reaching 6.8% (BE) of GDP in 2009 -10. This has put a pause to the process of fiscal consolidation as per the targets given by the implementation of Fiscal Responsibility and Budget Management Act (FRBMA).

The current expansionary fiscal policy has put a pause to the process of fiscal correction putting a doubt once again on the sustainability of it and on improvements in the quality of public expenditure, which should lead to superior outcomes, through higher productivity. The current situation thus, has necessitated the review of the finances of Government of India for proper policy prescription.

Against the aforesaid situation the paper has been developed to analyse the trends in the finances of the Central Government of India. This paper has been developed in five sections. Section –I focuses on

analyzing the trend in the deficit parameters of finances of the Centre, Section –II studies the trends in the revenue generation and expenditure pattern of the Union Government of India. Section –III outlines the trend in the position of total debt and liability of the government of India, Section –IV discusses the issues, as well as, perspectives and Section – V concludes the paper.

### **Review of literature:**

The paper has been developed by the detailed study of the following literature (different reports and documents of the Government). Research papers and articles available in different sources have dealt with the analysis of fiscal situation of Government of India till the year 2005-06. The following literature are the new addition to the existing documents which publish the state of finances of Government of India periodically. To assess the fiscal health in present context of expansionary fiscal policy, the following literature are accepted as the benchmark and are studied in detail.

#### **Report of 12<sup>th</sup> Finance Commission:**

Twelfth Finance Commission had given emphasis on bringing the high fiscal deficit to GDP in to a sustainable path. It had provided guidelines for fiscal correction path to have sustainable debt to GDP and to have fiscal solvency. For sustainable deficit and fiscal solvency, it was prescribed to eliminate revenue deficit and a correction path was given to both State and Central Government of India.

#### **Fiscal Responsibility and Budget Management Act:**

Fiscal Responsibility and Budget Management Act (FRBMA), 2003 was enacted in Parliament of India to institutionalize Fiscal discipline in the country. It had given emphasis on reduction of fiscal deficit to bring to a path of fiscal transparency and sustainability. The main purpose was to eliminate revenue deficit (to build revenue surplus) so as to bring down Fiscal Deficit to 3% of GDP by March'2008. Economic Advisory Council advised government of India to reconsider the implementation of FRBMA in 2011 after adopting expansionary fiscal policy in 2008-09 and 2009-10 as counter cyclical measure to support the economy.

#### **13<sup>th</sup> Finance Commission's Report:**

Thirteenth Finance Commission in Chapter Four (in the chapter of Review of Union and State Finances) have analyzed the central finances from the year 2003-04 to 2009-10. The report does not discuss the Expenditure pattern and the debt position of the Government of India in detail. It had analyzed in one direction by taking all the fiscal indicators as the proportion of GDP.

#### **CAG reports on Union Government Accounts (2009-10):**

CAG reports on Union Government Accounts have done detailed analysis on revenue receipt and expenditure incurred

by the government of India. It has brought analysis till the year 2008-09.

Economic Survey of India (2010-11):

The Economic Survey of India 2010-11 in the chapter –III, has discussed Fiscal Developments and fiscal stance of the Government of India till 2009-10. Almost all analysis were pro – government and it lacks the critical analysis of the finances of the Government of India.

### **Objective:**

The objective of this paper is to analyze the fiscal stance of the Union Government of India in the juncture of world economic crisis and to review the feasibility of realization of fiscal consolidation path which was recommended by 12<sup>th</sup> Finance Commission and Fiscal Responsibility and Budget Management Act (FRBMA).

### **Methodology:**

This paper has been developed by the help of secondary data published in different Government documents and reports published by Reserve Bank of India, Ministry of Finance Government of India, Planning Commission, CAG Reports and different reports of Finance Commission. Analysis has been developed through ratio and proportion methods. Statistical tables and diagrams have been used to help the analysis.

### **Section I: Analysis of different deficit indicators; Fiscal Deficit (FD), Revenue Deficit (RD) and Primary Deficit (PD)**

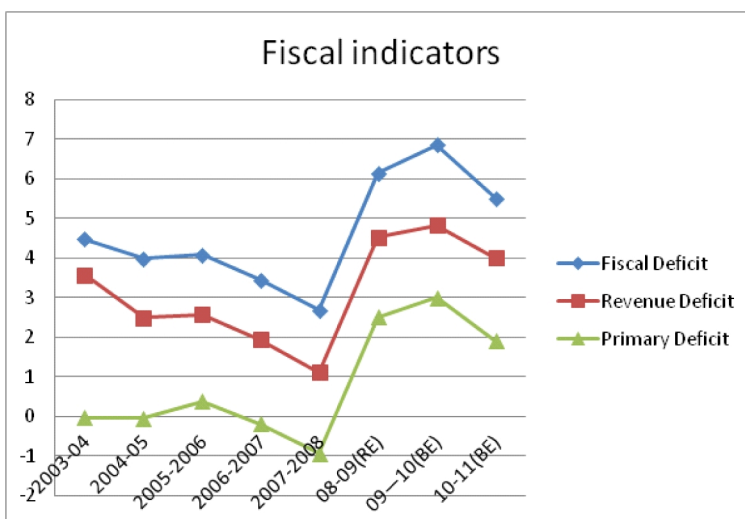
To tackle the unsustainable fiscal burden of the late 90s the Central Government of India came up with Fiscal Responsibility and Budget Management Act in 2003 to bring back fiscal deficit to a sustainable path and to improve the quality of the public expenditure. The FRBM rules as amended through the Finance Act 2004 emphasized on elimination of Revenue Deficit (RD) and reduction of Fiscal Deficit (FD) to 3% of GDP by the year 2008. For prudent fiscal management it has also emphasized on quarterly review of receipts and expenditure by the Central Government.

The table below displays the trend of different deficit indicators from the year 2003-04. The Annual deficit reduction targets could not be achieved in 2005-06, as the centre had to accommodate higher fiscal transfer recommended by 12<sup>th</sup> Finance Commission (FC). Revenue Deficit of the centre declined to its minimum value to 1.11% of GDP in 2007-08 since 1991. The different important fiscal indicators highlighted in the table given below are indicative of the fact that from 2008-09 onwards, the different deficit indicators took a complete reversal trend, once again raising a doubt on sustainability of it.

**Table 1.11: Profile of Deficit Indicators.***(percentage of GDP)*

Year	Fiscal Deficit	Revenue Deficit	Primary Deficit	Ratio of Revenue to Fiscal Deficit
2003-04	4.48	3.57	-0.03	79.71
04-05	3.98	2.49	-0.05	62.57
05-06	4.08	2.57	0.38	63.03
06-07	3.45	1.94	-0.19	56.27
07-08	2.69	1.11	-0.93	41.42
08-09(RE)	6.14	4.53	2.51	73.89
09—10(BE)	6.85	4.83	3.00	70.51
10-11(BE)	5.5	4.00	1.90	72.73

*\*Source : Calculated from the basic data given in different budget documents of Government of India.*

**D-1.11**

The Fiscal Deficit (F.D) of the centre had declined from 4.48% of the GDP in 2003-04 to 2.69% in 2007-08, the lowest since 90-91. There was a complete turn in the declining trend in 2008-09, by more than 250% rise. Similarly there was also sharp increase in the revenue deficit, by more than 400%. The values of this deficit indicator (F.D) have been budgeted as 6.85% and 5.5% of GDP for the year 2009-10 and 10-11 respectively. As per

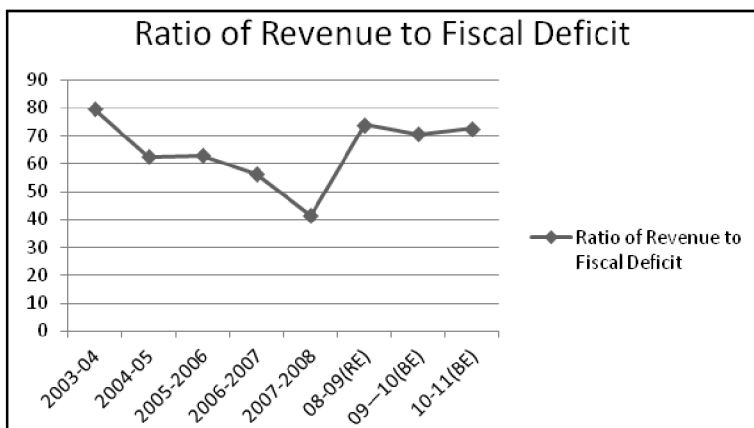
the observation of 13<sup>th</sup> Finance Commission, the reversal of fiscal correction was not entirely on account of fiscal stimulus measures. Implementation of pay revision as per the Sixth Central Pay Commissions' Recommendations, farm debt waiver and additional expenditure on food and fertilizer subsidies has also added significantly. This Fiscal Deficit figure will be inflated; if the off budget bonds issued to the oil marketing

and fertilizer companies, which itself amount to 1.8% of GDP, is included for the year 2008-09. If the rise in F.D and R.D as a percent of GDP are analyzed on a comparative basis F.D rose by more than 250% whereas R.D rose more than 400% implying sudden increase in the gap of revenue receipt and expenditure of Government of India. The similar kind of trend is also observable in the primary and revenue balance. For the year 2009-10 the primary balance has been budgeted as 3% of GDP, highest in the post reform period. Primary deficit is a matter of more concern as it adds to the debt to GDP ratio unless GDP growth rate is higher than the interest rate in the public debt.

The ratio of revenue deficit to fiscal deficit is another important fiscal indicator as it shows the extent to which borrowings are used to meet current expenditure. This indicator also shows a continuous declining trend from almost 80% to 40% over the five years (from the year 2003-04 to 2007-08). However, this proportion went back to nearly 74 % during 2008-09. In

the year 2010-11, there is a decrease in fiscal deficit to GDP ratio to 5.5% from 6.85% of 2009-10. In the parameter of revenue deficit to GDP ratio also, there has been reduction by more than 80% in the year 2010-11 according to the budget estimate. Despite this R.D to F.D ratio is very high nearly about 74%, implying that around 74% of the borrowed fund has been diverted to meet the current expenditure squeezing the scope for capital expenditure. In this context improvement in the quality of expenditure as it is mandated by 13<sup>th</sup> Finance Commission is definitely putting a question mark. In the year 2010 -11 Union Govt. has given stress on coming back to the path of fiscal consolidation following the mandate of FRBMA. Government should target explicitly to reduce the domestic debt to GDP ratio. For that, the government has to concentrate on both sides of the fiscal correction by augmenting the revenue generation and rationalizing the expenditure measure. The diagram below shows the trend of revenue deficit to fiscal deficit.

#### D-1.12



## Section –II: Union Government Finances; Trend in Revenue receipt and Revenue Expenditure

The fiscal consolidation process of the centre is backed by an increasing trend in the revenue generation capacity, which is revealed in the table below. As a proportion of GDP, the Total Revenue Receipt of Centre rose from 9.7% in the year 2004-05 to 10.52% in 2006-07 and

to 11.47% in 2007-08. However, it has reduced to 10.8 % and 9.6% in 2008-09 and 2009-10 respectively it was estimated to recover to 10.8% in 2010-11(BE). In the category of Tax Revenue, the similar kind of trend is also visible after 2007-08. However, in the category of non Tax Revenue there was found an increase from 1.81 % of GDP to 2.40% of GDP.

**Table: 2.11:- Major Taxes of The Centre: Performance Since 2003-04.**  
(Percentage of GDP)

	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Revenue Receipts	9.58	9.72	9.69	10.52	11.47	10.56	10.49
Tax Revenue	6.79	7.14	7.54	8.5	9.31	8.76	8.10
Non Tax Revenue	2.79	2.58	2.15	2.02	2.17	1.81	2.40

*\*Source: Calculated from the basic data given in different budget documents of Government of India.*

In the era of expansionary fiscal policy, on one hand the Government had given different fiscal stimulus packages to revive the economy from the slowdown process and on other hand there has been a decreasing trend in the tax revenue collection of the

central government of India. To probe into the causes for the declining trend of the Tax Revenue the sources of tax revenue as a percentage of Gross Tax Revenue and as a percentage of GDP have been displayed in the following table.

**Table: 2.12:- Tax Revenue\* as a percentage of Gross Tax Revenue:**

YEAR	2005-06	2006-07	2007-08	2008-09	2009-10(BE)	2009-10(P)	2010 -11(BE)
DIRECT	43.0	46.4	49.9	52.8	57.7	58.6	56.6
PERSONAL INCOME TAX	15.3	15.9	17.3	17.5	17.6	19.5	16.1
CORPORATION TAX	27.2	30.5	32.5	35.3	40.0	39.0	40.4
INDIRECT	54.4	51.0	47.0	44.5	42.0	39.5	42.2
CUSTOMS	17.8	18.2	17.6	16.5	15.3	13.4	15.4
EXCISE	30.4	24.8	20.8	17.9	16.6	16.7	17.7
SERVICE	6.3	7.9	8.6	10.1	10.1	9.3	9.1
TAX REVENUE* AS A PERCENTAGE OF GDP.							
DIRECT	4.3	5.1	5.9	5.7	6.3	5.6	5.4
PERSONAL INCOME TAX	1.5	1.7	2.1	1.9	1.9	1.9	1.5

CORPORATION TAX	2.7	3.4	3.9	3.8	4.4	3.7	3.8
INDIRECT	5.4	5.6	5.6	4.8	4.6	3.8	4.0
CUSTOMS	1.8	2.0	2.1	1.8	1.7	1.3	1.5
EXCISE	3.0	2.7	2.5	1.9	1.8	1.6	1.7
SERVICES TAX	0.6	0.9	1.0	1.1	1.1	0.9	0.9
GROSS TAX REVENUE.	9.9	11.0	11.9	10.8	10.9	9.6	9.5

*\*Tax revenue (net of states' share)*

*\*Source: Calculated from the basic data given in the different budget documents of the government of India.*

As a proportion of GDP, Gross Tax Revenue declined from 10.8% in 2008-09 to 9.6% in 2009-10. In spite of the partial increase in the budgeted excise duty for the year 2010-11 the Gross Tax Revenue as a percentage of GDP is estimated to be 9.5% indicating the lack of proper policy stance towards the process of revenue augmentation. Due to the gain in the momentum of economic recovery it has been estimated that tax to GDP ratio had increased to 10.8% in the current fiscal (2011-12).

Direct tax as a proportion of Gross Tax Revenue has shown an increasing trend till 2009-10, indicating a positive phenomenon as it is more progressive in nature. But there has been a reduction in this value by 2 percentage points to 56.6

in the budgeted estimation of 2010-11(BE) basically, due to reduction in personal income tax by 3 percentage points and stagnancy in the category of corporation tax. The path of fiscal consolidation got distorted due to the reduction in the tax revenue collection in the process of reviving the economy from the impact of economic slowdown.

The fiscal consolidation should also aim at rationalization public expenditure. In the era of expansionary fiscal policy the fiscal deficit has suddenly gone up from 2.69% of GDP in 2007-08 to 6.14% in 2008 – 09 and to 6.85% in 2009-10. To explore the reasons for this sudden jump in the F.D, the trend in the expenditure pattern of the Centre is studied. The trend in the revenue and capital expenditure is given in the table below:

**Table 2.13 : Trend in the Expenditure of the Centre.** (Percentage of GDP)

	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11(BE)
Revenue Expenditure	13.14	12.20	12.26	12.46	12.58	15.10	15.32	12.2
Capital Expenditure	3.96	3.62	1.85	1.67	2.50	1.83	2.11	1.9
Total Expenditure	17.11	15.82	14.11	14.13	15.09	16.93	17.43	14.1

*\*Source : Calculated from the basic data given in different budget documents of Government of India.*

The main focus of public expenditure management is to contain revenue expenditure and to raise the level of plan expenditure, preferably the capital one. The above table shows that from the year 2004-05 to 2007-08, revenue expenditure as a percentage of GDP has almost remained stagnant at around 12 %, but there is a sudden jump in this category to 15.10% in 2008-09 and to 15.32% in 2009-10. On the other hand, in comparison to Revenue Expenditure Capital Expenditure has declined from 3.96% of GDP from the year 2003-04 to 1.67% in the year 2006-07. Total expenditure of the central government increased due to relatively more proportionate rise in revenue expenditure

in comparison to the capital expenditure. For the prudent fiscal management, FRBMA had emphasized to contain the Non Plan Revenue expenditure and to raise the level of Plan expenditure, preferably the capital one.

It has been mentioned in different Government documents that the predominance of revenue expenditure is primarily on account of a conscious shift in plan priorities and systematic rigidity in non plan revenue expenditure, arising out of committed and obligatory expenditure such as interest payments, pensions, salaries and defense. To check the validity of the above statement, the trend of different components of Revenue Expenditure is studied in the table given below.

**Table: 2.14 : Revenue Expenditure and its components.** (Rs. in crore)

Period	RE	Pay & Allowances	Interest Payments	Pensions	Grants to the States	OTHERS
Xth Plan (2002-07)	500825	36728	135860	25539	60676	242022
Relative Share	100	7	27	5	12	48
XIth Plan (2007-12)						
2007-08	734861	44361	179987	37346	106333	366834
Relative Share.	100	6	24	5	14	50
2008-09	1010224	71726	200580	45747	121702	570469
Relative Share.	100	7	20	5	12	56
2009-10	1057479	98980	223701	66051	136915	531832
Relative Share	100	9	21	6	13	51
Average Annual Rate of Growth.						
Xth Plan (2002-07)	12.24	4.43	5.40	17.49	21.14	14.70
XIth Plan (2007-12)						
2007-08	11.64	11.31	16.66	-4.42	19.65	9.12
2008-09	37.47	61.69	11.44	22.50	14.45	55.51
2009-10	4.68	38.00	11.53	44.38	12.50	-6.77

\* Source: Calculated from the basic data given in different budget documents of Government of India.

