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PRICE EFFECT IN DHAKA STOCK EXCHANGE OF CROSS-LISTING IN CHITTAGONG STOCK EXCHANGE

MD. RAFIQU MATIN
DIRECTOR
MAINTENANCE & OPERATION
BANGLADESH TELECOMMUNICATION COMPANY LIMITED
DHAKA

DR. JAWAD R ZAHID
PROFESSOR
INSTITUTE OF BUSINESS ADMINISTRATION
UNIVERSITY OF DHAKA
DHAKA

ABSTRACT

While there are a quite a large number of researches on international cross-listing, a few studies have been made on domestic cross-listing. This paper examines the impact of domestic cross-listing on stock prices. The sample consists of 30 companies that are traded in Dhaka Stock Exchange (DSE) and had listed in Chittagong Stock Exchange (CSE) during the period 1995-2000. Using event study methodology, average abnormal returns (AAR_{*t*}) and average cumulative abnormal returns (ACAR_{*t*}) are calculated considering 61 days as event window (-30 days to + 30 days around the event day $t = 0$), with the different companies listed in CSE in different dates. The hypothesis of the study is whether the cross-listing of DSE stocks in CSE have positive effect on their prices in DSE. This paper provides evidence that the cross-listing of a particular share in CSE has a positive impact on price of that particular share in DSE. As there are many companies those are traded in DSE and yet to be listed in CSE, this study could convey very important information to the management of those companies. Again the policymakers can set the stage for this cross-listing and harness the related benefit of shareholder's wealth maximization.

KEYWORDS

Cross-listing, Pre-event, Post-event, Average Abnormal Return, Average Cumulative Abnormal Return.

INTRODUCTION

After the establishment of Chittagong Stock Exchange (CSE) in 1995, companies listed in Dhaka Stock Exchange (DSE) had the option of simultaneous listing over to the second bourse in the country. With the widened location of trade, firms may have reached wider cross-section of investors thereby increasing the demand of stocks. This phenomenon may have led to the increased firm value in turn. On the other hand though more than a decade has passed, many firms listed in DSE are yet to list in CSE. An empirical evidence of relationship between firm value and multiple listing is of significant importance for these companies. It is also important information for the policy makers in formulating right policy for facilitating and steering multiple listing efforts by firms. In this back drop we undertake this research with the objective of finding relationship between listing stock in CSE and its pricing in DSE. As on January 01, 2012 DSE has 501 listed securities (DSE official website) while CSE has 241 (CSE official website), so there are 260 securities yet to list in CSE. Leaving 221 Treasury Bonds aside there are at least 39 companies that are listed in DSE, but did not list in CSE. In this study we have attempted to measure the effect of economic event, the simultaneous listing in CSE, on the value of the firms by examining DSE market data. Our study has investigated whether the companies those are listed in DSE but did not list in CSE are depriving their shareholders in maximizing their worth. It would be interesting to know through this study. This requires us to accept the hypothesis that the stock markets are efficient in the sense that the prices reflect all publicly available information relevant to the prospects of the firm.

REVIEW OF LITERATURE

There are two terminologies used in the literature regarding plural listing of securities in the markets. These are dual-listing and cross-listing. Dual-listed companies arise out of mergers of two companies listed separately in two markets. After the merger the companies agree to combine their operations and cash flows, but retain separate identities and shareholders registries. These companies are also known as Siamese-twin companies. Dual-listing could also refer to dual-class shares where one company may list two classes (e.g. common and controlling share) of shares in the same market.

Cross-listing occurs when one company listed in one market decides to list simultaneously in another market generally across the national border. In this case it may even end up to multiple cross-listings if it decides to list in more than two markets. Our case is an unusual one where cross-listing occurs across two markets within a national border.

The growth of international integration among world capital markets since 1970 has been driven by the phenomena of corporations seeking additional listings for their stocks and corporate bonds in countries other than their home market. There has been a proliferation of literature on the international listing phenomena since 1970. Studies show that the effect of cross-listing in a foreign country is mostly positive. Early studies argue that cross-listing enables the companies to reduce their cost of capital, increase the liquidity of their securities, reduce trading frictions, increase visibility and facilitate increased information flow (Errunza and Losq 1985; Merton 1987; Alexander et al. 1988; Foerster and Karolyi 1993; Jayaraman et al. 1993). More recent studies investigate international listings from the perspective of how it impacts on corporate governance (La Porta et al. 1997; Doidge 2004a; Doidge et al. 2004). Many researchers argue that the cross-listing of stocks of developing countries in developed countries subjects the firm to a more stringent disclosure and legal environment than its home country, consequently, leading investors to more legal protection (Doidge 2004b; Doidge et al. 2005).

Most of the previous studies on cross-listing report a positive listing premium on listing dates or announcement dates. For example, Miller (1999) provides a comprehensive study using the announcement date, wherein he examines the cross-listing of firms onto U.S. market between 1985 and 1995. He reports a 1.15% listing premium. Similar results are also reported by Foerster and Karolyi (1998), Mittoo (2003), and Sarkissian and Schill (2004). A number of studies report either slightly positive or neutral market reactions to foreign listing; such as Lee (1991), Varela and Lee (1993a), and Lau et al. (1994).

Though lots of works have been made on international listings, a few studies have also been made on domestic cross listings. Ule (1937) was one of the first to examine the effects of domestic listing on stock prices. He uses 29 over-the-counter (OTC) stocks listed on New York Securities Exchange (NYSE) as sample. He compares their price changes relative to the corresponding industry index changes, finding a relative increase in price before listing and decrease after listing. Merjos (1962, 1963, 1967) examines stock transfers to organized exchanges over three non-overlapping periods. She finds that stock prices of new listings rise pre-listing and fall post-listing, but the overall price ends up higher. Merjos interprets this as consistent with exchange listing being valuable and there being profit taking by investors. Van Home (1970) also compares stock returns of cross-listing companies to industry returns for NYSE listings between 1960 and 1967. He finds the same pattern of positive excess pre-listing returns and negative excess post-listing returns, which he interprets as consistent with profit taking. Ignoring transaction costs there seems to be increased value, however, taking transaction costs into account no significant effect remains.

Ying, et al. (1977) examine 248 companies cross-listing their stock on the American Stock Exchange (AMEX) or NYSE between 1966 and 1968. They use the market model with monthly data of up to 84 months for beta estimates. They find no evidence of changes in betas, but find positive abnormal pre-listing returns and negative abnormal post-listing returns for the NYSE and the AMEX stocks. They also point out that almost all applications to the exchanges are accepted and therefore repeat the analysis around the public announcement of the application for listing. They find positive abnormal pre-application returns and positive abnormal returns right after the application (interpretable as effect of listing), then negative abnormal returns 2-3 months after application (which is usually also post-listing). According to them the negative abnormal post-listing returns may be due to a correction of an overreaction prior to listing.

Baker and Edelman (1992) take a slightly different approach and examine stock transfers from AMEX to NYSE. They use a market model with daily data for the period 1982-89 to examine. Interestingly they find that the pattern of positive abnormal pre-listing and negative abnormal post-listing returns is even present in stock transfers from AMEX to NYSE.

McConnell and Sanger (1987) examine OTC to NYSE transfers between 1966 and 1977. They utilize a market model with weekly data and find little or no change in the parameters. Similar to previous literature they also find the positive abnormal pre-listing returns and negative abnormal post-listing returns. However, they find that the introduction of National Association of Securities Dealers Automatic Quotation (NASDAQ) communications system to the OTC market in 1971 has reduced the post-announcement abnormal returns and made them insignificant.

McConnell and Sanger (1987) scrutinize the negative abnormal post-listing returns for possible explanations. They use market adjusted returns with monthly data for the NYSE between 1926 and 1982 and daily data for the NYSE and AMEX between 1962 and 1982 and are able to conclude that the following possibilities are not causing the anomaly:

1. Insider dumping
2. Correction of overreaction
3. Time period
4. Outliers
5. Original locale of trading
6. AMEX or NYSE peculiarities
7. Issuance of additional stock after listing

They conclude that the negative abnormal post-listing returns are not due to insider dumping/profit taking as stocks with insider selling actually did better. They also eliminate correction of overreaction as they fail to find significant correlation between the magnitudes of pre-listing run-ups and magnitudes of post listing falls of stock prices.

Dharan and Ikenberry (1995) are able to find some empirical support for one possible explanation of the negative abnormal post-listing returns. They use returns adjusted for size and book-to-market equity between 1962 and 1990 and find that smaller firms or firms with fewer institutional investors tend to have more negative abnormal post-listing returns. The managers of these firms are those that had greater autonomy and it was argued that under the opportunism hypothesis they time their applications to the exchanges when they expect bad performance in the future. Once the firm is listed, the bad news cannot do much harm, because the hurdles for remaining listed on the exchanges are much lower than those for initial listing.

