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## **Editorial**

It gives me immense pleasure to present before you Vol.VI, No.-2 of Business Spectrum, peer reviewed and UGC listed e-Journal of IAA Midnapore Branch. Although we are in late, but we have accommodate five qualitative articles on different area of business in this issue.

Dr. Debdas Rakshit and Mrs. Anshu Burnwal, in their article on “Liquidity Impact of Stock Split: An Empirical Study of select Indian Companies”, had mentioned that in most of the companies of large cap, mid cap and small cap groups have insignificant changes of liquidity on stock split announcement. The article also focused that stock split announcing companies’ liquidity is much more responsive than control companies.

Dr. Mitrendu Narayan Roy, in his article on “A comparative study in audit of accounting estimates in USA,UK and India desiring users perceptions had focused on auditor’s responsibilities with respect to the audit of accounting estimates. He had also compared Indian Standard of audit on accounting estimates with that of USA and UK.

Dr. Anupam Karmakar and Smt. Arunima Rudra, in their article on “Viewers’ perception about Indian Television Channels: A study with special reference to Kolkata” had mentioned that the growth of Television Industry for the last decade was very impressive and the steady growth of this industry may be attributed to increase in number of television households, rise in regional markets, increase in advertisement expenditure etc.

Shib Pada Patra in his article on “An Analytical Study on sector wise investment of LIC, during pre and post reform period” had mentioned that both public and private life insurance companies have made their investment portfolio in a significant magnitude as per IRDA regulations.

Dr. Sangita Ghosh, in her article on “Merger between Global Trust Bank and Oriental Bank of Commerce” had focused on the impact of merger on the banking industry and she has mentioned that liquidity, profitability and efficiency position of the transferee bank’s had increased due to merger.

Before I conclude I profusely thank to the paper writers, reviewers, desk editor and executive editor for their hearty co-operation in bringing out this volume of Business Spectrum.

Professor Samir Ghosh

## LIQUIDITY IMPACT OF STOCK SPLIT: AN EMPIRICAL STUDY OF SELECT INDIAN COMPANIES

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### **Abstract**

The main focus of this study is to examine how the liquidity of stocks of large cap, mid cap, and small cap companies in India changes due to stock split announcement. Based on the empirical evidence the result shows that most of the companies of all the three groups have faced insignificant changes in liquidity around the stock split announcement date. In case of mid cap firms, the percentage of stock split announcing firms, having positive change in liquidity is more than the percentage of those firms having negative change (based on all the three measurements viz. volume of trade, turnover and turnover ratio). Whereas in case of large cap and small cap firms, the percentage of stock split announcing firms, having negative change in liquidity is more than the percentage of those firms having positive change (based on volume of trade and turnover ratio). The average percentage of stock split announcing companies in case of mid cap and small cap group having Positive change in liquidity after the stock split announcement are higher than the average percentage of companies in case of large cap group having positive change in stock liquidity. The result also shows that the percentage of stock split announcing companies, in all the three groups and based on all the three measurements, having positive impact on liquidity is much more than that of control companies.

### **Introduction**

The management of a company usually decides to split its shares outstanding on the stock market when the price of its shares increases to either too high or is beyond the price level of similar or peer companies in the same sector. After the stock split the stock prices get reduced

to a certain level and the number of shares outstanding increases in the proportion of stock split. The decrement of share price due to stock split can result in a share price boost up after that decrement. After the stock split the shares seem more affordable to small investors and many small investors think to buy the stock as they have to pay less to buy the shares of such valuable company. Therefore the demand for stock increases which may lead to increase in the share prices. The share price may also increase because of the signalling impact of stock split. Stock split provides the signal that the price has been growing and the growth will be continued in future, and this may again pick up the demand and prices.

As the stock split is a measure to make shares more affordable to small investors, it provides greater marketability and liquidity in the market. This paper emphasises the “liquidity” impact of stock split. Market liquidity should be considered an important indicator of the state of market. Liquidity is the ability to trade a substantial amount of a financial asset at close to current market prices. “Market liquidity is considered as the capacity of financial markets to absorb temporary fluctuation in demand and supply without undue dislocation in prices” (Datar,2000). Liquidity describes the degree to which an asset or security can be quickly bought or sold in the market without affecting the asset’s prices. According to BERVAS(2006), Liquidity is a relative concept, as more liquid the asset, the more it is easily traded for liquidity “par excellence”: money, i.e. at low cost, at short notice and with no risk of notable change in price. Market liquidity is the primary consideration for an efficient market as market liquidity is the ability to settle transaction at current prices and at all time with no notable transaction costs.

So many researchers of different countries had worked on investigating the various aspects of stock split. FAMA, Fisher, Jensen, and Roll(1969); Wulff(2002); Mishra(2006); Aduda and Caroline(2010); Subaih(2013) etc focused on overall market reaction around the stock split announcement or event date. Copeland (1979); Muscarella and Vetsupens(1996); Dennis(2003), Joshipura(2009); Lin, singh , and Yu(2009); Thirunellai(2014) etc. had put their emphasis to examine the optimal price range and liquidity aspect of stock split around the stock split announcement or event date. In some cases positive change in liquidity or in some other cases negative change in liquidity was found. Ikenberry, Rankine, and Stice(1996); Desai and Jain(1997); Arif, Khan, and Baker(2004); Yague, Sala, and Fuent(2009); Reinkaine(2010) etc. conducted their study with the purpose to examine the extent to which the stock splits are motivated by the signalling hypothesis. On the other hand some researchers like Desai, Nimalendran, and Venkataraman(1998); NINI(2001) etc. emphasised on share price and stock return volatility of stock splitting companies around the

announcement as well as event date of stock split. D'Mellow; Tawantachai and Yaman(2003) had presented a test on Multiple event hypothesis whereas, Lamourax and Poon(1987), emphasised on tax option hypothesis related to stock split.

This study is fully based on Indian stock market. In India, stock split is relatively a new phenomenon as this event has been popularised since 1999. After F.Y. 2004-05 stock split has become frequent phenomenon undertaken by different companies in India when the stock prices of many companies become too high beyond the normal trading range.

The paper analyses the effect of stock split on liquidity of stocks around the stock split announcement date for a sample of stock split undertaken by BSE(Bombay Stock Exchange) listed companies over the period of 15 years from F.Y.2000-01 to F.Y.2014-15. Thus, the present study is based on longer time horizon. To make the study interesting, the stock splitting companies comprised in the study are segregated as Large cap, Mid cap, and Small cap companies based on their market capitalisation as on 1<sup>st</sup> April 2015. In this context, changes in liquidity are examined for the 40 days event window (i.e., 20 days before the split announcement and 20 days after the split announcement date). In this study, the control sample methodology is applied so that it will be possible to observe whether the stock splitting companies significantly differ from the non-stock splitting companies.

The rest of the paper is organised as follows: section **II** consists of the review of some earlier literatures on stock split. Section **III** presents the details of objective, database and methodology used in this study. Section **IV** includes the empirical findings of the study and summarisation. And section **V** indicates the concluding remarks.

## **II. Review of Literature**

Stock split event, being an interesting topic, so many researchers of different countries have put their emphasis on investigating the different aspects of it. The present research work also comes out of those previous research efforts and their findings. The review of some earlier studies is presented here below:

Fama, Fisher, Jensen and Roll(1969) first suggested that market reacts to the new information that are implicit in a stock split. According to them stock split tends to occur during general boom period when the stock performs usually well. Their study reveals that return on splitting shares is usually high in the month immediately preceding a split and after the split, the returns on split securities immediately resume their normal relationships to the market return.

Many researchers have elaborated the liquidity and optimal price range aspect of stock split. Some researchers like Copeland(1979), Lamoureux and Poon(1987) found a reduction in liquidity following a stock split due to increase in Bid-Ask spread and brokerage fee. As per Tax Option hypothesis Lamoureux and Poon observed a significant increase in the number of shareholders and the trading volume around the announcement of split. According to them market attaches positive value to the split because of its Tax Option impact.

By observing the case of ADR's solo splits Muscarella and Vetsupens(1996) found evidence of increase in liquidity but there was no signalling effect.

By taking the sample of index tracking stock Dennis(2003) found that liquidity seemed to have improved for smaller trades. The post split lower share price of the index tracking stock seemed to help smaller investors who liked being able to trade in small lot sizes but the post split increased bid-ask spread hurt large traders who were not wealth constrained and whose primary trading cost is bid-ask spread.

In the context of Indian market Joshipura (2009), Thirunnellei (2014) found a positive liquidity effect associated with stock split both surrounding the announcement and effective day but it does not carry any positive wealth effect.

Managers can reduce trading costs for share holders and improve their stock's liquidity if there is a corporate policy like stock split that can be used to attract more uninformed traders to participate in trading which can reduce both market maker's inventory holding costs and adverse information costs. [Lin,Singh and Yu(2009)]

Ikenbary, Reinkine and Stice(1996) observed highest excess performance for low book to market(or glamour) stocks. Firms voluntarily splitting to their shares to extremely low prices tended to generate positive announcement return but experienced negative long run performance i.e. sceptical market reaction by these firms.

On the other hand by taking the long run view Desai and Jain(1997) found positive average abnormal returns for one, two and three years after the announcement month which is consistent with the notion that market under reacts to the announcement or reacts with delay. It was also found that abnormal returns were larger for the firms initiating dividend with stock split.

With respect to the signalling hypothesis, signals considered by the market are the unexpected component of the split factor and there is a statistically significant relation between abnormal returns around the split announcement and the surprise component of the split factor.[Yague,Sala and Fuentes(2009)]

By examining the relation between trading activity following splits, change in volatility and bid-ask spread, Desai, Nimalendran and Venkataraman (1998) found a positive relation of spread and increase in volatility with the split factor where as negative relation of trade size with split factor. It was also found that a large component of increase in volatility was transient and attributable to noise.

Stock split conveys favourable industry-wide information about earning improvement and industry characteristics and firm-specific factors are significant determinants in explaining the stock price reactions. [Tawatnuntachai and D'Mello(1999)]

#### **Research Gap of the Earlier Studies:-**

- i) Some of these studies did not control for the potential contamination of other information releases on the stock prices at the split announcement date.
- ii) Most of these studies did not undertake the control sample methodology in order to specify whether there is any difference between the stock split announcing companies and the control companies.
- iii) In most of the cases the number of stock splitting companies considered for analysis is small and based on short time horizon.

#### **III. Objective of the Study**

The purpose of this paper is to measure the liquidity of stocks around the stock split announcement date in order to observe that the reduction of price due to stock split is helpful in what extent to boost up the market liquidity of the stocks.

#### **Database and Methodology**

The significance of any empirical research work is generally valued by its database and methodology. The present research study is based on the secondary data which is collected from the official website of the respective sample companies under the study as well as the

“Capitaline – 2000 Database package” is used for collecting data on daily share price, volume, turnover, and Market capitalisation.

The number of total BSE (Bombay Stock Exchange) listed companies that had undergone for stock split during the period of 15 years, from F.Y. 2000-01 to F.Y. 2014-15 was 1286. Out of that, the companies that had gone for stock split for two or more times or that had gone for reverse split discarded in order to analyse the accurate impact of stock split. The number of one time stock splitting companies was 902. Now for better analysis, based on the size of the companies, all the companies are segregated as Large cap Mid cap, and Small cap companies according to their market cap as on 31<sup>st</sup> march, 2015. The companies having market cap more than Rs. 1000 crore are kept as large cap. The companies having market cap between Rs 250 crore and Rs 1000 crore are considered as mid cap and companies having market cap between Rs 250crore and Rs 100 crore are grouped as small cap. The companies having market cap less than Rs 100 crore are not considered in this study. Some companies got unlisted or for some another reason the Market cap as on 31 Mar, 2015 of 240 companies are not found. Thus 661 one time stock splitting companies are remained that are having data on market cap as on 31 Mar, 2015.

Out of these 661 companies, only 183 companies are taken or finally analysed in this study because of the following reason:

- i) 218 companies are excluded because of having market cap less than Rs. 100 crore.
- ii) 162 companies are not taken because these companies had undergone for another price sensitive corporate events like merger or acquisition, demerger, buyback of shares, right issue, bonus issue, stock dividend etc. during the financial year in which stock split was announced.
- iii) 50 companies are discarded because of non-availability of daily share price data.
- iv) 48 companies are excluded for non-availability of daily share price data of control companies.

Thus the sample under study consisted of 183 stock splitting companies. The data of same number of control companies of the concerned stock splitting companies is also taken into consideration. Formation of control sample is not an easy task. In this study, for each stock splitting company, a non-stock splitting, belonging to the same industry and having approximately same market capitalisation as on 31/3/2015, has been selected. But in many cases, it is very difficult to find out. Thus in those cases, a non-stock splitting company

having next highest or next closest market capitalisation to the corresponding stock splitting company has been selected. In some cases, control company has been selected on the basis of three years gap from the date of stock split announcement by the stock splitting company. In other words, the company that did not announced any stock split within the period of three years before and three years after the financial year in which stock split announced by the respective stock splitting company, has been selected as the control company of that stock splitting company. Therefore, finally the sample in this study consists of total 366 companies (183 stock splitting and 183 non-stock splitting companies). Now, out of the total 183 stock splitting companies, 81 companies are found as large cap companies, 59 companies as mid cap companies and 43 as small cap companies.

### **Methodology**

In this study, the market liquidity of stock splitting companies is measured around the stock split announcement date in terms of volume of trade, net turnover, and turnover ratio. There are also other sophisticated measures of liquidity but because of lack of data in Indian context, the above three indicators are used in this study to measure market liquidity. Market liquidity can be simply measured through the indicator like frequency of trading, more frequent trading would certainly mean improved liquidity but the extent of liquidity cannot be measured among frequently traded stocks with such an indicator. Volume of trade (i.e. number of shares traded) is also a very simple measure of liquidity. But liquidity without reference to price is hardly meaningful as stock prices are linked to demand for stocks and the extent of trading volume (Datar, 2000). In order to combine these two, turnover is taken for measuring liquidity of stocks. But it is very difficult to assess the market liquidity only with reference to the absolute volume of trade or the absolute value of turnover. Thus, finally the turnover ratio (i.e., turnover/market capitalisation \*100) is taken into consideration as a relative measure which combines both share price and volume of trade and can be used across different market and over time.

In this study, the daily volume of trade, day wise turnover and day wise turnover ratio is compared for 20 days before and 20 days after the stock split announcement in order to observe whether there is any change in liquidity or not due to stock split announcement. Thereafter, the daily volume of trade, day wise turnover and day wise turnover ratio of Control Company of each stock splitting company are also computed and compared for the same period in order to examine the real impact of stock split on liquidity.

In order to know whether the change in liquidity is statistically significant or not, Paired –T Test is applied. Finally, a comparative analysis between the stock splitting companies and the control companies has been made.

#### **IV. Findings**

Daily Volume of trade, Turnover and the Turnover ratios of the large cap, mid cap, and small cap group companies are thoroughly analysed for the period of 20 days before and 20 days after the stock split announcement date. The overall summarisation of the results of paired t-test for the changes in turnover ratio, volume and turnover following the stock split announcement is presented in Table-I.

##### **LARGE CAP Group:**

From table-I, it is observed that maximum companies in the large cap group do not have any statistically significant impact of stock split announcement on their stock liquidity. The results show that out of the total 81 stock splitting companies in this group, 47 companies (i.e. 58.02% of 81 stock splitting companies) based on turnover ratio, 51 companies (i.e. 62.96% of 81 stock splitting companies) based on turnover, and again 47 companies (i.e. 58.02% of 81 stock splitting companies) based on volume of trade do not have any significant change in stock liquidity after the stock split announcement. In case of other companies in this group, 15 companies (i.e. 18.52% of 81 stock splitting companies) based on turnover ratio, 16 companies (i.e. 19.75% of 81 stock splitting companies) based on turnover, and again 15 companies (i.e. 18.52% of 81 stock splitting companies) based on volume of trade are having significant positive impact of stock split announcement on their stock liquidity. Whereas, the remaining 19 companies (i.e. 23.46% of 81 stock splitting companies) based on turnover ratio, 14 companies (i.e. 17.29% of 81 stock splitting companies) based on turnover, and again 19 companies (i.e. 23.46% of 81 stock splitting companies) based on volume of trade are having significant negative impact on their stock liquidity due to stock split announcement.

Now, taking the control companies of stock splitting companies of this group, the results show that most of the control companies are having no significant change in stock liquidity after the stock split announcement by their respective stock splitting companies. Out of the total 81 control companies in this group, 53 companies (i.e. 65.43% of 81 control companies) based on turnover ratio, 52 companies (i.e. 64.20% of 81 control companies) based on turnover, and 54 companies (i.e. 66.67% of 81 control companies) based on volume of trade

do not have any significant impact on their stock liquidity. Among the remaining control companies, 10 companies (i.e. 12.35% of 81 control companies) based on all the three measurements have shown significant positive change in their stock liquidity and other 18 companies (i.e. 22.22% of 81 control companies) based on turnover ratio, 19 companies (i.e. 23.45% of 81 control companies) based on turnover, and 17 companies (i.e. 20.98% of 81 control companies) based on volume of trade have shown significant negative change in their stock liquidity after the stock split announcement by their respective stock splitting companies.

### **MID CAP Group:**

Similarly, considering the mid cap group, it can be observed that in most of the cases there is no significant impact of stock split announcement on liquidity of the stocks. Out of the total 59 stock splitting companies in this group, 35 companies (i.e. 59.32% of 59 stock splitting companies) based on turnover ratio, 33 companies (i.e. 55.93% of 59 stock splitting companies) based on turnover, and 34 companies (i.e. 57.63% of 59 stock splitting companies) based on volume of trade do not have any significant change in stock liquidity after the stock split announcement. Whereas, 14 companies (i.e. 23.73% of 59 stock splitting companies) based on turnover ratio, 15 companies (i.e. 25.43% of 59 stock splitting companies) based on turnover, and again 14 companies (i.e. 23.73% of 59 stock splitting companies) based on volume of trade are found to have significant positive impact on stock liquidity i.e. stocks of these companies become more liquid after the stock split announcement. On the other hand, remaining 10 companies (i.e. 16.95% of 59 stock splitting companies) based on turnover ratio, 11 companies (i.e. 18.64% of 59 stock splitting companies) based on turnover, and again 11 companies (i.e. 18.64% of 59 stock splitting companies) based on volume of trade are found to have significant negative impact on their stock liquidity.

As far as, control companies of stock splitting companies in this group are considered, it is found that Out of the total 59 control companies in this group, stock liquidity of 42 companies (i.e. 71.19% of 59 control companies) based on all the three measurements have not significantly change after the stock split announcement by their respective stock splitting companies. While among the remaining control companies, 9 companies (i.e. 15.25% of 59 control companies) based on turnover ratio, 8 companies (i.e. 13.56% of 59 control companies) based on turnover, and again 9 companies (i.e. 15.25% of 59 control companies) based on volume of trade have shown significant positive change in their stock liquidity.