[Report of Comptroller and Auditor General on Union Government Accounts 2009-10.]

The above table shows the expenditure incurred on various components of revenue expenditure in terms of its major object-wise classification. From the above table it is clear that in spite of higher pay recommendation by the Sixth Central Pay Commission, the relative share of the pay & allowances in the total revenue expenditure has almost remained around 7%. If we look at the trend of the share of the interest payment, it has reduced from 27% in the X-five year plan period to almost 22% in the first three years of the current five year plan. The similar type of trend is also observed in the other subcategories of revenue expenditure. The major percentage of revenue expenditure of around 50% belongs to the category of "others". In the "others" category subsidy is the major component. As the proportion of GDP, subsidies have grown from 1.4% in 2004-05 to 2.3 % in 2008-09 (Economic Survey of India 2010-11). In comparison to Xth Plan period, there has been an almost one percentage point increase in 2008-09 in total subsidy as percentage of GDP but reduced marginally in the successive years. Subsidies as a percentage of revenue expenditure increased by 3.19 percentage

points in 2008-09 over 2007-08, but were contained to some extent in the subsequent years. This huge rise in subsidies was mainly due to the increased level of global crude oil prices. This huge increase in subsidy which has increased the revenue expenditure is mainly due to the lack of proper policy which should target the sectors specifically.

Prudent revenue management should aim at rationalization of Non- Plan expenditure, especially of non plan revenue expenditure and systematic strategic increase in capital expenditure (both in plan and non plan). Plan expenditure normally relates to incremental developmental expenditure on new projects and schemes which involves both revenue and capital. Non Plan expenditure, on the other hand, normally devoted to maintaining the level of services already achieved. However, in both Plan and Non Plan Expenditure, increase in capital expenditure relative to revenue is considered to be qualitatively more desirable, as it leads to extension of social and economic infrastructure and capital formation by the government. The table below presents the growth and the composition of Plan and Non Plan expenditure of the Union Government.

**Table: 2.15:- Growth in Plan and Non –Plan Expenditure** (Rs in crore)

Period.	Plan			Non - Plan		
	Total	Revenue	Capital	Total	Revenue	Capital
X Plan Average	138676	101635	17960	435176	399190	29033
XI Plan(2007-12)						
2007-08	205082	173572	21086	658493	561289	95131

2008-09	275301	234774	28123	827065	775450	49433
2009-10	303593	254087	35003	870687	803392	65683
2010-11(RE)	395024	326929	68096	821552	726749	94803
2011-12(BE)	441547	363604	77943	816182	733558	82624
AVERAGE ANNUAL RATE OF GROWTH						
X Plan ( 2002-07)	12.35	21.46	7.3	10.38	9.99	28.78
XI Plan (2007-12)						
2007-08	10.22	9.43	12.32	21.61	12.34	138.55
2008-09	34.24	35.26	28.97	25.60	38.16	-48.04
2009-10	10.28	8.23	24.46	5.27	3.60	32.87
2010-11(RE)	30.12	28.66	94.5	-5.6	-9.54	44.33
2011-12(BE)	11.78	11.22	14.5	-0.65	0.94	-12.84

*\*Source : Calculated from the basic data given in different Budget documents of Government of India.*

The growth trend in the Plan and Non-Plan expenditure indicates that, growth rate in plan expenditure has been more than growth rate in Non –Plan expenditure, which is desirable for prudent fiscal

management. But the trend of the relative shares of revenue expenditure both in Plan and Non- Plan which is given in the table below, somehow reveals a different picture.

**Table :2.16 : Plan and Non Plan Expenditure : Relative Share.**

Period	PE/TE	NPE/TE	PRE/PE	NPPE/PE
Xth Plan (2002-07) Average.	24.17	75.83	73.29	91.73
XI Plan(2007-12)				
2007-08	23.75	76.25	84.64	85.24
2008-09	24.97	75.03	85.25	93.76
2009-10	25.85	74.15	83.69	92.27
2010-11(RE)	32.47	67.53	82.76	88.46
2011-12(BE)	35.1	64.89	82.34	89.87

*\*Source: Calculated from the basic data given in different budget documents of Government of India.*

PE : Plan Expenditure, TE : Total Expenditure, NPE : Non Plan Expenditure, PRE : Plan Revenue Expenditure, NPPE : Non Plan Revenue Expenditure .

The above table is indicative of the fact that in comparison to the first three years of the current plan period, there has been an improvement in the percentage of Plan expenditure to total expenditure in 2010-11 and in 2011-12. On the contrary, in the category of Non –Plan expenditure during the recent two years ; 2010-11 and 2011-12 , there has been a reduction in comparison to Xth plan average and those of the first three years of current plan period, which is definitely an welcome improvement and it shows that after almost six decades the central govt. has realized the proper fiscal management.

The above table also explains the predominance of revenue expenditure both in Plan and Non-Plan expenditure

category. The dominance of revenue expenditure in the Plan and No – Plan category had squeezed the scope for capital expenditure, which is always incurred for the creation of capital assets and employment in the economy and hence considered to be qualitatively more desirable.

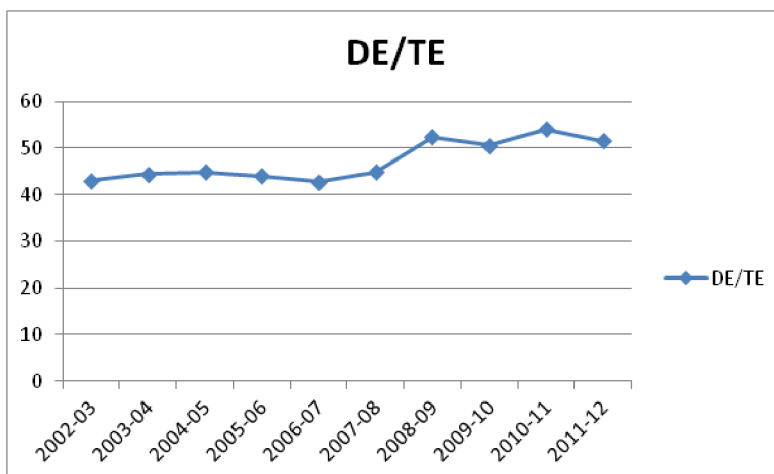
The division of total expenditure into Plan and Non- Plan is not a clear indication of quality of expenditure pattern of the Government of India. The quality of expenditure can be studied further if the trend of developmental and non developmental expenditure is taken into account. The following table shows the trend of the aforesaid expenditure pattern of the Government of India.

**Table : 2.17 : Expenditure Pattern of Government of India.** (Rs.in crore)

Year	D.E*	ESE*	SSE*	NDE*	TE*	D.E/T.E*	N.D.E/T.E
2002-03	184197	103820	22007	242749	426946	43.1	56.85
2003-04	195428	108071	23859	243298	438726	44.5	55.45
2004-05	214955	115030	29906	262904	477860	44.9	55.01
2005-06	229060	133053	38264	290677	519737	44.07	55.92
2006-07	255718	142772	43762	341278	596996	42.83	57.16
2007-08	325670	172955	61648	400728	726398	44.83	55.16
2008-09	471399	273222	89221	428145	899544	52.4	47.59
2009-10	528242	304440	102628	514101	1042343	50.6	49.32
2010-11	668277	409495	119003	567909	1236186	54.05	45.94
2011-12	662256	392361	113286	622065	1284321	51.56	48.43

\*Source: Calculated from basic data given in different reports of RBI.

DE = Developmental Expenditure, ESE= Economic Service Expenditure, SSE = Social Sector Expenditure , NDE = Non Developmental Expenditure and TE = Total Expenditure.

**D-2.11**

The trend of the ratio of developmental expenditure to total expenditure indicates that during X<sup>th</sup> plan period, the ratio was almost stagnant at around 42 to 44%. During the current plan period, there has been an increasing trend in this category. There is a sudden jump in this category by more than 8 percentage points and that was primarily due to anti recessionary measures taken by Government to revive the economy from the impact of economic slowdown. Once again it has got reduced in subsequent years.

The availability of better infrastructure in the social, educational and health sector in the country generally reflects the quality

of its expenditure. From the view of importance of public expenditure on developmental heads, it is imperative for the Government to take appropriate expenditure rationalization measures and lay emphasis of provision of core public goods which will ensure inclusive growth as well as welfare of the citizens. The efficiency of expenditure can be traced by the ratio of Capital Expenditure to the Total Expenditure, Economic Service Expenditure to Total Expenditure and Social Sector Expenditure to Total Expenditure. Higher the ratios, better will be the quality and efficiency of expenditure. All the ratios has been displayed in the table given below.

**Table -2.18:- Components of Total Expenditure.**

(Rs. in crore)

Year	TE	CE	ESE	SSE	CE*/TE	SSE/TE	ESE/TE	C.O	CO/TE
2002-03	426946	74535	103820	22007	17.45	5.15	24.31	29101	6.81
2003-04	438726	109129	108071	23859	24.87	5.43	24.63	34150	7.78
2004-05	477860	113923	115030	29906	23.84	6.25	24.07	52338	10.95
2005-06	519737	66362	133053	38264	12.76	7.36	25.6	55025	10.58

2006-07	596996	68778	142772	43762	11.52	7.33	23.91	60254	10.09
2007-08	726398	118238	172955	61648	16.27	8.48	23.8	106940	14.72
2008-09	899544	90158	273222	89221	10.02	9.91	30.37	76051	8.45
2009-10	1042343	112678	304440	102628	10.81	9.84	29.2	97031	9.3
2010-11	1236186	162899	409495	119003	13.17	9.62	33.12	137097	11.09
2011-12	1284321	160567	392361	113286	12.5	8.82	30.55	143417	11.16

*\*Source: Calculated from the basic data given in different reports of RBI.*

TE= Total Expenditure, CE = Capital Expenditure, ESE = Economic Service Expenditure, SSE = Social Service Expenditure, CO = Capital Outlay

CE\* = The Capital Expenditure here is the summation of Capital Outlay and Loans & advances, particularly the Capital Expenditure data for the years 2002-03, 2003-04 and 04-05 includes repayments to National Small Saving Fund (NSSF).

The quality and efficiency of expenditure is measured by CE as a proportion of Total Expenditure and SSE as a proportion of Total Expenditure. In comparison to Xth five year plan in the current Five Year Plan there has been an increasing trend in SSE as a percentage of Total Expenditure but in comparison to ESE it is much less. For ideal expenditure management the expenditure on social sector should be more than the expenditure on economic sector. As the data of Capital Expenditure includes the loans and advances, to assess the quality of expenditure of Central Government of India, the ratio of Capital Outlay to the Total Expenditure is taken in to account. The above data clearly reveals that, in comparison to expenditure on economic services the government outlay for capital projects has been less. But on an average there has been an increase in Capital Outlay in the current five year plan in comparison to the previous one, from 9.24% in Xth Plan (2002-2007) to 10.94% in XIth Five Year Plan (2007-2011).

The quality of financial outlay appears to have undergone an improvement in the current Five Year plan in comparison to the previous plan period. However unless financial outlays are translated into physical outcomes, it is difficult to assess the quality of expenditure.

### **Section –III: The Debt position of the Union Government of India**

The management of debt is a part of fiscal management of any country. The FRBM rule of 2004 states that “ the Central Government shall not assume additional liabilities ( including external debt at current exchange rate) in excess of 9% of GDP for the financial year 2004, the limit of 9% of GDP shall be progressively reduced by at least one percentage point of GDP’.

The outstanding liabilities of central govt. of India, after reaching 65.6% of GDP in 2004-05, started declining consistently (table below). This decline occurred even

though a new component had been added to internal debt in 2004-05, which is not reflected in Fiscal Deficit. The Govt. of India Introduced Market Stabilization Scheme in consultation with RBI in April 2004. Under that scheme, Govt. of India raises money through issue of dated securities / treasury bills to absorb excess liquidity in the market on account of foreign inflows. The amount so raised was meant to be kept in a separate account in the RBI

and was not meant to meet the expenditure needs of the government. Despite a sharp increase in the fiscal deficit in the years 2008-09 and 2009-10, there is a decline in the ratio of outstanding debt to GDP in those two years.

The detailed analysis of the different components of the total liability of the central government of India has been displayed in the table given below:

**Table 3.11: Debt Composition and position of Government of India. (Rs. In crore)**

Year	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
Total Debt	1994422	2260145	2538596	2837425	3159178	3515906	3944598
% of GDP	61.6	61	59.3	57.3	56.7	56.4	56.3
Public Debt	1336849	1484001	1647691	1920390	2151595	2477263	2898799
% of GDP	41.3	40	38.5	38.8	38.6	39.8	41.4
Internal Debt	1275971	1389758	1544975	1808359	2028549	2337682	2736754
% of GDP	39.4	37.5	36.1	36.5	36.4	37.5	39
External Debt	60877	94243	102716	112031	123046	139581	162045
% of GDP	1.9	2.5	2.4	2.3	2.2	2.2	2.3
Other liabilities Public Account % of GDP	657573	776144	890905	917035	1007583	1038643	1045799
	20.3	20.9	20.8	18.5	18.1	16.7	14.9

*\*Source: Report on "Government Debt Status and Road Ahead", published by Ministry of Finance, Department of Economic Affairs, New Delhi, November 2010.*

The above table shows that the overall debt and liabilities of the central government by the end of March'2011 was Rs. 3944598 crore amounting to 56.4 % of GDP. Except internal debt, the major component of total liability of the Central Government of India was the liability in the Public Account of the Government of India, amounting to 16.7% of GDP. Within the components of Public Debt some of the components

such as external debt, MSS, NSSF require special attention .For the better depiction of the current liabilities, the current value of the external data in rupee terms should be included, as the historic value of external data contracted over the years. The following table shows the value of the total liability of the Central Govt. of India by converting the value of the external debt in current exchange rate.

**Table- 3.12 : Debt Composition of Government of India.** (Rs. In crore)

Year	ACTUALS					ESTIMATES	
	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
Total debt	1994422	2260145	2538596	2837425	3159178	3515906	3944598
% of GDP.	61.6	61.0	59.3	57.3	56.7	56.4	56.3
External Debt at book value.	60877	94243	102716	112031	123046	139581	162045
	1.9	2.5	2.4	2.3	2.2	2.2	2.3
External Debt at current value	191144	194070	201199	210086	264062	249304	271768
% of GDP	5.9	5.2	4.7	4.2	4.7	4.0	3.9
Total debt with external debt at current exchange rate.	2124688	2359972	2637079	2935481	3300194	3625629	4054322
% of GDP.	65.6	63.7	61.6	59.3	59.2	58.2	57.8

*\*Source: Report on "Government Debt Status and Road Ahead", published by Ministry of Finance, Department of Economic Affairs, New Delhi, November 2010.*

The adjusted debt and liabilities shows a reduction from 65.6% of GDP in the year 2004-05 to 57.8% in the year 2010-11.

#### **National Small Saving Fund (NSSF) :**

The liability on account of NSSF needs special attention. All deposits under Small Saving Schemes are credited to National Small Saving Fund, established in the Public Account of India w.e.f 1.4.1999. The balance in this fund is invested in special central and state government securities as per the norms decided by the Central Government from time to time. The sums received in the NSSF on redemption of special securities are being reinvested in special central government securities. The special Central Government securities issued to NSSF constitutes a part of the internal debt of the government of India under the consolidated fund. As the total special securities issued towards NSSF are not used for financing the deficit, the amount should be deducted for calculating overall debt and liability of the central government of India.

#### **Market Stabilization Scheme (MSS):**

The proper calculation of debt to GDP ratio can only be done after netting out the Fund accumulated with RBI under Market Stabilization Scheme. The MSS borrowings are done through the instruments of dated securities and treasury bills. The amount is maintained in a separate account with RBI and only used for redemption of dated securities or treasury bills raised under this scheme. Accumulation of debt under MSS is used for the sterilization purpose of the monetary authority in meeting its monetary policy objectives. This fund is not used for financing the deficit of the Central Government. Therefore this debt cannot be considered as a part of the General Government's debt and liability and this component has to be netted out. The table below shows the Central Government's debt and liabilities net of NSSF and MSS liabilities.

**Table-3.13 : Central Government debt and liabilities net of NSSF and MSS liabilities.**

Year	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10(RE)	2010-11(BE)
Total Debt net of NSSF Liabilities	1794928	1946473	2169070	2457191	2830054	3152295	3578394
% of GDP	55.4	52.5	50.6	49.7	50.8	50.6	51
Of this MSS	64211	29062	62974	170554	88773	2737	50000
% of GDP	2.0	0.8	1.5	3.4	1.6	0.1	0.7
Total debt – (NSSF+MSS)	1730717	1917411	2106096	2286637	2741281	3149558	3528394
% of GDP	53.4	51.7	49.2	46.2	49.2	50.6	50.3

*\*Source: Report on “Government Debt Status and Road Ahead”, published by Ministry of Finance, Department of Economic Affairs, New Delhi, November 2010.*

The total debt (net of NSSF and MSS) as a percentage of GDP has shown an increasing trend after 2007-08. However, the Government of India has become successful in managing its debt position by restricting it to around 50 % of GDP by the year 2010-11 in spite of expansionary fiscal stance.

#### **Section –IV: Ways ahead**

For prudent fiscal management the Government needs to ensure prudent

expenditure management. Since the Government is increasingly relying on debt funds to finance the deficit, it is imperative to control the revenue deficit. In order to bring the revenue as well fiscal deficit to a sustainable path, a fiscal consolidation path has been provided by the Thirteenth Finance Commission in which the targets that are to be achieved by the Centre have been outlined. The target as per the fiscal consolidation path has been displayed in the following table.