METHODOLOGY

In our study event study model is adopted to study the behavior of share pricing in DSE around the event of simultaneous listing in CSE.

SAMPLE SIZE AND DATA

In this study we have selected 30 companies (Appendix A) that are traded in DSE and have listed in CSE on different dates between 1995 and 2000, as most of the shares were listed during this period. The majority of the empirical studies on international listings addressed the share price reactions around a firms listing decision. Some of these event studies employed monthly returns using a two-year event window, while others studied daily returns using a more conventional two-month window. While some focused on listing dates, others considered application dates, application-acceptance or regulatory-approval announcement dates. We know that at any given point in time, security prices might be affected by a large number of randomly generated pieces of new information or events. Given that more than one piece of news may be affecting the security's price at any given point in time; we have studied 30 companies, statistically considered a sample large enough to control the effects caused by other events, to determine how the listing of stocks in CSE had affected the price of those particular stocks in DSE. We have considered the following other points to minimize the effect of factors other than the event:

1. Efforts have been made to select companies from different industries.
2. Companies have been selected with listing dates in different years.
3. Securities those are traded actively in DSE.

Data of this study is the daily prices of the sample 30 companies in DSE and the corresponding All Share Price Index of DSE within the event window of 61 days. From the price data of the shares daily returns are calculated for the sample companies and from the All Share Price Index the corresponding daily market returns are calculated.

THE MODEL

In this paper we have examined the reaction on the pricing of a company's security in DSE relevant to the listing of that particular company in the CSE. So the "event" of our study is the listing of the sample firms in CSE. Methodology introduced initially by Fama, Fisher, Jensen and Roll (1969) is widely used till today. The initial task of conducting an event study is to define the event of interest and identify the period over which the prices of the relevant financial instruments will be examined. This period is called the 'event window'. We use the listing date on which the first trading took place in CSE as opposed to announcement date as the event date. There are a number of reasons in selecting this choice. First, many firms announce their intention of cross-listing yet never actually follow through for a variety of reasons. Second, listing is a complex process that takes from several months to several years to complete. This delay implies that the listing date is less noisy than the announcement date.

The selection of the event window can have profound effects on the results of the study. In a perfectly efficient market one would expect all value effects to be reflected immediately in asset prices. But in practice, the market may acquire information prior to the event; speculate on the content of an announcement before it is made; or take time to assimilate information and react to it. For these reasons, it is common in studies of this type to use an event window of a number of days encompassing the event day. The choice of "event window" is somewhat arbitrary and there does not appear to be any sound empirical basis for choosing a particular time period around an event. In our study, we have used an event window of sixty one days (30 days before and 30 days after the event) to capture both prior and post event effects.

To assess the impact of the event on returns of a company's securities, we first establish what the return would have been in the absence of the event (the 'normal return'). Brown and Warner (1980), in their classic study of event study methodologies, suggest three models to calculate the normal returns:

1. Mean Adjusted Returns: The normal return for a security equals a constant K_i . Typically, the mean return of a security over a period of time outside the testing period serves as the constant K_i . The expected return of a security is assumed to be constant over time, though ex-ante returns will vary among securities. Thus, the abnormal return of the security is found: $AR_{it} = R_{it} - K_i$. Where AR_{it} is the abnormal return and R_{it} is the actual return of a security i , over the period t .
2. Market Adjusted Returns: The normal return for a security at a given point in time equals the market return R_{mt} for that period. The expected returns for all securities are assumed to be the same during a given period, though they vary over time. Abnormal returns are found: $AR_{it} = R_{it} - R_{mt}$.
3. Market and Risk Adjusted Returns: Here, normal returns are assumed to be generated by a single index model: $R_{it} = RF + \beta_i(R_{mt} - RF)$. Typically, security returns are linearly related to market returns through stock betas. These risk-adjusted returns vary across securities and over time. Abnormal returns then is determined: $AR_{it} = R_{it} - [RF + \beta_i(R_{mt} - RF)]$.

One tests the significance of an event by averaging the abnormal performance of the sample of securities around the event dates. If the average abnormal returns are not significantly different from zero during the relevant testing period, one may conclude that the test did not provide evidence indicating the significance of the event.

Extensive tests examining the power of various methodologies for measuring abnormal returns have been done by Brown and Warner (1980) using simulation techniques. In general, they find that simpler methodologies, such as the Market Adjusted Returns Model, are no less effective than more sophisticated models to detect abnormal performance when it is present. In our study, therefore, we have used Market Adjusted Return Model to capture the expected return of a sample firm within the event window.

The Market Adjusted Returns model is used to measure abnormal performance of firms around event time. The model assumes that security returns change over time, but at a given time expected returns are equal across securities. Since the market portfolio is linear combination of all securities, in equilibrium the $E(R_{it}) = E(R_{mt})$ for any security i . If this relationship does not hold for any security i , forces of supply and demand for the security will lead to price adjustments which will equilibrate its return with that of the market.

The measure for abnormal returns, AR_{it} to any security i in time t is given by the difference between its return and the return on the market portfolio, and is expressed as:

$$AR_{it} = R_{it} - R_{mt} \quad (1)$$

Where, R_{mt} is represented by the return on the DSE All Share Price Index. The abnormal returns are calculated for each of the sample companies on each of the 61 days, day 31 being the listing day.

The Average Abnormal Returns (AAR) are tested for significance using a t-statistic for each day across the 30 firms. The average abnormal return is calculated for each day in the event window as follows:

$$AAR_t = \frac{1}{N} \sum_{i=1}^N AR_{it} \quad (2)$$

Where, $t = -30, \dots, 0, \dots, +30$ days

N = The number of firms in the sample

Averaging is used because we are interested in the effects of listing in general on return behavior, not in the effects on individual firms.

The AAR_t actually reflects whether listing of DSE stocks in CSE affect stock prices in any given day around the event window. We may find no significant effect for any single day returns. In some other instance, we may find that while no effect is found on the abnormal return for any particular day, the effect might be realized over a period of days. This might be expected if market reactions are slow, that is, if the market is somewhat inefficient. To address the problem, we also broaden our test to visualize the effect on return over a period of days. For the purpose, we have computed Cumulative Abnormal Returns (CAR_{it}) for each stock over the period by accumulating the abnormal returns during the event window, as follows

$$CAR_{it} = CAR_{i(t-1)} + AR_{it} \quad (3)$$

Then the Average Cumulative Abnormal Returns ($ACAR_t$) has been calculated with

$$ACAR_t = \frac{1}{N} \sum_{i=1}^N CAR_{it} \quad (4)$$

Where, $t = -30, \dots, 0, \dots, +30$ days

N = The number of firms in the sample

To observe the effect of event on average abnormal returns AAR_t in pre-event as well as in post-event times, we have tested the significance of the average of AAR_t in pre-event period ($t = -30$ to $t = -1$) and also the average of AAR_t in post-event period ($t = +1$ to $t = +30$).

HYPOTHESIS

While the process of cross-listing to CSE goes on, the stock in DSE experiences a buying pull on its price in the window prior to the listing date in CSE because of an expected future increase in demand and also the same price pull occurs in the post-event windows as there will be an actual increased demand because of a widening of the market base. So, in the total event window there will be positive daily abnormal returns. For any noise in the market, we may not find all the daily average abnormal returns significantly positive, but those will be significantly positive on the average and cumulative basis.

Therefore:

$$H_{1,0} : AAR_t \leq 0$$

$$H_{1,A} : AAR_t > 0 \quad [\text{In two panes}]$$

and

$$H_{2,0} : ACAR_t \leq 0$$

$$H_{2,A} : ACAR_t > 0 \quad [\text{In total window}]$$

TESTING FOR SIGNIFICANCE

Our objectives are to determine:

- Whether any daily Average Abnormal Return (AAR_t) is significantly positive.
- Whether the average of AAR_t in pre-event and post-event period are significantly positive.
- Whether any Average Cumulative Abnormal Return ($ACAR_t$) is significantly positive.