Other 8 companies (i.e. 13.56% of 59 control companies) based on turnover ratio, 9 companies (i.e. 15.25% of 59 control companies) based on turnover, and again 8 companies (i.e. 13.56% of 59 control companies) based on volume of trade have shown significant negative change in their stock liquidity.

#### **SMALL CAP Group:**

In the same way, in case of small cap companies, the results indicates that out of the 43 stock splitting companies in this group, 21 companies (i.e. 48.84% of 43 stock splitting companies) based on turnover ratio, 22 companies (i.e. 51.16% of 43 stock splitting companies) based on turnover, and 20 companies (i.e. 46.51% of 43 stock splitting companies) based on volume of trade do not have statistically significant impact of stock split announcement on their stock liquidity. Whereas, stocks of other 9 companies (i.e. 20.93% of 43 stock splitting companies) based on turnover ratio, 12 companies (i.e. 27.91% of 43 stock splitting companies) based on turnover, and 10 companies (i.e. 23.26% of 43 stock splitting companies) based on volume of trade become significantly more liquid after the stock split announcement. Remaining 13 companies (i.e. 30.23% of 43 stock splitting companies) based on turnover ratio, 9 companies (i.e. 20.93% of 43 stock splitting companies) based on turnover, and again 13 companies (i.e.30.23 % of 43 stock splitting companies) based on volume of trade are found to have significant negative impact of stock split announcement on their stock liquidity.

While considering the control companies of the stock splitting companies in this group, it is found that most of the control companies do not have any significant change in liquidity after the stock split announcement by their respective stock splitting companies. Out of 43 control companies 31 companies (i.e. 72.09% of 43 control companies) based on turnover ratio and turnover, and 30 companies (i.e. 69.76% of 43 control companies) based on volume of trade have shown insignificant change in liquidity. Among the other control companies, only 3 companies (i.e. 6.98% of 43 control companies) based on both turnover ratio and volume of trade and 4 companies (i.e. 9.31% of 43 control companies) based on turnover are found to have significant increment in their stock liquidity. Remaining 9 companies (i.e. 20.93% of 43 control companies) based on turnover ratio, 8 companies (i.e. 18.60% of 43 control companies) based on turnover, and again 10 companies (i.e.23.26 % of 43 control companies) based on volume of trade are found to have significant negative change in their stock liquidity.

On summarising the above findings, it can be observed that the results based on turnover ratio and volumes of trade are more or less same in case of all the three groups. As far as turnover is considered the result is somewhat different from that based on the other two measurements. Now, in case of all the three groups (viz. large cap, mid cap, and small cap) the average percentage (based on all the three measurements) of stock splitting companies having no significant change in liquidity is high but the average percentage of control companies having no change in liquidity is higher than that of stock splitting companies. This difference is much more in case of mid cap and small cap companies. Where, an average 59.67%, 57.62% and 48.84% of stock splitting companies in case of large cap, mid cap, and small cap group respectively are found to have insignificant impact of stock split announcement on their stock liquidity, there an average 65.43%, 71.19%, and 71.32% of control companies in case of large cap, mid cap, and small cap group respectively are found to have insignificant change in liquidity. In case of large cap and small cap group, average percentage of stock splitting companies having positive change in liquidity after the stock split announcement (i.e. 18.93% and 24.03% respectively) is less than that of stock splitting companies with negative change in liquidity (i.e. 21.40% and 27.13% respectively). Results based on turnover, in case of all the three groups, the percentage of stock splitting companies having positive impact on liquidity is more than the percentage of stock splitting companies with negative change in liquidity after the stock split announcement. It is also observed that average percentage of stock splitting companies with positive change in liquidity in case of mid cap and small cap group (i.e. 24.30% and 24.03% respectively) are higher than that in case of large cap group (i.e. 18.93%). Finally the result indicates that where an average 18.93%, 24.30% and 24.03% of stock splitting companies in case of large cap, mid cap, and small cap group respectively have shown positive change in liquidity due to stock split announcement, there only an average 12.35%, 14.69%, and 7.75% of control companies in case of large cap, mid cap, and small cap respectively have shown positive change in liquidity without stock split.

## **V. Conclusion**

Stock split, being an interesting event as earlier in the past, by several researchers, it (stock split) was considered just as a 'cosmetic event' which does not carry any real impact. But with the passage of time, several researchers, all over the world, found that it has impact on market liquidity, price, signalling impact, optimal trading range, tax option, market maker, multiple event (issue of equity shares after stock split), share holders wealth etc. Researchers have examined the liquidity hypothesis of stock split around the announcement or the event

date. Some found positive impact on liquidity or some like Copeland, Lamourex and Poon have found negative change in the liquidity of stocks after the stock split.

This study is also based on the examination of liquidity hypothesis in the context of Indian companies. By using the indicators of liquidity like daily volume of trade, daily turnover, and daily turnover ratio (ratio of turnover to market capitalisation) for measuring the liquidity of stocks during 20 days prior and 20 days post the stock split announcement date, it is observed that all the three measurements present more or less same results in case of Large cap, Mid cap and Small cap groups. Maximum companies of all the three groups have no impact of stock split announcement on liquidity of stocks. But the average percentage of companies having insignificant impact on liquidity in case of large cap group is more than that in case of mid cap and small cap group. Whereas, the average percentage of control companies having insignificant impact on liquidity in case of large cap group is less than that in case of mid cap and small cap group. Based on turnover, percentage of firms having positive impact on liquidity is more than the percentage of firms having negative impact in case of all the three groups. Whereas, based on volume of trade and turnover ratio, only in case of mid cap group, percentage of companies having positive impact on liquidity is more than the percentage of companies having negative impact and in case of large cap and small cap group the result is just the opposite. It is also found that in case of mid cap and small cap group, the percentages of stock splitting companies with positive impact on their stock liquidity are much more than that in case of large cap group. Finally, the result shows that the percentages of stock split announcing companies in all the groups and based on all the three measurements, having positive impact on liquidity due to stock split announcement are much more than that of the control companies.

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TABLE: I Summarisation of the Result of paired t-test for the change in turnover ratio, volume, and turnover following the stock split announcement.

LARGE CAP					MID CAP					SMALL CAP				
	STOCK SPLITTING		CONTROL COM.			STOCK SPLITTING		CONTROL COM.			STOCK SPLITTING		CONTROL COM.	
	COM.					COM.					COM.			
_Total	<b>81</b>		<b>81</b>		Total	<b>59</b>		<b>59</b>		Total	<b>43</b>		<b>43</b>	
<b>Based on Turnover ratio</b>	Number	%ge	Number	%ge	<b>Based on Turnover ratio</b>	Number	%ge	Number	%ge	<b>Based on Turnover ratio</b>	Number	%ge	Number	%ge
Insignificant	47	58.02	53	65.43	Insignificant	35	59.32	42	71.19	Insignificant	21	48.84	31	72.09
Significant positive	15	18.52	10	12.35	Significant positive	14	23.73	9	15.25	Significant positive	9	20.93	3	6.98
Significant Negative	19	23.46	18	22.22	Significant Negative	10	16.95	8	13.56	Significant Negative	13	30.23	9	20.93
<b>Based on Turnover</b>					<b>Based on Turnover</b>					<b>Based on Turnover</b>				
Insignificant	51	62.96	52	64.20	Insignificant	33	55.93	42	71.19	Insignificant	22	51.16	31	72.09
Significant positive	16	19.75	10	12.35	Significant positive	15	25.43	8	13.56	Significant positive	12	27.91	4	9.31
Significant Negative	14	17.29	19	23.45	Significant Negative	11	18.64	9	15.25	Significant Negative	9	20.93	8	18.60
<b>Based on Volume</b>					<b>Based on Volume</b>					<b>Based on Volume</b>				
Insignificant	47	58.02	54	66.67	Insignificant	34	57.63	42	71.19	Insignificant	20	46.51	30	69.76
Significant positive	15	18.52	10	12.35	Significant positive	14	23.73	9	15.25	Significant positive	10	23.26	3	6.98
Significant Negative	19	23.46	17	20.98	Significant Negative	11	18.64	8	13.56	Significant Negative	13	30.23	10	23.26
<b>Average</b>					<b>Average</b>					<b>Average</b>				
Insignificant		59.67		65.43	Insignificant		57.62		71.19	Insignificant		48.84		71.32
Significant positive		18.93		12.35	Significant positive		24.30		14.69	Significant positive		24.03		7.75
Significant Negative		21.40		22.22	Significant Negative		18.08		14.12	Significant Negative		27.13		20.93

Source: Computed by the researchers

## A COMPARATIVE STUDY ON AUDIT OF ACCOUNTING ESTIMATES IN USA, UK AND INDIA DESIRING USERS' PERCEPTIONS

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### **Abstract**

Financial information conveyed through financial statements influence stakeholders' logical decision about the company. Reliability of financial information is important to them. Accounting estimates used to evaluate some accounting items might cause an impediment to the production of reliable information. Hence, audit of accounting estimates becomes a complex affair. The paper begins with a conceptual discussion on auditors' responsibilities with respect to the audit of accounting estimates. It also makes a comparative analysis of Indian standard on audit of accounting estimate with that of United States of America (USA) and United Kingdom (UK). Based on the theoretical discussion, a few critical issues governing audit of accounting estimates are identified and opinions of Chartered Accountants (CAs) and Students on those issues are collected and empirically analysed. It is ultimately observed that CAs have a practical insight into this issue which makes them different from Students. However, both the groups believe that a thorough enquiry into the managerial intentions behind use of accounting estimates would help an auditor to reduce the risk of material misstatements.

**Keywords:** Accounting Estimates; ISA (UK & Ireland) 540; Mann-Whitney U Test; Mean Score; Percentage Analysis; SA 540; SAS 122 (AU-C 540); Statutory Auditor.

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### **1. Introduction**

Financial statements convey information on financial result and financial position of a corporate enterprise that is inevitable source of decision making by the stakeholders. Quality of financial information impacts their logical decision making. Hence, it is the duty of both preparer and auditor of financial statements to ensure reliability and authenticity of financial statements. Financial statements are prepared in accordance with national or international financial reporting standards [in India, financial statements are prepared according to

Accounting Standards (AS) under Indian Generally Accepted Accounting Principles (GAAP)]. While the evaluation of most of the items in financial statements is made in historical terms, some of the items are subject to estimates. They are commonly known as accounting estimates. One such area where there is a plenty of scope of using accounting estimate is measurement and recognition of non-current intangible assets that constitute a significant proportion of the total asset base of the company. Accounting estimates involve a great deal of subjectivity as two different estimates for an item can result in completely different accounting information. Consequently, financial result or position of the company would vary impacting decision making process of the stakeholders (Sacer, et.al., 2016). As accounting estimates involve a number of managerial judgements, audit of accounting estimates is a complex issue for the accounting profession. Many audit firms have expressed their views regarding problems in inspecting accounting estimate. Hence, the United States Securities and Exchange Commission (SEC) had tightened the disclosure norms for accounting estimates (KPMG, 2015).

## **2. Objectives of the Study**

Based on the research problem, the main research objectives of the study are:

- (i) To conceptually discuss the responsibilities of the auditors with regard to audit of accounting estimates in the light of applicable auditing standard;
- (ii) To comparatively analyse different provisions of the auditing standards governing audit of accounting estimates in USA, UK and India; and
- (iii) To empirically analyse users' perceptions on audit of accounting estimates.

## **3. Auditing Accounting Estimates based on Indian Auditing Standard**

Accounting estimate is an important tool in the hands of the management to manipulate financial result. Management's choice of assumption, method applied could influence accounting estimate. Therefore, accounting estimate is detrimental to the conduct of a quality audit. The auditor needs to perform necessary audit procedures to ensure that accounting estimates are not used for material misstatement and assumptions of accounting estimates have been consistently used and disclosed in the financial statements. Auditing accounting estimates, fair value estimates and related disclosures are one of the most crucial areas of auditing. It involves significant amount of managerial judgements. Failure to properly audit these issues may give rise to possible frauds. In India, Standard on Auditing (SA) 540 titled 'Auditing Accounting Estimates, including fair Value Accounting Estimates and Related

Disclosures' issued by the Institute of Chartered Accountants of India (ICAI) guides an auditor in this respect.

As per the provision of this standard, the auditor should have an understanding of a few issues in order to audit accounting estimates, such as the financial reporting framework followed by the company while preparing financial statements; requirement for accounting estimates and revision of accounting estimates in case of changing circumstances; assumptions required for accounting estimates; changes in assumptions over years; means used for development of estimates; requirements for management's expert; relevant internal control with respect to accounting estimates; and effect of estimation doubt on the opinion of auditors.

The auditor should measure whether estimation doubt can lead to significant risk. If the management does not deal with judgmental doubts, it may lead to major risks. In that case, the auditor should collect adequate suitable evidence on management's objective behind development of accounting estimate in the financial statements.

The auditor is required to appraise rationality of the assumptions in view of applicable financial reporting framework. He may also state a range within which it evaluates the rationality of the assumptions. He should obtain written representation from the management and those charged with governance about reasonableness of assumptions used in formulation of accounting estimates.

The auditor should come to a decision whether accounting estimates are rational within the appropriate financial reporting framework of the firm or are misstated. He should guarantee that accounting estimates and estimation uncertainties are disclosed in the financial statements as per the provision of applicable financial reporting framework. They also should try to measure management's partiality from their choice of accounting estimates.

Based on assessed risk of material misstatement, the auditor should assure that financial statements are prepared as per applicable financial reporting framework; methods of accounting estimates are suitable and reliable; adequate and proper evidence have been collected about accounting estimates; assumptions used for development of accounting estimates are rational; and internal control mechanism with respect to accounting estimate are efficient. Finally, Auditor's conclusion about fairness of accounting estimates and their disclosure and possible management bias should be documented (ICAI, 2009).

#### **4. Auditing Accounting Estimates: Comparison of Auditing Standards in Select Countries**

In this segment, the main objective is to make a comparative study among the provisions of auditing standards governing audit of accounting estimates in a few countries including India. As per World Bank data dated July 22, 2016, the first 10 countries of the world as per their Gross Domestic Product (GDP) calculated as per Purchasing Power Parity (PPP) theory are: China, United States (US), India, Japan, Germany, Russia, Brazil, Indonesia, United Kingdom (UK) and France (World Bank, 2016). Among these 10 countries, for the current study, three countries - US, UK and India are selected for the current study based on Judgemental Sampling technique (Kothari, 2010). All three countries have a developed or developing economies and significant contribution in regulatory development for accounting and auditing issues.

In all three countries, accounting estimates are the most critical area of auditing as it involves significant amount of managerial judgements. In each country under consideration, there is a professional standard that guides an auditor in auditing accounting estimates.

In the US, the Auditing Standards Board (ASB) under the American Institute of Certified Public Accountants issues auditing standards. Different aspects of auditing which are represented with the help of different Statements of Auditing Standards (SASs) were known as Auditing (AU) sections. With a view to improving the applicability of SASs and making it comparable with International Standards on Auditing (ISAs) issued by the International Auditing and Assurance Standards Board (IAASB) under the International Federation of Accountants (IFAC), ASB has started redrafting the SASs in line with ISAs. Consequently, old auditing (AU) sections were converted into new auditing section. In order to avoid any confusion between the old and new auditing sections, the new auditing sections are termed as Clarified Auditing Sections (AU-C Sections) (Flood, 2015). The applicable auditing standard for audit of accounting estimates is SAS-122 (AU-C 540) titled, 'Auditing Accounting Estimates, Including Fair Value Accounting Estimates, and Related Disclosures'.

In UK, the Financial Reporting Council (FRC) is entrusted with the duty of issuing auditing standards. In 2004, auditing standards were fully converged with ISAs and the FRC adopted this standard without any change. The new standards are known as ISAs (UK & Ireland). The applicable standard for audit of accounting estimate is ISA (UK & Ireland) 540 titled, 'Audit of Accounting Estimate'.

As mentioned in Section 2, in India, SA-540 is the governing standard for audit of accounting estimates. A comparative analysis of the requirements of these three individual standards is made in the following table.

**Table 1**  
**Requirements of Auditing Standards governing Audit of Accounting Estimates in USA, UK and India**

United States of America	United Kingdom	India
<ul style="list-style-type: none"> <li>◆ Understanding crucial aspects for formulation of accounting estimates;</li> <li>◆ Evaluating estimation uncertainty;</li> <li>◆ Evaluating rationality of assumptions;</li> <li>◆ Gathering evidences on managerial intent;</li> <li>◆ Assessing impact of accounting estimates on material misstatement;</li> <li>◆ Assuring disclosure of estimation uncertainty;</li> <li>◆ Evaluation of management bias;</li> <li>◆ Documentation of key aspects (AICPA, 2012).</li> </ul>	<ul style="list-style-type: none"> <li>◆ Understanding vital aspects for formulation of accounting estimates;</li> <li>◆ Evaluation of ambiguity in judgment;</li> <li>◆ Evaluating reasonableness of assumptions;</li> <li>◆ Collecting evidences on managerial intent;</li> <li>◆ Evaluating impact of accounting estimates on material misstatement;</li> <li>◆ Attesting disclosure of estimation uncertainty;</li> <li>◆ Assessment of management bias;</li> <li>◆ Obtaining written representation from management and those charged with governance about rationality of accounting estimates;</li> <li>◆ Documentation of important aspects (FRC, 2010).</li> </ul>	<ul style="list-style-type: none"> <li>◆ Understanding critical aspects for formulation of accounting estimates;</li> <li>◆ Evaluation of estimation uncertainty;</li> <li>◆ Evaluating sensibleness of assumptions;</li> <li>◆ Acquiring evidences on managerial intent;</li> <li>◆ Assessing impact of accounting estimates on material misstatement;</li> <li>◆ Assuring disclosure of estimation uncertainty;</li> <li>◆ Examination of management bias;</li> <li>◆ Gathering written representation from management and those charged with governance about reasonableness of accounting estimates;</li> <li>◆ Documentation of key aspects (ICAI, 2009).</li> </ul>

Source: Compilation by Author based on SAS–122 (AU–C 540), ISA (UK & Ireland)–540 and SA–540

It is observed from the above table that the provisions of these standards are almost identical. All three standards require the auditor to understand the key aspects for formulation of accounting estimates. They should gather sufficient and appropriate evidences on managerial intent behind a particular estimate. They should also evaluate reasonableness of the assumptions taken for the estimate, estimation uncertainty and inherent management bias in the use of that estimate. They should also check disclosure of estimation uncertainty in the financial statements. In addition to the above requirements, in UK and India, the auditors are required to obtain written confirmations from management or those charged with governance about reasonableness of written confirmations and document the key aspects relating to audit of accounting estimates.