**Table: 4.11: - Fiscal Consolidation Path for the Centre. (Percentage of GDP)**

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Revenue Deficit	4.8	3.2	2.3	1.2	00	-0.5
Non debt capital receipt.	0.1	0.5	0.6	0.8	0.9	1.0
Capital expenditure	2.1	3.0	3.1	3.8	3.9	4.5
Fiscal Deficit	6.8	5.7	4.8	4.2	3.0	3.0
Outstanding debt(adj)	54.2	53.9	52.5	50.5	47.5	44.8

*\*Source: Report of Thirteenth Finance Commission.*

To eliminate revenue deficit by 2013-14, fiscal correction should be brought from revenue receipt side and expenditure side. The “Golden rule” of zero revenue deficit should aim at spending of

borrowing for the investment purpose only. Fiscal Planning should be prepared in such a way that the current expenditure can be financed entirely from current receipts.

For proper estimation of Revenue deficit, proper definition of revenue expenditure is desirable. All the items under services which are providing long term benefits to the society over time should be treated as “Capital Expenditure”, such as labor in the form of doctor, nurse and teacher. Since expenditure on health and education leads to growth of human capital, the expenditure incurred in these categories should be recorded in the category of capital expenditure. There are other related issues such as classification of grants. At present all grants to different tiers of government are classified as revenue expenditure of Central Government of India irrespective of its purpose. Sometimes grants provided for the creation of capital assets, are also recorded as revenue expenditure, as the capital asset created belongs to the grant recipient and not to the grant provider. A mechanism should be created to record this type of expenditure as investment. In the context of above stated issues, proper study of classification of expenditure and grants is imperative. For the rationalization of revenue expenditure special attention should be paid to the provision of subsidy. Subsidies are required to be targeted to the beneficiaries directly and should be pruned properly according to the sector requirements.

In a market economy, the Government has to deliver the dual responsibility of providing proper production base and key

infrastructure for the growth of the industrial sector and to address the market failure in the provision of public goods and merit goods to the poor and under privileged sections. In such a situation Government of India relies upon debt. To reduce debt to GDP ratio disinvestment plays a vital role. Hence, more emphasis should be laid on the process of disinvestment to provide fiscal space to the centre. To increase the revenue receipt capacity of the centre, emphasis should be given to the non tax revenue and non debt capital receipt.

### Section –V: Conclusion

In the crossroad of economic growth and combating recession, fiscal policy has been identified as preferred policy instrument across the globe. For the proper long term fiscal management, it is important to achieve desirable tax revenue to GDP growth and to plan proper rationalization of expenditure of the government. To maintain the sustainable Debt to GDP path and for the fiscal solvency, it is important to invest the borrowed fund in capital projects and in developmental projects.

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# MARGIN IMPROVEMENT – OPEX EFFICIENCY - A CASE OF HARYANA

**Rosy Kalra**

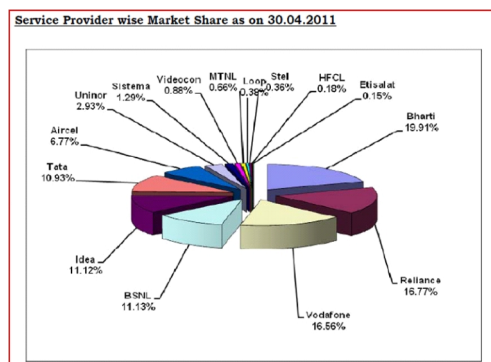
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## Abstract:

*Indian Telecommunication industry is the world's fastest growing industry with millions of mobile phone subscribers. It is also the second largest telecommunication network in the world in terms of number of wireless connections. In a competitive environment it is very difficult to retain as well as attract new customers to the network. Even the average revenue per unit (ARPU) of Airtel is decreasing as per TRAI which has become the matter of concern, affecting the margins. Thus, the present paper aims at reducing the operating expenditure, particularly energy cost of Bharti Airtel. After depth analysis of the costs, savings are taken out which the organization can have and with which they can increase their revenue.*

## INTRODUCTION

The Indian Telecommunication industry is the world's fastest growing industry with 826.93 million mobile phone subscribers as of April 2011. With the increasing competition in the Indian Telecom Industry, the market shares of the telecom players are at continuous threat from the rival companies.



**Figure: 1 Service provider wise market share as on 30.04.2011**

\*Source: TRAI Database

It is clear from the figure: 1 that market share of Bharti Airtel is 19.91% which is highest one.

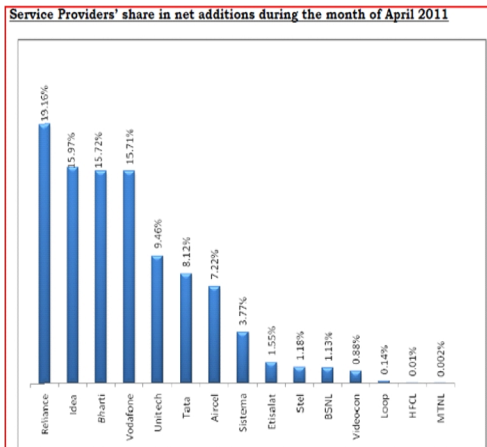
In such a competitive environment, the Government scheme of Mobile Number Portability (MNP) has added to the need for the telecom companies to constantly stay on watch. As per the data reported by the service providers, by the end of April 2011 about 85.41 lakh subscribers have submitted their requests to different service providers for porting their mobile number. With regard to customers entering or leaving a network, the following terms are defined in the telecom sector :

**Gross Adds:** Total additions into the network

**Churns:** Total customers leaving the network

### Net adds: Net Additions =Gross Adds-Churns

Hence these are important numbers to keep track of. The figure given below shows the percentage share of Net Adds in the sector, as per TRAI :



**Figure: 2 Service Providers' share in net additions during the month of April 2011**

In the above figure:2 the net additions of Bharti Airtel during the month of 2011 is 15.71percent which is less than Reliance and Idea which indicates that Bharti Airtel's churns are more than Reliance and Idea.

In an industry with very less service differentiation like the decreasing outgoing call rates, unlimited free incoming, free minutes of usage, free SMSs and the various competitive plans introduced by telecom companies to retain as well as attract new customers to the networks has become a very difficult task. As a result of this, the average revenue per unit (ARPU) is decreasing as per TRAI. OPEX is ongoing cost for running a product, business or system. OPEX efficiency refers

to a business goal which seeks to reduce inefficiencies and increase quality. By increasing the OPEX efficiency, the bottom-line of a company improves, improving the margin, hence maximizing the stakeholders' interests. The Margin Improvement for a company depends mainly on increasing revenue and decreasing operating expenditure.

### OBJECTIVE OF THE STUDY

The objective of the study is to evaluate the operating cost incurred by Bharti Airtel Limited in running of towers by Infratel Limited particularly in Haryana circle.

#### Sub-Objectives:

- To analyze the energy cost (Diesel and electricity) at 1667 sites of Infratel Limited.
- To analyze the reasons for increase in the energy cost.
- To determine the focus areas for cost reduction so that efficiency can be increased.

### Research Methodology

Exploratory Research is used which is aimed at identifying the reasons for increased Energy Cost of Telecommunication Sites of Infratel Limited in Haryana Circle. Secondary data is collected for 1667 sites by the interviewing the executives from Finance, Technical and SCM department. The observations are made on the basis of working of sites during period of six months i.e.October, 2010 to March, 2011.

**ASSUMPTIONS:** As Electrified Sites have access to electricity, they must run on electricity in order to increase efficiency and reduce the cost. Despite having electricity connection, these sites can not use electricity for 24 hours a day. There are various reasons for the same; few of which are power cuts, low voltage,

unhealthy disconnections, disputed site property etc. Hence, considering all these factors it is assumed that in order to gain cut off rate of its efficiency, a site can run on diesel for less than equal to 8 hours. This assumption defines the basis of further research and is made keeping power cuts and all such reasons in consideration.

**Table 1(a): Distribution of sites**

	Frequency	Percent	Cumulative Percent
Electrified	1657	99.40%	99.40%
Non Electrified	10	0.60%	100.00%
Total	1667	100.00%	100.00%

Table 1(a) depicts that 1657 are electrified and 10 are Non Electrified sites. The Electrified Sites constitutes to 99.4% while remaining 0.6% are Non Electrified.

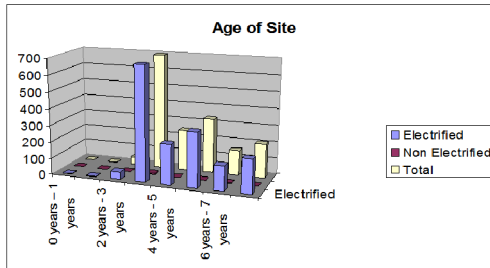
Electricity is a cheaper source of energy as compared to diesel. Using electricity as a source of energy, the generator can run for 'X' hours in Rs. 4.82 (approx); while

using diesel as a source of energy, the same generator will run in Rs. 36 (approx) giving same productivity. Hence it is beneficial for the company to run its sites on Electricity rather than on Diesel. Moreover as 99.4% of sites under study are electrified so they are assumed to run on Electricity rather than on Diesel.

**Table 1(b): AGE OF SITES (as on june 9, 2011)**

		EB Status		Total
		Electrified	Non Electrified	
Age of the Site as on 9 June'11	0 years – 1 years	1	0	1
	1 years - 2 years	1	0	1
	2 years - 3 years	46	0	46
	3 years - 4 years	688	8	696
	4 years - 5 years	245	0	245
	5 years - 6 years	330	0	330
	6 years - 7 years	151	1	152
	7 years - 8 years	205	1	206
	Total	1657	10	1667

above table shows distribution of sites in accordance to their age



**FIG. 3 Age of sites and their EB status.**

Of the 1667 sites, 10 sites are Non Electrified., 8 of which have an age of 3-4 years while 1 site is established 6-7 and one in 7-8 years category. According to company policies, it takes approximately 6 months for a site to be electrified, but it is found that Non Electrified sites have an age more than 3 years. These 10 are to be taken care of as their conversion would result in saving of energy cost.

## **Data Analysis and Interpretation**

### **(A) Analysis of Diesel Bills**

#### **Components of data under study**

The data of 1667 sites of Infratel Limited – Haryana Circle is analyzed with a view to minimise the diesel cost. The components of 1667 sites under study are:-

**AGE OF SITE** Age of a site is calculated by On Air Date. On Air Date is the date when site becomes operational and provides networking functions. The age of a site is calculated till June 2011 (in years).

**PIU HM START READING** The diesel running hours in a particular month are calculated with the help of PIU HM Meter. The PIU HM Start Reading is the closing reading of last month which is taken as

base for calculation purposes in the current month.

**PIU HM END READING** This meter reading at the end of month is referred to as PIU HM End Reading. The difference between PIU HM Start and PIU HM End Reading gives the number of hours site runs on diesel in a particular month.

**DG RUNNING HOURS** The number of hours, for which a site runs on diesel.

**PER DAY DIESEL RUNNING HOURS** Per day Diesel running hours is calculated by dividing DG Hours with Number of Days in a month.

Per day Diesel Running Hours= DG Running Hours/ Number of Days in a month

**DG CAPACITY** DG Capacity refers to the capacity of generator used at a site. The DG Set is normally of 7.5, 10, 15 and 25 KVA.

**DIESEL QUANTITY** It is the quantity of Diesel used in a particular month.

**TOTAL TENANTS** Setting up of Tower includes huge cost so to save the capital expenditure, a number of mobile service providers share the site. Tenancy refers to the number of operators sharing a particular site for networking purposes.

**EB STATUS** Sites are categorised into two according to EB Status – Electrified and Non Electrified. The sites having Electricity connection are Electrified Sites. These are run on Electricity, Diesel or Battery Banks.

Non Electrified Sites are the sites which do not have Electricity Connection. They can be Mobility Sites.

**CPH**: This a technical specification of the generators installed at a site. CPH stands for consumption per hour of diesel used in the generator.

**PER HOUR CONSUMPTION ON SITE**: According to the Master Service Agreement between Bharti Airtel Limited and Bharti Infratel Limited, the energy cost is estimated as following table.

**Table 1( c) : DG Set litres per hour consumption for the site**

No of operators at the site	DG Set litres per hour consumption for the site
1	2.1 litres
2	3.0 litres
3	3.9 litres
4	4.4 litres

The above table shows the per litre consumption of the site, depending upon the tenancy of the site. This is the ideal consumption of diesel per hour which will be used to find out if there are any discrepancies.

**CALCULATION OF IDEAL COST OF DIESEL**: This is found by using the following formula:

$$\text{per litre consumption on site} * \text{Rate per litre.}$$

**CALCULATION OF ACTUAL DIESEL COST PER HOUR**:

$$\text{Rate per litre} * \text{CPH}$$

**DIFFERENCE B/W ACTUAL AND IDEAL**: This is to find out, whether the expected and actual cost of diesel is within acceptable limits or not.

**TOTAL DIESEL COST**: This is taken from the bills given by the Network department.

**HOURS OF DIESEL USAGE**: This is found out by dividing the total diesel cost by actual diesel cost per hour.

The data for analysis has been taken from the bills of respective months, which were provided by the SCM Department. A snapshot of the same, for the month of January 2011 is shown in Annexure: 1

## TREND ANALYSIS

### Calculation of Monthly usage of diesel :

To perform a trend analysis, the hours of diesel usage is find out for all the 6 months, which gives the monthly usage of diesel at a site, and was observed for any discrepancy. The analysis has been carried out to find out any **unusual trend** in the consumption of diesel for six months. The minimum, maximum and average functions are used to find out discrepancies in an easier manner. The abnormal hours have been highlighted with yellow colour which is shown properly in Annexure:2

$$\text{* This has been calculated by dividing; total diesel cost actual diesel cost per hour}$$

## PER DAY RUNNING HOURS ANALYSIS

### Calculation of Per day running hours

To perform the per day running hours analysis, the total DG Running hours is divided by the number of days in the month. The per day running hours are found out for all the sites for the six months. The cells with no of hours more than 20 hours a day are highlighted with red colour which is shown in Annexure:3

An unobvious observation found out during this analysis was that in certain months, on certain sites per day running hours exceeded 24 hours, which clearly shows manipulated bills, were sent for processing. For such entries a credit note is provided to the company and the amount paid in excess is adjusted in the following months. Like the amount for 26 hours paid in Feb. will be adjusted in the month of April or May.

### METER READING CHECK

The meter reading check is used to confirm whether the opening reading of a month matches with the closing reading of the previous month. The observation is coded as:

0: The opening reading of this month matches with the closing reading of previous month.

1: The opening reading of this month does not match with the closing reading of previous month, which is shown in Annexure: 4

After this analysis, the reasons for the mismatch of readings were investigated and it came out to be due to the following reasons:

At certain sites - there was an installation of a new meter at the site

- the meter had turned faulty
- There was some diesel theft (.i.e. Tapping) leading to manipulated entries

## MAXIMUM CONSUMPTION ANALYSIS

The Maximum Consumption Analysis is an extreme case analysis. The maximum diesel consumption is a hypothetical situation as it assumes that the site runs on diesel for 24 hours a day, on all days of the month, which is a rare possibility in electrified sites. Hence, it is calculated by taking the product of CPH with 24 hrs a day multiplied with the no of days in the month. It is then compared with actual Bill Diesel Quantity used at that site.

The excess Diesel quantity is then calculated by taking the difference of Bill Diesel Quantity from the maximum Diesel Consumption.

### The observations during this analysis were as follows:

At a number of sites, there were negative numbers in the excess diesel column which was creeping due to a 0 CPH at certain sites. However, this is a flawed case because the CPH at a site can not be 0. However, at certain other sites, even with

a valid CPH value of the DG Set, there was a negative difference, which surely is a point of concern. The excess diesel quantity is highlighted with red colour and is clearly shown in Annexure: 5

Some sites were identified on which diesel running hours were more than 20 per day. Only those sites have been identified for which per day running hours of diesel were more than 20 hours, in at least four out of six months and this has been shown in Annexure: 6

After investigation, we found out that out of these 13 approximately, 8 sites used less electricity as they were in remote areas or there were a lot of voltage fluctuations due to which electricity could not be used as a major source of energy in these sites. Then the results were compared for electrified and non electrified sites and is shown in Annexure: 7

Similar analysis was done for all the five months being analysed. Though different number of sites were identified, every month, the factors of which were due to seasonality, weather changes, electricity cuts etc. On performing the various trend analyses, (as explained earlier) a total of 55 sites were found out, because of a consistency of unusually high usage.

## FINDINGS OF PART A

For non electrified sites, the sites where diesel running hours in a day are around 20+ hours, should be electrified. However, there are certain sites which are non electrified and still run for lesser no of hours

are the sites which operate for that no of hours only. However a matter of concern is the sites that are electrified and still run for around 20+ hours. The no of sites is 55, which should be checked.

Hence, after completing the site wise analysis, the results were compiled district wise and it is shown in Annexure: 8. Here, since the grand total was identified, so a district with higher number of sites would definitely have higher costs. So we divided the total cost with the number of sites, to see per unit cost of each district.

### **(A) Analysis of Electricity bills**

While dealing with the electricity bills, the cost of the bills had to be proportioned according to the number of days in the month, because a combined electricity bill comes for more than 1 month. These details were further used to allocate the cost of electricity to their months.

Hence, the bills were divided depending upon the number of days in the period for which the bill was received and the electricity cost were taken from electricity bills of the sites. A snapshot of bill is presented in Annexure: 9

In this screen shot, the column G depicts the **Period Check** which is the number of days for which the bill has been received. Then **Cost per Day** is calculated (column H) by employing following formula:

Total Bill of that period the number of days ( Period Check)

Total bill of each month for each site was obtained as shown in Annexure: 10. After allocating cost of electricity to their respective months, per day running hours of electricity were calculated the total bill of each month for each site was obtained as shown in Annexure 4.10

After allocating cost of electricity to their respective months, per day running hours of electricity were calculated with the help of total units of electricity used in a month.