To test the significance of the daily Average Abnormal Return (AAR_t) and Average Cumulative Abnormal Returns ($ACAR_t$) along with the test statistics, the standard deviations have been computed. We have assumed that the AAR_t and $ACAR_t$ follow a t-distribution. As we want to test whether the sample means i.e. AAR_t and $ACAR_t$ are significantly positive or not, we have performed one tailed test. Based on that, t value of the sample means i.e. t_{obs} have been calculated both for AAR_t and $ACAR_t$ with

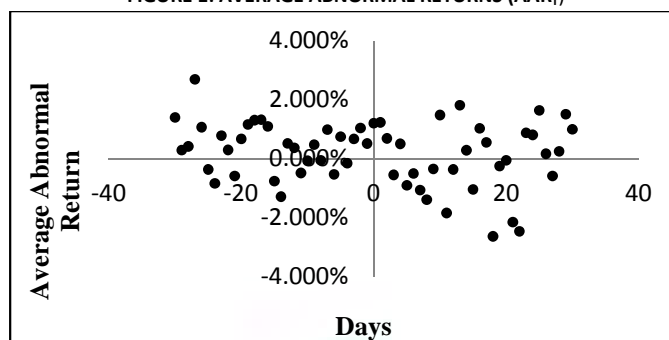
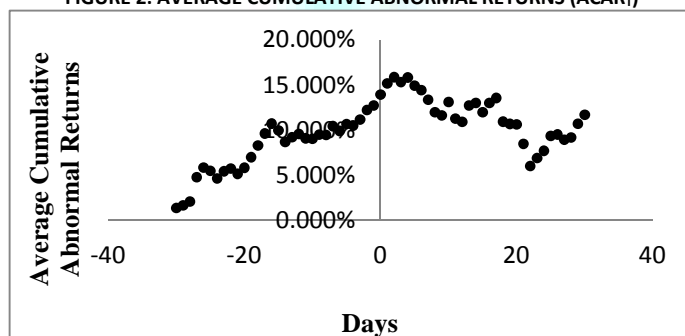
$$t_{obs} = \frac{\text{Sample mean} - \text{Hypothetical mean}}{\frac{\text{Sample Standard deviation}}{\sqrt{n}}} \quad (5)$$

Further, the computed t_{obs} values are compared with critical values of $t = 2.462$ for $\alpha = 0.01$, $t = 1.699$ for $\alpha = 0.05$ and $t = 1.311$ for $\alpha = 0.10$ to find out whether these are significantly positive.

The same test has been performed for average of AAR_t in pre-event and post-event period to test whether these are significantly positive.

ANALYSIS OF RESULTS

The average abnormal returns and average cumulative abnormal returns are represented graphically in Figure 1 and Figure 2 respectively.

FIGURE 1: AVERAGE ABNORMAL RETURNS (AAR_t)FIGURE 2: AVERAGE CUMULATIVE ABNORMAL RETURNS ($ACAR_t$)

Details of the abnormal returns are shown in Table 1. The results show that average (over 30 sample companies) abnormal returns are positive on 36 days and 13 (5 in pre-event and 7 in post-event days, one in $t = 0$) of them are significant. Therefore we can reject the first null hypothesis and say that stocks on the average earned positive daily abnormal returns overall in the total event window of 61 days.

If we examine the window further splitting into its two panes (Table 1), we observed that average (over 30 days) of the AAR_t is positive (0.43%) in the pre-event days and is significant at $\alpha=0.01$. But the same is negative (-0.08%) in the post-event days and is not significant even at $\alpha=0.10$. Though there are more positive significant AAR_t in post-event panes (7) than in the pre-event panes (5), this insignificant negative AAR_t may have occurred because of the price adjustment or profit taking tendency of the investors in the post-event days. To investigate this apparent anomaly we may now look into the analysis of average cumulative abnormal returns ($ACAR_t$).

TABLE 1: SUMMARY STATISTICS OF AVERAGE ABNORMAL RETURNS (AAR_t) AND AVERAGE CUMULATIVE ABNORMAL RETURNS (ACAR_t)

	Day	AAR _t	T _{obs}	Average AAR _t	T _{obs}	ACAR _t	T _{obs}
Pre-event	-30	1.400%	0.9591	0.43%	2.7868***	1.400%	0.9591
	-29	0.291%	0.6409			1.691%	0.9944
	-28	0.420%	0.8392			2.112%	1.1214
	-27	2.695%	1.7252**			4.807%	1.8503**
	-26	1.071%	0.8281			5.878%	2.2809**
	-25	-0.363%	-0.3479			5.515%	2.2431**
	-24	-0.835%	-1.1897			4.680%	2.0062**
	-23	0.786%	1.3167*			5.466%	2.3791***
	-22	0.301%	0.4725			5.767%	2.5926**
	-21	-0.581%	-0.8511			5.186%	2.4570***
	-20	0.674%	0.7912			5.860%	2.6715***
	-19	1.165%	1.0780			7.025%	3.0524***
	-18	1.309%	1.7275**			8.334%	3.1697***
	-17	1.323%	1.1568			9.657%	3.1009***
	-16	1.099%	1.2874			10.757%	3.1215***
	-15	-0.758%	-0.9107			9.999%	2.9746***
	-14	-1.283%	-1.8626			8.715%	2.6211***
	-13	0.520%	0.4040			9.235%	2.6328***
	-12	0.374%	0.2010			9.609%	2.8678***
	-11	-0.481%	-0.5327			9.128%	2.7884***
	-10	-0.068%	-0.1115			9.060%	2.8338***
	-9	0.477%	0.6175			9.538%	2.9372***
	-8	-0.054%	-0.1003			9.484%	2.9569***
	-7	0.986%	1.1466			10.470%	3.1311***
	-6	-0.527%	-0.6770			9.943%	3.1302***
	-5	0.747%	1.6059*			10.690%	3.2624***
	-4	-0.153%	-0.2877			10.537%	3.0843***
	-3	0.671%	1.2851			11.208%	3.1347***
	-2	1.043%	1.4982*			12.251%	3.1011***
	-1	0.518%	0.8667			12.769%	3.0701***
Post-event	0	1.206%	1.8643**	-0.08%	-0.3339	13.975%	3.2269***
	1	1.232%	2.3595**			15.207%	3.3874***
	2	0.693%	1.0627			15.900%	3.4826***
	3	-0.545%	-0.6883			15.354%	3.2708***
	4	0.506%	0.9358			15.860%	3.3349***
	5	-0.903%	-1.4132			14.957%	3.2506***
	6	-0.501%	-0.7121			14.456%	3.1564***
	7	-1.061%	-1.5757			13.395%	2.9966***
	8	-1.388%	-1.8026			12.006%	2.8638***
	9	-0.343%	-0.5732			11.663%	2.8436***
	10	1.483%	1.3047*			13.146%	3.2943***
	11	-1.839%	-1.6523			11.307%	2.6224***
	12	-0.364%	-0.7669			10.943%	2.5426***
	13	1.817%	1.3730*			12.760%	2.7648***
	14	0.288%	0.4448			13.048%	2.9037***
	15	-1.040%	-1.6809			12.008%	2.6293***
	16	1.030%	1.5479*			13.038%	2.9611***
	17	0.555%	0.7287			13.593%	2.9705***
	18	-2.632%	-1.9690			10.961%	2.4225**
	19	-0.247%	-0.2171			10.714%	2.1180**
	20	-0.052%	-0.0590			10.662%	2.1397**
	21	-2.150%	-1.6915			8.512%	1.6628*
	22	-2.460%	-2.2713			6.052%	1.1402
	23	0.879%	1.5336*			6.931%	1.3236*
	24	0.809%	1.3274*			7.740%	1.4779*
	25	1.642%	1.4906*			9.381%	1.7563**
	26	0.171%	0.1478			9.553%	1.7433**
	27	-0.582%	-0.8076			8.971%	1.5620*
	28	0.251%	0.3604			9.222%	1.5275*
	29	1.511%	0.7169			10.733%	1.5686*
	30	0.998%	0.9469			11.731%	1.7183**

* Significant at $\alpha=0.10$ ** Significant at $\alpha=0.05$ *** Significant at $\alpha=0.01$

Average cumulative abnormal returns (Table 1) have positive values throughout the event window. Almost all ACAR_t are significant expecting on three initial days ($t=-30$, $t=-29$ and $t=-28$) and on the day, $t=22$. Most of the ACAR_t are highly significant at $\alpha=0.01$. ACAR_t on $t=+2$, just one day after the event day ($t=0$) is the highest (15.9%).

Though ACAR_t are decreasing after $t=+2$ because of the probable price adjustment or profit taking tendency of the investors, these are unlike AAR_t significantly positive. Therefore, we can also reject the second null hypothesis and say that the stock on average earned positive cumulative abnormal returns in the total event window.

Finally considering both hypotheses together we can say that the stocks by simultaneous listing in CSE earn positive abnormal returns in DSE around the listing dates. This finding is consistent with the findings of Merjos (1962, 1963, 1967), Van Home (1970), and Ying, et al. (1997).