## **5. Analysis of Users' Perceptions on Audit of Accounting Estimates**

### **5.1 Data & Methodology**

In the previous sections, a theoretical background has been set based on governing audit standards in different countries. Based on such theoretical underpinning into this issue and a meticulous consultation with a few reputed accounting firms in Kolkata, a few pertinent issues have been selected concerning audit of accounting estimates. They are as follows:

- (i) Problem of accounting estimates in drawing conclusive evidence about financial statement ( $V_1$ );
- (ii) Difficulty to identify management's bias using accounting estimates ( $V_2$ );
- (iii) Enquiry into management's justification behind using certain accounting estimates ( $V_3$ );
- (iv) Non-reliance on the expert's certificate on accounting estimates ( $V_4$ ).

These four issues have been converted into four close ended statements and incorporated in a structured questionnaire with 5-point scale where the scales represent different degrees of agreement of the respondents with a particular statement. Now, opinions on these 4 issues are collected from two categories of respondents. They are practising Chartered Accountants (CAs) Students pursuing Chartered Accountancy Course.

The main reason behind selection of these two respondent categories is evident from their occupation only. CAs in addition to the theoretical knowledge in this field deals with audit of accounting estimates in their engagements, whereas Students have a strong theoretical knowledge and may be a few new ideas in this field.

An initial sample of 250 respondents has been selected for each of the categories. The questionnaire is administered on them and during January, 2016 to June, 2016 in Kolkata, India. Completed responses were received only from 373 respondents comprising 227 CAs and 146 Students. Out of these 373 respondents, majority (98.4%) are male respondents, while it was not intentional. However, the entire respondents are well distributed in terms of their age groups. Majority of them (42.6%) are young in age (Age less than 30 years) followed by (33.5%) middle aged groups (Age between 30 to 50 years). After the data collection is complete, the entire data is incorporated in statistical software package, SPSS 20.0.

**5.2 Perceptions of Individual Respondent Categories on Audit of Accounting Estimates**

As mentioned earlier, the data is collected in 5-point scale showing different levels of agreement of the respondents. With a view to conducting statistical analysis qualitative opinions of the respondents needs to be converted into quantitative data. Hence, individual perceptions are assigned a score. Consequently, the level Strong Agreement (SA) received a score of 5; Agreement (A) received a score of 4; Neutral Approach (N) had a score of 3; Disagreement (D) received a score of 2; and finally, Strong Disagreement (SD) received a score of 1. Now, the opinions of the respondents on 4 different variables are projected in terms of 5 different numbers. As the data become quantitative, it is now becomes easy to find out the proportion of each respondent category in each agreement level. Such proportion would convey the individual perceptions of the respondent categories towards a particular variable. The result is shown below:

**Table 2**  
**Percentage of Respondents in Different Agreement Levels**

Variable Code	Variables	Category	SA	A	N	D	SD
V <sub>1</sub>	Problem of accounting estimates in drawing conclusive evidence about financial statement	CAs	2.20%	49.30%	15.40%	33.00%	0.00%
		Students	12.30%	44.50%	15.10%	21.20%	6.80%
		Total	6.20%	47.50%	15.30%	28.40%	2.70%
V <sub>2</sub>	Difficulty to identify	CAs	4.40%	74.90%	10.60%	10.10%	0.00%

	management's bias using accounting estimates	Students	19.20%	59.60%	10.30%	10.30%	0.70%
		Total	10.20%	68.90%	10.50%	10.20%	0.30%
V <sub>3</sub>	Enquiry into management's justification behind using certain accounting estimates	CAs	4.40%	87.20%	4.40%	4.00%	0.00%
		Students	26.00%	63.00%	9.60%	1.40%	0.00%
		Total	12.90%	77.70%	6.40%	2.90%	0.00%
V <sub>4</sub>	Non-reliance on the expert's certificate on accounting estimates	CAs	10.60%	63.40%	9.30%	16.70%	0.00%
		Students	26.00%	50.70%	12.30%	7.50%	3.40%
		Total	16.60%	58.40%	10.50%	13.10%	1.30%

Source: Compilation of Field Survey Data using SPSS 20.0

According to most of the CAs and Students, accounting estimate creates some problem in drawing conclusive evidence about the financial statements. They are also of this opinion that that management bias cannot be identified in accounting estimates. Maximum number of both the respondent categories had proposed that auditors should conduct an enquiry into the management's justification behind selection of certain estimates. Wide range of respondents from both the occupational groups prohibits auditors from relying on the expert's certificate on accounting estimates (Refer to Table 2).

From the above discussion, it is evident that both CAs and Students consider accounting estimate as an area of significant risk and management often use this measure for fabrication of financial statements. However, a thorough enquiry into the assumptions and justification of accounting estimates could reduce the risk of material misstatement.

### ***5.3 Importance of Individual Variables Concerning Audit of Accounting Estimates***

As mentioned in Section 3, the questionnaire for the current study is designed on 5-point scale and each statement in the questionnaire is associated with 5 levels of agreement. Each agreement level is assigned a particular score (Refer to Section 3). Now, 373 respondents comprising 227 CAs and 146 Students assign individual scores to each variable depending upon their level of agreement with it. When the data collection is complete, each variable has 373 different scores. Mean score for each variable across respondent groups has been calculated. As the score 3 in questionnaire represent a neutral outlook, mean score more than 3 signifies respondents' inclination towards agreement with that variable and vice versa.

Based on this rule, mean score for each variable has been calculated for individual respondent categories and for the entire sample.

**Table 3**  
**Mean Score of Individual Occupational Categories and Overall Sample**

Variable Code	Variables	Mean Score		
		CAs	Students	Total
V <sub>1</sub>	Problem of accounting estimates in drawing conclusive evidence about financial statement	3.207048	3.342466	3.260054
V <sub>2</sub>	Difficulty to identify management's bias using accounting estimates	3.735683	3.863014	3.785523
V <sub>3</sub>	Enquiry into management's justification behind using certain accounting estimates	3.920705	4.136986	4.005362
V <sub>4</sub>	Non-reliance on the expert's certificate on accounting estimates	3.678414	3.883562	3.758713

Source: Compilation of Field Survey Data using SPSS 20.0

In the above table, both CAs and Students have shown agreement (Mean score more than 3) to all 4 variables considered in this study. However, the magnitude of mean score determines their level of agreement. Accordingly, level of agreement of the both the respondent categories are highest for 'Enquiry into management's justification behind using certain accounting estimates' (V<sub>3</sub>). Hence, it may be said that according to both CAs and Students, a thorough enquiry into the managerial justification behind use of accounting estimates is the most important issue considered by both the respondent categories. On the other hand, level of agreement is least for the variable, 'Problem of accounting estimates in drawing conclusive evidence about financial statement' (V<sub>1</sub>). Hence, it may be said that CAs and Students do not allot too much significance to the problem of accounting estimates in drawing conclusive evidences.

**5.4 Significant difference of opinions between CAs and Students on Audit of Accounting Estimates**

In the current study, two sets of respondents are selected for field survey: CAs and Students. While CAs have professional knowledge and practical experience in audit of accounting estimates, students pursuing Chartered Accountancy course know this issue from books and other legal and regulatory pronouncements. Hence, there may be a possibility of difference of opinion between these two respondent groups. In order to test it empirically, Mann-Whitney (M-W) U test is conducted which is a non-parametric test conducted to compare differences between two independent groups when the dependent variable is either continuous or ordinal but not normally distributed (Roy & Saha, 2016). Here, CAs and Students are two independent groups and variables selected for the study are the Dependent Variable. M-W U test is conducted subject to fulfilment of following assumptions (Fay & Proschan, 2010):

(i) The dependent variable should be measured at ordinal level

Variables selected for this current study are measured in 5 point scale. It is an ordinal scale. Hence, the assumption is met for the study.

(ii) Independent variable should consist of two categorical independent groups

Two groups, CAs and Students can be clearly identified and categorised. Hence, independent variable of the study i.e. occupation is categorical in nature. It fulfils the second assumption.

(iii) Observations of one group must be independent from observations of another group

Observations of CAs were no way influenced by the observations of Students. They were independent from each other. Hence, the assumption is met.

(iv) The Dependent Variable across independent groups do not follow normal distribution

In order to test normality of distribution of the dependent variables across independent groups, a hypothesis is taken:

◆ Null Hypothesis ( $H_0$ ): Distribution is normal

◆ Alternate Hypothesis ( $H_1$ ): Distribution is not normal

With a view to testing the above hypothesis, Shapiro-Wilk's Test is conducted for each select variable across independent groups at 'n' (sample size of each group) degrees of freedom and 5% level of significance. If P-Value of statistic is less than 0.05,  $H_0$  is not accepted proving the distribution as non-normal distribution.

Table 4

## Results of Shapiro-Wilks Test on Individual Variables

Variable Code	Variables	Categories	Statistics	DF	P-Value	Decision Rule	Decision
V <sub>1</sub>	Problem of accounting estimates in drawing conclusive evidence about financial statement	CA	0.762	227	0.000	P-Value<0.05	Rejected
		Student	0.869	146	0.000	P-Value<0.05	Rejected
V <sub>2</sub>	Difficulty to identify management's bias using accounting estimates	CA	0.637	227	0.000	P-Value<0.05	Rejected
		Student	0.792	146	0.000	P-Value<0.05	Rejected
V <sub>3</sub>	Enquiry into management's justification behind using certain accounting estimates	CA	0.460	227	0.000	P-Value<0.05	Rejected
		Student	0.764	146	0.000	P-Value<0.05	Rejected
V <sub>4</sub>	Non-reliance on the expert's certificate on accounting estimates	CA	0.750	227	0.000	P-Value<0.05	Rejected
		Student	0.815	146	0.000	P-Value<0.05	Rejected

Source: Compilation of Field Survey Data using SPSS 20.0

It is observed here that  $H_0$  is not accepted for any of the dependent variables across independent groups. As Null Hypothesis is rejected and Alternate Hypothesis is accepted, data for all dependent variables across groups do not follow normal distribution which is in line with the spirit of this assumption.

Following fulfilment of all four assumptions for conducting M-W U test, the test is conducted on the current sample. The test involves assigning ranks to each individual observation. Summation of ranks from each sample gives us the test statistic known as U. For large samples, U follows normal distribution. Hence, standardised value of the test statistics is computed and decision is taken on the null hypothesis which state that no significant

difference exists between the independent groups (Zar, 1998). The hypothesis designed for the current study is:

H<sub>0</sub>: There is no significant difference of opinions between CAs and Students;

H<sub>1</sub>: Significant difference of opinions exists between CAs and Students.

At 5% level of significance and K-1 Degree of Freedom (DF) where K is number of independent groups (2), if probability (P-Value) of selecting H<sub>0</sub> is less than 0.05, H<sub>0</sub> cannot be accepted and vice versa.

**Table 5**  
**Results of Mann–Whitney U Test for Select Variables**

Variable Code	Variables	U	Z	P-Value	Decision Rule	Decision on H <sub>0</sub>
V <sub>1</sub>	Problem of accounting estimates in drawing conclusive evidence about financial statement	15113.5	-1.54071	0.123388	P-Value>0.05	Accepted
V <sub>2</sub>	Difficulty to identify management's bias using accounting estimates	14744.5	-2.19614	0.028082	P-Value<0.05	Rejected
V <sub>3</sub>	Enquiry into management's justification behind using certain accounting estimates	13645	-3.96353	0.000074	P-Value<0.05	Rejected
V <sub>4</sub>	Non-reliance on the expert's certificate on accounting estimates	14196	-2.62523	0.008659	P-Value<0.05	Rejected

Source: Compilation of Field Survey Data using SPSS 20.0

H<sub>0</sub> is accepted only for the variable, 'Problem of accounting estimates in drawing conclusive evidence about financial statement' (V<sub>1</sub>). It suggests that respondents irrespective of their professional experience accept the problems associated with accounting estimate in drawing conclusive evidence about financial statements. However, for rest of the variables, opinions

of CAs are significantly different from that of Students mainly because of CAs' practical insight in this field.

## 6. Conclusions

Accounting estimates involve a great deal of subjectivity and managerial judgements. Hence, audit of accounting estimates is a complex job. However, SA-540 vividly describes auditors' responsibilities with respect to collection of sufficient and appropriate evidences on accounting estimates to reduce risk of material misstatements. When the situation in India is compared to that of USA and UK, it is observed that the standard in all three countries is almost similar. In fact, Indian standard is more comprehensive than its foreign counterparts. Based on theoretical discussion, a few critical issues are selected. CAs and Students were asked to give their opinion on those issues. According to them accounting estimates do pose some problems in drawing conclusive evidence about financial statements as they are highly driven by management bias. A thorough investigation into the estimates is thus necessary. Enquiry into the management's justification behind use of accounting estimate is the most important variable considered by both the respondent categories. Research findings also suggest that CAs and Students perceive the issue of accounting estimate differently. CAs with their professional experience has a practical insight into this issue, whereas Students observe this issue academically. Though accounting estimates pose a threat of material misstatements, as the study suggests proper audit of accounting estimate as per the provisions of SA-540 can bring out the reliable information and help stakeholders in decision making process.

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**VIEWERS' PERCEPTION ABOUT INDIAN TELEVISION CHANNELS: A  
STUDY WITH SPECIAL REFERENCE TO KOLKATA**

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**Abstract**

The growth of Television industry for the last decade was very impressive. The steady growth of this industry can be attributed to many factors, such as rise in the number of television households, growth of regional markets, increasing advertisement expenditure etc. The Indian Television market is expected to grow at a compound annual growth of 15.5% to reach US \$15.2 billion in 2019 according to KPMG India Report, 2016. The main objective of this paper is to highlight the type of programs that are aired in Indian television channels, penetration of these channels in the minds of the consumers and the perception of consumers regarding different television channels. This study is based on the response of 122 viewers selected from the different wards of the city of Kolkata. This paper analyses the findings on the basis of charts and graphs and finally concludes that most of the television viewers are spending time on watching news, soap advertisements and serials and people are prepared to pay more for quality content and high definition viewing.

**Keywords:** IPTV (Internet Protocol Television), Direct-to-Home (DTH), Head-end-in-the-sky (HITS), STB

**I. INTRODUCTION**

The television industry witnessed healthy growth during the last decade driven by increasing advertising spends, rise in the number of television households, robust growth in DTH and expanding regional markets. The Ministry of Information and Broadcasting (MIB), Government of India, says that with the growth of television channels from 130 in 2004 to 800+ channels in

2016, India has become the third largest TV market with close to 154 million TV households, next to China and the United States. At the same time, the size of the TV industry has witnessed an exponential growth as well. The value of the TV industry is valued at Rs 50,140 crore in 2014 from Rs 18,300 crore in 2006. The digitization process has brought transparency in the system with 30 million STBs being installed in the first two phases. The television and broadcasting industry has grown almost to 100 million viewers in 2010 to reach a total of above 600 million viewers by the start of 2015.

Some of the highlights of the decade have been the implementation of various guidelines including policy guidelines for up linking and down linking of TV channels (amended in 2011), policy guidelines for HITS broadcasting services (2009), policy guidelines for IPTV (2008), Revision of FDI Policy in five segments of broadcasting sector (2012), policy guidelines for TV rating agencies in India (2014) and policy guidelines on direct to home services (2001).

Each of the segments in television like television distribution, advertising and content, registered robust growth during 2010 to 2016; the distribution industry grew by 16.4% in the year 2016 aided by high growth rates of the DTH industry and advances in digitization. This sector is expected to maintain steady growth and keep adding to the overall television pie. The segment stood at an estimated INR 250 billion in 2016 up from INR 165 billion in 2012 as per BCG-CII Report in the year 2016. The other two segments i.e., television advertising and television content also grew by 14% and 13% in the year 2016 respectively.

## **II. OBJECTIVES OF THE STUDY**

**The objectives of this study are:**

- To Understand and compare Indian Television channels and the type of programs that are aired.
- Penetration of these channels in the minds of the consumers and how they perceive the different categories of channels and programs on Television.

## **III. LITERATURE REVIEW**

The volume of literature that has so far developed on the theme is scanty. There are a few number of Journals, Articles and text book materials which account for the whole of the literature that currently exist in relation to this subject.

In spite of that from the available literature, it has been observed that by Mohana Krishnan, (2014) regarding viewer's perception towards watching national English news channels in Kerala (India) and found that almost all the segment of population were eager to watch news updates on local news channels ahead of others. But their perception towards watching other news channels especially English was unknown. Parul N. et al (2014) mainly studied reality shows hosted by famous actors. 'Satyamev Jayate' and revealed that television shows backed by sound research and clarity of message can act as potential change agents in modifying the perceptions of the audience and generating increased sensitivity towards various social discords. Rajagopal (2002) reported that TV shows have a stronger impact on shaping gender images in people, female oriented serials influence women to become self conscious about their manifestation as a measure of their worth. Since the 1960s, communication scholars have examined television's contributions to viewers' perceptions of a wide variety of topics and issues. Valaskakis (1983) examined television viewing tastes and habits among the Indians of the Eastern and Southern India. He found that programmes that are aired were very different between two regions and also the viewing tastes and habits are significantly different between the people of two regions.

Unfortunately, little/no effort has been made to investigate the viewers' perception and penetration of Indian TV channels in the minds of the consumers and how they perceive the different categories of channels and programs on Television. The above identified gap provided the basis for this research work.

According to Media Partners Asia (MPA) Report 2016, India will remain the key pay-TV market in Asia as the penetration rate of digital TV grows to encompass half the population by 2016 and 61% by 2020. Just 20% of India's homes had digital television in 2011, but the mandatory drive to digitize the cable TV network, as well as the six commercial direct to home (DTH) pay TV platforms, in addition to DD Direct, the DTH platform operated by the state broadcaster Doordarshan, will attract more and more subscribers in the coming four years.

“India's digitalization timetable implies a three-year transition to full digital TV (DTV) conversion. This is ambitious, though we believe DTV transition will occur but over a longer time frame,” said Vivek Couto, executive director, MPA. "The industry will remain capital-intensive until 2017 at the earliest, due to the capex requirements associated with digitalization. This will lead to more mergers and acquisitions (M&A) and fund-raising activity in both primary

and secondary markets. The sector's improved transparency, scale and operating leverage will attract large domestic and international strategic players, who will play a key role in M&A activity," he added.

MPA predicts pay TV subscription fees will grow at an 11% compound annual growth rate from 2011-2016, driven by increased DTH and digital cable volume. The total number of pay TV subscribers in India is expected to reach 172 million by 2016, and 199 million by 2020. MPA's biggest concerns for the industry include, Couto says, "Cable execution and capitalization, as MSOs transition from a B2B to B2C model; DTH satellite capacity; and the extent of regulation in the broadcast ecosystem. While digitalization is the result of policy progress, this has not been the case for investment and taxation policies."