The formula for calculating total units of electricity used in a month is as follows:

$\frac{\text{TOTAL COST}}{\text{PER UNIT COST (4.82)}}$
---

### **CALCULATION OF PER DAY RUNNING HOURS OF ELECTRICITY**

$\frac{\text{Total units of electricity used in a month}}{\text{Consumption per hour / no. of days in a month}}$
--

**Consumption per hour of electricity has already been fixed on the basis of tenancy**

Table 1(d): Bharti Airtel's units of Electricity used per hour.

No. of tenants	Total units of electricity used per hour	Bharti Airtel's Units of electricity
1	5.2	5.2
2	7.2	3.6
3	9.2	3.1
4	11.2	2.8
5	14.0	2.8
6	16.8	2.8

### Sum of bills for that month

Per hour EB units according to tenancy

### **CALCULATION OF MONTHLY UNITS OF EB CONSUMED PER MONTH FOR BHARTI AIRTEL LTD.**

#### **Formula:**

$\frac{\text{Sum of bills for that month}}{\text{Per hour EB units according to tenancy}}$
--

From the monthly units of EB consumed, per day running hours were calculated by dividing the monthly units of EB as calculated above, with the number of days in that month. A snapshot for the above calculation for the month of October is shown in Annexure: 11

Similar calculations were carried out for the months of November, December, January and February. The data for March was not available, as the Electricity Bill of March was not yet obtained.

### **CALCULATION OF THE TOTAL HOURS A SITE RUNS (DIESEL + ELECTRICITY)**

After these calculations, Diesel hours which were calculated earlier, were plotted in the sheet, so that the total hours of diesel plus electricity could be calculated.

The sites with hours greater than 24 hours for the sum of EB hours and diesel hours are highlighted with red colour and a snapshot of this is shown in Annexure :12

Further discussion was done with the Technical team to find out the reasons for these.

**INTERPRETATIONS:** 13 Sites using diesel for more than 21 hours per day require serious evaluations. Despite being Electrified Sites, they are running on electricity for less than 4 hours a day which should be ideally 16 hours per day. Further 76 sites are running on diesel for 13 – 21 hours per day. This constitutes to be a large number of sites, the usage of which when converted could result in saving of huge amount of operating expenditure in terms of diesel cost.

### **FOLLOW UP WITH THE TECHNICAL DEPARTMENT ABOUT FINDINGS OF BILL ANALYSIS**

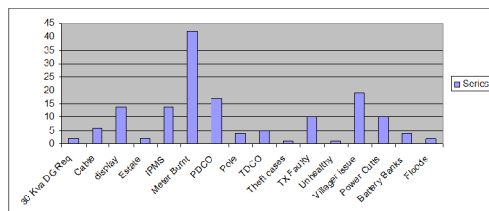
The remarks obtained from the Technical Department brought into light the following points :

1. **DISPLAY FAULTY:** Numerics of the display of metre are not clear.
2. **PDCO:** Permanent Disconnection
3. **TDCO:** Temporary Disconnection
4. **FIRST BILL ISSUE :** Bill comes after a year. So the amount is higher.
5. **30 kVA DG REQUIRED:** Backup insufficient, so it takes longer time to restart after electricity connection resumes. Also known as DG Automation fault.
6. **VILLAGER ISSUE:** Due to certain local issues, owner's dissatisfaction with the company officials, they may switch off the electricity connection to the tower.
7. **IPMS:** PIU equipment faulty. So IPMS may be used.
8. **CABLE:** Cable may fluctuate, due to which power connection may become loose. If the cable is shorter it has to be replaced, due to which diesel consumption increases.
9. **ESTATE:** Issues with the owner where the site is located.
10. **METER BURNT**
11. **POLE:** Pole is at an inappropriate place. Meters of towers are placed on poles.
12. **UNHEALTHY:** This is due to EB Fluctuation, when EB connectivity varies. Sites with lesser voltage available are known as unhealthy areas.
13. **RENTAL DG SET :** The generator set used by the company was acquired on rent. It was giving incorrect diesel utilisation quantity. The change of DG Set showed a decrease in diesel consumption along with per day diesel consumption hours.
14. **TAPPING CASES** Inflating the diesel consumption hours and stealing the diesel by site owner in order to earn money is known as Tapping. The cases showed tapping of diesel by the site owner with a view to earn money by selling stolen diesel. The 5 tapping cases were identified which lead to decrease in per day diesel consumption hours.
15. **BATTERY BANKS** Additional battery banks were maintained for the month of May at 30 sites in order to

avoid site running on diesel during electricity cuts. This lead to reduction in per day diesel running hours in May as compared to April.

16. **REPAIRS OF DG SET** 11 DG Sets were repaired with a view to give more productivity in the same amount of diesel. As a result diesel consumption reduced along with reduction in per day diesel consumption hours. The sites were used more on Electricity in May as compared to that in April. 22% of the sites showing decrease in per day diesel consumption hours were because of efficiency build up.
17. **POWER CUTTS :** Due to excessive power cuts in the area, dependency on diesel increases.
18. **FLOODS:** Due to floods, the towers could not be run on electricity.

Reason	No. of sites
30 Kva DG Req	2
Cable	6
Display	14
Estate	2
IPMS	14
Meter Burnt	42
PDCO	17
Pole	4
TDCO	5
Theft cases	1
TX Faulty	10
Unhealthy	1
Villager issue	19
Power Cutts	10
Battery Banks	4
Floods	2



**Fig. 4 Remarks given by technical department**

In the above figure the reasons for the high operating cost on different sites are shown and it is evident from the bar graph that large number of sites are having meter burnt i.e. 42 sites.

A snapshot of the remarks is shown in Annexure: 13

### SAVINGS EXPECTED BASED ON ANALYSIS

Although 55 sites showing 20+ hours per day diesel consumption is critical for the company as it is the major reason of augmenting Site Energy Cost in Haryana Circle, the sites with per day diesel consumption of more than or equal to 20 hours are evaluated

The Electrified Sites despite having electricity connection can't be run on Electricity because of few unavoidable factors such as power cuts, default in DG Set, owner issues etc. Hence, keeping all these factors in consideration, it is assumed that a particular site operates for maximum of 8 hours using electricity in order to attain comparatively greater efficiency. The site showing more than 8 hours per day diesel running signifies the requirement of further evaluations and scope of cost reduction.

## COMPONENTS OF DIESEL COST

Diesel cost of a site is computed on the basis of amount of Diesel Consumed, Rate of Diesel and Tenancy (number of mobile operators sharing a particular site). Hence the basic formula for computation of Diesel Cost is as bellow:

$$\text{Cost} = \frac{\text{Diesel Running Hours} \times \text{Consumption per Hour} \times \text{Diesel Rate}}{\text{Tenancy}}$$

e.g. if an electrified site runs on diesel for approx. 21 hours, considering two tenants on the site, the cost for a month will be

$$\text{Diesel Cost} = \frac{630 (\text{Diesel running hours}) \times 3 (\text{Consumption per hour}) \times 36 (\text{approx. Diesel rate})}{2 (\text{Tenancy})}$$

$$\text{DIESEL COST} = 34020$$

In order to gain the efficiency and minimize the energy cost, it is assumed that an electrified site runs on diesel for less than equal to 8 hours. This assumption is made taking all the unfavorable factors such as power cuts, low voltage, and unhealthy disconnections in consideration. Had this site been running using diesel for 8 hours per day, the cost would have been:

$$\text{Diesel Cost} = \frac{240 (\text{Diesel running hours}) \times 3 (\text{Consumption per hour}) \times 36 (\text{approx. Diesel rate})}{2 (\text{Tenancy})}$$

$$\text{DIESEL COST} = 12960$$

The cost saved in terms of Diesel by bringing down the diesel running hours to 8 per day from 21 per day will be **21060** (34020 – 12960).

Assumming CPH=3, diesel cost = Rs.36 per unit and tenancy =2, on all the sites, an estimate of cost is taken . The actual data could not be shown because of confidentiality reasons.

		CPH	3		
		Tenancy	2		
<b>HOURS</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>
<b>No of Sites</b>	<b>9</b>	<b>21</b>	<b>10</b>	<b>13</b>	<b>2</b>
<b>Total Cost</b>	9720	23814	11880	16146	2592
<b>Cost with 8 hours</b>	3888	9072	4320	5616	864
<b>Savings</b>	5832	14742	7560	10530	1728

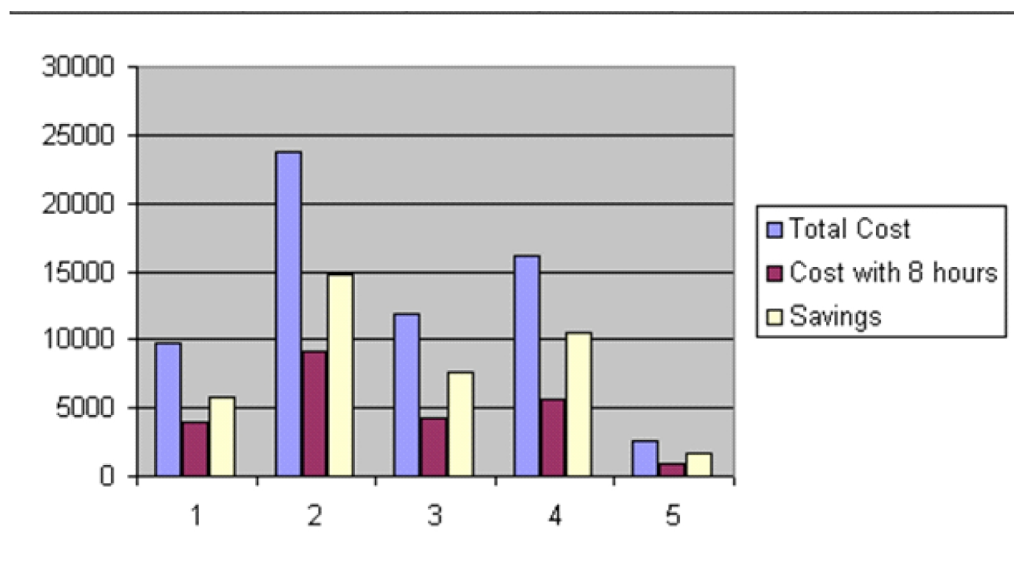


Fig.5 calculation of savings

Hence it is found that the total per day saving is Rs. 40392. Multiplied with the number of days in a month, a total savings of Rs. 12,52,152 can be achieved, thereby increasing bottom line.

### **RECOMMENDATIONS**

The various recommendations in order to gain efficiency in the system are:

#### **DIESEL RUNNING**

The Electrified sites constitutes major proportion of sites under study. The Electrified sites have electricity connection and hence the ability to run DG Set on electricity. Taking all the unavoidable circumstances viz power cuts, unhealthy disconnections, disputed property etc, it is recommended that **an electrified site should not run for more than 8 hours on Diesel** in order to gain least

possible rate of efficiency. It is suggested to keep a check on Diesel consumption in order to minimize the cost and gain efficiency. This can be done through:-

#### **TAPPING CASES**

The Tapping Cases must be reduced in order to minimise the cost. This can be done by:-

- a) **Surprise visits:** Surprise checks throws light on the real operational conditions on sites. This helps in checking the manipulations done by the site owner and fear of check leads to promotion of authenticity.
- b) **Legal actions:** The tapping cases can also be minimised by taking the legal actions and hence saving the cost of company.

## BATTERY BANKS

The power cuts is a major reason of increase in diesel consumption and hence, the energy cost of site. It is advised to maintain adequate amount of battery banks such that diesel running hours donot exceed 8 hours per day. This helps in savings of huge amount of OPEX.

## REPAIRS OF DG SET

Proper repair and maintenance of DG Set is required in order to gain the efficiency non fulfilment of which can lead to increased diesel consumption. Hence, it is recommended to make regular visits to the site for maintenance purposes.

## FOCUS ON USAGE OF SOLAR ENERGY

Huge energy savings is possible by use of Solar Diesel hybrid (65% savings) as compared to relatively less savings by use of biomass power (29% savings). Also there is a possible 40% reduction in site maintenance expenditure for the companies who install solar as compared to the use of diesel genset. With the use of batteries it is even possible to power the towers during the night and effective diesel usage hours can be reduced to as low as 8 hours per day. The newer telephone towers are being installed based on a new technology that will consume less power and also do away with the air conditioning so critical to the telephone towers. For the newer towers, where air conditioning is not a requisite, it makes more sense to use solar power, especially, where the EB electricity is not available for considerable duration.

## LIMITATIONS OF STUDY

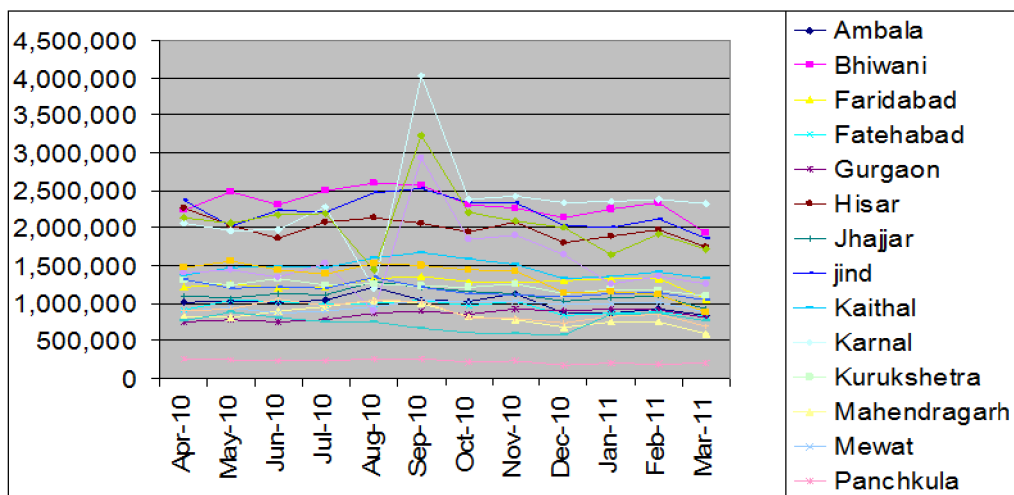
The data on which the project is made is sensitive from strategic point of view. Hence, we had to face delay in getting the required data. Some of the values taken in consideration are based on assumptions. They may not hold well in the real circumstances. But still efforts have been taken to take values nearest to the original values. Few concepts were unexplained within the organization. Few reasons of increase in cost were just assumed on the certain basis but were not tried and tested. The Energy cost constitutes of Diesel and Electricity Cost and the invoice of Diesel and Electricity is received by the company after one month of actually incurring the cost on site. The diesel cost of March was used for analysis purposes but the electricity bills for the month of March was not available. Hence, we could not perform the complete cost analysis of the sites for this month. This narrowed the scope of study and hence Diesel Cost is considered to be the energy cost for evaluation purposes.

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**Per Day Diesel Running Hour Of Electrified And Non Electrified Sites:**

District	Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11
Ambala	1,031,000	1,124,000	869,000	862,000	929,000	841,000
Bhiwani	2,305,000	2,267,000	2,129,000	2,252,000	2,333,000	1,936,000
Faridabad	1,279,000	1,265,000	1,295,000	1,328,000	1,330,000	1,048,000
Fatehabad	962,000	1,020,000	838,000	867,000	881,000	818,000
Gurgaon	857,000	918,000	893,000	916,000	909,000	814,000
Hisar	1,940,000	2,079,000	1,804,000	1,895,000	1,979,000	1,745,000
Jhajjar	1,151,000	1,125,000	1,027,000	1,069,000	1,091,000	920,000
jind	2,334,000	2,340,000	2,037,000	2,005,000	2,113,000	1,867,000
Kaithal	1,580,000	1,512,000	1,322,000	1,349,000	1,418,000	1,330,000
Karnal	2,378,000	2,423,000	2,335,000	2,349,000	2,382,000	2,326,000
Kurukshetra	1,213,000	1,261,000	1,126,000	1,186,000	1,168,000	1,090,000
Mahendragarh	827,000	777,000	681,000	755,000	749,000	598,000
Mewat	1,010,000	1,019,000	984,000	989,000	1,013,000	887,000
Panchkula	216,000	230,000	180,000	196,000	190,000	197,000
panipat	1,844,000	1,897,000	1,650,000	1,254,000	1,354,000	1,260,000
Rewari	810,000	793,000	732,000	823,000	851,000	696,000
Rohtak	1,122,000	1,117,000	1,075,000	1,118,000	1,140,000	1,037,000
Sirsa	602,000	598,000	582,000	848,000	864,000	758,000
Sonipat	2,211,000	2,098,000	2,003,000	1,639,000	1,921,000	1,716,000
Yamunanagar	1,438,000	1,430,000	1,139,000	1,154,000	1,113,000	886,000
Grand Total	27,111,000	27,292,000	24,702,000	24,852,000	25,728,000	22,770,000



## Challenge of Emotional labor in present day work scenario

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### **Abstract**

*Organizational success relies heavily upon the organizations' approach to attain competitive advantage. In this context the utility of the labour force comes into sharper focus. The architecture, reputation, innovation etc, ensure distinctive capabilities of the organization and within the framework of formulating a value-added mechanism, the roles of the individuals appear to be prominent. This is so because it is the individuals who, within the nested architectural relationships of the organization, facilitate value-added articulations. So, collective and coherent work behaviours of the individual employees within the content, context, work design and process of the work determine the extent of organizational success and to this end, thereby, emotional labor produces far-reaching impacts over the sustenance of the organizational success within the time frame. There is no denial to the fact that building block of organizational success is its manpower and the efficiency of the individuals under work-led organizational sequences are being pushed only by the way employees can add value to organization-wide activities. In fact, the problems of dissonance between felt and displayed emotions in terms of the job characteristics evoke various job related problems that revolve around mental health of the labor force, affecting altogether the organizational performance and success. Thus an endeavor is made here to depict conceptual and analytical issues relating to the phenomenon of emotional labour.*

**Key words :** Emotional labor, emotional dissonance, display rule, felt and displayed emotion

### **Introduction:**

Factors of cognitive and non-cognitive domains, within the structure of the personality, synchronize at a particular moment of time to produce behaviour. This is true for all types of behaviour, manifested by the individuals. Work

behaviour is no exception to this rule. It is the trend in the academic discourses to put extraordinary weightage to the inter-linked factors of the cognitive domain as the major stimulators of human behavior. Only motive as one of the non-cognitive factors has got prominence and is being coupled

to express behaviour but emotion and its role are kept aside meaningfully. [Curwen et. al; 2000; Grant et. al; 2004]

The reflection of negative image of emotion, thereby, has occupied a voluminous share in the literature of nineteenth and early part of the twentieth centuries, encompassing the business activities in general and management thought processes in particular. [Luthans, 1998; Morris, 1996; Schutte et. al, 1998]

The prevalence of this revelation has constituted, shaped, developed and designed varied numbers of management thought exercises within the ambit of time-propagation that operates around viewing organizations as the rational entities where individuals' work endeavors are to be more rational and less emotional. Indeed, all types of human societies under open system dynamics, irrespective of geographical dispersions, cater these general partitioned attitudes for emotion in different extent and do not allow any such socio-attitudinal enhancement for intellectual disasters. So to say, intellectual disasters are also common in the pages of history, as well. [Spencer & Spencer, 1993]

The familial nurture of this condition advocates the projection of more or less emotion scanned behavior in the name of rational behavior. Thus, social training aims towards reinforcing, positively, the intellectually driven behavior and negatively, the emotional one. [Mooney et. al; 2005]

Organizational dynamics, therefore, is perceived to push robot like programmed behavior and denounces the emotional human behavior with the notion that emotion negatively alters the work performance. However, there are a number of instances that talk about different stories altogether [Mayer et. al, 2000; Bliss2010)]. In fact, an intelligent person with emotional instability can in no way be effective in his/her performance, related to work.