CONCLUSION

Though lots of works have been done on international cross-listing, a few studies have been done on domestic cross-listing. In our country there are two stock exchanges but a number of companies listed in DSE are yet to be listed in CSE. Among those there are some large capitalization companies such as Atlas

Bangladesh, United Leasing, Glaxo SmithKline and Reneta Ltd. It is interesting to see that these companies are depriving their stockholders in maximizing their wealth. In other words the companies are not utilizing the opportunity of maximizing their market value. Our test result confirms that the cross-listing of a particular share in CSE has a positive impact on price of that particular share in DSE.

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APPENDIX

APPENDIX A: LISTING DATES OF SAMPLE COMPANIES IN CSE

Sl	Name of the Company	Listing Date
1	Rupali Life Insurance Company Ltd.	21/10/1995
2	Janata Insurance Company	21/10/1995
3	Phoenix Insurance Company	22/09/1996
4	Apex Spinning & Knitting Mills	21/10/1995
5	Beximco Textiles Limited	6/11/1995
6	Ashraf Textile Mills Limited	10/11/1996
7	Square Pharmaceuticals	21/10/1995
8	Beximco Pharmaceuticals Ltd.	6/11/1995
9	Reckitt Benckiser (bd) Limited	6/11/1995
10	Orion Infusion Limited	28/10/1996
11	Bangladesh Chemical Industries Ltd.	29/09/1996
12	Apex Foods Limited	21/11/1995
13	Bengal Biscuits Limited	21/10/1995
14	Confidence Cement Limited	21/10/1995
15	Heidelberg Cement	21/10/1995
16	Meghna Cement Mills Limited	26/10/1996
17	Aftab Automobiles Limited	17/09/1996
18	Olympic Industries Limited	18/09/1996
19	BD. Thai Aluminum Limited	3/11/1996
20	Bangladesh Lamps Limited	24/11/1996
21	Eastern Cables Limited	29/06/1997
22	Singer Bangladesh Limited	25/11/2000
23	Apex Tannery Limited	4/10/1995
24	Eastern Housing Limited	23/09/1996
25	BOC Bangladesh Limited	22/06/1996
26	National Bank Limited	6/11/1995
27	Islami Bank Bangladesh	7/3/1996
28	Usmania Glass Sheet fac Ltd.	21/11/1995
29	GQ Ball pen Industries Limited	10/10/1996
30	British American Tobacco Bd. (BATBC)	15/05/1996

STUDY OF SHOPPER'S ATTITUDE TOWARDS PRIVATE LABELS IN DUBAI**DR. TANMAY PANDA****PROFESSOR****BITS****PILANI - DUBAI CAMPUS****DUBAI****K. TEJA PRIYANKA YADAV****STUDENT****DEPARTMENT OF COMPUTER SCIENCE****BITS****PILANI - DUBAI CAMPUS****DUBAI****ABSTRACT**

The present study is analysing the Shopper's attitude towards the private Labels in Dubai. It finds that the deciding factors like quality, durability, freshness of the content, shelf life and provisions for exchange etcetera play a major role in influencing the shoppers to choose a particular brand. Pricing is the only strategy that seems to be working out in favor of the store brands in Dubai, as of now. 41 percent of the shoppers have cited cheaper prices as the sole reason they purchase store brands. There are only two retail giants offering store brands pertaining to Electronics – First 1 (Carrefour) and Lulu Electronics. Spinneys offer maximum range for bakery goods and yet does not make relatively that great revenue for its store brands. For clothes, as well, there are only two retail giants offering store brands namely – N1 (Carrefour) and Lulu Clothes. Factors like proximity of the retail stores or the strategic location seems to offer more footfalls to the retail stores like in the case of Lulu Hypermarkets that are in densely to heavily populated resident areas of Dubai. Carrefour owns the maximum store brands for a single retailer in Dubai. It offers 8 store brands namely – Carrefour, Carrefour 1, Carrefour discount, Carrefour kids, First 1, N1, Carrefour Bio and Carrefour Light. All of Union Co-op stores' store brands have ranked as the best sellers barring a few products, a rare feat for any retail stores considered as part of the thesis in Dubai. Although Choithrams offers only two store brands, they both are among the best sellers for their retail chain. There is not much option between store brands when it comes to the kids segment. Segments like sports equipment, home needs like plumbing equipment, are untapped by all the retailers in Dubai except for Carrefour. Shoppers seem to be drawn towards retail stores for discounts as the products offered under a discount are purchased by 59 percent of the respondents of the survey. 57 people think that the store brands meet their expectations in terms of factors like 'value for money', 'quality/durability', 'after sales service/provision for exchange', 'shelf life' and the store brands competitiveness with the main stream brands in terms of them being 'trendy/comfortable'. 51 people out of the 100 shopper's surveyed state that they wish to recommend the store brand to friends and relatives. 63 shoppers who were surveyed have expressed the view that they believe there is enough room for overall improvement of a store brand. For a store brand to be successful, it is not only essential that the product offer value for money but also that it be competitively priced when compared against the main stream, already established premium products.

KEYWORDS

shopper's attitude, private labels.

INTRODUCTION

A private label is understood as a product line which is owned, controlled, merchandised and sold by a specific retailer in its own stores. Private label is sometimes also called store brands. Store brands were earlier defined as "generic" foods, packed in plain logo-less brown bags that have over the years undergone a sea change into carrying distinct logos and brand names on their packages. Private label goods and services are available in a wide range of industries from food to cosmetics. They are often positioned as low cost alternatives to regional, national or international brands, although recently some private label brands have been positioned as "premium" brands to compete with existing "name" brands. Beginning with abysmally low market share and having to compete with mainstream, already established brands in quality, price and varied range of products, private labels over the years have come a long way to account for a sizable percent of sales in the present day.

GROWTH OF RETAIL IN DUBAI

Dubai, located strategically between the continents of Asia, Africa and Europe has acted as an important port of trade since the medieval ages. Over the years, it has grown into an international city with a population of over 2 million people from around 190 countries that are involved actively in the trade and business that occurs here. With a growing economy, post the oil boom, Dubai has undergone a sea change from being a small desert port to one of the world's most attractive cities for investments in real estate, retail and tourism. The then ruler of Dubai, Sheikh Rashid Bin Saeed Al Maktoum threw open the gates of Dubai for business opportunities to the firms abroad with the idea of 'free trade zone', in 1995 that lured the multi national firms with a bounty of opportunities, including duty exemption.

The evolution of retail sector in Dubai goes hand in hand with the progress that the UAE has achieved in the past 40 years. While the nation was a port of call for trade in the region, it was principally serving as a market intermediary initially; goods from the East and West being shipped in before they reached end users in distant markets that could be easily accessed through sea from the UAE. Over the years, the retail industry evolved to largely meet the needs of the domestic population; and the showcase was rather limited to everyday necessities. A strategic growth shift occurred in the 1970s when the booming Japanese electronics industry found ideal partners in some of Dubai's older trading houses. This set in motion an electronics boom, which ruled the retail trade for nearly a decade with buyers from rest of the region realizing that they could make a fast business gain by shopping in the UAE. Simultaneously, the UAE also became the hub for gold trade, a premier position that the nation continues to uphold to this day. BMI, a research firm based in UAE estimated that the retail market will grow from some 79.3 billion AED in 2011 to 105.4 billion in the next four years.

Today, there's a market capital of 200 million AED being invested in Dubai. The fledgling modern retail (including food services) sector has created as many new jobs as the construction sector. Over 8 per cent of Dubai's population is engaged in retailing. The growth of the Dubai economy is now manifesting itself in the growing purchasing power of its citizens. A 10% to 12% increase in the economy's disposable income is also reflecting itself in the way goods and services are bought and sold.

IMPORTANCE OF RETAIL IN DUBAI ECONOMY

A strong and vibrant retailing industry has the potential to provide the required impetus to agricultural growth through value-added food processing, handicrafts and small and medium enterprises, thereby indirectly creating millions of new jobs annually. According to Dubai Statistics Center report in 2009, Retail

contributes to nearly 30% of the growth in GDP and also, the output is worth 150 billion AED. The private label industry has registered a whopping 11 per cent growth in value terms across the Middle East over the last year, which is significantly higher than a global average of 5 per cent, according to a report by The Nielsen Company, the world's leading marketing information company. In fact, the United Arab Emirates constantly ranks in the top twenty countries in retail investment attractiveness amongst emerging markets of the world.

PRIVATE LABELS

The rise in the market share of Private Label products is one of the most intriguing retail success stories of the past few years. Private Label's market share has been growing at twice the rate of famous brands' market share over the last several years and the Private Label industry is worth an estimated US\$ 1 trillion.