In terms of DTH penetration, the active subscriber base of paying customers may grow from 29 million in 2011 to 89 million by 2017, says the report, reaching 93 million in 2020. This would represent a 46% share of the overall market by 2020, compared with 23% in 2011, and a 65% share of the digital pay TV market according to MPA. The analysts also predict the majority of DTH pay-TV platforms will be generating cash within the next four years in the report, titled 'Asia Pacific Pay TV & Broadband Markets 2017'. However, consolidation of last-mile local cable operators will become inevitable, leading to a shift in industry profits and value to centralized distribution platforms and broadcasters.

Approximately 33 million homes will subscribe to digital cable TV by 2016 and 48 million by 2020, with the multiple service offerings in the form of channel packs, high definition, value-added services and broadband, driving both subscribers and average revenue per user (ARPU) growth. MPA predicts the monthly digital cable ARPUs will rise from US\$4 in 2011 to \$5 by 2016, and \$6 by 2020. Subscription revenues in the cable industry will grow from \$4.2 billion in 2011 to \$6.4 billion by 2020, with broadband providing 15% of these sales and pay-TV accounting for 85%.

According to iSuppli Corporation, National Readership Survey 2005, FICCI-PricewaterhouseCoopers report, 2016 the current scenario of Television Market Segmentation is given in Table 1.

**Table 1: Television Market Segmentation**

INR Billion	2012	2013	2014	2015	2016	CAGR
<b>Television Distribution</b>	<b>117.0</b>	<b>136.5</b>	<b>150.0</b>	<b>165.0</b>	<b>192.0</b>	<b>13.2%</b>
% Change	20.6	16.7	9.9	10.0	16.4	
<b>Television Advertising</b>	<b>66.2</b>	<b>78.0</b>	<b>84.2</b>	<b>89.0</b>	<b>101.5</b>	<b>11.3%</b>
% Change	21.5	17.8	7.9	5.7	14.0	
<b>Television Content</b>	<b>8.0</b>	<b>9.4</b>	<b>10.5</b>	<b>11.5</b>	<b>13.0</b>	<b>16.7%</b>
% Change	14.3	17.5	11.7	9.5	13.0	
<b>Total</b>	<b>191.2</b>	<b>223.9</b>	<b>244.7</b>	<b>265.5</b>	<b>306.5</b>	<b>12.5%</b>

*Source:* iSuppli Corporation, National Readership Survey 2005, FICCI-Pricewaterhouse Coopers report, 2016

- ❖ **Television Distribution:** The distribution industry consists of subscription revenue obtained from pay TV households in the country. This industry is highly fragmented in India with about 50,000+ local cable operators (LCOs), 7,000+ multi system operators (MSOs) and six direct-to-home (DTH) operators. The top five MSOs account for less than 30% of the revenues of this industry.
- ❖ **Television Advertising:** Television advertising is one of the largest segments in the total advertising pie in India. With the economic turnaround, it bounced back to double-digit growth in line with the growth of the total advertisement market. Television advertisement consists of revenue from advertisers spending on terrestrial, satellite as well as mobile TV. Mobile TV advertising is still nascent in India. The TV advertisement expenditure has grown from 23,022 crore in 2015 to 27,378 crore in 2017 with an average growth rate of 9% according to WPP-owned media company GroupM in 2017. The television advertising industry is a third of total television industry revenue and 41% of the total advertising industry. With buoyant revenues expected in future, it is likely to consolidate its position

going forward.

- ❖ **Television Content:** It is a system for evaluating the content of the TV programs and reporting the suitability of viewing different TV programs for the children, teenagers and adults. The broadcaster or the content producer mainly rates the programmes. Table 1 shows that from 2012 to 2016 there is a considerable change in the rating of television content which shows a compound annual growth rate of 16.7%.

### **Different categories of Television Channels:**

1. **News Channels:** What comes to your mind when you see the word news? If we were to answer this question 10-15 years back, we may have said that news bulletins are telecast at night. But today, the answer would be news channels showing news round the clock. Initially news on television meant a bulletin of half an hour or one hour usually telecast at the prime time comprising the top stories of the day. But today the meaning and definition of news has changed considerably. There are various programs, and a number of ways in which the news is being broadcast.

- ❖ **General News channels:** BBC World, CNN, Times Now, CNN IBN, Headlines Today, NDTV 24x7, News X, DD News.
- ❖ **Business News channels:** CNBC-TV18, NDTV Profit, Bloomberg UTV, ET Now
- ❖ **Regional News channels:** NDTV Hindu Channel for Chennai, NDTV Metro Nation Channel for Delhi NCR

### 2. **Sports Channels:**

**Sports channels in India:** TEN Sports, TEN Cricket, TEN Action+, TEN Golf, TEN HD, STAR Sports, STAR Sports 2, STAR Sports 3, STAR Cricket, STAR Cricket HD, NEO Sports, NEO Prime, DD Sports, Sony SIX, Sony SIX HD.

3. **Cartoon Channels:** Do you have any younger sister or brother at home? Ask them what their favorite channel on television is. Well, their answer would probably be Pogo or Cartoon Network. The most popular category of television channels among kids are the cartoon channels.

Cartoon Network India is the most popular cartoon-dedicated television channel in India. It airs English, Tamil and Hindi-dubbed versions of a variety of cartoons, including traditional Cartoon Network programs featuring Tom and Jerry, Pokemon, Doraemon, Scooby-Doo and Popeye the Sailor Man.

Programs also include the superhero series including Superman: The Animated Series, Batman: The Animated Series and Justice League Unlimited, Beyblade, Xiaolin Showdown, Duel Masters, Transformers: The Unicorn Trilogy and the Teenage Mutant Ninja Turtles.

Cartoon Network, Disney Channel India, Disney XD (India), Disney Junior (India) Discovery Kids, Nickelodeon, Nick Jr., Pogo, Sonic (TV channel), Baby TV.

4. **Entertainment Channels:** Zee TV, Sony TV, Colors, Star Plus, Life OK, 9x, DD national, Sab TV, Zindagi, etc are some example of entertainment channels.

5. **Movie Channels:** Most TV viewers' favorite pass time is to watch movie channels be it Hollywood, Bollywood or regional movies. Some popular movie channels are HBO, Star Movies, Movies Now, Zee studio, Zee MGM etc in English, Zee cinema, Star gold, Set Max etc in Hindi.

New Movie channels are coming in thick and fast with 40 channels pending for approval from the ministry. These days all the new movies are aired within a month of their actual release as the rights are bought by individual channels.

6. **Educational Channels:** Animal Planet, Discovery Channel, Discovery Science, Discovery Turbo, Fox Traveler, National Geographic Channel, Nat Geo Adventure, Nat Geo Wild, History Channel.

#### IV. RESEARCH METHODOLOGY

- ❖ **Data Collection:** Survey data were collected by means of in-person interviews with 122 adult residents of a large, northern metropolitan area.
- ❖ **Research Time Frame:** The data for this research work was collected during April, 2016 to 31<sup>st</sup> January, 2017.
- ❖ **Data Collection Instrument:** The research instrument for collection of primary data is the questionnaire. The questionnaire is designed to be self-administered to provide a standardized presentation of items. However, the interviewers remain with the respondents to answer any questions that arise, to stimulate interest in the survey, and to monitor compliance with the instructions. Most questions use six-point rating scales. However, some variables require forced choice or free response measures. The nature of

the responses and numerical codes for each variable appear following the variable name in.

- ❖ **Research Design:** *Sampling Elements:* Families (Nuclear & Joint families), *Sampling Units:* Adult residents, *Extent:* Selected wards of Kolkata.
- ❖ **Sample Size:** A sample size of 122 was chosen from the 82 wards out of 141 wards of Kolkata in order to make the sample representative of the population. Finally eliminating the extreme response of the respondents and sampling error only the response of 105 respondents were retained in the study.
- ❖ **Sampling Technique:** Simple random sampling was employed as per the requirement of the study. One to two respondents were selected from each 82 wards of Kolkata in order to ensure broad representation of the socioeconomic characteristics of the population.
- ❖ **Statistical Tools Used:** For a comparative study and for better visual understanding and better presentation of the data, charts and tables have been used. Moreover, the following statistical techniques are used to analyze the collected data. Bar Chart, Line Chart, Mean, Likert Scale, Chi-square Test etc.

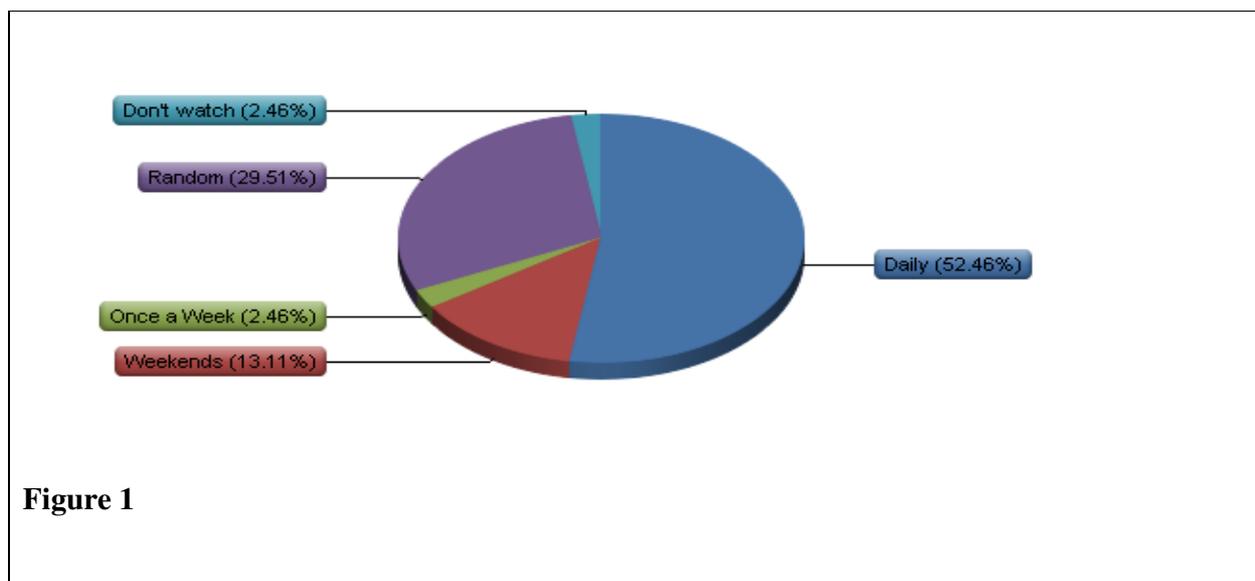
## V. CASE STUDY BASED ON ANALYSIS AND FINDINGS

### ANALYSIS OF THE QUESTIONNAIRE

#### Table 2: Socio-economic Characteristics of the Respondents

Statistic		Value		
<b>Total Responses</b>		<b>122</b>		
#	Gender		Response	%
1	Male		83	68%
2	Female		39	32%
<b>Total</b>			<b>122</b>	<b>100%</b>
#	Age Group		Response	%
1	18 - 25		97	80%
2	26 - 35		19	16%
3	35 - 50		6	5%
4	50 and above		0	0%
<b>Total</b>			<b>122</b>	<b>100%</b>
#	Occupation		Response	%
1	Student		90	74%
2	Home maker		1	1%
3	Service		24	20%
4	Business		7	6%
<b>Total</b>			<b>122</b>	<b>100%</b>

**How often do you watch TV?**



**Figure 1**

Source: Compiled by the authors

Figure 1 shows that 52.46% of the respondents watch television daily, 29.51% randomly, 13.11% watch at the weekends, 2.46% watch once in a week and 2.46% does not watch at all.

**Rate the following options by the amount of time spent on each segment while watching TV**

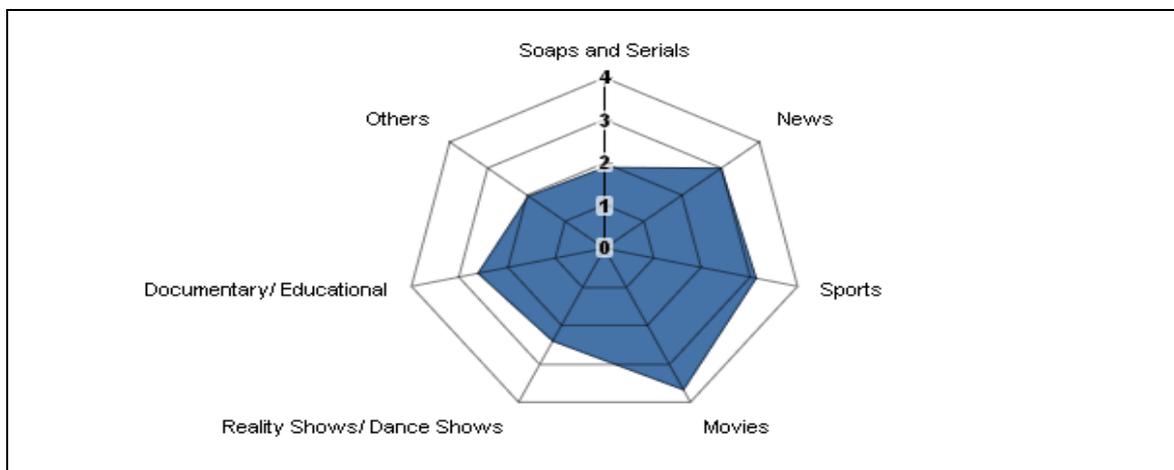
**Table 3: Amount of time spent on each segment while watching TV**

#	Types	Min Value	Max Value	Average Value	Responses
1	Soaps and Serials	0.00	5.00	1.90	105
2	News	1.00	5.00	3.01	105
3	Sports	1.00	5.00	3.14	105
4	Movies	1.00	5.00	3.68	105
5	Reality Shows/ Dance Shows	0.00	5.00	2.41	105
6	Documentary/ Educational	0.00	5.00	2.62	105
7	Others	0.00	5.00	1.96	105

Source: Compiled by the authors

From the analysis of Table 3 figures it is very clear that viewers like to watch movies (3.68 Average) followed by Sports (3.14 Average) and News (3.01 Average).

The Figure 2 below shows the perceptual mapping of the amount of time spent on each segment while watching TV.



**Figure 2**

Source: Compiled by the authors

**Rank the channels in order of your preference in the soaps and serials category****Table 4: Ranking of channels in the soaps and serials category**

#	Soaps	1	2	3	4	5	6	Total
1	Star Plus	26	22	27	18	8	4	105
2	Sony	25	42	26	10	1	1	105
3	Colors	27	20	23	26	5	4	105
4	Zee TV	3	7	19	42	26	8	105
5	SAB	18	6	4	5	42	30	105
6	Life OK	6	8	6	4	23	58	105
	<b>Total</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>-</b>

Source: Compiled by the authors

From the analysis of Table 4 figures we can clearly understand that the Top 3 Soaps and serial TV channels are Colors (27 people), Star Plus (26 people) and Sony (25 people) respectively. This shows the neck to neck competition amongst these channels where people are indifferent to them in most ways. If we talk in percentage terms, the 3 channels gross up nearly 75% of the audience choice.

**Rank the channels in order of your preference in the NEWS category**

**Table 5: Ranking of channels in the news category**

#	NEWS	1	2	3	4	5	6	Responses
1	Aaj Tak	17	16	9	14	18	31	105
2	NDTV 24X7	34	39	19	12	1	0	105
3	CNN IBN	25	27	23	20	9	1	105
4	Headlines Today	2	6	31	39	20	7	105
5	Times Now	23	15	20	17	22	8	105
6	Zee news	4	2	3	3	35	58	105
	<b>Total</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>-</b>

Source: Compiled by the authors

From the analysis of Table 5 figures NDTV 24X7 is the clear viewer's favorite with 34 votes followed by CNN IBN and Times Now.

**Rank the channels in order of your preference in the Sports category**

**Table 6: Ranking of channels in the Sports category**

#	Sports	1	2	3	4	5	6	Responses
1	Sony Six	51	33	10	7	2	2	105
2	DD	23	37	35	4	5	1	105
3	Ten	0	7	19	29	20	30	105
4	Ten sports	5	11	24	38	23	4	105
5	Star	24	11	11	16	36	7	105
6	Neo	2	6	6	11	19	61	105
	<b>Total</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>-</b>

Source: Compiled by the authors

Table 6 figures show that Sony Six is the market leader in the Sports category followed by Star Sports and DD Sports

**Rank the channels in order of your preference in the Movies category**

**Table 7: Ranking of channels in the Movies category**

#	Movies	1	2	3	4	5	6	Responses
1	Star	58	36	5	4	1	1	105
2	HBO	33	47	10	6	4	5	105
3	Movies	2	7	30	28	30	8	105
4	Set	9	6	48	32	6	4	105
5	Star	3	7	11	29	49	6	105
6	Zee Cinema	0	2	1	6	15	81	105
	<b>Total</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>-</b>

Source: Compiled by the authors

Table 7 reveals that Star Movies are viewer’s favorite followed by HBO.

**Are the modern TV channels more innovative and adaptive to change than Doordarshan?**

**Table 8: Response regarding innovative and adaptive features of modern TV channels compared to Doordarshan**

#	Answer	Response	%
1	Yes		98%
2	No		2%
	<b>Total</b>	<b>100</b>	<b>100%</b>

Source: Compiled by the authors

From the Table 8 it can be observed that Doordarshan has really lagged behind when it comes to Modern Television channels and needs a makeover and change in style to catch the viewer’s attention back.

**Do you believe there is any reality in the reality TV shows?**

**Table 9: Response regarding reality in the reality shows**

#	Answer		Response	%
1	Yes		20	20%
2	No		80	80%
	<b>Total</b>		<b>100</b>	<b>100%</b>

Source: Compiled by the authors

Table 9 shows that most viewers had the perception that Reality TV shows are not actually real and are staged for more TRP.

**Have the cookery shows actually helped you in preparing better dishes at home?**

On a scale of 0 -10, the cookery shows have actually helped you in preparing better dishes at home. This is shown in Table 8 below.

**Table 10: Response regarding cookery shows**

#	Scale		Response	%
0	0		0	0%
1	1		15	15%
2	2		13	13%
3	3		7	7%
4	4		8	8%
5	5		6	6%
6	6		16	16%
7	7		15	15%
8	8		10	10%
9	9		6	6%
10	10		4	4%
	<b>Total</b>		<b>100</b>	<b>100%</b>

Source: Compiled by the authors

The average highest score is 6.0/10

### Are you likely to shift to another news channel if your favourite news anchor moves to another channel?

On a scale of 0 -10, news channels tend to take some news out of context to increase their TRP.