### **A Reality of Emotion-led Behavior:**

Now-a-days, individuals, operating within the organizations in different role capacities, are nothing but information processors who, under the governance of interaction incited determinism of cognitive, non-cognitive and situations, opt to articulate behaviours which propagate in accordance to its acclaimed behavior norms. This is true for all types of jobs. Now, so far as perceived emotion is concerned it is really the feelings a person confronts due to his/her personality structure that dictates the evaluations of socio-cultural codes, acquired through socio-familial nurture, immediately, without any alignment towards organizational display codes of emotion, whatsoever. In fact, interdependence between cognition and emotion modifies all the time person's innate feelings in such a way that felt feelings (culture driven critical psychological state of feeling, bringing to mind the extent of conscious perception i.e., the strength of such feeling, known as

intensity) can be differentiated from impulses which are pure genetically embedded reactions [Sosik et. al, 1999]

Felt feeling, in all its probabilities, is being influenced by culture which is trans-generational in one hand and genetically tuned on the other. It, thereby, is concerned only with the real feeling a person confronts, immediately after receiving meaningful information from the time-linked situational pattern of the environment. Felt feeling at a particular time, thus, determines the intensity of perceived emotion. Nonetheless, varied personality structures, generating felt feelings, not only give shapes to the natures and degrees of their intensities but at the same time, these are not at all being shaped by organizational display rule.

On the other hand, expected feelings or emotions move around the ways and means of displaying individuals' emotions, well, within the content and context of organizational structure and process. Expected emotions cover a wide range of situation- dispersed average consensus feelings that are to be manifested, publicly, within the above framework of explicit and/or implicit norms as dictated by the organization.

Organization expects that under an identical situation average people consistently express pattern –ridden consensus feelings, irrespective of varied degrees of felt emotion. This, in other way, talks about the overt and/ or covert expression of a feeling imagery in the line

of organization –wide derived display rules of emotion (Goleman, 1998). The interpersonal interactions of the dyadic relationships [customer/consumers including the potential incumbent, peer, superior, subordinate, debtor, creditor, supplier, shareholder/ stockholder etc.] within the organization's operating conditions, thereby, uphold the need-based values of organization-specific display rules of emotion. In all their likelihoods, the average profiles of interactions are to be guided by the said rules. So the person is to express a pattern of organizationally acclaimed emotions or feelings over the passage of time by negating, consciously, the inner perceived feelings.

### **Emotional Dissonance & Emotional Labor:**

A number of sources in and out of the organization may add felt emotion but owing to the display rule, a person is, only, permitted to exhibit organization endorsed emotion. Technically, display rules of emotion are gradually gaining their momentum due to the challenges faced by the present day organizations with reference to mental health of the employees (Abraham, 1999; Singh, 2007; Schmisser, 2010). In fact, mental health is the essential requirement of work competencies linked to performances. So to say, human effectiveness and efficiency, to a large extent in the context of the job, are, operationally, meaningful if and only if mental health permits no unusual deviation

from the average standard of the working population, placed under ranking of the job families [Offermann, 2004].

In continuation, therefore, displayed emotions in the organization are, primarily, the overt enacted emotions [projected through the hybridization of both verbal and non verbal reactions in reality] which the person manifests, consciously, in consonance with the display rule. This, in fact, is the onset of emotional dissonance. This term refers to a condition where an employee articulates an emotion, consciously, in the job scenario which he or she does not feel in the inner self and is compelled to manipulate a behavior which he /she does not want at all [a number of jobs, both from product and/ or services, procreate, directly, very acute degrees of emotional dissonance]. Under emotional dissonance, a person operates with a critical psychological state of emotional feeling where he or she perceives a constant gap between felt and displayed emotion. Actually, manipulation of the felt emotion by opposite displayed emotion produces a psychological state of mind that experiences pressure due to the inability of the person to eliminate the real perspective of the operating conditions of the organization.

This differential perception in one hand and unwilling pursuance of overt and/ or covert behaviour, encompassing regular activity in the line of display rule of the organization on the other, generate moderate to high degrees of emotional labour with respect of time and innate mechanism of

personality [Rafaeli & Sutton, 1989; Caudron, 1999]. Particularly, it is interesting to note that emotional labour is too high when perceived and manipulated feelings are antagonistic in nature and the person for the purpose of carrying out the job uses to adhere with the organization-driven emotional behavior.

### **Levels of Emotional Labor: Role of Personality Attributes**

A few personality attributes like Machiavellianism, self-esteem, self-monitoring, risk taking etc., can give some logical explanation about the contribution of personality in yielding emotional dissonance and emotional labor. (Table 4.1)

Persons, with high Machiavellianism and high self-monitoring attributes, know to keep emotional distance always. Their interpersonal interactions are more cosmetic in nature that projects altogether very low emotional involvements. So they are the individuals who operate with high degrees of empathy whereby they exhibit the capability to handle others emotions. To this end, low self- esteem acts as catalyst to induce the manifested cosmetic behavior. To these persons, therefore, the occurrence of emotional dissonance is very low because of the presence of very negligible gap between felt and displayed emotions. On the other hand, there are the persons who operate with moderate to high degrees of self-esteem, low to moderate extents of mach-combinations along with conventional values to influence their respective decision making

processes. In all its likelihood, these people are more sensitive than the previous class who can't keep emotional distances with the others in their time-widen personal interactions. They are the individuals who manifest moderate to high degrees of emotional dissonance and concomitant emotional labor. In fact, different permutations and combinations of various degrees of these personality attributes within the said ranges yield differentiated extents of emotional labor with respect to time-linked interactions.

Actually, a person manifesting emotional dissonance is susceptible to emotional labour which arises out of the fact that the person is unable to eliminate emotional discord associated with perceptual gap between felt and displayed emotions.

Prolonged emotional labor insights problems of mental health, having far-reaching consequences upon physical, behavioral, social and professional competencies of the person concern. From the physical side a number of psycho-somatic disorders can crop. From the behavioral side irritation, depression, mild to high degrees of sleep disturbances, sentence repairing etc., may appear. Social competence of the individual is more influenced by emotional labour whereby the person expresses mal-adjustments, mild to high degrees of poor intra-family relationships, rigidity in behavioral interactions showing high degrees of inflexibility in personal interactions etc. So far as professional competencies are

concerned frequent forgetting, problems with the application of inductive and deductive logics, faulty verbal comprehensions along with choices of expressions, increase of the transaction-time of information etc. are the major dysfunctional factors.

All these produce negative impacts upon organizational dynamics. So, poor performance, employee dissatisfaction, turnover, poor customer relationship, ineffective time-management, absenteeism etc. are some of the many outcomes that are common features of the employees as a whole operating under prolonged moderate to high degrees of emotional labour.

### **Conclusion:**

Exploitation of incoming opportunity, very fast, is the basic ingredient of effective decision-making. An effective decision differs from ineffective one in the sense that opportunity cost in the first is lesser than the second. Here, emotional labour plays a significant role in determining the extent of opportunity cost. The person, now-a-days, can add a value to his/her work if he/she suffers less with emotional labor having low emotional dissonance. Preferably then, Level 1 person, having specific personality attributes, will be more suitable than Level 4 persons in so far as decisions and executions of these are concerned within the framework of value addition motive.

Minimization of emotional dissonance gradually gets organizational boost. In

other way, it is meaningful to the organizations in terms of faster decisions and executions whereby an individual with low emotional labor will be suitable to take quality decisions under time-driven executions. Interestingly, there are some jobs where females are more prominent than males. Jobs of airhostess, modeling, interior decoration, call centres, front desk executives, tele caller, retail sales etc., precisely, need the articulation of emotional intelligence that assures lesser degrees of emotional labour. These jobs, in reality, generate outcomes having negative consequences upon mental health of some of the female employees who suffer with the disorders of emotional labour.

In order to tackle the problem of emotional labour, the organizations, now-a-days, emphasize upon emotional intelligence [Copper, 1997]. While selecting employees, organizations, particularly, the service sector organizations emphasize upon some of the characteristics of the persons like self-awareness, self-management, self-motivation, empathy and social skills of the knowledgeable workforce.

Indeed, employee development programmes of these organizations are targeted mostly towards enhancing social skills of the persons, so that, managing the relationships between persons and customers are more positive. To this end, emotional contagion is a condition that is pronounced in employee development programmes with high strength because

employee contagion is a reciprocatory feeling that one may catch from others'. So organization, now-a-days, tries to evoke mechanism by which it can generate meaningfulness about the display rule and simultaneously makes the employee to understand about the gravity of emotional contamination in the light of minimizing emotional dissonance. [Robbins et. al, 2008]

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Levels of Emotional labor	DESCRIPTION
<b>Level 1:</b>  <b>[ Very Low Emotional Labor-High degrees of emotional distance &amp; very low emotional dissonance]</b>	<p>This level is manifested by the people who can keep high degrees of emotional distance in all practical purposes. The spike potential of the intensity of negative emotion is very low and it comes meaningfully in the conscious domain by putting it a little above the threshold value of the conscious potential. These persons operate more with the utilitarian value and put thrust upon the end results without giving emphasis on the means. Particularly, high Machiavellianism, low self-esteem, high self monitoring , and more or less calculated risk taking are the personality attributes that make a type of personality profile of the persons who are able to keep emotional distances with others. To them, it is the ends that can justify the means. Emotional labor is really insignificant and very occasional under exceptional circumstances.</p>
<b>Level 2:</b>  <b>[ Moderate Level of Emotional Labor-Moderate degrees of emotional distance &amp; moderate emotional dissonance]</b>	<p>This particular level is also expressed by the people who maintain moderate degrees of emotional distance in all their likelihoods of behaviour. The spike potential of negative emotion is low and thereby comes in a moderately meaningful way in the conscious domain. The intensity of the spike potential is such that it crosses moderately the conscious potential value of the person. A condition that results in producing the perception of cognitive dissonance. These persons can, simultaneously, use ego defense mechanisms, appropriate to their respective cognitions and thereby immediately are able to lower the values of the spike potential which in other way, gets very fast to drop the values of conscious potential. So these types of personalities never sustain their emotional dissonance for a pretty long time and thereby indulge them with very low level of emotional labor. High- Machiavellianism, moderate self-esteem, moderate self-monitoring with moderate degrees of social values essentially are the characteristics of this type of person.</p>
<b>Level 3</b> <b>[High Emotional Labor-Low degrees of emotional distance &amp; high degrees of emotional dissonance]</b>	<p>These people , on the other hand, are incapable to keep emotional distances and put stresses upon the means to achieve the ends. Moderate degrees of Machiavellianism - attribute, moderate self- monitoring attribute, moderate self -esteem attribute and low/high risk taking often constitute a type of personality who often comes under this category. Persons ,within this class, are hard to minimize the conscious presences of the emotional dissonance because values of the spike potential of emotion, most of the time, cross the threshold value of the conscious potential. This is a condition that develops and governs a state of mind whereby these people are sensitive and more vulnerable to emotional labor. They are susceptible because even after opting to ego defense –mechanism they take a long time to eliminate the emotional discords between felt and displayed emotions.</p>
<b>Level4</b>  <b>[Very High Emotional Labor Very low degrees of emotional distance &amp; very high degrees of emotional dissonance]</b>	<p>These people ,usually, can't keep emotional distances and all the time put stresses upon the means to achieve the ends. Persons with high mach attribute, extremely low self- monitoring attribute, low self-esteem attribute and low/high risk taking propensity often form a kind of personality that comes under this class. So to say, persons into this class never able to minimize the conscious presences of the emotional dissonance because values of the spike potential of emotion ,readily, cross the threshold value of the conscious potential, producing a state of mind that shapes the personality with high sensitivity in one hand and on the other indulges it with more openness to emotional labor. In fact, these people can't get rid of the emotional discords, arising from the gap between felt and displayed emotion.</p>

**Table 4.1: Levels showing Emotional Labor linking personality attributes.**



# A STUDY ON THE PERFORMANCE EVALUATION OF MUTUAL FUNDS IN INDIA (EQUITY, INCOME AND GILT FUNDS)

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## Abstract

*In the past few years Mutual Fund has emerged as an effective tool for ensuring one's financial well being. Mutual Funds have not only contributed to India's growth story but have also helped the individual investor tap into the success of the Indian Industry. In this study, three categories were chosen such as Equity, Income and Gilt Funds. Four mutual fund schemes from each category were selected for evaluating their performance during the period 2006-2009. The analysis of the study includes various performance measures and statistical tools. Also a rank correlation was used to figure out the interdependence between the funds. Suggestions given in the end will help the investors to sort out the errors committed by them in making investment decisions.*

## Introduction

Today, an investor is provided with a huge volume of investment avenues. An investor can opt for bank deposits, corporate debentures and bonds where there is low risk and low return. Or he can choose stock market investment option where the risk is high and the return is proportionately high. The recent trends in the stock market have shown that the average investor always lost with

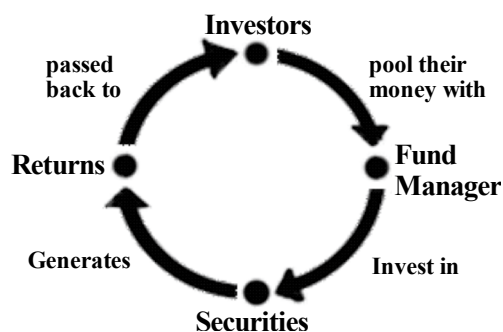
periodic bearish trends. So, the investors highly depend on the portfolio managers who are expertise in stock market. These portfolio managers would invest in securities on behalf of the investors. Thus, many financial institutions started providing wealth management services. However, they proved too expensive for a small investor. These investors have found a good shelter with the mutual funds.

The past decade has seen a tremendous change in the mutual fund industry, with multinational companies coming into the country, bringing in their professional expertise in managing funds worldwide. In the past few months there has been a consolidation phase going on in the mutual fund industry in India. Now investors are provided with a wide range of Schemes depending on their individual profiles. This study gives an overview of mutual funds by analyzing a few prominent mutual funds schemes.

### Concept

A mutual fund is an open-ended investment company. They are called open-ended because the number of shares continually changes as investors change or redeem shares. The price for purchase or redemption is based on the most recent Net Asset Value (NAV) of the shares which is usually computed daily. A mutual fund pools the money of many or some investors to invest them in a variety of securities. Investments may be in stocks, bonds, short-term money market instruments or some combination of these. The securities are professionally managed on behalf of the investors, and each investor holds a pro rate share of the portfolio and is entitled to any profit/loss when the securities are sold. For the individual investor, mutual funds provide the benefits of professional investment management, diversification, low cost, convenience, flexibility and liquidity. The process of investment can be described by the following figure.

### Investment Process in Mutual Funds



The major types of the mutual funds are Equity Funds, Bond Funds, and Money Market Funds, Hedge Funds and Hybrid Funds. Since the fund managers are professional and have the capability of diversifying the risk of the assets many investors started investing in mutual funds market. This is the reason for the increasing number of funds each year. But before investing the investor should have a clear picture of the objectives of the fund in which the investment is made. An investor should first understand that the investment in a mutual fund has the risk potential and it follows the basic principle, which says: High return - High risk and Low return - Low risk. Performance analysis of mutual funds is a solution for the competition among this financial intermediary. It helps the investors to have an idea about the qualities of the financial managers who use active investment strategies. Hence, over the past years many academics spend so much time in evaluating the mutual funds and also proposing so many portfolio performance measures.