Private label brands is the name used in the United States for retailers' own brands, while in the UK they're known as own brands, and in Australia they are called home brands. With the help of their own Private labels, retailers can compete on price against other bigger, pre established brands and thus make significant profits in addition to increasing their market share and revenues owing to the increased sales. Thus, the private label segment is quite a promising segment for retailers who wish to increase their sales, market share, revenues and thus profit.

STATEMENT OF THE PROBLEM

Despite their popularity and increasing market share in the US and Europe, private labels still lag behind in creating their own market share while competing against established premium brands in Dubai. It is taking more time for the private label strategy to catch up in Dubai, which happens to be one of the booming retail markets in the world, than it has taken in other countries. This research aims to explore the reasons for the slack in the growth rate of Private Labels in Dubai and determine the causes, if any and also offer suggestions to overcome the shortcomings in order to initiate the market growth of Private labels in Dubai.

REVIEW OF LITERATURE

Many earlier studies detail the areas such as branding and positioning of retail malls, and various variables influencing may be due to brand preference, amenities available in the malls, factors which are influencing the consumers to attract towards malls. The empirical studies find out whether size, location, amenities available, infrastructure, convenience and Cineplex in suburban malls do matter in attracting the shoppers.

Prof. S.L. Gupta and Tripat Kaur in their article "Exploring the trends of retail formats in India – A study of shopping malls" published in Indian Journal of Marketing, July, 2007 have studied the malls and established the relationship between the shoppers' behaviour and various attributes/indicators of apparel stores in the malls, which influence them. The relationships between the retailers (dealing in multi-brand retail outlets and exclusive outlets) and indicators, which retailers feel important in selecting target customers have been analyzed. The hypothesis tested for differences in different formats revealed that significant difference is found in all the indicators dealing in multi brand outlets of apparel of exclusive brands of apparel.

Kumar and Leone (1988) find a significant impact of promotions on stores switching/traffic. However, it is unlikely that consumers would keep track of weekly promotions on a multitude of categories in all the stores in their neighborhood. (Bucklin and Lattin 1992) show that retail promotions in any one category do not directly influence a consumer's store choice decision, but they indirectly affect where the category is purchased.

Consumers' perception of the breadth of different products and services offered by a retailer under one roof significantly influence store image. The benefits of a wide assortment are clear, first, the greater the breadth of product assortment, the greater the range of different situations in which the retailer is recalled and considered by the consumer, and therefore the stronger its salience. (Keller 2003) salience is the most basic building block for a brand. Second, the one-stop shopping convenience that a broad product assortment enables is becoming more important than ever for today's time-constrained consumer (Messinger and Narasimhan 1997) putting pressure on retailers to broaden their assortment. Third, consumers regularly shop at more than one store, and, as noted earlier, they may purchase a category in the store that they are visiting based on in-store assortment and marketing mix activities whereas they would otherwise have purchased it in another store.

In the wake of review of the literature of the earlier studies, it can be understood that the studies carried out on the retail sector have not covered issues relating to private labels in Dubai. These studies are either done on a different socio-ethnic, or when the organized retailing yet to take its shape in true form. The studies conducted on a related topic either studied in a different country or the study is not similar to the dimensions chosen by the researcher.

SIGNIFICANCE OF THE STUDY

Nearly everybody buys Private Label goods. Of every US\$100 spent around the world, US\$17 is spent on Private Label and the industry is worth an estimated US\$1 trillion. Private label growth is outpacing that of manufacturer brands, and 'Private Label' as a whole can be viewed as the biggest "brand" in the world. In fact, sales of Wal-Mart's private brands are worth more than Unilever's, PepsiCo's and Coca-Cola's brands put together. If you are a brand manufacturer competing for shelf space, pricing of products and the resultant market share are daunting tasks and cannot be achieved without several efforts.

Private labels were primarily introduced to provide a low cost alternative to the low and middle income sections who cannot afford to spend money on branded products and hence the need arose to offer products at competitive prices without compromising on the quality. Several attractive offers were provided like seasonal sales and steep occasional discounts that have managed to draw the low and middle income segment to purchase the private labels. It has been observed that over the years, even the consumers from higher income groups are taking to private labels in comparison to the earlier days when the higher income groups would stick to branded products with the notion that anything that is offered at a lower price must be of inferior quality. Simultaneously, it has also been noticed that private labels have gone beyond their original purpose to provide low-cost alternatives to the national brands.

Private labels are increasingly becoming bigger than their initial purpose. With the advent of time, more number of shoppers are inclined towards stepping out of the conservative mindset of shopping only established brands and are venturing into trying out private labels which are competent with the established brands in quality, pricing, value for money, durability and every other decisive factor. Even global retailers such as Wal-Mart, Carrefour and others are essentially increasing their focus on private labels to accommodate the changing shoppers' needs and demands and also increase their market revenue from the sales.

SCOPE OF THE STUDY

The study limits itself to the study of store brands only, in Dubai, spread over retail industry covering food –beverages, clothes and other consumer durables.

OBJECTIVES OF THE STUDY

1. To identify the private labels of the retail giants such as Carrefour, Lulu, Spinneys, Choithrams and Union Co-op stores in Dubai.
2. To study the evolution and growth of store brands in Dubai.
3. To identify the shoppers' perception and attitude towards different store brands in Dubai.

METHODOLOGY

In order to study the topic the data and information are needed from primary and secondary sources. The primary data were collected through questionnaire from the shoppers in Dubai.

A sample size of 100 shoppers was made at random from different stores. The collected data and information were analyzed using simple percentage calculation, histograms and pie charts. The secondary data were collected from various research papers, articles published in the various magazines, journals, business newspapers, periodicals and websites of the retail malls.

DATA ANALYSIS AND FINDINGS

1. There are many firms playing in the retail sector in Dubai. Refer Table 1 below:

Retail Store	Presence	Catering to	Size/ Volume/ Space	History & Remarks
Carrefour	Many outlets spread across Dubai	All segments	- Hypermarkets in all City Centres - 4-5 Carrefour express, a supermarket format store	French Giant, operates through Majid Al Futtaim group, largest in volume of sale and space
Lulu	Many outlets spread across Dubai	All Segments	- 2-3 hypermarkets - few supermarkets	Indian owned, attracts most Indian buyers, present in all GCC countries
Spinneys	Many outlets spread across Dubai	All Segments	- 13 Supermarkets	Egypt based, present in all GCC countries
Choithrams	Many outlets spread across Dubai	All Segments	- 15 supermarkets	Established in 1944 in West Africa, spread across 60 countries in the world
Union Cooperative	Many outlets spread across Dubai	All Segments	- 8 Supermarkets	Established in 1971 in the UAE
Geant	1 outlet in Dubai	All Segments	- 1 Hypermarket present in Ibn Batuta Mall, Dubai - 4 Geant Easy, supermarkets	French retailing giant Groupe Casino, fifth largest retail chain in the world
Al Madina	Many outlets spread across Dubai	All Segments	- 39 supermarkets	Established in 1971, present only in UAE
Al Manama	Few outlets spread across Dubai	All Segments	Mostly Supermarkets and 2-3 Hypermarkets	Present in Dubai, Ajman and Sharjah
Al Maya/ Citi Mart	Few outlets spread across Dubai	All Segments	Mostly Supermarkets	Indian Owned, not able to attract premium segment

Table 1: The various retailers operating in Dubai Market

2. It was found that Carrefour, Lulu, Spinneys, Choithrams and Union Cooperative stores have their own private labels which are well established, as enlisted below:

Retailers	Private Label	Product Line/ Product
Carrefour	Carrefour	Hand sanitizer, Body gel, Nail polish remover, Disposable aluminum foil, Air tight containers, Sanitary napkins, Cotton ear buds and Petroleum jelly
	N1	Mineral Water, Salt, Women's apparel, Men's clothes
	Carrefour Bio	Organic foods
	First 1	Electronics and Stationery items
	Carrefour Light	Bakery and Frozen foods
	Carrefour kids	clothes, food and toiletries
	Carrefour discount	Wafers, Honey, Cookies, Coffee, Tea, Chips, Roasted Nuts, Biscuits and Muesli
	Carrefour 1	Groceries and Toiletries
Lulu	Lulu groceries	Groceries
	Lulu clothes	women, men and kids
	Lulu electronics	Electric kettle, Coffee maker, Juicer, Mixer, Blender, Hair straightener and electric shaver
	Lulu toiletries	Soaps and Detergents
	Lulu bakery/frozen foods	Bread, Cakes and meat
Choithrams	Choithrams bakery/frozen foods	Bread, bun, Meat and Canned items
	Choithrams groceries	Groceries
Spinneys	Spinneys bakery	Bread and buns
	Spinneys frozen foods	Pizza bases, Meat etc
Union	Union groceries	Groceries
	Union frozen foods	Canned items
	Union toiletries	Soap and Detergents
	Union utilities	Disposable products and Kitchen ware containers

Table 2: Table depicting various private label brands of Retail Giants in Dubai Market

DATA ANALYSIS AND INTERPRETATION

1. HOW OFTEN YOU VISIT THE STORES?

Stores	Often	Sometimes	Rare	Never
Carrefour	55	27	14	4
Lulu	43	22	28	7
Spinneys	35	22	30	13
Choithrams	30	22	31	17
Union Co-op	34	15	33	18

Table 3: Table depicting the frequency of shoppers' visiting selected Retail Stores.