**Table 11: Response regarding moving to another news channel**

#	Answer		Response	%
0	0		0	0%
1	1		0	0%
2	2		0	0%
3	3		3	3%
4	4		5	5%
5	5		4	4%
6	6		11	11%
7	7		24	24%
8	8		27	27%
9	9		10	10%
10	10		16	16%
	<b>Total</b>		<b>100</b>	<b>100%</b>

Source: Compiled by the authors

The average score is 8.0/10. This is shown in Figure 3 which shows that 41.28% respondents like to shift to another news channel when they see that their favourite news anchor moves to another Source: Compiled by the authors

channel and 58.76% does not like to change the news channel.

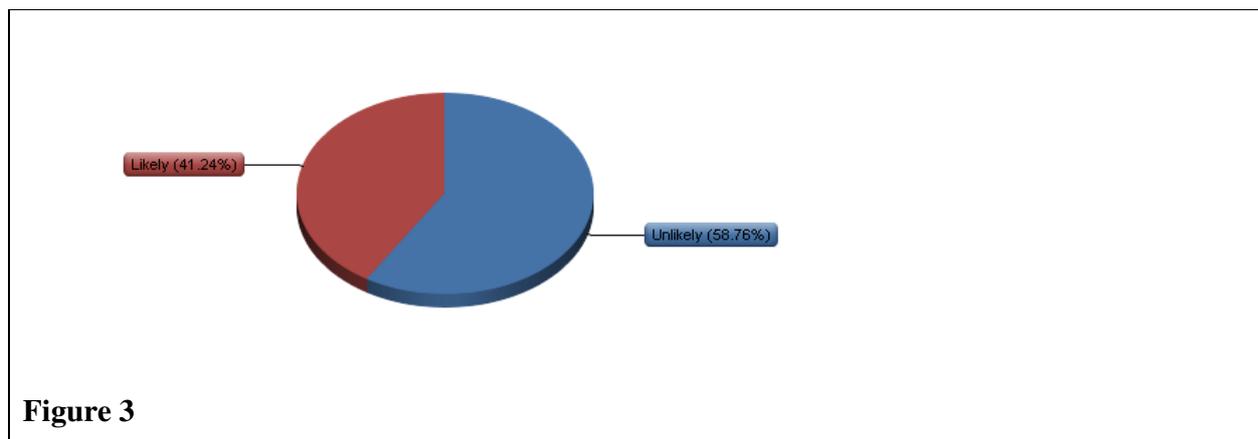
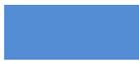


Figure 3

Source: Compiled by the authors

**You have changed your daily habits by getting influenced by the TV channels**

**Table 12: Response regarding changing of daily habits by getting influenced by TV channels**

#	Answer		Response	%
1	Strongly Disagree		9	9%
2	Disagree		31	32%
3	Neither Agree nor Disagree		38	39%
4	Agree		17	18%
5	Strongly Agree		2	2%
	<b>Total</b>		<b>97</b>	<b>100%</b>

Source: Compiled by the authors

Viewers are neutral to the statement.

**Should every TV channel have a HD (high definition) channel for their high end users?**

**Table 13: Response regarding HD channels**

#	Answer		Response	%
1	Strongly Disagree		2	2%
2	Disagree		15	15%
3	Neither Agree nor Disagree		20	21%
4	Agree		38	39%
5	Strongly Agree		22	23%
	<b>Total</b>		<b>97</b>	<b>100%</b>

Source: Compiled by the authors

Table 13 shows that viewers mostly agree to the statement (39%) as High Definition has come in a big way in the last few years or so with currently 49 HD channels and growing.

**Elements Important for you to choose a particular channel to watch**

**Table 14: Response regarding important elements to choose for watching a particular channel**

#	Elements	Extremely Important	Very Important	Somewhat Important	Neither Important nor	Somewhat Unimportant	Very Unimportant	Not at all Important	Total Responses	Mean
1	Entertainment Quotient	46	40	11	0	0	0	0	97	1.64
2	Brand Image	7	35	39	9	7	0	0	97	2.73
3	Content	56	36	3	1	1	0	0	97	1.51
4	Hosts/Anchors	13	32	35	10	3	4	0	97	2.69
5	Language	29	37	22	6	2	1	0	97	2.15
6	Emotional Quotient	11	10	43	20	5	5	3	97	3.26
7	Acting/Drama	15	26	33	13	10	0	0	97	2.76
8	Live	19	23	31	14	5	3	2	97	2.79
9	Sexism	4	6	19	32	13	8	15	97	4.32
10	Design/Outlook	15	31	38	11	2	0	0	97	2.53

Source: Compiled by the authors

From the analysis of Table 14 we conclude that Content (56) and Entertainment Quotient (46) are extremely important to the viewers, while Language and Brand image is a very important factor in choosing a particular channel to watch. It is also clear from their respective mean values that most of these parameters except sexism are important to viewers.

## **VI. CONCLUSION**

Television in India is a huge industry which has thousands of programs in many languages. The small screen has produced numerous celebrities, some even attaining national fame. TV soaps are extremely popular. More than half of all Indian households own a television.

**From the analysis of the various viewers' responses to the questionnaire, we can conclude:-**

- Most of the viewers prefer to watch cable channels whilst Doordarshan has taken a back seat in almost 95% of the cases.
- Most of the viewer's television time is spent on News, sports and soaps and serials.
- With Internet booming in the last decade, where digital media can be easily downloaded or viewed on YouTube, the importance of live coverage is even more overwhelming.
- People are ready to pay more for quality content and High definition viewing. Although it is costly and the viewer has to have a HD enabled Television, it is becoming very popular.
- With more and more reality Television series airing on prime time, it is interesting to note that people are willing to invest time and money on viewing other people's life on camera. However the current media is prone to sensationlization and very short sighted reporting. There is hardly any follow up reporting to take the story to its logical conclusion. Currently it is more of drama, in presentation, and less of content.
- *Zindagi*, an Indian entertainment television channel owned by the Zee Entertainment Enterprises (ZEEL), launched on 23 June 2014, and its programs have been very well received by the Indian audience and the channel has also set a few records. It became the first ever general entertainment channel (GEC) to air syndicated content from Pakistan. The channel also embarked a new beginning for cultural exchange between India and other nations. It was also launched with the incentive to initiate a different direction towards peace between Indian and Pakistan; given the situation between the two countries.

## **VII. LIMITATIONS OF THE STUDY AND SCOPE FOR FURTHER STUDIES**

The main limitation of this study is that the total population of Kolkata City is too large, whereas the sample size is limited to 122 viewers selected from a few wards of Kolkata due to time and resource constraint. As the sample size is not large so generalization of the findings is not possible. Secondly all the viewers are not channel oriented some of them are program oriented.

Thirdly, the sample has been chosen from Kolkata and nearby areas, and so it still needs to be explored whether the findings of this study can be replicated in a different geographical area for further verification and generalization. The scope of further research is huge in spite of the fact very little literature is available regarding viewers' perception about Indian television channels.

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QUESTIONNAIRE

Q1. Name:

Q2. Gender:

- Male (1)
- Female (2)

Q3. Age Group

- 18-25 (1)
- 26-35 (2)
- 36-50 (3)
- 50 & above (4)

Q4. Occupation

- Student (1)
- Home maker (2)
- Service (3)
- Business (4)

Q5. How often do you watch TV?

- Daily (1)
- Weekends (2)
- Once a Week (3)
- Random (4)
- Never (5)

Q6. Rank the following categories of programs in TV Channels in order of your preference (With 1 being most preferred and 7 being least preferred)

- \_\_\_\_\_ Soaps and Serials (1)
- \_\_\_\_\_ News (2)
- \_\_\_\_\_ Sports (3)
- \_\_\_\_\_ Movies (4)
- \_\_\_\_\_ Reality shows/Dance shows (5)
- \_\_\_\_\_ Documentary/Educational (6)
- \_\_\_\_\_ Others(7)

Q7. Rank the channels in order of your preference in the SOAPS AND SERIALS category (With 1 being most preferred and 7 being least preferred)

- \_\_\_\_\_ Star Plus (1)
- \_\_\_\_\_ Sony (2)
- \_\_\_\_\_ Colors (3)
- \_\_\_\_\_ Zee TV (4)
- \_\_\_\_\_ Sab TV (5)
- \_\_\_\_\_ Life OK (6)

Q8. Rank the channels in order of your preference in the NEWS category (With 1 being most preferred and 7 being least preferred)

- \_\_\_\_\_ Aaj Tak (1)
- \_\_\_\_\_ NDTV 24X7 (2)
- \_\_\_\_\_ CNN IBN (3)
- \_\_\_\_\_ Headlines Today (4)
- \_\_\_\_\_ Times Now (5)
- \_\_\_\_\_ Zee News (6)

Q9. Rank the channels in order of your preference in the SPORTS category (With 1 being most preferred and 7 being least preferred)

- \_\_\_\_\_ Sony Six (1)
- \_\_\_\_\_ DD Sports (2)
- \_\_\_\_\_ Ten Action (3)
- \_\_\_\_\_ Ten Sports (4)
- \_\_\_\_\_ Star Sports (5)
- \_\_\_\_\_ Neo Sports (6)

Q10. Rank the channels in order of your preference in the MOVIES category (With 1 being most preferred and 7 being least preferred)

- \_\_\_\_\_ Star Movies (1)
- \_\_\_\_\_ HBO (2)
- \_\_\_\_\_ Movies Now (3)
- \_\_\_\_\_ Set Max (4)
- \_\_\_\_\_ Star Gold (5)
- \_\_\_\_\_ Zee Cinema (6)

Q11. Do you think people still watch Doordarshan?

- Yes (1)
- No (2)

Q12. Are the modern TV Channels more innovative and adaptive to change than Doordarshan?

- Yes (1)

No (2)

Q13. Do you believe there is any reality in the reality TV shows?

- Yes (1)
- No (2)

Q14. Have the cookery shows actually helped you in preparing better dishes at home?

\_\_\_\_\_ Rate on a scale of 0-10 (1)

Q15. Do News channels tend to take some news out of context to increase their TRP?

\_\_\_\_\_ Rate on a scale of 0-10 (1)

Q16. Are you likely to shift to another news channel if your favorite news anchor moves to another channel?

- Yes (1)
- No (2)

Q17. Rate the following -

	Strongly Agree (1)	Agree (2)	Neither Agree nor Disagree (3)	Disagree (4)	Strongly Disagree (5)
You have changed your daily habits by getting influenced by the content shown in TV Channels. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q18. Rate the following -

	Strongly Agree (1)	Agree (2)	Neither Agree nor Disagree (3)	Disagree (4)	Strongly Disagree (5)
Should every TV Channel have a HD (High	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Definition) channel for their high end users? (1)					
------------------------------------------------------------	--	--	--	--	--

Q19. Elements important for you to choose a particular channel to watch

	Extrem ely Importa nt (1)	Very Importa nt (2)	Somew hat Importa nt (3)	Neither Important nor Unimport ant (4)	Somewha t Unimport ant (5)	Very Unimport ant (6)	Not at all Importa nt (7)
Entertainment Quotient (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Brand Image (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Content (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stars/Hosts/Anc hors (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Language (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotional Quotient (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Acting/Drama (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Live Coverage (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sexism (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Design/Outlook (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**AN ANALYTICAL STUDY ON SECTOR WISE INVESTMENT OF LIC  
DURING PRE AND POST-REFORMS PERIOD**

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**Abstract**

Currently, there are 24 life insurance companies (both public as well as private) operating in India. The most significant life insurance company among 24 life insurance companies is Life Insurance Corporation of India (LIC). In India, both public as well as private life insurance companies have made their investment portfolio in a significant magnitude as per IRDA (Insurance Regulatory and Development Authority) regulations. Thus, with a view to safeguarding the interests of the policyholders as well as the national interest, the investible funds are invested in different sectors in Indian economy. As per IRDA regulations, enormous amount of premium collected and other incomes after meeting various expenses by life insurance companies are invested in financial markets through their investment portfolio in various sectors. However, the present paper is based on secondary data to analyze the growth of sector-wise investment of LIC during pre and post-reforms period using log-linear model. This paper also focuses on significant differences among public sector, private sector, joint sector and co-operative sector investments of LIC during pre and post-reforms period using Independent samples t test.

**Keywords:** *Log-Linear Model, Sector Wise Investments, IRDA, LIC, Independent Samples t Test.*

**I Introduction**

Life insurance industry plays a significant role in Indian financial system in order to develop the Indian economy in meeting demand for the creation of appropriate funding possibility. Life Insurance companies engage to convert the savings of people into investments to develop economy<sup>1</sup>. Nationalization of life insurance sector was a further step for effective mobilization of the people's savings in Indian economy<sup>2</sup>. Life Insurance protects an individual and /or its family at the premature death or at the old age by

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1 I. Ege and T. Bahadir, *The Relationship between Insurance Sector and Economic Growth: An Econometric Analysis*, IJER, 2011, pp. 1-19.

2 D. Kumar, *Tryst with Trust: The LIC Story*, Mumbai, LIC of India, 1991, p. 31.

providing an adequate return to insured people<sup>3</sup>. Investment in life insurance products is historically an important investment method through which individuals with relatively low incomes have been able to save and invest effectively for the long term<sup>4</sup>. Currently, there are 24 life insurance companies (both public as well as private) operating in India. The most significant life insurance company among 24 life insurance companies is Life Insurance Corporation of India (LICI). In India, both public as well as private life insurance companies have made their investment portfolio in a significant magnitude as per IRDA (Insurance Regulatory and Development Authority) regulations. Thus, with a view to safeguarding the interests of the policyholders as well as the national interest, the investible funds are invested in different sectors in Indian economy<sup>5</sup>. As per IRDA regulations, enormous amount of premium collected and other incomes after meeting various expenses by life insurance companies are invested in financial markets through their investment portfolio in various sectors. However, the present paper is based on secondary data to analyze the growth of sector wise investment of LICI during pre and post-reforms period using log-linear model. This paper also focuses on significant differences among public sector, private sector, joint sector and co-operative sector investments of LICI during pre and post-reforms period using independent samples t test.

## II Past Studies

Adigal and Mehta (2014) in their book, “Changing Finance and Economic Perspectives” explained investment portfolio, savings mobilization into Indian economy, growth of LICI. Bhole (2004) in his book, “Financial Institution and Markets” explained insurance funds, investments pattern of LIC fund, and growth of life business and fund, valuation of life policies, structure of insurance plans, and aggregative view of Indian insurance. Gupta (2003) in his book, “Insurance: A General Text Book” explained real facts of life insurance, future prospectus of life insurance. Khan (2006) in his book, “Indian Financial System” discussed insurance Act 1938, registration, power of IRDA to make regulations, rural/social sector obligations, investments norms, maintenance of books of accounts and records, and distribution of surplus regulations. Kumar (1994) in his book, “Tryst with Trust: The LIC Story” compiled the insurance Act 1938, nationalization of insurance, Act 1968, investments policy business

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<sup>3</sup> S. S. Saha, (2013), *Indian Financial System and Markets*, McGraw Hill Education Private Limited, New Delhi, 2013, p. 152.

<sup>4</sup> G. Dickinson., *Encouraging a Dynamic Life Insurance Industry: Economic Benefits and Policy Issues*, City University Business School, London, pp. 1-9.

<sup>5</sup> Notification, IRDA/Reg./8/2000

performance, policy bonuses, LIC mutual fund, and LIC growth statistics. Kumar and Kumari (2012) in their article, “A Comparative Study on Public vs. Private Sector in Life Insurance in India” stated insurance density and penetration, gross direct premium, total insurance premium, market share of different private players. Noronh (2012) in his article, “A Comparative Study of Cost Efficiency Score of Life Insurance Companies in India” discussed life insurance sector in India, international comparison of life insurance, cost efficiency score. Palande, Shah and Lunawat (2003) in their book, “Insurance in India Changing Policies and Emerging Opportunities” discussed the special position of insurance in the Indian economy, influence of global markets, growth and development of Indian insurance industry. Pathak (2006) in his book, “The Indian Financial System” explained indicated the pattern of investments, fund wise life insurance investments, and market share of life insurance players. Rajendran and Natarajan (2009) in his article “The Impact of LPG on Life Insurance Corporation of India (LICI)” revealed pre-independence scenario, post-nationalization trend of life insurance, growth of life insurance, analysis and interpretation of LIC, trend analysis of life business. Saha (2013) in his book, “Indian Financial System and Markets” explained principles of insurance, origin of insurance sector, reforms of insurance sector in India, different product of life insurance, regulatory framework of insurance, investment pattern of insurance. Singh and Singh (2011) in his article “An Empirical Analysis of Life Insurance Industry in India” discussed position of Indian life insurance industry in the pre-LPG era, Progress of Indian life insurance industry in the post-LPG era total life insurance premium, two ways ANOVA.

### **Research Gap**

Studying the past studies, the research gaps are identified as below:

- ◆ Rational researches in this field are insignificant;
- ◆ Literatures studied mainly focus on overall LICI and life insurance sector in India;
- ◆ Literature reviewed so far; do not study significant differences in sector wise investment of LICI during pre and post-reforms period.

### **III Objectives of Study**

The major objectives of the study are given as follows:

- ◆ To make growth analysis of sector wise investments of LICI during pre and post-reforms stage;
- ◆ To analyse significant difference among sector wise investments of LICI during pre and post-reforms period;

### **IV Research Methodology**

The present study is exploratory in nature. The methodology adopted in pursuing the study, has been organized in the following paragraphs:

◆ *Searching the Underlying Concept*

To explore the area under the study, an attempt has been made to study the available books and journals on life insurance activities in India. These have been studied to acquire a general knowledge on the conceptual issues on life insurance activities, its problem areas and related matters.

◆ *Sample Design*

At present, 24 life insurance companies including public and private life insurance companies are operating in India. The research study is being restricted to Life Insurance Corporation of India (LICI), because only one public life insurance company is present in India and LICI is life insurance business leader in Indian life insurance sector. Sector wise investments of LICI are analyzed during the pre-reforms period 1986-1987 to 1999-2000 and post-reforms period 2000-2001 to 2013-2014 for its long service in India.

◆ *Collection of Data*

Secondary data are collected from books, journals, magazines, internet based materials and online database of libraries during the pre-reforms period 1986-1987 to 1999-2000 and post-reforms period 2000-2001 to 2013-2014.

◆ *Statistical Tools for Interpretation*

Empirical Analysis in this study is made with the help of SPSS 20 version. Log-Linear Model is used to find the trend analysis during pre and post-reforms period and independent samples t test is applied to study the comparative performance in sector wise investment during pre and post-reforms period.