### Need for the Study

The main factors which decide the avenue of investment of an individual are return, safety and flexibility of operation. As far as India is concerned, Gold and Bank deposits have been the major avenues of investment. In the recent times Real estate has also become a major area of investment. But mutual funds have the capability of providing good returns specific to the risk perception of the investor. With a large number of banks and financial institutions providing mutual fund services, these investments have become more accessible and flexible. But the concept of investing in mutual funds is new as far as Indians are concerned. Yet, high returns, safe play, flexibility of investment and operation in mutual funds has attracted the investors. Hence, this study has been made to help the investors by providing a comparison of performance of different types of mutual funds.

### Objectives of the Study

To evaluate performance of selected mutual fund schemes under equity diversified income and gilt funds on the basis of risk-return relationship. To find out the best mutual fund using various performance measures like Sharpe, Treynor, correlation, Beta, etc. To analyze the relationship between the different ratios. To analyze the fund management process of mutual funds and to suggest ways for selecting particular scheme for investment purpose.

### Theoretical Framework

**M. Jayadev** (1996) evaluated the performance of two growth oriented mutual funds (Mastergain and Magnum Express) on the basis of monthly returns compared to benchmark returns. Risk adjusted performance measures suggested by Jensen, Treynor and Sharpe were employed. It was found that, the two growth oriented funds have not performed better in terms of total risk and the funds are not offering advantages of diversification and professionalism to the investors. **Arnold L. Redman, N.S. Gullett and Herman Manakyan** (2000) examined the risk-adjusted returns using Sharpe's, Treynor's, and Jensen's indices for five portfolios of international mutual funds and for three time periods: 1985-1994, 1985-1989, and 1990-1994. The benchmarks for comparison were the U. S. market proxy by the Vanguard Index 500 mutual fund and a portfolio of funds that invest solely in U. S. stocks. The results showed that for 1985 through 1994 the portfolios of International mutual funds outperformed the U. S. market and the portfolio of U. S. mutual funds under Sharpe's and Treynor's indices. During 1985-1989, the International Fund Portfolio outperformed both the U. S. market and the domestic fund portfolio, while the portfolio of Pacific Rim funds outperformed both benchmark portfolios. **Michael C. Jensen** (2002) introduced a risk adjusted measure of portfolio performance that estimates how much a manager's forecasting ability contributes

to the funds-return. The measure was based on the Theory of the Pricing of Capital assets by Sharpe (1964) Lintner (1965) and Treynor. **Timotej Jagric, Boris Podobnik, Sebastjan, Strasek, and Vita Jagric** (2007) studied the mutual fund industry and apply various tests to evaluate the performance capacity of mutual funds. They used performance measure to evaluate funds and also they rank them according to the results. **J.Cai, KC Chan and T.Yamada** (2002) analyzed the performance of Japanese open-type stock mutual funds for the 1981-1992 period. **David Blake**, Birbeck College (2003) reviewed the extensive empirical literature on mutual fund performance and also conducted an empirical analysis of the performance of a large sample of UK unit trusts. **S.P. Kothari, Jerold B, Warner** (2005) indicates standard modal fund performance measures, using simulated funds whose characteristics mimic actual funds. **Gerasimos G. Rompotis** (2008) examined the performance and expenses of Greek mutual funds during the period from 2002 to 2005 using an extensive sample of equity, bond, balanced and money markets funds. The results indicated that the expenses negatively affect performance. The results also demonstrated strong economies of scale for expenses, a negative relationship between expense ratio and assets managed by the funds families while the category of funds impacts positively the level of expenses charged on investors.

**Bruce A. Costa, Keith Jakob** (2009) introduced a new methodology to eliminate problems with the four-factor model. Alphas for a relevant benchmark index and 211 Large Capitalization and Growth Funds were calculated. The results reveal whether the manager has truly outperformed the index and whether the portfolio management strategy has significantly deviated from the benchmark's asset allocation. **Dr. Zakri Y. Bello** (2009) investigated the performance of five categories of U.S. domestic equity mutual funds during the recessions of 1990 and 2001 and during the 12 months following each recession. The study shows that recessions identified by the National Bureau of Economic Research (NBER) are not all the same with regard to their impact on the behavior of common stock prices, and that investment strategies based on a fixed rule of thumb are likely to lead to disastrous outcomes. **Denis O. Boudreaux, S. P. Uma Rao, Dan Ward, Suzanne Ward** (2007) examined the annual risk-adjusted returns using Sharpe's Index for ten portfolios of international mutual funds for the period September 2000 through September 2006. The international funds were analyzed by combining the funds into individual portfolios based on sector, geographics and company size. The benchmarks for comparison were the U.S. mutual fund performance reported by MorningStar. The risk-adjusted returns were then determined and compared to each other and to the U.S. market. During

this period, nine out of ten of the International mutual fund portfolios outperformed the U.S. market.

### Methodology

Descriptive research – longitudinal study is used in this research paper. The top performing equity, income & gilt funds are selected subject to the availability of NAV prices for the period 2006-2009. After the fundamental screening, a total of 12 funds, 4 each in equity, income & gilt funds are chosen. The study has used the sample size consisting of 4 Equity diversified schemes, 4 income fund schemes and 4 gilt funds schemes chosen from 10 different Asset Management Companies. The schemes were selected using the purposive sampling. The choice of sample was largely based on the availability of the necessary data. Basically, this study is all about the evaluation of the performance of various mutual funds and the data can be got only from websites, journals, books, newspapers etc. Hence the research pertains to collection of secondary data.

### Period of the study:

The study was carried out for a period of five years from 1<sup>st</sup> April 2006 to 31<sup>st</sup> March 2009.

### Tools Used for Analysis:

**Return:** Profit on Capital Investment or security. It is expressed as follows:

$$R_i = \frac{NAV_t - NAV_{t-1}}{NAV_{t-1}} \times 100$$

Where  $R_i$  is the difference between net asset values for two consecutive days divided by the NAV of preceding day.

**Risk:** Classification of risk for portfolio is systematic or unsystematic risk. Systematic risk is market-related or non-diversifiable. Unsystematic risk is one that is unique to given particular mutual fund portfolio and is diversifiable.

**Standard deviation:** It is a statistic to measure the variation in individual returns from the average expected return over a certain period of time.

$$\sigma_i = [\sum (R_i - R)^2 / n]^{1/2}$$

**Beta :** Beta is the slope of the characteristic regression line. Beta describes the relationship between the stock's return and the index returns.

$$\beta = \frac{N\sum XY - (\sum X)(\sum Y)}{N\sum X^2 - (\sum X)^2}$$

**Sharpe Performance Index:** The Sharpe's performance index gives a single value to be used for the performance ranking of various funds.

$$S = \frac{R_i - R_f}{\sigma_i}$$

**Treynor Performance Index:** The fund's performance is measured in relation to the market performance.

$$T = \frac{R_i - R_f}{\beta_i}$$

**Jensens Performance Index:** The standard is based on the manager's predictive ability.

$$J_P = R_P - R_F = \alpha + \beta (R_M - R_F)$$

**Fama's Performance Index:** The Fama's measure of net selectivity reflects the difference between the return earned

on the funds and the return posited by the capital market line

$$F_P = (R_P - R_F) - (R_M - R_F)(\sigma_p / \sigma_m)$$

## ANALYSIS & DISCUSSION:0

## PERFORMANCE MEASURES OF EQUITY – DIVERSIFIED FUNDS

**Table No: 1.1 Performance Measures of Dspbr Equity Fund and Sundaram Bnp Paribas – Regular**

Equity Fund	DSPBR				SUNDARAM BNP PARIBAS			
	2006	2007	2008	2009	2006	2007	2008	2009
Annual return	57.9038	40.5014	-75.7232	61.8973	49.5297	51.1999	-81.4976	80.6657
Market return	32.5719	55.2288	-52.9406	68.4030	32.5719	55.2288	-52.9406	68.4030
Covariance	27.4140	46.0540	121.3864	106.2218	16.3207	38.3214	140.6053	173.7719
SDY	8.4128	7.8244	12.7356	8.5366	5.9207	6.3043	12.0652	13.8811
SDX	7.9650	8.0227	15.4362	14.7443	7.9650	8.0227	15.4362	14.7443
Beta	0.4091	0.7337	0.6175	0.8439	0.3461	0.7577	0.7550	0.8490
Correlation	0.4463	0.8004	0.6736	0.9207	0.3775	0.8266	0.8236	0.9262
Monthly average return	4.8253	3.3751	-6.3103	5.1581	4.1275	4.2667	-6.7915	6.7221
Average Market return	2.7143	4.6024	-4.4117	5.7002	2.7143	4.6024	-4.4117	5.7002
RFR	0.4033	0.3717	0.1150	0.0117	0.4033	0.3717	0.1150	0.0117
Sharpe ratio	0.5256	0.3839	-0.5045	0.6029	0.6290	0.6178	-0.5724	0.4834
Treynor Ratio	10.8085	4.0937	-10.4059	6.0982	10.7608	5.1407	-9.1481	7.9035
Alpha	3.5458	-0.2175	-3.8584	2.1197	3.3657	1.2773	-3.9515	1.7515
Fama	1.9811	-1.1227	-2.6905	1.8529	2.0063	0.5704	-3.3683	1.3549
Jensens alpha	4.4912	2.8865	-6.6535	6.9205	4.1655	4.4829	-7.3690	6.5814
R Square	0.1992	0.6406	0.4537	0.8476	0.1425	0.6832	0.6783	0.8579
Tracking Error	17.7593	-9.6028	-24.1790	-4.6279	8.3669	-2.1166	-28.7121	14.1851
Information Ratio	0.1189	0.1278	0.0785	0.1171	0.1689	0.1586	0.0829	0.0720

In the year 2006, the DSPBR diversified fund had a return of 57.9% decreased to 40.5% in 2007 and further decreased in the year 2008 because of the recession. The Beta value for 2006 is 0.4, 0.7 for 2007, 0.6 for 2008 and 0.8 for 2009, this shows the volatility in the risk-return relationship. In the years 2007, 2008 and 2009 the correlation has increased, which

means the fund return goes almost hand in hand with the market return. The Sharpe, Treynor, Fama and Jensons are the highest for the year 2006. So, the risk adjusted performance is good in 2006. Since the tracking error is very low that is negative it gave a higher information ratio, which shows the better performance of the mutual fund.

For sundaram BNP Paribas, in 2006, the return was 49.53%, in 2007 it slightly went up to 51.2% and drastically declined in the year 2008 to -81.5% due to the fall in the stock market. The year 2009 showed a recovery with 80.67%. The Sharpe ratio for the year 2006 and 2007 are almost same and this indicates that the fund was performing well. The Treynor's ratio is the highest in the year 2006, indicating the best performance in

that particular year. Fama measure for the years 2006 and 2007 indicates that the fund earned higher returns than expected and lies above the Capital Market Line, whereas a negative value in 2008 indicates that the fund earned less than expected and is in that case below the Line. A positive value of Jensen's measure over the years 2006, 2007 and 2009 indicates that the fund has gained in the years.

**Table No 1.2 Performance Measures of Reliance and Birla Sunlife Frontline Growth**

Equity Fund	RELIANCE				BIRLA SUNLIFE FRONTLINE			
	2006	2007	2008	2009	2006	2007	2008	2009
Annual return	36.9804	58.0564	-71.7785	75.5843	41.6773	51.0476	-58.6301	68.2629
Market return	32.5719	55.2288	-52.9406	68.4030	32.5719	55.2288	-52.9406	68.4030
Covariance	31.9675	38.3989	128.0469	126.5922	24.5310	35.9854	135.5923	117.0477
SDY	7.0998	6.2396	10.7517	9.9700	5.0020	5.5390	11.5258	9.0898
SDX	7.9650	8.0227	15.4362	14.7443	7.9650	8.0227	15.4362	14.7443
Beta	0.5653	0.7671	0.7715	0.8612	0.6157	0.8098	0.7621	0.8733
Correlation	0.6167	0.8368	0.8417	0.9395	0.6717	0.8834	0.8314	0.9527
Monthly average return	3.0817	4.8380	-5.9815	6.2987	3.4731	4.2540	-4.8858	5.6886
Average Market return	2.7143	4.6024	-4.4117	5.7002	2.7143	4.6024	-4.4117	5.7002
RFR	0.4033	0.3717	0.1150	0.0117	0.4033	0.3717	0.1150	0.0117
Sharpe ratio	0.3772	0.7158	-0.5670	0.6306	0.6137	0.7009	-0.4339	0.6245
Treynor Ratio	4.7379	5.8225	-7.9019	7.3006	4.9856	4.7942	-6.5617	6.5002
Alpha	1.5896	1.8426	-3.3952	2.6776	2.3281	1.4468	-2.1471	2.3405
Fama	0.6184	1.1759	-2.9436	2.4404	1.6185	0.9613	-1.6209	2.1699
Jensons alpha	2.8960	5.0880	-6.8877	7.5764	3.7511	4.8728	-5.5970	7.3086
R Square	0.3803	0.7003	0.7084	0.8826	0.4512	0.7804	0.6912	0.9077
TE	2.6082	1.4702	-16.8781	5.9665	3.7954	-1.9301	-5.4645	-0.1061
IR	0.1408	0.1603	0.0930	0.1003	0.1999	0.1805	0.0868	0.1100

The annual return of Reliance growth is higher than the market return for all the years. Reliance growth has promised its investors a good return throughout the

years. There is a high correlation between the annual return and the market return. The Sharpe ratio (0.72) for the year 2007 was the highest which shows a best

performance in that year. Treynor ratio was high during the year 2006 (7.3). It declined in 2008 to a greater extent indicating a high systematic risk. Jensen's ratio is higher for the year 2009, which indicates that the fund has performed well in this year. The information ratio expresses how effectively a fund generates active return relative to the amount of risk taken.

The annual return of Birla Sun Life for the year 2006 is 41.68% and there was a slight decline in the year 2007 and again declined in the year 2008, giving a negative return to the investors. In the year 2009, the annual return managed to reach 68.26%.

Due to the decrease in the return in the year 2008, the standard deviation increased to 2.51%, and when the return went up in the year 2009, it decreased to 1.9%. The Sharpe ratio is highest for the year 2007, this shows that the return per unit of risk has increased and this year has the best risk adjusted performance. Jensen's and Fama measure is high only for the year 2009. In the year 2008, all the ratios went to negative which indicates that the return earned in the portfolio is less than the expected return.

## PERFORMANCE MEASURES OF INCOME FUNDS

**Table No 1.3 Performance Measures of Birla Sunlife and Reliance Monthly Income Plan**

Income Fund	BIRLA MIP				RELIANCE MIP			
	2006	2007	2008	2009	2006	2007	2008	2009
Annual return	9.2320	14.9917	-3.9214	14.5521	13.8336	8.0511	9.3680	19.2094
Market return	32.5719	55.2288	-52.9406	68.4030	32.5719	55.2288	-52.9406	68.4030
Covariance	6.2731	7.7532	32.3999	12.4971	6.2513	7.9389	38.2725	24.4022
SDY	1.0015	1.5029	3.1502	1.6987	1.3119	1.5488	4.1788	2.8679
SDX	7.9650	8.0227	15.4362	14.7443	7.9650	8.0227	15.4362	14.7443
Beta	0.7864	0.6430	0.6663	0.4990	0.5983	0.6389	0.5933	0.5771
Correlation	0.8579	0.7015	0.7269	0.5443	0.6526	0.6970	0.6473	0.6295
Monthly average return	0.7693	1.2493	-0.3268	1.2127	1.1528	0.6709	0.7807	1.6008
Average Market return	2.7143	4.6024	-4.4117	5.7002	2.7143	4.6024	-4.4117	5.7002
RFR	0.4033	0.3717	0.1150	0.0117	0.4033	0.3717	0.1150	0.0117
Sharpe ratio	0.3654	0.5840	-0.1402	0.7070	0.5713	0.1932	0.1593	0.5541
Treynor Ratio	0.4654	1.3648	-0.6630	2.4070	1.2527	0.4684	1.1219	2.7537
Alpha	0.4765	0.6445	0.3276	0.8552	0.8610	0.0516	1.5537	0.9028
Fama	0.0754	0.0851	0.4820	0.5456	0.3688	-0.5175	1.8911	0.4826
Jensons alpha	2.2938	3.3650	-2.6885	3.6936	2.2436	2.7547	-1.1321	4.1855
R Square	0.7359	0.4921	0.5283	0.2963	0.4259	0.4858	0.4190	0.3963
TE	-1.9480	-5.0394	12.8684	-7.6231	-2.0486	-6.0891	21.6979	-11.7570
IR	0.9985	0.6654	0.3174	0.5887	0.7623	0.6457	0.2393	0.3487

The annual return of the Birla MIP fund is less than the market returns for all the return because it is an income fund. In 2008 the fund gave a negative return due to the

drastic change in the economy throughout the world. The beta value is lower because this is a low return investment and hence the systematic risk is also lower. Since the

tracking error is lower for all the years, the information ratio is higher. The higher the information ratio the better is the performance of mutual funds. The Sharpe ratio is an excess return earned over risk free return per unit of risk involved i.e., per unit of standard deviation. Negative value in the year 2008 shows poor performance of the fund. Sharpe, Treynor, Jenson's and Fama ratios are highest for the year 2009, indicating that the fund has outperformed the market index.

The annual return of Reliance MIP for the years 2006, 2007 and 2009 are lower than the market return. The year 2008 showed a massive recession and the market return

was -52.94% but Reliance showed a positive return of 9.37%. The information ratio of the funds shows that the performance of the funds is better. The beta value shows that the fund undergoes a consistent amount of risk over the time period. The Sharpe ratio was the highest for the year 2006. Treynor's and Jenson's were higher for the year 2009. Fama ratio indicates a higher value for the year 2008, since it is an income fund it shows better return even when the market shows negative values. Jenson's measure is negative for the year 2008, it indicates that the fund has not performed well during the year 2008.