KEY FINDINGS

- Carrefour** – Carrefour is the second biggest retail giant in the world, next only to Wal-Mart. Since it opened its first stores in Dubai in 1995, Carrefour has steadily grown to capture the maximum market in the retail sector in Dubai. According to the statistics of the survey, 55 percent state that they visit Carrefour 'Often'. The reasons that can be attributed to explain the realized trends are the location of the stores, the varied range of the products offered, the pricing, quality of the products offered etc. Carrefour is located in almost all the malls of Dubai except Dubai Mall and this could be attributed as one of the prime reasons why it receives that many footfalls.
- Lulu** – Lulu Hypermarket with 9 branches all over Dubai got the second best preference by our respondents as their choice of retail stores to visit when they want to purchase something. It is the choice of 43 percent of the shoppers who visit the stores 'often'. The reasons owing to this could be the location of the stores and also the pricing of the products amongst other reasons that attract shoppers like seasonal sales and discounts etc. Lulu Hypermarket is a rare feature in the shopping malls of Dubai; it is located in crowded resident areas like Karama, Al Quasis and Deira.

3. **Spinneys** – Spinneys has 13 stores all over Dubai and has ranked the third best preference by the respondents of this survey. Spinneys offer diverse range of products from Bakery, frozen foods, groceries, butchery to pharmacy. 35 percent of the shoppers have voted for Spinneys as the stores they visit 'often'. Spinneys haven't yet opened its store in most of the densely populated resident regions of Dubai while it caters to the needs of moderately populated areas like International City and Jumeirah. Pricing is another factor that influences shoppers to visit the stores in addition to the strategic location.
4. **Choithrams** – Choithrams caters to the needs of the shoppers in Dubai from 15 stores spread all over the City from Silicon Oasis till Jumeriah. It remains the choice of 31 percent of the respondents as the stores they visit 'often'. Choithrams offers butchery, bakery, groceries, home needs, beauty and health products, frozen foods section, fresh vegetables and fruits section. The reasons for these trends can be attributed to reasons like pricing and range offered for certain products, the two factors that influence a shopper's decision to visit a particular store in addition to the location of the stores.
5. **Union Co-op** – With 8 stores across Dubai, Union Co operative stores remains the choice of 34 percent of the respondents of this survey who mention that they visit the stores 'often'. The reasons for the above realized trends can be attributed mainly to store locations; it is not strategically located in all the resident regions across Dubai. While it caters to the needs of a few resident areas, there are potential regions that haven't been tapped yet.

2. PREFERENCE TOWARDS STORES AND ITEMS

	Often	Sometimes	Rare	Never
Groceries	61	21	15	3
Electronics	31	19	15	35
Bakery	39	14	22	25
Garments	29	20	22	29
Stationery	42	27	22	9
Frozen foods	36	23	32	9
Anything that is offered on discount	59	17	19	5

Table 4: A Table depicting the frequency of Shoppers' purchasing various items like Groceries, Bakery, Frozen Foods etc.

3. SHOPPERS' ATTITUDE TOWARDS STORE BRAND EXTENSIONS OF CARREFOUR

Stores	Store brands	Store brand extension	I have heard about them but never purchased them	I have purchased them	I have never heard about them
Carrefour	Carrefour Bio	Organic foods – Rice	30	36	33
		Pasta	25	22	54
		Nutritious pulses	34	21	45
		Cereals	18	13	69
		Low carb foods	15	44	41
	Carrefour Light	Fibrous grains	41	33	26
		Frozen foods – pizza bases,	12	80	8
		Cheese	40	48	12
		Canned products	14	70	16
		Yogurt	39	50	11
		Meat	10	80	10
	First 1	Ice creams	30	57	13
		Steamer	12	26	62
		Heater	40	48	12
		Iron Box	44	16	40
		Coffee maker	10	15	75
		Toaster	10	31	59
		Juice extractor	30	57	13
	Carrefour discount	Microwave	18	12	70
		Wafers	35	40	25
		Honey	27	22	51
		Cookies & Biscuits	19	27	54
	Carrefour kids	Coffee & Tea	13	18	69
		Pasta, Cereal and biscuits	55	25	20
		Toiletries	61	29	10
	Carrefour 1	Clothes	57	35	8
		Rice	16	74	14
		grains	18	70	12
		Water	13	80	7
Carrefour	N1	Oil	20	66	14
		Clothes	30	49	21
		Footwear	25	60	15
	Carrefour	Women's Accessories	34	46	20
		Hand sanitizer	34	45	21
	Carrefour	Body gel	45	29	26
		Disposable aluminum foil	51	25	24
		Air tight containers	37	23	40
		Sanitary Napkins	34	14	52
		Petroleum jelly	17	8	75

Table 5: A Table depicting the frequency of Shoppers' purchasing various Private Labels owned by Carrefour

4. SHOPPERS' ATTITUDE TOWARDS STORE BRAND EXTENSIONS OF LULU

Stores	Store brands	Store brand extension	I have heard about them but never purchased them	I have purchased them	I have never heard about them
Lulu	Lulu electronics	Electric kettle	43	31	26
		Coffee maker	13	23	64
		Juicer	15	55	30
		Mixer	8	12	80
		Hair Straightener	41	44	15
		Electric shaver	23	41	36
	Lulu clothes	Women's apparel	13	66	21
		Men's clothes	30	24	23
		kids garments	15	55	30
	Lulu Groceries	Rice	12	81	8
		Oil	23	66	21
		Pulses	9	80	1
		Spices	18	67	15
		Tea & Coffee	17	70	13
		Nuts	9	82	9
		Oats & Cereal	25	56	9
		Water	23	71	6
	Lulu toiletries	Floor cleaners	13	65	22
		Hand sanitizer	20	57	23
		Fabric Softener	5	65	30
		Detergent	14	70	16
		Shampoo	12	65	23
		Soaps	15	67	18
	Lulu bakery/ frozen foods	Bread	12	81	7
		Cakes	23	66	11
		Pizza	17	70	13
		Meat	13	80	7

Table 6: A Table depicting the frequency of Shoppers' purchasing various Private Labels owned by Lulu

5. SHOPPERS' ATTITUDE TOWARDS STORE BRAND EXTENSIONS OF CHOITHRAMS

Stores	Store brands	Store brand extension	I have heard about them but never purchased them	I have purchased them	I have never heard about them
Choithrams	Choithrams bakery/ frozen foods	Bread - French, Garlic, wheat, milk, fruit	22	61	17
		Zaatar and hummus,	30	51	19
		Doughnuts	17	70	13
		Sandwiches	21	66	13
		Frozen foods – pizzas, fries and parathas	18	65	17
		Meat and sea food	11	70	19
	Choithrams groceries	Rice	12	81	8
		Pulses	15	75	10
		Wheat	17	70	13
		Indian spices	21	66	13
		Grains	19	74	7
		Grams	9	82	9

Table 7: A Table depicting the frequency of Shoppers' purchasing various Private Labels owned by Choithrams

6. SHOPPERS' ATTITUDE TOWARDS STORE BRAND EXTENSIONS OF SPINNEYS

Stores	Store brands	Store brand extension	I have heard about them but never purchased them	I have purchased them	I have never heard about them
Spinneys	Spinneys bakery	Bread	18	77	5
		Doughnuts	30	41	29
		Pies	17	50	33
		Muffins	11	83	6
		Cakes	9	83	8
		Pastries	25	53	22
		Croissant	21	53	16
		Sandwich	24	56	20
	Spinneys frozen foods	Roasted chicken	27	60	13
		Pizzas and pizza bases	18	51	31
		Meat balls, nuggets	30	41	29
		Hash browns	32	35	33
		fries	20	60	20
		sandwiches	29	53	18
		Meat & sea food	7	71	22

Table 8: A Table depicting the frequency of Shoppers' purchasing various Private Labels owned by Spinneys