## V Analysis and Discussion

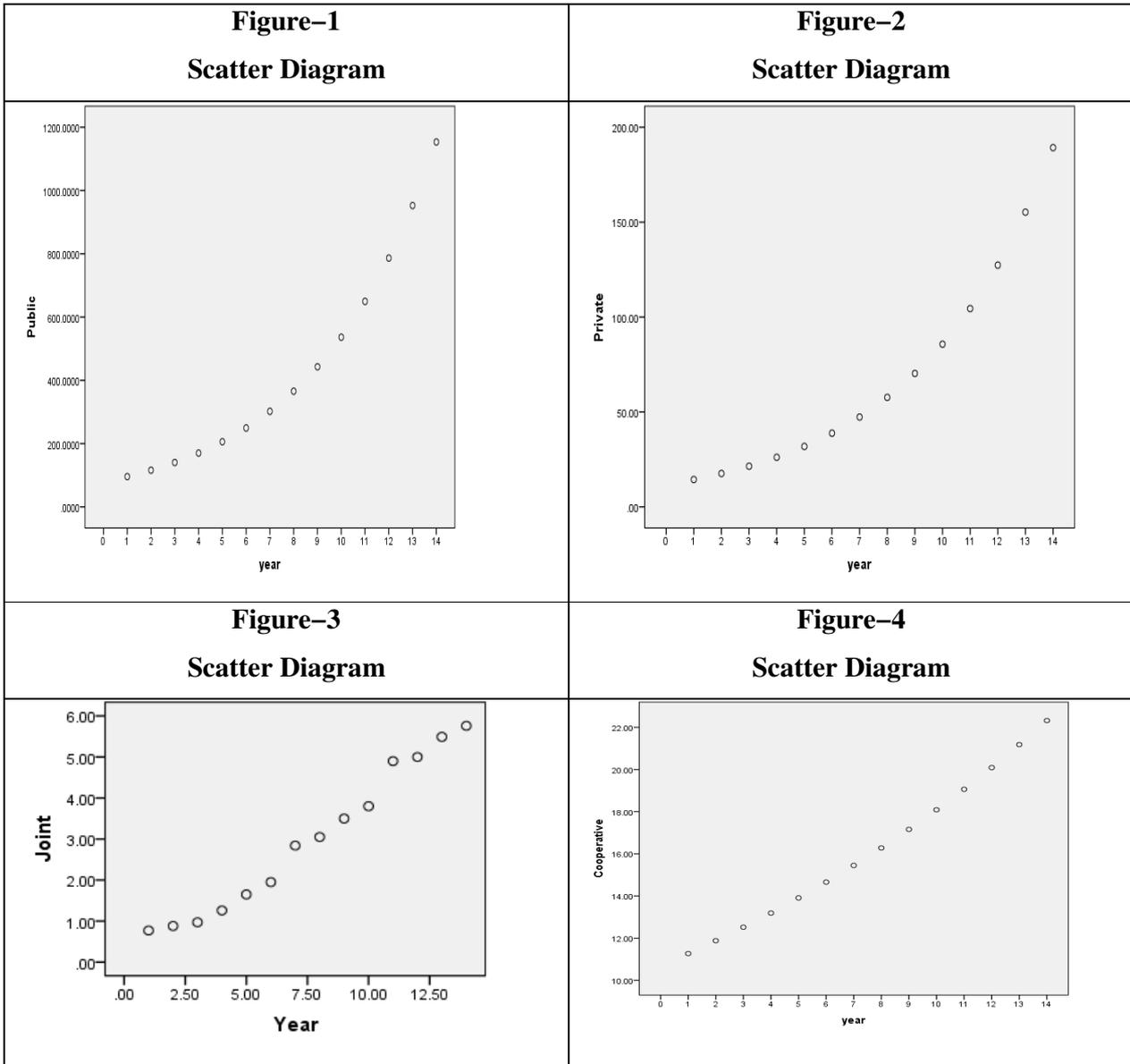
In this section, sector wise investments are analysed using log-linear model and independent samples t test.

(a) *Exploring Trend Analysis of Sector Wise Investments during Pre-reforms Period using Log-linear Model*

In this section, the trend values of sector wise investment are studied during pre-reforms period to identify the character of trends of different investments of LICI. For this purpose, the equation of data sets are linear or non-linear which is justified in the following way.

**Scatter Diagram**

Now, public sector, private sector, joint sector and co-operative sector investments are plotted in scatter diagram on the basis of actual data to analyse the functions in the parameters in the following subsequent Figures.



[Source: Compilation of secondary data using SPSS 20.0 Version]

**Findings**

Figures shown above explain sector wise investments during pre-reforms period in the scatter diagram. These are the exponential form of equations,  $Y_t = ab^t$ . The diagrams show the non-linear in parameters in the above Figures.

Here, sector wise investment is the Dependent Variable (DV) and time represented by year is the Independent Variable (IV). Now, this relationship is established based on the following equations:

$$\Rightarrow Y_t = Y_1 \times (1+g)^t \dots\dots\dots(i)$$

Where,

- ◆  $Y_t = \text{Total Investment at time } t$
- ◆  $Y_1 = \text{Total Investment in the beginning year and}$
- ◆  $g = \text{Compound Annual Growth Rate (CAGR)}$

If, term  $Y_1 = a$ , and  $(1+g) = b$ , the above equation in exponential trend is written in the following way:

$$\Rightarrow Y_t = ab^t \dots\dots\dots(ii)$$

Therefore, a non-linear relationship exists between sector wise investment and time period. It is statistically known as exponential relationship. In order to get the trend of  $Y_t$  during study period, the values of a and b are estimated. For this purpose, the above non-linear equation is transformed into a linear equation by taking log at the both sides. Now, the equation is shown as under:

$$\Rightarrow \text{Log } Y_t = \text{Log } a + t \text{ Log } b \dots\dots\dots(iii)$$

Then, the observed values are log transformed by SPSS 20.0 Version for calculation of the values of log a, and log b. Now, the values of log a, and log b is estimated using the following formulae:

$$\Rightarrow \text{Log } b = (N \sum \text{Log } Y_t \times t - (\sum \text{Log } Y_t) (\sum t)) \div (N \sum t^2 - (\sum t)^2)$$

$$\Rightarrow \text{Log } a = (\sum \text{Log } Y_t - \text{Log } b (\sum t)) \div N$$

Where,

- ◆  $N$  stands for number of observations = 14
- ◆  $t$  is the time period [1986–1987 to 1999–2000]

After measuring the values of log a, and log b, the values of a and b are measured taking antilog. Putting these values of a and b in Equation (ii), estimated trend values of  $Y_t$  are found. From this equation, it is forecasted the values of  $Y_t$  in the forthcoming periods. In equation (ii), b is represented by  $(1+g)$ ; where, g is compound annual growth rate (CAGR) for the study period. From the estimated value of b, the value of CAGR for sector wise investment is calculated using the following equation:

$$\Rightarrow \text{CAGR } (\%) = (b-1) \times 100$$

Based on the observed values, the estimated trends of sector wise investment are found using aforesaid formulae. Estimated values of log a, log b, a, b, and trend values of sector wise investment during study period are presented in Table-I.

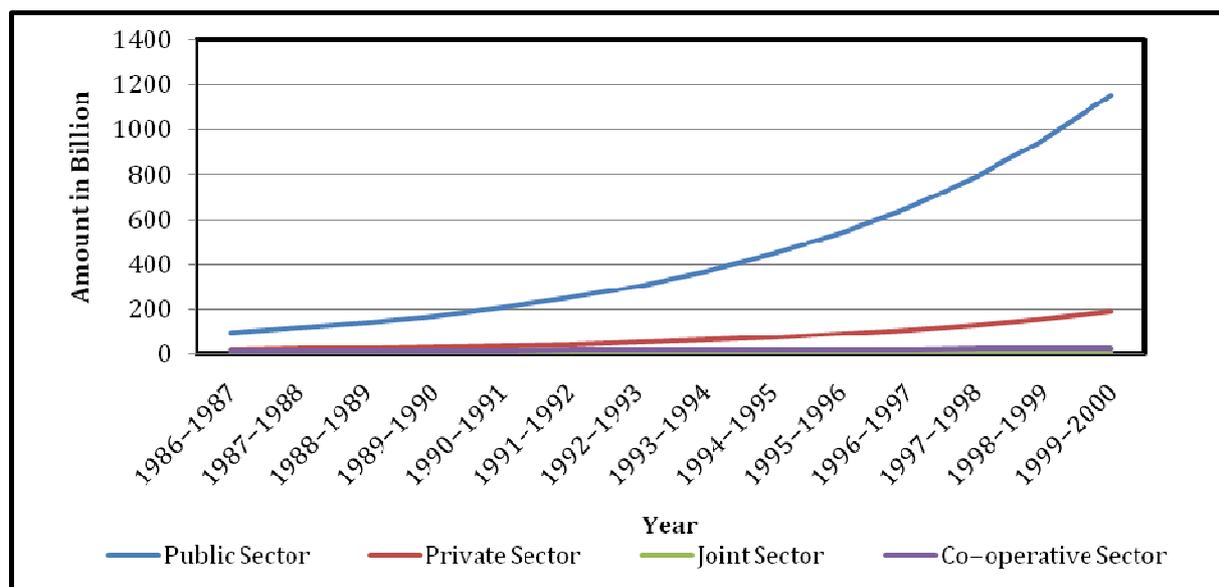
**Table-I: Actual & Trend Values in Sector Wise Investments**

Year (As on 31st March)	Public Sector (Rs. in Billion)		Private Sector (Rs. in Billion)		Joint Sector (Rs. in Billion)		Co-operative Sector (Rs. in Billion)	
	Actual value	Trend value	Actual value	Trend value	Actual value	Trend value	Actual value	Trend value
1986-1987	102.59	95.75	14.08	14.42	0.77	0.82	10.59	11.27
1987-1988	118.37	115.95	16.25	17.58	0.88	0.97	11.62	11.88
1988-1989	140.32	140.42	19.73	21.43	0.97	1.15	12.40	12.52
1989-1990	164.04	170.05	26.41	26.12	1.26	1.36	13.33	13.19
1990-1991	199.80	205.93	33.10	31.84	1.65	1.60	14.44	13.91
1991-1992	244.25	249.38	42.40	38.82	1.95	1.89	15.63	14.66
1992-1993	289.83	302.00	53.97	47.32	2.84	2.23	16.58	15.45
1993-1994	362.47	365.72	58.94	57.68	3.05	2.63	17.16	16.28
1994-1995	443.19	442.89	70.17	70.31	3.50	3.10	17.93	17.16
1995-1996	540.03	536.34	88.14	85.71	3.80	3.66	18.59	18.09
1996-1997	659.17	649.51	95.89	104.48	4.90	4.32	19.42	19.06
1997-1998	792.36	786.56	118.34	127.36	5.00	5.09	20.30	20.09
1998-1999	964.11	952.52	150.48	155.25	5.49	6.01	20.95	21.18
1999-2000	1170.59	1153.50	192.68	189.25	5.76	7.09	21.29	22.32
log a	-	1.898	-	1.073	-	-0.156	-	1.029
log b	-	0.083	-	0.086	-	0.072	-	0.023
a	-	79.068	-	11.830	-	0.699	-	10.690
b	-	1.211	-	1.219	-	1.180	-	1.054
CAGR	-	21.10	-	21.90	-	18.00	-	5.40

Source: Compilation on the basis of actual data using MS Excel 2007

Trend values and expected values during pre-reforms period are projected in the following Figure-5:

**Figure-5: Trend Lines in Sector Wise Investments**



Source: Compilation on the basis of Table-I using MS Excel 2007

### Findings

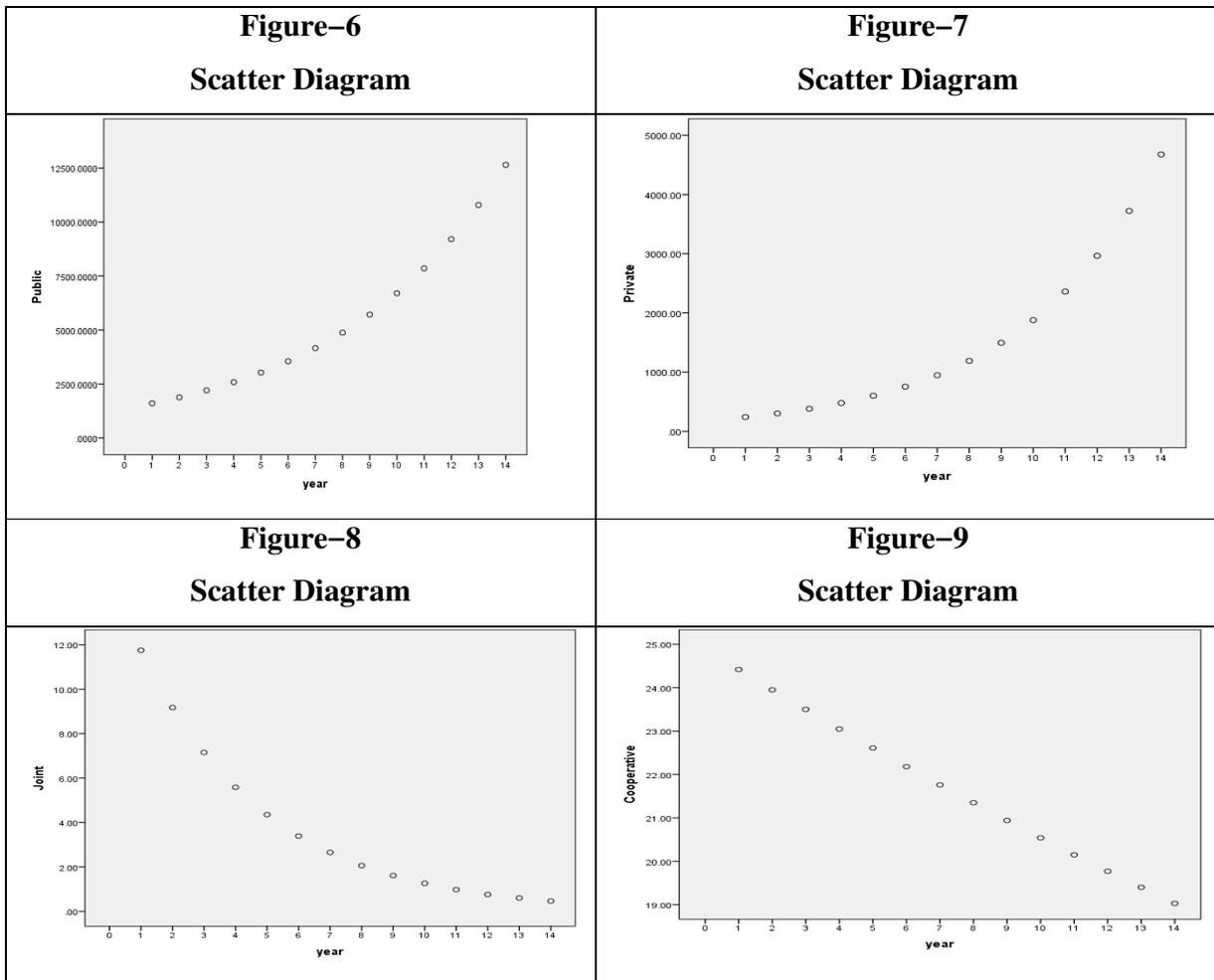
- ◆ CAGRs of public sector, private sector, joint sector and co-operative sector investment are 21.10%, 21.90%, 18.00% and 5.40% respectively. CAGRs of private sector are more than public sector, joint sector and co-operative sector but CAGR of co-operative is not very well.
- ◆ CAGRs are different for the different returns on sectoral investments as well as favourable investment portfolio during pre-reforms period.
- ◆ Figure-5 shows the trends of investments in public sector is increasing mostly, it is growing moderately in private sector but this is very small in joint sector and co-operative sector.
- ◆ As per investment portfolio during pre-reforms period, large investments are made in public and private sector but these are small in joint sector and co-operative sector.

### (b) Exploring Trend Analysis of Sector Wise Investments during Post-reforms Period using Log-linear Model

In present segment, trend of sector wise investment during post-reforms period are studied to find the nature of trend in investment of LIC. At this time, the equations are verified for data sets for linear or non-linear in the following way:

#### Scatter Diagram

Currently, scatter diagram is set as made previously. The Figures on the basis of real data are shown as under:



[Source: Compilation of secondary data using MS Excel 2007]

**Findings**

Figure-6, Figure-7, Figure-8 and Figure-9 explain the sector wise investment during post-reforms period in the scatter diagram. The diagrams explain the non-linear in parameters in the above Figures.

These are the exponential form of equation  $Y_t = ab^t$ .