**Table No 1.4 Performance Measures of Lic Mf Floater and Canara Robeco Monthly Income Plan**

Income Fund	LIC MIP				CANARA ROBECCO MIP			
	2006	2007	2008	2009	2006	2007	2008	2009
Annual return	11.7393	18.0697	-3.5470	14.5245	18.8049	19.3684	-12.1515	24.9820
Market return	32.5719	55.2288	-52.9406	68.4030	32.5719	55.2288	-52.9406	68.4030
Covariance	6.6646	9.3313	29.5186	19.1726	10.2791	10.5542	33.0355	19.5682
SDY	1.6796	1.4315	2.3522	1.6065	2.1081	1.8927	2.8922	2.9682
SDX	7.9650	8.0227	15.4362	14.7443	7.9650	8.0227	15.4362	14.7443
Beta	0.4982	0.8125	0.8130	0.8094	0.6122	0.6951	0.7400	0.4471
Correlation	0.5435	0.8864	0.8869	0.8830	0.6678	0.7582	0.8072	0.4878
Monthly average return	1.0162	1.5058	-0.2956	1.2104	1.5671	1.6140	-1.0126	2.0818
Average Market return	2.7143	4.6024	-4.4117	5.7002	2.7143	4.6024	-4.4117	5.7002
RFR	0.4033	0.3717	0.1150	0.0117	0.4033	0.3717	0.1150	0.0117
Sharpe ratio	0.3649	0.7923	-0.1745	0.7461	0.5520	0.6564	-0.3899	0.6975
Treynor Ratio	1.2303	1.3958	-0.5050	1.4810	1.9010	1.7874	-1.5239	4.6298
Alpha	0.7052	0.7779	0.3006	0.6619	1.0873	0.7907	-0.3454	1.5221
Fama	0.1256	0.3793	0.2792	0.5789	0.5521	0.2442	-0.2795	0.9250
Jenson's alpha	1.8565	4.2155	-3.3795	5.2663	2.5021	3.7313	-3.6949	4.0657
R Square	0.2954	0.7857	0.7866	0.7797	0.4460	0.5749	0.6516	0.2379
TE	-2.8521	-4.4327	9.6822	-7.2131	-2.4185	-5.6561	9.8310	-10.7400
IR	0.5954	0.6986	0.4251	0.6225	0.4744	0.5283	0.3458	0.3369

The annual return of LIC MIP is much lower than the market return from the year 2006-2009. The annual return for the year 2007 was 18.1% which was better when compared to the other years. The

information ratio shows that the fund has performed better in the year 2007 with a ratio of 0.7 when compared to 2007, 2008 and 2009. Even though the funds earn a return much lesser than the market return,

the fund was affected less in the year 2008, when the stock market faced a crash. The fund return per unit of risk expressed by Sharpe ratio shows that return per unit risk has increased in 2007, Fama and Jenson's were also better for the year 2007.

The annual return of the Canara Robeco fund is lower than the market return for all the years. The beta value is low for all the years anticipating a low return from the funds. The information ratio for 2007 is

higher compared to the other years. The Sharpe ratio shows that the Canara Robeco return per unit of risk is highest for the year 2009. In the year 2008, it is negative which indicates that the return earned on the portfolio is less than the expected return. The Jenson's and Fama is also negative for the year 2008, indicating that the fund has not performed well in the year 2008.

## PERFORMANCE MEASURES OF GILT FUNDS

**Table No 1.5 Performance Measures of Kotak Gilt and Baroda Pioneer Gilt – Trust and Dividend Plan**

Gilt Fund	Kotak Gilt				BARODA PIONEER			
	2006	2007	2008	2009	2006	2007	2008	2009
Annual return	0.7379	1.8676	13.7291	-13.2500	4.7310	3.8132	4.2441	0.7184
Market return	32.5719	55.2288	-52.9406	68.4030	32.5719	55.2288	-52.9406	68.4030
Covariance	2.0063	-0.3310	18.2779	15.3183	0.1497	0.7581	0.3456	-0.3968
SDY	1.0858	0.9221	3.7810	2.9256	0.4231	0.7303	0.1581	0.0543
SDX	7.9650	8.0227	15.4362	14.7443	7.9650	8.0227	15.4362	14.7443
Beta	0.2320	-0.0447	0.3132	0.3551	0.0444	0.1294	0.1417	-0.4956
Correlation	0.2531	-0.0488	0.3416	0.3874	0.0485	0.1412	0.1545	-0.5406
Monthly average return	0.0615	0.1556	1.1441	-1.0937	0.3942	0.3178	0.3537	0.0599
Average Market return	2.7143	4.6024	-4.4117	5.7002	2.7143	4.6024	-4.4117	5.7002
RFR	0.4033	0.3717	0.1150	0.0117	0.4033	0.3717	0.1150	0.0117
Sharpe ratio	-0.3148	-0.2343	0.2722	-0.3778	-0.0215	-0.0738	1.5101	0.8875
Treynor Ratio	-1.4736	4.8278	3.2860	-3.1128	-0.2045	-0.4165	1.6849	-0.0973
Alpha	-0.0322	0.1815	1.5133	-1.5319	0.3873	0.2586	0.3607	0.0712
Fama	-0.6569	-0.7023	2.1379	-2.2342	-0.1319	-0.4390	0.2850	0.0272
Jenson's alpha	0.5039	-0.0079	0.0956	0.4882	0.4899	0.8061	1.2806	-2.7478
R Square	0.0640	0.0024	0.1167	0.1501	0.0023	0.0199	0.0239	0.2923
TE	-2.8805	-4.1003	21.0064	-19.8764	-0.9817	-3.1290	0.7532	-0.3063
IR	0.9210	1.0845	0.2645	0.3418	2.3633	1.3693	6.3270	18.4142

The annual return of Kotak Gilt is very much less when compared to the market return, because these are investment made in the government securities. The return from these securities is low because the risk is low. The return for the year 2008 is 13.73% which is higher than the market return. The returns are always consistent.

The Sharpe ratio shows that the Kotak Gilt fund return per unit of risk is positive only for 2008. In the years 2006, 2007 and 2009, it is negative which indicates that the return earned on the portfolio is less than the expected return. The Treynor is also positive only for 2008 indicating less systematic risk. The Fama measure is also

positive only for the year 2008. Jensen's ratio is higher for the year 2009.

The annual return of Baroda Pioneer for the year 2008 is higher than the market return because the fund is not affected by the recession. The standard deviation for the year 2008 is 0.03% which is very low because the return has increased in that

particular year. The Sharpe ratio and Treynor ratio was highest in the year 2008 indicating the best risk adjusted performance. Fama and Jensen's ratios were also highest in the year 2008. This indicates that the fund has out-performed in the year 2008. The fund earned good returns than the expected return.

**Table No 1.6 Performance Measures of Ing Gilt Fund – Provident Fund – Dynamic Plan Cyclical Series & ICICI Prudential Gilt Fund**

Gilt Fund	ING Gilt				ICICI PRUDENTIAL			
	2006	2007	2008	2009	2006	2007	2008	2009
Annual return	4.3525	5.7673	22.0608	-0.9987	7.2603	8.1771	31.5107	-6.2833
Market return	32.5719	55.2288	-52.9406	68.4030	32.5719	55.2288	-52.9406	68.4030
Covariance	1.7857	1.3600	25.7249	11.9950	5.4966	1.4177	19.2526	24.2540
SDY	0.5595	0.7479	3.7485	2.6699	1.0301	0.9942	4.9779	2.9304
SDX	7.9650	8.0227	15.4362	14.7443	7.9650	8.0227	15.4362	14.7443
Beta	0.4007	0.2267	0.4446	0.3047	0.6699	0.1777	0.2506	0.5613
Correlation	0.4371	0.2473	0.4850	0.3324	0.7308	0.1939	0.2733	0.6124
Monthly average return	0.3627	0.4806	1.8384	-0.0832	0.6050	0.6814	2.6259	-0.5236
Average Market return	2.7143	4.6024	-4.4117	5.7002	2.7143	4.6024	-4.4117	5.7002
RFR	0.4033	0.3717	0.1150	0.0117	0.4033	0.3717	0.1150	0.0117
Sharpe ratio	-0.0726	0.1457	0.4598	-0.0355	0.1958	0.3116	0.5044	-0.1827
Treynor Ratio	-0.1014	0.4806	3.8764	-0.3114	0.3011	1.7427	10.0213	-0.9536
Alpha	0.2794	0.3745	2.3580	-0.4263	0.3485	0.5708	3.0148	-1.2174
Fama	-0.2030	-0.2855	2.8227	-1.1250	-0.0972	-0.2145	3.9707	-1.6659
Jensons alpha	1.2053	1.3334	0.3455	1.3070	1.8967	1.3228	1.8806	1.9759
R Square	0.1910	0.0611	0.2352	0.1105	0.5341	0.0376	0.0747	0.3750
TE	-1.3158	-3.0828	23.4288	-15.4410	-2.1728	-3.8981	35.0327	-18.2384
IR	1.7872	1.3370	0.2668	0.3746	0.9708	1.0059	0.2009	0.3412

ING Gilt Security's returns are good when compared to the other gilt funds. The annual return for the year 2008 is 22.06% which is much higher than the market return. The coefficient of determination is low for all the years because, since it is a gilt fund the annual return will not be much affected by the market return. There will always be a lesser amount of volatility in the risk and return relationship. The Sharpe, Treynor, Fama and Jensen's ratios are good for the year 2008, indicating a good risk-adjusted performance.

The annual return of ICICI Prudential in the year 2008 is 31.51% which is higher than the market return. The annual return for 2006 is 7.26%, 2007 is 8.18% and 2009 is -6.28% which are all lower than the market return. The Sharpe ratio is highest for the year 2008 and has the best risk adjusted performance. The Treynors ratio is also highest for the year 2008 indicating a low systematic risk. Fama is also highest for the year 2008. Jensen's alpha is positive for all the years.

## RANKS OF THE FUNDS BASED ON THE PERFORMANCE MEASURES

The funds were ranked based on Sharpe, Treynor, Fama and Jensen's ratios. The ranks are in the order from highest-lowest. The main objective of ranking is to find out which fund is performing well in a particular time period.

**Table No: 2.1 Ranks for Equity Diversified Funds**

EQUITY FUND	2006				2007				2008				2009			
	S	T	F	J	S	T	F	J	S	T	F	J	S	T	F	J
SUNDARM	1	2	2	2	4	2	4	4	4	5	5	5	5	5	5	5
BNP PARIBAS																
RELIANCE	5	5	5	5	1	1	1	1	3	3	3	3	2	1	1	1
DSPBR	3	1	1	1	5	5	5	5	2	2	2	2	4	4	4	4
BIRLA																
SUNLIFE	2	4	3	3	2	3	2	2	1	1	1	1	1	2	2	2

The equity diversified funds were ranked based on their performance measures and according to the ranks assigned the best performing fund for the year

- ❖ 2006 – DSP Black Rock Equity - Regular
- ❖ 2007 - Reliance Growth
- ❖ 2008 – Birla Sun Life Frontline Equity Plan A
- ❖ 2009 – Reliance Growth

**Table No: 2.2 Ranks for Income Funds**

INCOME FUND	2006				2007				2008				2009			
	S	T	F	J	S	T	F	J	S	T	F	J	S	T	F	J
RELIANCE MIP	1	2	2	2	5	5	5	5	1	1	1	1	5	2	5	5
BIRLA SUNLIFE	3	5	5	3	3	3	3	3	2	4	4	2	3	3	4	4
LIC MIS	4	3	3	5	1	2	1	1	3	2	3	4	2	5	3	3
CANARA ROBECO	2	1	1	1	2	1	2	2	5	3	5	5	4	1	1	1

The income funds were ranked based on their ratios such as Sharpe, Treynor, Fama and Jenson's and the best performing fund for the year was found out:

- ❖ 2006 - Canara Robeco Monthly Income Plan
- ❖ 2007 – LIC Monthly Income Scheme
- ❖ 2008 – Reliance Monthly Income Plan
- ❖ 2009 - Canara Robeco Monthly Income Plan

**Table No: 2.3 Ranks for Gilt Funds**

GILT FUND	2006				2007				2008				2009			
	S	T	F	J	S	T	F	J	S	T	F	J	S	T	F	J
ICICI PRUDENTIAL	1	1	1	1	1	1	2	1	2	1	1	1	4	3	4	2
BARODA PIONEER	2	2	2	4	4	3	4	3	3	5	5	5	1	1	1	1
KOTAK	4	4	5	5	5	5	5	4	5	3	3	4	5	5	5	5
ING	3	3	4	3	2	2	3	2	4	2	2	3	2	2	2	3

The Gilt funds were ranked according to the performance measures and the best performing fund for the year was found out:

- ❖ 2006 – ICICI Prudential Gilt Investment
- ❖ 2007 - ICICI Prudential Gilt Investment
- ❖ 2008 - ICICI Prudential Gilt Investment
- ❖ 2009 - Baroda Pioneer Gilt Fund – Growth Plan

**Table No: 3.1 Rank Correlation for the Performance Measures**

The correlation coefficient lies between +1 and -1 and shows how two rankings move together. If the coefficient is +1 the variables move exactly in the same way and if

it is -1 the move exactly in the opposite direction. A correlation of '0' means that there is no connection between the two variables. If the funds are ranked the same across the four different performance measures, then the correlations in the table should be high in magnitude, positive and statistically significant.

MEASURES	RANK CORRELATION		
	EQUITY	INCOME	GILT
Sharpe-Treynor	0.8	0.28	0.68
Sharpe-Fama	0.9	0.62	0.66
Sharpe-Jenson	0.9	0.52	0.66
Treynor-Fama	0.92	0.52	0.74
Treynor-Jenson	0.92	0.5	0.7
Fama-Jenson	1	0.66	0.62

**Equity Diversified funds:** All the performance measures – Sharpe, Treynor, Fama and Jenson shows a high degree of positive correlation. Fama-Jenson shows a perfect positive correlation, it indicates that the relationship among the ratios is very strong.

**Income Funds:** Even though the measures show a positive correlation, the correlation among the variables is only moderate. It means there is a large amount of volatility among the ratios. The correlation for Fama-Jenson is the highest and the correlation among Sharpe-Treynor is the least. Sharpe and Treynor has a low degree of positive correlation among them.

**Gilt Funds:** All the measures show a good correlation among themselves. Among them, Treynor-Fama & Treynor-Jenson has the highest correlation followed by

Sharpe-Fama, Sharpe-Jenson & Fama-Jenson.

## Findings

### Equity diversified funds

All the equity diversified funds earn a higher return than the expected return. It shows all the funds are performing well. In 2008, the equity funds show a down trend because of the recession in the stock market. The equity funds have the highest unsystematic risk and systematic risks when compared to income and gilt funds. The funds-return depends highly on the market fluctuations and changes accordingly. Hence, the equity funds are aggressive. All the equity diversified funds performed better in the year 2009. The funds were heavily affected by the stock market crash in the 2008. In this particular year the funds return had a strong association with the market return. From the analysis it was found that among the equity diversified funds Reliance Growth showed the best performance for the years 2007 and 2009. Further DSP Black Rock Equity- regular fund showed the best performance for the year 2006 and Birla Sun Life Frontline Equity Plan A for the year 2008. The rank correlation between the ratios for the equity diversified funds was very high. Especially the Fama-Jenson relationship had a perfect positive correlation. This is because both the ratios are based on the average performance of the fund taking into account the funds' general sensitivity to the market. Unlike the Treynor ratio these ratios are not affected

by the bullish or bearish pattern of the market. Finally in equity diversified funds Reliance Growth has performed well in the period 2006-2009.

### **Income funds**

The income funds Birla, Reliance, Canara Robeco, LIC and UTI shows an annual return which is always less than the market return because the return is taken back on a regular basis. Even in 2008 when there was a stock market crash most of the income funds generated a good return than its market. Generally, these funds are not fully dependant on the stock market, this is because the funds adopt the policy of a low risk and a low return. The returns are very less because the funds are conservative. From the analysis it was found that among all the income funds the best performing fund was Canara Robeco Monthly Income Plan in the years 2006 and 2009. The best performing fund for the year 2007 was LIC Monthly Income Scheme and Reliance Monthly Income Plan for the year 2008. The results from the rank correlation between the ratios show that Fama-Jenson has the highest correlation. The correlations for this fund was only moderate, this shows that there is some amount of volatility among the ratios. This shows that the portfolios of the funds are less diversified. The Sharpe-Treynor correlation is the least and it shows that the unsystematic risk is not fully diversified. Canara Robeco Monthly Income Plan has performed well during the period 2006-2009.

### **Gilt funds**

Gilt funds are the investments made in Government securities. Generally, they involve no default risk. From the gilt funds taken for analysis it was found that the funds are not affected by the 2008 stock market crash. All the funds generated good returns in the year 2008. Immediately as the recovery period started the funds declined highly in the year 2009. This is because of the reason that the funds were heavily affected by the interest rates and other economic factors. These funds are also conservative in nature. From the analysis it was found out that among all the funds ICICI prudential Gilt investment gave the highest performance in the years 2006, 2007 and 2008. Secondly Baroda Pioneer Gilt Fund – Growth Plan had the highest performance in the years 2006 and 2009. The results based on the rank correlation analysis for the ratios shows that all the ratios have a moderate relationship among them. Specifically, Treynor-Fama and Treynor-Jensens have the highest correlation indicating that the ratios have a high degree of positive relationship among them. The result of the Treynor's ratio can mislead if it is applied during the bear phase of the benchmark index to the funds which have negative values of Beta. Jensen's alpha represents the average performance of the fund taking into account the funds' general sensitivity to the market. A positive value for Fama's measure says that the mutual fund earns returns which are higher than the expected ones and lie above Capital Market Line.