7. SHOPPERS' ATTITUDE TOWARDS STORE BRAND EXTENSIONS OF UNION CO-OP STORES:

Stores	Store brands	Store brand extension	I have heard about them but never purchased them	I have purchased them	I have never heard about them
Union Co-op stores	Union groceries	Rice	13	77	10
		Sugar	11	83	6
		Oil	9	83	8
		Water	13	72	15
		Nuts	31	40	29
		Spaghetti, Macaroni, Vermicelli	12	19	69
		Tomato paste	34	51	15
	Union frozen foods	Chicken	15	76	9
		Canned items	25	56	19
		fries	20	65	15
		Mixed vegetables	10	85	5
	Union Toiletries	Toilet roll	14	78	8
		Antiseptic	25	52	23
		Hand Sanitizer			
		Detergent	13	70	17
		Soap			
		Washing Powder	12	67	21
		Bleach	10	72	18
		Fabric Softener	12	43	45
	Union Utilities	Disposable products	18	73	9
		Aluminium foils, trays, roll	14	78	8
		Kitchen ware containers	18	58	24

Table 9: A Table depicting the frequency of Shoppers' purchasing various Private Labels owned by Union Co-op Stores

8. REASONS FOR PURCHASING THE ABOVE SELECTED PRIVATE LABELS:

Reasons	Percentage of Shoppers' who've selected the particular reason
Cheaper prices	41
Quality	15
Durable	11
Discount on products when purchased in bulk	33

Table 10: A Table depicting the reasons and the percentage of Shoppers' that cited these reasons

9. RATING OF VARIOUS STORE BRANDS BASED ON KEY FACTORS

	Value for money	Quality/Durability	Offered with warranty/ freshly made	After sales service/ exchange provision	Trendy/comfortable fit
Groceries	18	15	14	-	-
Carrefour 1					
Carrefour Bio	5	5	14	-	-
Carrefour Light	9	9	14	-	-
First 1	16	22	14	-	-
Union	27	25	20	-	-
Lulu	25	24	24	-	-
Electronics	45	50	55	50	-
Carrefour					
Lulu	55	50	45	50	-
Bakery					
Carrefour	14	14	9	-	-
Spinneys	44	45	50	-	-
Lulu	9	10	14	-	-
Union	20	18	16	-	-
Choithrams	13	13	11	-	-
Frozen foods	13	12	15	-	-
Carrefour					
Choithrams	16	15	15	-	-
Lulu	17	23	30	-	-
Union	20	20	20	-	-
Spinneys	34	30	20	-	-
Garments	65	60	-	50	70
Carrefour					
Lulu	35	40	-	50	30

Table 11: A Table depicting the shoppers' satisfaction based on various factors of the store brands owned by a selected few retail stores.

10. OVERALL OPINION ABOUT THE STORE BRAND

1.	Do you feel the store brand meets your expectation?	YES	57	NO	43
2.	Will you recommend this store brand to friends and relatives?	YES	51	NO	49
3.	Is there any room for improvement of the store brand?	YES	63	NO	36

Table 12: A Table depicting the overall opinion of the Shoppers' about the store brands (private labels) owned by selected few retail stores.

KEY FINDINGS

1. Deciding factors like quality, durability, freshness of the content, shelf life and provisions for exchange etcetera play a major role in influencing the shoppers to choose a particular brand.
2. Pricing is the only strategy that seems to be working out in favor of the store brands in Dubai, as of now. 41 percent of the shoppers have cited cheaper prices as the sole reason they purchase store brands
3. There are only two retail giants offering store brands pertaining to Electronics – First 1 (Carrefour) and Lulu Electronics.
4. Spinneys offer maximum range for bakery goods and yet does not make relatively that great revenue for its store brands.
5. For clothes, as well, there are only two retail giants offering store brands namely – N1 (Carrefour) and Lulu Clothes.
6. Factors like proximity of the retail stores or the strategic location seems to offer more footfalls to the retail stores like in the case of Lulu Hypermarkets that are in densely to heavily populated resident areas of Dubai.
7. Carrefour owns the maximum store brands for a single retailer in Dubai. It offers 8 store brands namely – Carrefour, Carrefour 1, Carrefour discount, Carrefour kids, First 1, N1, Carrefour Bio and Carrefour Light.
8. All of Union Co-op stores' store brands have ranked as the best sellers barring a few products, a rare feat for any retail stores considered as part of the thesis in Dubai.
9. Although Choithrams offers only two store brands, they both are among the best sellers for their retail chain.
10. There is not much option between store brands when it comes to the kids segment.
11. Segments like sports equipment, home needs like plumbing equipment, are untapped by all the retailers in Dubai except for Carrefour.
12. Shoppers seem to be drawn towards retail stores for discounts as the products offered under a discount are purchased by 59 percent of the respondents of the survey.
13. 57 people think that the store brands meet their expectations in terms of factors like 'value for money', 'quality/durability', 'after sales service/provision for exchange', 'shelf life' and the store brands competitiveness with the main stream brands in terms of them being 'trendy/comfortable'
14. 51 people out of the 100 shoppers surveyed state that they wish to recommend the store brand to friends and relatives.
15. 63 shoppers who were surveyed have expressed the view that they believe there is enough room for overall improvement of a store brand. For a store brand to be successful, it is not only essential that the product offer value for money but also that it be competitively priced when compared against the main stream, already established premium products.

SUGGESTIONS

1. Retailers should consider not compromising with the quality of a store brand while continuing to offer the store brand at a competitive price.
2. Retailers should consider working out innovative ways to improve the brand image of store brands.
3. Retailers should offer seasonal discounts for improving the revenues of store brands.
4. Retailers should understand that in order to compete with an established brand, the store brand must be competent not just in price but in other major factors like quality, durability, looks, provisions for warranty and exchange and after sales service etc.
5. Retailers can study the success stories of Private Labels in the European countries and the United States in order to obtain a set of guidelines and learn how to implement the strategies that ensure the success of a private label.

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FACTORS INFLUENCING INDIVIDUAL INTRANET USAGE: A LITERATURE REVIEW**MOHAMAD NOORMAN MASREK****CO-ORDINATOR FOR RESEARCH PROGRAMMES****ACCOUNTING RESEARCH INSTITUTE & FACULTY OF INFORMATION MANAGEMENT****UNIVERSITI TEKNOLOGI MARA****MALAYSIA****DANG MERDUWATI HASHIM****HEAD OF FIM POSTGRADUATE STUDIES****FACULTY OF INFORMATION MANAGEMENT****PUNCAK PERDANA CAMPUS****UNIVERSITI TEKNOLOGI MARA****MALAYSIA****MOHD SHARIF MOHD SAAD****ASSOCIATE DEAN (RESEARCH)****FACULTY OF INFORMATION MANAGEMENT****PUNCAK PERDANA CAMPUS****UNIVERSITI TEKNOLOGI MARA****MALAYSIA****ABSTRACT**

While the intranet has been significantly matured since its first inception in the mid 90s, studies addressing on the determinants of usage at the individual perspective has been very scarce. To this effect, this paper presents a review of the extant literature on factors that influence individual usage of intranet. Four groups of determinants were found to be influential are organization factors, technological factors, individual factors and environmental factors. The findings of this review should be useful for researchers intending to investigate the topic. The variables identified in the study can be empirically tested in diverse intranet implementation setting using either quantitative, qualitative or mixed method approach.

KEYWORDS

intranet, determinants, organizational factors, technological factors, individual factors.

INTRODUCTION

Since its first inception in the mid 1990s, the intranet has achieved major advancement and sophistication. Today, intranet technologies have significantly matured more sophisticated terms like intranet portal, enterprise portal, enterprise information portal or EIP have been used to replace intranet. Unlike any other application systems, the intranet is usually implemented for company-wide usage. In other words, almost everyone in the organization has access and rights in using the intranet. In a typical intranet computing environment, individual usage can be divided into mode of usage or purpose of usage. Damsgaard and Scheepers (2001) identified the mode of intranet usage as being publishing, transacting, interacting, searching and recording. On the other hand, the literature indicates that the purposes of usage are mainly centered upon decision support (Ba, Lang and Whinston, 1997; Sridhar, 1998; Denton, 2005) and knowledge sharing (Ruppel and Harrington, 2001; Stoddart, 2001; Lichtenstein, Hunter and Mustard, 2004; Panteli, Tsiourva and Modelly, 2005; Stenmark, 2005c).

In publishing mode, intranet is used to publish information such as home pages, newsletter, employee directories or organizational information. In transacting mode, intranet can be used for transacting the functions of the intranet pages and other computer-based information systems such as Human Resources Information Systems, Customer-Relationship Information Systems etc. In interacting mode, intranet is used to interact with other individuals and groups in the companies via discussion groups or collaborative applications. In searching mode, intranet is used for searching organizational information via the search engines, indexes or search agents. In recording mode, intranet is used for recording the computer-based organizational memory such as best practices, business processes or frequently asked questions. Decision support in intranet computing environment relates to the users' usage of the intranet for decision making and problem-solving purposes. On the other hand, knowledge sharing denotes users' usage of the intranet as a medium for sharing their knowledge with colleagues and peers.