Trend values of public sector, private sector, joint sector and co-operative sector investments for the period 2000-2001 to 2013-2014 and expected trend values for the period 2014-2015, 2015-2016 and 2016-2017 are measured. These values for sector wise investments during post-reforms stage are stated in the Table-II:

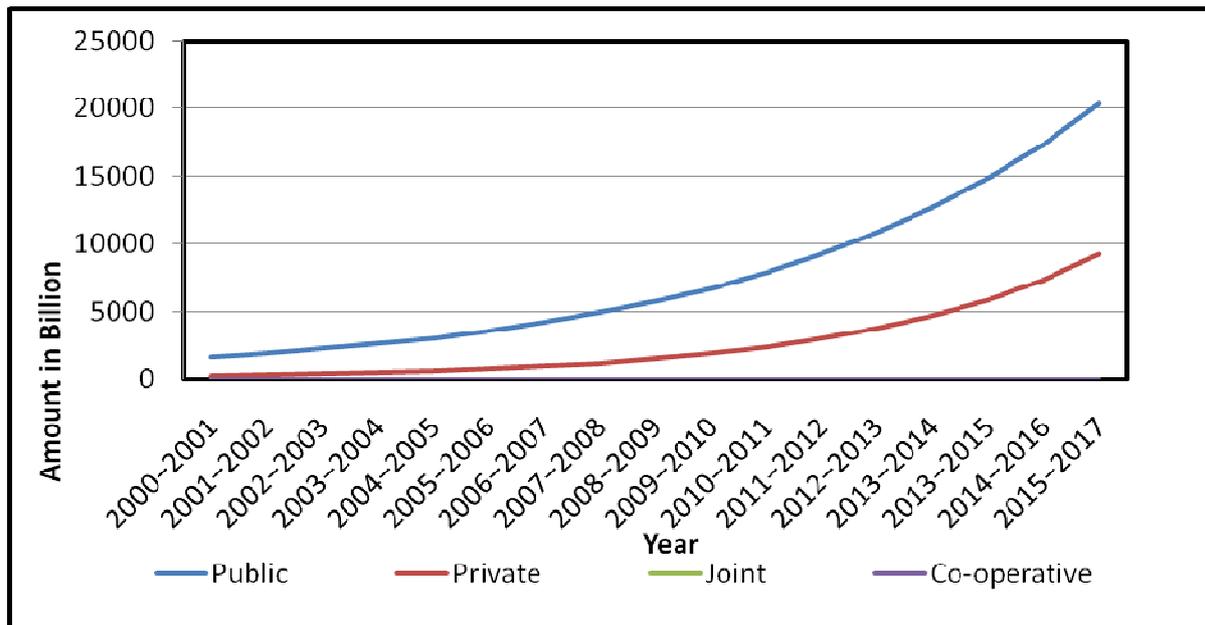
**Table-II: Actual & Trend Values in Sector Wise Investments**

Year (As on 31st March)	Public Sector (Rs. in Billion)		Private Sector (Rs. in Billion)		Joint Sector (Rs. in Billion)		Co-operative Sector (Rs. in Billion)	
	Actual Value	Trend Value	Actual Value	Trend Value	Actual Value	Trend Value	Actual Value	Trend Value
2000-2001	1412.56	1606.67	227.80	241.54	8.00	11.75	21.68	24.42
2001-2002	1805.74	1883.02	237.08	303.37	7.93	9.17	21.29	23.95
2002-2003	2195.97	2206.90	294.07	381.04	6.85	7.15	20.82	23.50
2003-2004	2717.79	2586.49	519.24	478.58	9.60	5.58	10.80	23.05
2004-2005	3220.22	3031.36	684.85	601.10	12.70	4.35	14.08	22.61
2005-2006	3788.07	3552.76	1051.48	754.98	19.15	3.39	13.56	22.18
2006-2007	4338.10	4163.83	842.94	948.26	0.75	2.65	35.55	21.76
2007-2008	5033.88	4880.01	1284.68	1191.01	0.74	2.06	38.18	21.35
2008-2009	5720.50	5719.38	1871.41	1495.91	0.72	1.61	36.29	20.94
2009-2010	6783.74	6703.11	2361.35	1878.87	0.71	1.26	36.67	20.54
2010-2011	7990.09	7856.04	2675.18	2359.86	0.82	0.98	36.68	20.15
2011-2012	8996.55	9207.28	3005.10	2963.98	0.85	0.76	35.67	19.77
2012-2013	10187.81	10790.93	3293.08	3722.76	0.86	0.60	8.22	19.40
2013-2014	11942.61	12646.97	3160.24	4675.79	0.94	0.46	7.54	19.03
2013-2015	-	14822.25	-	5872.79	-	0.36	-	18.67
2014-2016	-	17371.68	-	7376.22	-	0.28	-	18.31
2015-2017	-	20359.61	-	9264.53	-	0.22	-	17.96
log a	-	3.137	-	2.284	-	1.178	-	1.396
log b	-	0.069	-	0.099	-	-0.108	-	-0.008
a	-	1370.882	-	192.309	-	15.066	-	24.889
b	-	1.172	-	1.256	-	0.78	-	0.981
CAGR	-	17.20	-	25.60	-	-22.00	-	-1.90

[Source: Compilation on the basis actual data using MS Excel 2007]

During post-reforms period, trend lines are shown in the following Figure-10.

**Figure-10: Trend Lines in Sector Wise Investments**



Source: Compilation on the basis of Table-II using MS Excel 2007

### Findings

- ◆ Future-10 shows the trend of public sector, private sector are increasing to a great extent but joint sector and co-operative sector are increasing bit by bit during the study period 2000-2001 to 2013-2014. Expected trends are also increasing during the period 2014-2015 to 2016-2017.
- ◆ CAGRs of public sector, private sector, joint sector and co-operative sector of LIC are 17.20 %, 25.60 %, -22.00 % and -1.90 % respectively.
- ◆ During post-reforms period, returns on joint and co-operative sector investment are decreasing more than returns on these sectors during pre-reforms period. IRDA is also not giving more investment and proper investment strategies in joint and co-operative sector during post-reforms period.

### (c) Exploring Significant Difference among Sector Wise Investments during Pre and Post-reforms Period using Independent Samples t Test

In this segment, significant difference among public sector, private sector, joint sector and co-operative sector investments of LIC during pre and post-reforms period has been made using independent samples t test on the basis of actual data of Table-I and Table-II.

### Independent Samples t Test

*Assumptions<sup>6</sup> for Independent Samples t Test*

- ◆ *Assumption-1: Independent variable is two categorical independent groups:* In this recent study, sector wise investments during pre and post-reforms era are related two categorical independent groups. Therefore, first assumption of independent samples t test is fulfilled
- ◆ *Assumption-2: Populations are normally distributed:* Shapiro-Wilk test is used to verify normally distributed data for each group of independent variable. The method is described as below:

<i>Hypothesis</i>	<ul style="list-style-type: none"> <li>◆ <i>Null Hypothesis (H<sub>0</sub>): Investments in public, private, joint and co-operative sector are normally distributed during pre and post-reforms period.</i></li> <li>◆ <i>Alternate Hypothesis (H<sub>1</sub>): Investments in public, private, joint and co-operative sector are not normally distributed during pre and post-reforms period.</i></li> </ul>
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Test Statistic	Shapiro-Wilk Test
Significance Level	5 %
Decision Rule	If P-Value is less than 0.05, H <sub>0</sub> is not accepted.

The results of this test are stated as under:

**Table-III: Results of Shapiro-Wilk Tests**

Parameter		Statistic	DF	P-Value	Decision Rule	Decision on H <sub>0</sub>
Public sector	Pre-Reforms Period	0.935	14	0.356	P-Value>0.05	Accepted
	Post- Reforms Period	0.890	14	0.081	P-Value>0.05	Accepted
Private sector	Pre-Reforms Period	0.882	14	0.062	P-Value>0.05	Accepted
	Post- Reforms Period	0.886	14	0.070	P-Value>0.05	Accepted
Joint sector	Pre-Reforms Period	0.770	14	0.002	P-Value<0.05	Rejected
	Post- Reforms Period	0.907	14	0.142	P-Value>0.05	Accepted
Co-operative sector	Pre-Reforms Period	0.859	14	0.029	P-Value<0.05	Rejected
	Post- Reforms Period	0.958	14	0.691	P-Value>0.05	Accepted

*Source: Compiled and based on secondary data<sup>7</sup> using SPSS 20 Version*

<sup>6</sup> <https://statistics.laerd.com/spss-tutorials/independent-t-test-using-spss-statistics.php>

**Findings**

At 5 % level of significance, Table-III states that p-values is greater than 0.05 for public sector and private sector during pre and post-reforms period, hence population of public sector and private sector investments data during pre and post-reforms period are only normally distributed.

**Remedial Measure**

Original data sets of joint sector and co-operative sector investments during pre and post-reforms period are log transformed and then, Shapiro–Wilk test is used. The test results are shown as below:

**Table–IV: Results of Shapiro–Wilk Tests**

Parameter		Statistic	DF	P–Value	Decision Rule	Decision on H <sub>0</sub>
Joint Sector	Pre–Reforms Period	0.909	14	0.153	P–Value>0.05	Accepted
	Post– Reforms Period	0.764	14	0.002	P–Value<0.05	Rejected
Co–operative Sector	Pre–Reforms Period	0.937	14	0.382	P–Value>0.05	Accepted
	Post– Reforms Period	0.861	14	0.031	P–Value<0.05	Rejected

Source: Compilation of Secondary Data using SPSS 20 Version

**Findings**

Table-IV shows that joint sector during post-reforms period and co-operative sector during post-reforms period are not normally distributed. Joint sector and co-operative sector are not taken for independent samples t test.

◆ *Assumption-3: Variances are homogeneous:* The homogeneity of variances for public sector and private sector during pre and post-reforms period is verified using Levene’s test. The following method is adopted for this test:

<i>Hypothesis</i>	<ul style="list-style-type: none"> <li>◆ <i>H<sub>0</sub>: Variances of public and private sector during pre and post-reforms period are homogeneous.</i></li> <li>◆ <i>H<sub>1</sub>: Variances of public and private sector during pre and post-reforms period are not homogeneous.</i></li> </ul>
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Test Statistic	Levene’s Test
Significant Level	5 %

<sup>7</sup> [http://planningcommission.nic.in/data/datatable/1612/table\\_3.pDF](http://planningcommission.nic.in/data/datatable/1612/table_3.pDF)

Decision Rule	If P-Value is less than 0.05, Ho is not accepted.
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The results are mentioned as below:

**Table-V: Results of Levene’s Test**

Parameter		Statistic	P-Value	Decision Rule	Decision on H <sub>0</sub>
Public Sector	Pre-Reforms Period	27.319	0.000	P-Value<0.05	Rejected
	Post-Reforms Period				
Private Sector	Pre-Reforms Period	60.874	0.000	P-Value<0.05	Rejected
	Post-Reforms Period				

[Source: Compiled and based on secondary data<sup>8</sup> using SPSS 20 Version]

**Findings**

Here, in Table-V, p-values are less than 0.05; hence, variances of public sector, private sector investments during pre and post-reforms era are not homogeneous. The data sets are log transformed to meet the homogeneity of variances in following way:

**Remedial Measure**

Original data sets of public sector and private sector during pre and post-reforms period are log transformed and Levene’s test is applied. The test results are given as below:

**Table-VI: Results of Levene’s Test**

Parameter		Statistic	P-Value	Decision Rule	Decision on H <sub>0</sub>
Public Sector	Pre-Reforms Period	0.869	0.360	P-Value>0.05	Accepted
	Post-Reforms Period				
Private Sector	Pre-Reforms Period	0.607	0.443	P-Value>0.05	Accepted
	Post-Reforms Period				

Source: Compilation of Secondary Data using SPSS 20 Version

**Findings**

In Table-VI, variances between public sectors investments during pre and post-reforms era and private sectors investment during pre and post-reforms era are homogeneous.

<sup>8</sup> Ibid.

**Independent Samples t Tests**

Based on the above assumptions, the independent samples t tests under equal variances are executed for public sector and private sector investments during pre and post-reforms period. In this case, the Methodology of test statistic of independent samples t test is shown as below:

<i>Hypothesis</i>	<ul style="list-style-type: none"> <li>◆ <i>H<sub>0</sub>: Sector wise investments during pre and post-reforms period are equal.</i></li> <li>◆ <i>H<sub>1</sub>: Sector wise investments during pre and post-reforms period are not equal.</i></li> </ul>
Period of Test	<ul style="list-style-type: none"> <li>◆ Pre-reforms period: 1986-1987 to 1999-2000</li> <li>◆ Post-reforms period: 2000-2001 to 2013-2014</li> </ul>
Test Statistic	Independent Samples t Tests
Significance Level	5 %
Number of Observation	28
Decision Rule	If P-value is less than 0.05, H <sub>0</sub> is rejected.

The test results are given as under:

**Table-VII: Results of Independent Samples t Tests**

Parameter		Test Statistic	DF	P-Value	Decision Rule	Decision on H <sub>0</sub>
Public Sector	Pre-Reforms Period	-5.621	13.274	0.000	P-Values < 0.05	Rejected
	Post-Reforms Period					
Private Sector	Pre-Reforms Period	-4.730	13.056	0.000	P-Values < 0.05	Rejected
	Post-Reforms Period					

Source: Compiled and based on secondary data<sup>9</sup> using SPSS 20 Version

**Findings**

Public sector and private sector investments of LIC during pre and post-reforms era are significantly different at 5 % level of significance. Reforms in life insurance sector and its modified investment

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<sup>9</sup> Ibid.

portfolio have changed the investments in public sector and private sector during the pre and post-reforms period.

## VI Conclusion

From the study, it is concluded that during pre-reforms period, total investments of public sector, private sector, joint sector and co-operative sector are Rs. 6161.12 Billion, Rs. 980.58 Billion, Rs. 41.71 Billion and Rs. 230.23 Billion respectively during the study period. During post-reforms stage, this total investment is Rs. 76133.63 Billion for public sector, Rs. 21508.50 Billion for private sector, Rs. 70.62 Billion for joint sector, and Rs. 347.03 Billion for co-operative sector. The average growths are 20.62 %, 22.51 %, 16.69 % and 5.54 % for public sector, private sector, joint sector and co-operative sector respectively during pre-reform stage. These growths are 17.92 % for public sector, 25.05 % for private sector, 2.84 % for joint sector and 2.89 % for co-operative sector during post-reforms stage. Average growths are different for different investment strategies followed as per investment portfolio of IRDA during pre and post-reforms period. Public sector and private sector investments of LIC during pre and post-reforms era are significantly different because of reforms in life insurance sector and modified investment portfolios in public sector and private sector during the study period.

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## **MERGER BETWEEN GLOBAL TRUST BANK (GTB) AND ORIENTAL BANK OF COMMERCE (OBC)**

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Merger is a combination of two or more companies into one company. In banking industry when two or more banks pool their resources together then merger took place. In this study through ratio analysis and principal component analysis, I have examined the impact of merger on the transferee bank's performances. Here transferee bank is Oriental Bank of Commerce, whose liquidity, profitability and efficiency position increases in post merger period than pre-merger period, and overall performance has improved significantly.

**Key words: Merger, Acquisition, Transferor bank and Transferee bank**

### **1. Introduction**

In India, the New Economic Policy and subsequently, the financial reforms, the competitiveness among the corporate bodies and the banking institutions has grown to such a point that many financially not- so-strong or rather weak firms have either merged or one company has acquired another in order to effectively face the growing competition and strengthen their strengths to meet threats and materialize different opportunities. In this study an attempt has been done to analyze the change in performance of the banks due to merger.

#### **1.1 Literature Review**

Some of the important literatures in the area of merger and related issues are discussed below. Angelidis and Lyroudi (2006), had studied productivity of the Italian Banking system, and examine the impact of bank size on its performance. Ojose and Dacanay (2007) had studied the technical efficiency of Philippine Commercial Banks in post Asian Financial crisis period through Data Envelope analysis. They had found that bank had improved their productivity, efficiency in post merger period. Universal Banks are more technically efficient than simple commercial banks due to scope of more return earning via economy of scale. Nazir and Atia, (Jan2010), had studied on operating efficiency on 28 Pakistani Commercial Banks at the juncture

of the privatization. The study revealed that privatisation could not help banks in improving their operating income. Public sector banks had more control on interest and operating expenses. State controlled banks efficiency had improved, but private sector banks had declined. Vidye (2011) had compared efficiency of public, private and foreign banks and also measured change in productivity of those banks. Public sector banks from technical and operational efficiency point of view were much ahead than private and foreign banks. Foreign banks had improved their efficiency gradually. Sinha (2011) had found temporary differences in performances between public sector Banks and Private sector Bank. They had used Data Envelop analysis and found that in year 2001 to 2006, there was a declining trend of public and private sector banks technical efficiency. Mohaman (2012) had focused on technical efficiency measurement of the banks during 1992-2009. He had found that there was a positive relationship between banks profitability and technical efficiency. It was also found that Islamic banks were more efficient in exploiting their resources than other banks. Nedunchezian and Premalatha (2014) in their article on “Analysis of Pre and Post Merger Public sector Bank efficiency: ADE” published in IJARS (vol.3, issue-1) had focused on the comparative of performance assessment of some selected commercial banks. They had found that in post merger banks performances were better than pre merger. Efficiency of the selected banks was increased in post merger period. Sinha and Gupta (2011) had compared the Banks performance between pre and post merger period. They had mention that in post merger period there were improvement of EBIT, EPS, Interest coverage, Current ratio and Cost efficiency during post merger period in relation to pre merger period. Goyal and Joshhi (2011) in their article had given an overview on Indian banking performance in post merger period. They had mentioned that some banks had accepted merger as an expansion strategy to tap the rural market. The article also highlighted on the advantages of merger in banking industry. Sony and Kumar (2010), in their article had focused on the strategic and financial similarities of merged banks to get synergetic benefit. They pointed out that private sector banks had adopted voluntary merger strategy, but Public sector banks were reluctant. They told that one of the aims of merger is to attain optimum capital structure.

From the literature review summary we can write

- Most of the articles had mentioned the strategies behind merger and acquisition
- Few articles had measured the pre-merger and post merger performances of the acquiring banks on the basis of financial ratio analysis only

- Few articles had mentioned various types of efficiency improvement like technical, operational efficiency due to merger of the purchasing bank.

### **1.1. Research Gap:**

Few articles had measured pre- and post- merger performance of the selected acquiring banks on the basis of ratio analysis. It is also found that in most cases there was no trend of the ratios; in such case they had not used principal component analysis to identify the leading ratio responsible for change in liquidity, efficiency and profitability performance of the purchasing bank due to merger.

### **1.2. Objectives of the Study:**

The main objectives of the study are:

- To measure the performance of the selected acquiring banks in terms of their profitability, liquidity, operating efficiency etc. both in the pre- and post- merger period;
- To compare the performances of the purchasing bank (Oriental Bank of Commerce) between pre- and post-merger period and to assess the impact of merger on the acquiring bank's efficiency.

### **1.3. Objectives of the Study:**

The main objectives of the study are:

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- To compare the performances of the purchasing bank (Oriental Bank of Commerce) between pre- and post-merger period and to assess the impact of merger on the acquiring bank's efficiency.

### **1.4. Sources of data and methods for analysis of financial strength and weaknesses of the banks**

Financial analysis is the process of identifying the financial strength and weaknesses of any institution by properly establishing relationship by means of ratios between the items of its balance sheet and profit and loss account. Ratio analysis is the most widely used tool of financial analysis. We apply this ratio analysis for evaluating the financial strength and weaknesses of the selected merged banks. The objectives of financial analysis are:

- i) to determine the financial soundness and solvency of the bank, i.e., the liquidity of the bank,
- ii) to assess the profitability of the bank,
- iii) to measure the operational efficiency of the bank,
- iv) to do intra-bank comparison etc.

A ratio is a quotient of two numbers representing certain characteristics of two variables and is an expression of relationship between the two variables. Ratio analysis indicates a quantitative relationship, which is used for a qualified judgment and decision-making. In this study we have judged bank's liquidity position using three ratios, namely, current ratio, liquid ratio and absolute liquid ratio. Current ratio indicates the bank's ability to pay its current liabilities. The formula for current ratio is current assets divided by current liabilities. Current assets consist of (1) cash and balances with R.B.I., (2) balances with banks, (3) money at call and short notice, (4) advances except long term loans and (5) other assets. Current liabilities consist of (1) demand deposit, (2) savings bank deposits, and (3) other liabilities and provisions. The standard norm of current ratio is 2:1. In case of banking industry the standard norm of 1.5:1 is considered as satisfactory because cash and marketable securities constitute 10% of total current assets. Current ratio is a liberal test of a bank's ability to meet its current liabilities, whereas liquid ratio is a more stringent test of a bank's ability to meet its current liabilities. The formula for liquid ratio is liquid assets divided by liquid liabilities. Liquid assets are defined as current assets less other assets. Liquid liabilities are current liabilities less other liabilities and provisions. As the conversion of other assets into cash takes time, it is excluded from current assets in order to arrive at the amount of liquid asset. Other liabilities and provisions are excluded from current liabilities because these are not immediate liabilities. Liquid ratio is a true test of business solvency. The rule of thumb for Liquid Ratio is 1:1. Higher ratio (i.e. greater than 1:1) indicates sound financial position and lower ratio (i.e. smaller than 1:1) indicates financial difficulty. Absolute liquid ratio is still a more stringent test of liquidity. It may not be possible to realize amounts from all the loanees and hence the amount of loans and advances is treated as non-liquid asset. The formula for absolute liquid ratio is quick asset divided by liquid liabilities. Quick assets consist of cash and balances with R.B.I., balances with other banks and money at call and short notice. The standard norm of Absolute Liquid Ratio is 0.5:1.