On the contrary, a negative value indicates lower earned returns compared to the expected, being situated below Capital Market Line. At the overall level, the best performing Gilt Fund during the period 2006-2009 was ICICI Prudential Gilt Investment.

## RECOMMENDATIONS

- ❖ The investors who aim for high returns can invest in equity diversified schemes, but the risk tolerance level should be known and based on that the equity diversified scheme should be selected.
- ❖ While selecting the equity diversified schemes the investors should find a portfolio which will have a balance between high returns and low risks in order to avoid negative returns.
- ❖ Exempting the year 2008 which faced a stock market crash, the equity diversified funds can yield high returns for the investors with high risk appetite.
- ❖ It is better to plan the investment over a longer period of time, keeping in mind/view the investor's age, financial targets, level of risk aversion, saving pattern and investment objectives.
- ❖ The risk averse investors can invest in gilt funds which show a better performance even in the recession period of the year 2008.
- ❖ Investors can invest more in stock funds but must keep a reasonable part of the investment in liquid securities

as money market funds, short-term bonds etc so to meet any contingent situation.

- ❖ Investors who are risk averse and also need a regular income on their investment can prefer income funds for their investment decision.
- ❖ Enough patience is needed for keeping money invested for a long period of time and if one wishes that his capital should grow consistently then mutual funds are the better option, but they too cannot make one wealthy in a short period of time.

## CONCLUSION

The mutual fund industry in India has expanded enormously in the last decade. Especially, the private sector has shown galloping growth. Reforms on the information technology front, increased role of Financial Institutional investors in the stock market and SEBI still in its infancy, the mutual fund industry players gained unparalleled and unchecked power. In the day-to-day busy pattern of our life the investors are not able to spare time to have a close watch with the stock market in which they love to invest. An alternative way to invest in the stock market securities without sharpening the investor's market timing skills is getting the aid of the fund managers and investing in mutual funds. Mutual funds have introduced a large number of schemes and the investor has to make discretion based on his/her risk profile. If the investor is a risk-loving

person then he may choose a growth fund, if he is a risk-averse person then he can invest in a gilt fund. If the investor expects a return on a regular basis then he can choose a monthly income fund. Likewise mutual funds provide a lot of schemes which are customized according to the investor's perception. The performance analysis of this study would help an investor and also a funds manager to study the risk-return relationship to make further investment decisions. In particular, the evaluation of the performance of mutual funds has been a very interesting research topic not only for researchers but also for managers of Financial, Banking and investment Institutions.

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# Sensex and Whole Sale Price Index of India: Are they integrated?

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## Abstract

*This study empirically assesses the relationship between daily closing price of Sensex, a leading stock index of India and whole sale price index of India. The study has used co-integration test to check the relationship. The study has covered data from both pre and post reforms period of Indian economy and it has decomposed the whole sale price index into expected and unexpected parts. The study has proved that neither whole sale price index nor any of its form can influence the sensex price in any of the periods.*

**Keywords:** Sensex, whole sale price index, expected and unexpected whole sale price index, Co-integration test.

## Section-I Introduction:

Security markets in India have made enormous progress by developing sophisticated instruments and modern market mechanisms. The key strengths of the Indian capital market include a fully integrated and automated trading system on all stock exchanges, a wide range of products, a nationwide network of trading and strong regulation system. Around five thousand companies command a total market capitalization of USD 1.06 trillion as of May 15, 2012 at Bombay Stock Exchange and became world's number one exchange in terms of listed members and fifth most active exchange in terms of

number of transactions handled through its electronic trading system. National Stock Exchange (NSE) of India is the 16th largest stock exchange in the world in terms of market capitalization and largest in India for daily turnover and number of trades.

India after independence has had a more stable record of inflation than most of other developing countries. Since 1950, the inflation in Indian economy had been in single digits for most of the years (two percent in 1950-1960, Seven point two percent in 1960-1970, and eight point five percent in 1970-1980). During the current year, inflation remained stubbornly high at

around 9-10 percent and was fairly broad-based. The rise in inflation started with food and later got generalized. Food inflation which has remained persistently high, has become a major cause of concern. With the inflation remaining beyond the comfort level of Reserve Bank of India (RBI), the RBI continued to tighten its monetary policy through the year to arrest inflation, even in the face of a slowdown in economic growth. Increase in inflation may eat out the future nominal cashflow of the companies and reduce their value or vice a versa. Nobody will be willing to pay much for the growth if inflation is going to erode the value of that growth because it will be worth less in a high inflationary environment. That implies fall in price/earnings ratios. Therefore, lower inflation may lead to higher price/earnings ratios and vice a versa. Inflation of India is now going to touch double digit number, hence this has motivated the authors to study whether the stock market investors needs to be worried of it or not.

Therefore this study has been organized as follows. Section II reviews the published literature pertinent to the topic. Section III mentioned the required data and their sources, Section IV outlines the methodology used, section V provides the empirical results and analysis and finally concluding remarks are given in section VI.

## **Section – II Review of Literature:**

Fisher (1930) hypothesis, in its most familiar version, states that “the expected nominal rate of return on stock is equal to

expected inflation plus the real rate of return”, where the expected real rate of return is independent of expected inflation. Fisher hypothesis, therefore, predicts a positive homogenous relationship between stock returns and inflation. In other words, Fisher hypothesis implies that stocks offer a hedge against inflation.

Adam and Frimpong (2010) studied the relationship of stock price and inflation for Ghana for the sample period 1991:1-2007:12. Cointegration analysis was employed and the findings showed strong support for Fisher hypothesis. Spyrou (2001) and Floros (2004) examined stock returns-inflation relation in Greece, using the Johansen cointegration test and they found that there is no significant long-run relationship between inflation and stock returns in Greece. Al-Khazali and Pyun (2004) investigated the statistical relationship between stock prices and inflation in nine countries in the Asia Pacific Basin. Using Johansen cointegration test and they concluded that stock prices in Asia reflect a time-varying memory associated with inflation shocks that make stock portfolios a reasonably good hedge against inflation in the long run. Spyrou (2004) examined the Fisher hypothesis for 10 emerging countries, namely, Chile, Mexico, Brazil, Argentina, Thailand, South Korea, Malaysia, Hong Kong, Philippines and Turkey. They found little evidence to support this hypothesis in these countries. Kim and Francis (2005) studied the Fisher hypothesis based on a wavelet multi-scaling method for US, for the period from

1926:1 to 2000:12. Their findings revealed that there is a positive relationship between stock returns and inflation in the shorter period, while a negative relationship is found in longer period. Ahmad and Mustafa (2005) studied the relationship for Pakistan, for the period from 1972 to 2002. Full Information Maximum Likelihood (FIML) method was employed. They divided the inflation into two parts – expected and unexpected. Results revealed that relationship between real returns and unexpected growth and unexpected inflation are negative and significant. Kim (2003) employed quarterly data of Germany for the period from 1971:1 to 1994:4. Symmetric and asymmetric Granger causality test was performed and results demonstrated the negative correlation between stock returns and inflation. Using the monthly data, Nelson (1976) studied the relationship for the US in the postwar period, (from 1953:1 to 1972:12). Box and Jenkins' ARIMA method was used to divide the inflation into expected and unexpected part. They found the stock returns were negatively related with both expected and unexpected inflation. Samarokoon (1996) and Jaffe and Mandelker (1976) used the same method on Sri Lanka and US data respectively and got the same result. Some of the studies had divided the study period into various zones and got various results. Kolluri and Wahab (2008) studied the relationship between stock returns and inflation through asymmetric test specification, which is capable to

distinguish stock returns into high and low inflation period. The study period was from 1960:1 to 2004:12 and Findings of the study revealed that there was inverse relationship between stock returns and inflation during low inflation periods. On the contrary, positive relation is observed through high inflation periods. Lee (2008) analyzed the causal relationship in the UK, the sample period ranged from 1830 to 2000. The sample period was further divided into two sub-periods, 1830-1969 and 1970-2000. The empirical findings of the study reported that there is a significant negative correlation between unpredictable stock returns and inflation for the subperiod 1970-2000. However, unpredictable stock returns were hardly correlated to unpredictable inflation during the same subperiod. Employing the wavelet methodology Durai and Bhaduri (2009) examined the relationship between stock returns, inflation for the post-liberalization period in India. The study employed monthly data from 1995:1 to 2006:7. The wavelet analysis helped to decompose the inflation into expected and unexpected components. In short run, the expected component of inflation was insignificant, while in the medium and long run, the expected component was found to be negatively significant with the real stock returns. Therefore Fisher hypothesis is not unanimously applicable on all stock markets. Hence this study will investigate whether closing price of sensex is related to whole sale price index of India in both short and long period.

### Section-III Data:

Some studies used Consumer Price Index (CPI) as inflation measure (Kumari 2011, Schwert 1989 and Alagidede 2009). Shanmugam and Mishra (2008) mentioned that there is not a single indicator of CPI in India. Four different variants of CPI are compiled on monthly basis that are designed for specific group of population with specific objectives. Therefore this study has taken Wholesale Price Index (WPI) as inflation measure. Monthly data covering period from April 1982 to March 2011 of WPI, and Sensex has been taken for analysis. This time period comprises of pre and post reforms phase of Indian Economy. Sensex data has been collected from Bombay Stock Exchange of India. The Ministry of Industry, Government of India is the sources for the WPI.

### Section-IV Methodology:

Auto-Regressive Integrated Moving Average (ARIMA) is not applicable on the WPI data because auto-correlation is not dying exponentially (Gujarati 1995). Hence Hodrick-Prescott (HP) filter is used to derive the expected and unexpected components of the inflation. This filter decomposes the inflation into its trend and unexpected deviations from the trend. As suggested in Hodrick and Prescott (1980) for monthly data, ( $\phi = 14400$ ) have been used as the value of the smoothing parameter. Cointegration method has been used to check the relationship.

### Equation

$$SP_t = \beta_1 + \beta_2 WPI_t + \varepsilon_t \text{ ————— (1)}$$

Wherein  $SP_t$  and  $WPI_t$  are the closing price Sensex price wholesale price index at  $t$  th period respectively.  $\varepsilon_t$  is the error term.

$$\varepsilon_t = SP_t - \beta_1 - \beta_2 WPI_t \text{ ————— (2)}$$

Here both are nonstationary but to satisfy the cointegration needs to be stationary.

Relationship between Stock price and expected inflation

$$SP_t = \delta_1 + \delta_2 WPI_{Expectedt} + \phi_t \text{ ——— (3)}$$

Wherein is the expected inflation at  $t$  th period and is the error term

$$\phi_t = SP_t - \delta_1 - \delta_2 WPI_{expectedt} \text{ ——— (4)}$$

Relationship between stock price and unexpected inflation

$$SP_t = \rho_1 + \rho_2 WPI_{unexpectedt} + v_t \text{ — (5)}$$

$$v_t = SP_t - \rho_1 - \rho_2 WPI_{unexpectedt} \text{ — (6)}$$

Wherein  $WPI_{unexpectedt}$  is the unexpected inflation at  $t$  th period and  $v_t$  is the error term.

Data from April 1982 to March 2011, pre-reforms period (April 1982-Dec 1991) and post-reforms period (January 1991-March 2011) will be used in the above equations.

**Section-V Empirical results:**

As noted earlier, the HP filter is employed to derive the expected and unexpected inflation. Then data has been separated between pre-reform and post-reform period.

**The test of nonstationarity of data:**

Data needs to be nonstationary before using for co-integration process (Gujarati 1995). Table 1 shows the Dickey Fuller test result for wholesale price index, daily closing price of sensex, expected and unexpected whole sale price index.

**Table-1 Dickey Fuller Test result**

Total Data				
	Log Level		1 <sup>st</sup> difference	
Variable	Intercept	Trend and Intercept	Intercept	Trend and Intercept
Whole sale price Index	-1.992	-1.686	-8.168*	-8.247*
Sensex	-0.039	-1.944	-7.821*	-7.391*
Expected Whole shale price index	-1.904	-1.341	-2.339	-2.815
Unexpected Whole sale price index	-5.707*	-5.691*		
Pre Reforms Period				
Whole sale price Index	-2.815***	-0.007	-5.507*	-5.888*
Sensex	0.428	-1.806	-4.682*	-4.878*
Expected Whole shale price index	2.241	-0.526	-0.313	-0.724
Unexpected Whole sale price index	-3.261**	-3.497**		
Post Reforms Period				
Whole sale price Index	-1.839	-2.323	-6.802*	-6.856
Sensex	-0.446	-2.033	-6.068*	-6.125*
Expected Whole shale price index	-1.449	-2.958	-2.167	-2.421
Unexpected Whole sale price index	-4.733*	-4.713*		

\*, \*\*, \*\*\* Represents significance at 1%, 5% and 10% level respectively.

**Section-V Empirical results:** As noted earlier, the HP filter is employed to derive the expected and unexpected inflation. Then data has been separated between pre-reform and post-reform period.

**The test of nonstationarity of data:**

Data needs to be nonstationary before using for co-integration process (Gujarati

1995). Table 1 shows the Dickey Fuller test result for wholesale price index, daily closing price of sensex, expected and unexpected whole sale price index.

**Table-1 Dickey Fuller Test result**

Whole sale price index, monthly closing price of sensex and expected wholesale price index are nonstationary at all stages

i.e. in whole period (April 1982-March 2011), pre-reforms period (April 1982 – December 1991) and Post-reforms period (January 1992 – March 2011). ADF test value of whole sale price index is significant

at ten percent significance level at pre-reforms period. Unexpected wholesale price index is significant at all stages. Hence it is not possible to use unexpected WPI data for cointegration process.

**Table-2: Estimation of result of equation 1, 3, and 5 for three periods**

Whole data					
Constant	Whole sale price index	Expected Wholesale Price index	Unexpected Whole sale price index	R <sup>2</sup>	d
1354.325 (1.6251)	16.734 (4.391)			0.528	0.0113
656.3575 (0.7314)		20.11236 (4.858)		0.0638	0.0093
4811.953 (17.158)			-1.1408 (-0.0911)	0.00002	0.0086
Pre reforms period					
-848.98 (-12.883)	9.907 (20.8126)			0.808	0.234
-834.399 (-13.553)		9.783 (22.0503)		0.825	0.274
489.4468 (21.1869)			-59.05370 (-4.516)	0.1653	0.1006
Post reforms period					
1059.73 (8.279)	-16.276 (-3.14)			0.039	0.015
11994.47 (8.084)		-22.468 (-3.677)		0.053	0.0131
6673.894 (19.774)			-1.908 (-0.1514)	0.000	0.0122

Validity of the above table or cointegration between closing price of sensex and whole sale price index, expected whole sale price index and unexpected whole sale price

index will be proved if Augmented Dickey-Fuller (ADF) test result of the error term in equation in 1, 3 and 5 i.e.  $\varepsilon$ ,  $\phi$ , and  $\nu$ , is significant.

**Table 3: ADF test result**

	Whole period	Pre-reforms Period	Post-reforms Period
$\varepsilon_t$	1.045	-2.357	-0.291
$\phi_t$	1.222	-2.438	-1.038
$\nu_t$	0.896	-1.049	0.267

Table 3 shows that none of the ADF result is significant at even ten percent level. As it is cointegration test therefore in place of

ADF test augmented Engle-Granger (AEG) test will be used. At the time of ADF test in case of  $\varepsilon$  in equation one

(when whole period's data was considered) the following equation was obtained-

$$\Delta \varepsilon_t = 0.0059 \varepsilon_{t-1}$$

$$t = 1.0278$$

$$R^2 = -0.005641 \quad d = 1.499$$

This  $t$  is the  $\tau$  in AEG test (Gujarati 1985). The critical value at one percent level is -2.5899. As the calculated value is positive hence the residuals received from regression between whole sale price index and closing price of sensex during April 1982 – March 2011 is not .

**Table-4: AEG test result of residuals**

	Whole period	Pre-reforms Period	Post-reforms Period
$\varepsilon_t$	1.0278	-2.37	-0.3045
$\phi_t$	1.2026	-1.074	-0.1538
$\nu_t$	0.8763	-2.438	0.2477

None of the  $\tau$  values are more negative than -2.5899. Hence it can be concluded that whole sale price index is not integrated with closing price of sensex in any period.

An alternative and quicker way to findout the cointegration between wholesale price index and closing price of Sensex is Cointegrating Regression Durbin-Watson (CRDW) test (Gujarati 1985). Here the CRDW is the  $d$  value in table 1. The critical value of CRDW at one percent significance level is 0.511. Here all the  $d$  values are less than its critical value.

## Section – VI: Conclusion

The study has critically assessed the relationship between closing price of sensex and whole sale price index. Using Hodrick-Prescott (HP) filter the whole sale price index has been decomposed into expected and unexpected part. To be more affirmed about the behavior of the data the whole study period i.e. April-

1982 to March 2011 has been separated into two parts i.e. pre-reforms period and post-reforms period of Indian economy. The result shows that closing price of Sensex and whole sale price index in any time (both shorter and longer periods) were not cointegrated. Even expected part of whole sale price index also cannot explain the movement of sensex. Therefore Fisher Hypothesis is valid in Indian Economy. This implies that stock price provides a complete hedge against inflation. Investors at share market need not to bother about the inflation even if it touches double digit number.

There are some more sophisticated methods to prove this relationship. These are out of the scope of this research work. Some more available Indian indices may be analysed before generalising of the result. Still the study can provide a clear idea about this.

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