In this study we have measured banks profitability position using eight ratios, namely, Earning per share (EPS), Dividend per share (DPS), Net Asset Value per share, Dividend Pay-out ratio. Profitability ratios indicate the relationship between different components of profit on total revenue. It is useful to the investors in judging the prospects of return on their investments. It indicates the degree of efficiency of the Loans and Advance department, Deposit department, Investment department etc. and also the degree of cost control. Earning per share indicates how much earning is available to per shareholder; Dividend per Share indicates how much total dividend available to per shareholder of the bank by deploying fund. Higher the ratio, higher is the t earning capacity of the bank and vice versa. EPS is calculated by dividing total earnings by number of shareholders. Similarly DPS is calculated by dividing total divided by number of shareholders Financial cost percentage indicates the interest burden of the bank on deposits and borrowings in relation to deployed average working fund. Financial cost ratio is defined as the ratio of interest spent on deposits and borrowings to average working fund. The higher percentage indicates greater interest burden on the bank and vice versa. Risk cost ratio indicates the risk management capacity of the bank. It establishes the relationship between risk cost (i.e., provisions during the year) and average working fund. The higher the risk cost percentage, the greater is the risk on investment and vice versa. Operating expense ratio indicates the relationship between operating expense and average working fund. Operating expense includes all expenses except the amount of interest expended. Higher operating expense ratio indicates lower profitability and inefficiency in respect of cost controlling capacity of the bank and vice versa. Miscellaneous income ratio indicates the non-funding income earning capacity of the bank. It is the ratio of miscellaneous income including commission to average working fund. Miscellaneous income of the banks includes locker rent, commission etc. Employee cost to total cost shows the relationship between employee cost and total cost. The higher ratio of employee cost to total cost indicates that the employee cost has a large share in the total cost and to improve the profitability position of the bank this cost is to be controlled. Ratio of interest cost to total cost establishes the relationship between interest cost and total cost. Similarly, the ratio of interest income to total income shows the relationship between interest income and total income. It shows whether the interest income is the major income source in total income or not.

In this study we have also judged bank's performance efficiency using efficiency ratio includes Cost – Income ratio and Operational Cost to Total Asset ratio. The primary function

of banking institution is to mobilize resources collected through deposits and borrowing and lending the same to the borrowers thereby making a profit after meeting its fixed and variable costs. The ratios utilized here are to find out the diligence of the banks in these functions. The ratios are worked out by relating actual costs to returns. Operational Cost to Total Assets ratio is calculated using the formula operational cost divided by total operational assets .It indicates the total asset management ability of the organization. The aim of the management should be to keep the operational cost of fund lower. Credit-deposit ratio is obtained by dividing total loans and advances outstanding by total deposit outstanding. It indicates the fund deploying capacity of the bank through loans and advances. Operational ratio includes Return On Asset% (ROA %) and Return On Equity % (ROE %).

Margin ratio includes yield on Investment, Yield on advances and Spread.

Capital Adequacy ratio (CAR) includes CAR (Basle-I) and CAR (Basle-II).

Growth ratio includes Net Profit growth and Advances growth.

Liquidity ratio includes CD ratio, Interest expended to Interest earned, Investment to Deposit ratio. Asset quality includes Net NPA to Net Advances.

### **1.5. Major Findings of the Study:**

Merger between Global Trust Bank (GTB) and Oriental Bank of Commerce (OBC) had took place in the year 2005. The main objective of this merger was to expansion of business.

#### **1.5.1. Operational or Financial ratio:**

In operational ratio analysis it is found that since 1997 up to year 2000, EPS of GTB was in rising trend, but since 2001 to 2003, it was in decreasing trend, consequently Dividend per share and Dividend payout ratio of this bank also in increasing up to year 2000 and since 2001 it was in declining trend (see Table-1).

But in OBC bank EPS was in rising trend up to year 2005, then it had fluctuated time to time. In case of Dividend per share there was an increasing trend up to year 2012 and then fluctuated. In Dividend payout ratio it was found that it was fluctuated time to time up to year 2005, after that it was around 20% p.a.(see Table-7)

#### **1.5.2. Margin ratio:**

In margin ratio analysis of GTB it was found that in first 3 years (1997 to 1999), there was no trend on Yield on advance, but since 2000 it was in rising trend. In case of Yield on investment analysis up to year 2001 there was a declining trend. In Interest spread analysis ratio, it was fluctuated time to time (see Table-2).

In OBC bank Yield on Advance and Yield on Investment were fluctuated time to time, there was no discernable trend. Interest spread ratio, it was also fluctuated time to time, but in post merger period it was around 6% (see Table-8).

### **1.5. 3. Performance ratio:**

In performance ratio analysis of GTB, it was found that in both ROA(%) and ROE(%), there was a declining trend over the study period (see Table-3), but in OBC bank, there was no trend of both ROA (%) and ROE(%) (see Table-9).

### **1.5. 4. Capitalization ratio:**

In Global Trust Bank there was no capitalization ratio data (see Table-4). But in OBC Bank Capital adequacy ratio of Basel I was always above the standard norm, the trend of CAR as per Basel I was fluctuated time to time over the study period. In case of CAR as per Basel II norms, it was always below the standard norm (15%) and it was also fluctuated time to time (see Table-10)

### **1.5.5. Efficiency ratio:**

In efficiency ratio analysis of GTB, CD ratio was declined over the study period. Operating cost ratio was declined up to year 2000, but then it was raised (see Table-5).

In case of OBC Bank CD ratio was fluctuated time to time over the study period, but in post merger period CD ratio was comparatively better than pre merger period. In Operating cost to Total asset ratio of OBC Bank there was a decline trend and this ratio was much longer in post merger period than pre merger (see Table-11).

### **1.5. 6. Liquid ratio:**

In liquid ratio analysis of GTB Bank, it was found that there was no discernable trend of cash to deposit and loan to deposit ratios (see Table-6).

But in OBC Bank cash to deposit ratio was fluctuated time to time. But in post merger period loan to deposit ratio was inclined (see Table-12)

In case of merging between **Global Trust Bank** and **Oriental Bank of Commerce**, it was found that in both the banks all the three Operational ratios were fluctuated time to time over the study period.

### **1.5.7. Principal Component analysis of Liquidity, Profitability, Efficiency and overall performance position of the transferee banks**

In the above section the bank's liquidity, profitability and efficiency positions had been analyzed by using the relevant ratios for each of these positions and the performance of the bank was assessed on the basis of these positions. But it can be safely said that not all these three factors with their all constituent ratios are not equally important in determining performance of the bank. Someone of these factors may be more important than others in the sense of its explaining power or predictive power. Further, all the ratios may not move in the same direction to derive valid conclusion. An attempt is made here to club the homogeneous ratios in the form of either liquidity or profitability or efficiency ratio through factor analysis and then special type of regression equation (namely regression equation with dummy dependent variable) has been estimated to assess the performance of the bank over time.

#### **Factor Analysis of Oriental Bank of Commerce**

##### **Liquidity Factor:**

To construct liquidity factor, two ratios namely, current ratio, Cash ratio have been clubbed through factor analysis and it is observed from the table below that first principal component (or factor) represents 92.37% of the total sampling variations of the two related ratios and its Eigen value is 1.12. As the Eigen value of the first factor is highest and more than 1, so according to Kaiser's criterion only second principal component is to be chosen as the liquidity factor. It should be mentioned in this connection that according to Kaiser's criterion only those principal components will be chosen whose Eigen values are greater than one. Further Bartlett's test of sphericity is estimated to be 46.3, which is found to be significant at 1% probability level; this implies that here principal component analysis is a fruitful exercise in clubbing the basic ratios (e.g. current ratio, Cash ratio, Cash to Deposit and Loan to Deposit ratio). From the values of the last column of the table (related to factor matrix in factor 1) it is also observed that in the

constructed first principal component the contributions of the basic four ratios are very high (more than 80%).

Factor (F)	Eigen value	Percent of variation	Factor Matrix in Factor 1
1	1.12	92.37	.8216 (Current ratio)
2	.135	7.63	.8521 (Cash ratio)

Bartlett's test of sphericity is estimated to be 46.3\*

**Efficiency Factor:**

To construct principal component for efficiency factor, three basic variables, namely, Credit Deposit ratio, Operating Cost to Total Asset, NPA to Total Advance ratio have been clubbed and applying Kaiser's criterion (Eigen value >1), first principal component has been selected as efficiency factor which represents more than 97.49% of the sample variations of the related basic three variables (see the following table). Further, Bartlett's test of sphericity is estimated to be 27.29, which is found to be significant at 1% probability level, implying that principal component analysis is here required to club the variables of efficiency ratio.

Factor (F)	Eigen value	Percent of variation	Factor Matrix in Factor 1
1	2.561	98.43	.817 (Credit-Deposit ratio)
2	1.93	1.52	.848 (Operating Cost to Total Assets)
3	.058	.05	.836 (NPA to Total Advance)

Bartlett's test of sphericity = 27.29\*

In the constructed principal component for efficiency factor, the contributions of the basic variables are more than 80% (being positive or negative according to their nature).

**Profitability Factor:**

Similarly, through factor analysis, the principal component for profitability factor has been constructed and the results are presented in the following table. Here Bartlett's test of sphericity is estimated to be 78.441, which is found to be significant at 1% probability level and so principal component analysis may be statistically accepted here.

Factor (F)	Eigen value	Percent of variation	Factor Matrix in Factor 1
1	3.112	95.85	.8565 (Yield on advance)
2	2.15	3.74	.8802 (Yield on Investment)
3	.23	.41	.808 (Interest spread)

Bartlett’s test of sphericity =78.441\*

On the basis of Kaiser’s criterion (Eigen value >1), first principal component has been selected and it explains 95.85% of the total sampling variation of the basic variables. The constructed principal component signifies the combined effect of the profitability ratios and in this principal component contributions of the basic variables are not less than 80% (see last column of the table).

**Performance Factor:**

Similarly, through factor analysis, the principal component for Performance factor has been constructed and the results are presented in the following table. Here Bartlett’s test of sphericity is estimated to be 31.676, which is found to be significant at 1% probability level and so principal component analysis may be statistically accepted here.

Factor (F)	Eigen value	Percent of variation	Factor Matrix in Factor 1
1	1.563	99.93	.869 (Return on assets)
2	.025	.07	.885 (Yield on Capital Employed)

Bartlett’s test of sphericity =31.676\*

On the basis of Kaiser’s criterion (Eigen value >1), second principal component has been selected and it explains 99.93% of the total sampling variation of the basic variables. The constructed principal component signifies the combined effect of the profitability ratios and in this principal component contributions of the basic variables are not less than 85% (see last column of the table).

Let F<sub>1</sub>, F<sub>2</sub> and F<sub>3</sub>, F<sub>4</sub> be the constructed principal components representing the liquidity, efficiency, profitability and Performance conditions of the bank respectively.

After the construction of the principal components, regression of Dichotomous dependent variable (D which is ‘0’ for pre-liberal and ‘1’ for liberal period) has been estimated on the respective first principal components of liquidity (F<sub>1</sub>), efficiency (F<sub>2</sub>), profitability (F<sub>3</sub>) and Performance (F<sub>4</sub>). The estimated regression results are presented below:

$$\bar{R}^2 = .740^*$$

$$[F=1.604]$$

$$D = -23.208^{**} -5.192F_1^{69.6\%} +.357F_2^* +.348F_3^{***} +.157F_4^{***}$$

(11.104) (0.015) (0.113) (0.196) (0.329)

$$DW=.974$$

Finally from the regression result it is observed that, Efficiency, Profitability and Overall Performance of the bank increases significantly between pre-merger and merger period; but Liquidity of Oriental Bank of Commerce remains unchanged between pre-merger and merger period.

### 1.6. Conclusion

The basic objective of merger between Global Trust Bank and Oriental Bank of Commerce was expansion of business. From the analysis of performance of purchasing bank i.e. Oriental Bank it is found that efficiency , profitability and overall performance had increased in post merger period in comparison with pre-merger period; but liquidity position remain unchanged.

**Table-1: Operational / Financial Ratio Analysis of Global Trust Bank**

Year	Earning per share	Dividend per share
1997	5.52	1.5
1998	7.71	1.8
1999	6.81	2
2000	8.95	2.2
2001	1.5	1.5
2002	3.32	1
2003	-22.47	0

Source: Computed by the author

**Table-2: Margin Ratio Analysis of Global Trust Bank**

Year	Yield on advances	Yield on Investment	Interest Spread
1997	24.4	11.76	12.17
1998	22.44	12.93	12.73
1999	23.19	11.09	13.62
2000	20.13	10.48	12.44
2001	21.89	10.46	13.53
2002	23.88	14.47	14.11
2003	16.47	12.41	9.02

Source: Computed by the author

**Table-3: Performance Ratio analysis of Global Trust Bank**

Year	Return on Asset (ROA)	ROE (%)
1997	2.16	31.24
1998	2.49	37.67
1999	1.58	26.64
2000	1.71	26.54
2001	0.94	14.39
2002	0.48	8.19
2003	-3.71	-137.46

Source: Computed by the author

**Table-5: Efficiency Ratio Analysis of Global Trust Bank**

Year	CD Ratio	Operating cost to Total Asset
1997	64.16	2.01
1998	53.44	1.88
1999	51.71	1.83
2000	51.8	1.65
2001	53.01	1.73
2002	47.07	2.32
2003	47.34	2.39

Source: Computed by the author

**Table-6: Liquid Ratio Analysis of Global Trust Bank**

Year	Cash to Deposit	Loan to Deposit
1997	0.11	0.04
1998	0.09	0.01
1999	0.12	0.12
2000	0.8	0.06
2001	0.09	0.08
2002	0.08	0.01
2003	0.11	0

Source: Computed by the author

**Table- 5.5.7: Operational / Financial Ratio Analysis of Oriental Bank of Commerce**

Year	EPS	DPS	D/P
1996	8.97	2.5	27.86
1997	9.36	2.5	26.71
1998	10.91	3	27.51

1999	11.95	3.5	29.28
2000	14.47	3.5	24.19
2001	10.54	3.5	33.22
2002	16.65	3.5	21.02
2003	23.73	4.5	18.96
2004	35.63	5	14.03
2005	37.71	3	7.96
2006	22.24	4.5	20.24
2007	23.18	4.7	20.27
2008	14.1	4.7	33.34
2009	35.54	7.3	20.54
2010	45.29	9.1	20.09
2011	51.51	10.4	20.19
2012	39.13	7.9	20.19
2013	45.51	9.2	20.21
2014	38	7.6	20

Source: Computed by the author

**Table-8: Margin Ratio Analysis of Oriental Bank of Commerce**

<b>Year</b>	<b>Yield on advances</b>	<b>Yield on Investment</b>	<b>Interest Spread</b>
1996	21.96	11.3	15.22
1997	25.29	11.3	17.71
1998	23.08	11.47	15.79
1999	24.3	11.1	16.67
2000	26.36	12.32	18.64
2001	24.91	12.49	17
2002	21.48	13.49	14.37
2003	21.02	13.36	14.18
2004	16.77	12.73	11.7
2005	14.12	10.41	9.9
2006	12.27	10.72	7.35
2007	11.7	8.63	6.33
2008	12.53	8.39	6.06
2009	12.93	9.21	6.16
2010	12.29	8.06	6.14
2011	12.6		6.4
2012	14.21		7.37
2013	13.73		6.87
2014	13.67		7.42

Source: Computed by the author

**Table- 9: Performance Ratio Analysis of Oriental Bank of Commerce**

<b>Year</b>	<b>ROA (%)</b>	<b>ROE(%)</b>
1996	1.64	20.96
1997	1.63	20.42
1998	1.59	20.75
1999	1.37	19.89
2000	1.29	20.95
2001	0.79	13.63
2002	1.08	20.23
2003	1.38	24.51
2004	1.83	28.67
2005	1.53	24.19
2006	0.99	13.11
2007	0.87	10.87
2008	0.43	6.21
2009	0.88	14.56
2010	0.91	16.48
2011	1.01	17.15
2012	0.67	10.72
2013	0.7	11.46
2014	0.54	9.16

Source: Computed by the author

**Table-10: Capitalization ratios of Oriental Bank of Commerce**

<b>Year</b>	<b>Capital Adequacy Ratio (BASEL-I)</b>	<b>Capital Adequacy Ratio (BASEL II)</b>
2000	14.1	
2001	12.72	
2002	11.81	
2003	10.99	
2004	14.04	
2005	14.47	
2006	9.21	
2007	12.46	
2008	12.51	
2009	12.12	12.98
2010	12	12.54
2011	10.83	14.23
2012	12.3	12.69
2013	11.01	12.04
2014	10.75	11.85

Source: Computed by the author

**Table-11: Efficiency Ratio Analysis of Oriental Bank of Commerce**

Year	CD Ratio	Operating cost to Total Asset	NPA to total Advances
1996	53.63	2.14	
1997	48.6	2.19	5.84
1998	48.39	2.03	4.5
1999	45.87	1.97	4.5
2000	42.21	1.74	3.8
2001	44.88	1.94	3.6
2002	49.7	1.64	3.2
2003	52.59	1.71	1.4
2004	55.17	1.57	0
2005	52.87	1.93	1.29
2006	66.89	2.06	0.49
2007	68.97	1.68	0.49
2008	70.08	1.73	0.99
2009	69.64	1.24	0.65
2010	69.43	1.23	0.87
2011	68.97	1.17	0.98
2012	71.8	1.3	2.21
2013	73.31	1.33	2.27
2014	71.88	1.32	2.28

Source: Computed by the author

**Table-12: Liquid Ratio Analysis of Oriental Bank of Commerce**

Year	Cash to Deposit	Loan to Deposit
1996	0.16	0.07
1997	0.11	0.01
1998	0.12	0.01
1999	0.12	0.02
2000	0.1	0.01
2001	0.08	0.02
2002	0.08	0.03
2003	0.06	0.02

2004	0.07	0.02
2005	0.13	0.02
2006	0.08	0.01
2007	0.08	0.02
2008	0.09	0.03
2009	0.07	0.04
2010	0.07	0.04
2011	0.07	0.03
2012	0.05	0.04
2013	0.05	0.04
2014	0.05	0.03

Source: Computed by the author

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