Stenmark (2004) noted that despite the growth of corporate organizations embracing intranets, research in this topic is still very scarce and limited. To this effect, this paper presents a review of the extant literature on factors that influence individual usage of intranet.

INTRANET CHARACTERISTICS

Many IS researchers have adopted the Zachman's Information Architecture framework (Zachman, 1987) to explain the characteristics of information systems architecture (see Scheepers, 1999; Lyytinen et al., 1998). The framework employs the typical English interrogatives of *what, how, where, who, when* and *why* to describe the different aspects of information systems architecture. Question on 'what' focuses on the content or data entities of the architecture. Question regarding 'how' enquires about possible applications and functionalities of the intranet. Questions about 'where' describes the scope or location of the intranet architecture. Questions on 'who' refers to the people involved with the intranet. Questions on 'when' refer to time-related matters, i.e., the appropriate timing for the adoption of the intranet. Finally, questions on 'why' examine reasons for adopting the intranet. Table-1 presents the intranet characteristics based on Zachman's Information Architecture framework.

TABLE-1: INTRANET CHARACTERISTICS

Characteristics	Description
What? (i.e., intranet content?)	Contents are company-specific and may encompass information on corporate policies, employee benefits, internal job openings, sales information, newsletters, event schedules, press releases (Butler et al., 1997). Contents can appear in many forms (e.g. text, audio, video) and format (e.g. MSWord, Adobe Acrobat)
How? (i.e., intranet applications?)	All intranet applications fall into three main categories (i) publishing applications or applications that allow one person or group to talk to many (ii) discussion applications which allow many people to talk to many people and (iii) interactive applications or applications that interact with a program or other document (Casselberry et al., 1996). The three described application possibilities can be used in any combination or simultaneously (Scheepers, 1999)
Where? (i.e., intranet architecture?)	The scope of intranet coverage depends upon the implementation model being adopted. Stanek (1997); Zimmerman and Evans (1996) identified three possible models for intranet implementation being (i) centralized model with a single web server administered by a specific organization in the company, and a formal process for developing and installing new services (ii) decentralized model with anyone free to set up a web server and place resources of their choice on it (iii) mixed model with elements of both the centralized and decentralized models.
Who? (i.e., intranet users)	Intranet users are both consumers and developers of intranet. As consumers, users surf the intranet for information seeking and retrieval but as developers, users themselves involve in the development of intranet pages and even functionalities such as pages with embedded scripts and applications (Scheepers, 1999)
When? (i.e., timing of intranet adoption?)	The rational and approach to determine whether a company / department needs intranet is similar to that used to determine whether any new IS should be implemented. However, the implementation does not start at a definite point in time, but emerges through a series of implementation initiatives that combine existing initiatives with novel one. Likewise, the implementation never seems to end because new functionalities and possibilities evolve over time (Karlsbjerg and Damsgaard, 2001)
Why? (i.e., reasons for intranet adoption?)	Reasons for intranet adoption include for internal communication and trainings (Bottazzo, 2005), knowledge management initiatives (Sarkar and Bandyopadhyay, 2002; Dingsoyr and Conradi, 2003); strategic weapons for competitive advantage (Curry and Stanchich, 2000); decision support tool (Sridhar, 1998; Denton, 2005); enabler for Business Process Reengineering (Golden and Hughes, 2001)

INTRANET USAGE

Organizational adoption of IS generally experiences two stages, namely, (i) primary adoption by a firm, division, or department, and (ii) secondary adoption by individual employees (Hsieh and Zmud, 2006). To describe the process of IS implementation processes, Kwon and Zmud (1987) developed a six-stage model which consists of initiation, adoption, adaptation, acceptance, routinization, and infusion. According to (Hsieh and Zmud, 2006), the last three stages of the model refer to different levels of implementation activities where individual IS usage behaviours may take place. Acceptance denotes users' commitment to use the system. Routinization relates to the state where the system use is no longer perceived as out-of-ordinary but actually becomes part of an individual's behavioural routine. Infusion describes the process of embedding an IT application deeply and comprehensively within an individual's or an organization's work systems (Cooper and Zmud 1990). It is evident that through direct experiences with an IS and associated learning processes and activities, individuals develop abilities to utilize the IS to its fullest potential at the infusion stage (Cooper and Zmud 1990; Saga and Zmud 1994; Jaspersen et al., 2005). Saga and Zmud (1994) asserted that the stage model should not be seen as a strict sequential process, but rather should be thought of as activities, some of which may occur in parallel. The present study defined intranet usage is an individual intranet usage behaviour that embraces the threefold stages, i.e., acceptance, routinization and infusion of the six-stage model developed by Kwon and Zmud (1987).

DETERMINANTS OF INTRANET USAGE

Every individual is subject to his own personal traits and to the environment or surrounding that he belongs to or is attached with. The Theory of Reasoned Action (TRA) and The Theory of Planned Behaviour (TPB) posited that individual beliefs such as object-based belief of a particular technology are influential in shaping individual behaviours. Diffusion of Innovation (DOI) posited that besides individual beliefs of the innovation characteristics (i.e. the object or technology being studied) other factors such as individual characteristics, organizational characteristics and external characteristics are also influential in molding one's behaviour associated with individual adoption behaviour. Models such as Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology or UTAUT (Venkatesh et al., 2003) which are mainly derived from TRA and TPB have been consistently showed by researchers that individual characteristics, organizational characteristics and technology characteristics are predictors or antecedents of technology adoption (Jeyaraj et al., 2006).

The term 'predictors' or 'antecedents' which are sometimes used interchangeably with determinants in the IS literature, refers to "a determining or causal element or factors". Depending on the number of articles reviewed and the theories being referred to, various authors have identified scores of determinants to technology adoption and usage. In their review, Trice and Treacy (1988) synthesized that four main determinants of IS usage are design and implementation process characteristics, information systems characteristics, individual characteristics and task characteristics. Building upon the TRA and TPB, and supported by previous researches on individual IT adoption, Agarwal (2000) conceptualized that the determinants to IS adoption are managerial interventions, social influences, beliefs and attitudes, situational influences and individual characteristics. Larsen (2001) examined 5000 articles from five highly ranked journals and identified the determinants of IS usage as being inter-organizational, environment, structure, task, process, technology and individual. Recent review by Jeyaraj et al., (2006) of 99 empirical studies on IT adoption that was published between 1992 and 2003 categorized four major determinants to IT adoption i.e. individual, organizational, and technological and environment.

A large number of studies on the intranet have attempted to investigate the effects of the aforementioned determinants on intranet adoption. However, these studies either done at the firm-level perspective (Al-Gharbi and Atturki, 2001; Eder and Igbaria, 2001) or user-level perspective (Horton et al., 2001; Weitzel and Hallahan, 2003; Chang, 2004) were meant to determine use or non-use. Furthermore, the purposes of the studies conducted by Horton et al., (2001) and Chang (2004) was to validate the TAM model in the context of intranet. While TAM is recognized as parsimonious, its constructs only embraced two aspect of the technology characteristics i.e. perceived ease of use and perceived usefulness. Clearly, in explaining the phenomenon of intranet usage especially effective usage, there are still many other contributing factors that have varying effects. Studies have shown that individual whose backgrounds or characteristics are not in favor on technology disposal, are somehow affected by factors such as social influence or organizational factors. Likewise, individual whose traits are inclined towards technology adoption could be inhibited from embracing the technology when the characteristics of the technology itself does not fit or match his needs and requirements. Against this argument, it is imperative to investigate how determining factors effects individual usage behaviour on the intranet. Depending on the unit of analysis, either individual or organizational, studies on intranet adoptions and acceptance have investigated numerous determinant or antecedent factors. Following the categorization by Jeyaraj et al., (2006), these determinants are grouped as individual, organizational, technology (innovation) and environmental characteristics.

ORGANIZATIONAL FACTORS

Diverse studies have shown that various organizational characteristics are influential in determining both organizational and individual IT adoption and acceptance (Jeyaraj et al., 2006). Organizational characteristics relate to organizational attributes or features such as top management support, user support, user training, and IT facilities. Table-2 exhibits various organizational characteristics that were found to be significant predictors or determinants of intranet

adoption and acceptance. These characteristics comprise of top management support, user participation (involvement), IT infrastructure, champion presence, culture, functional integration, slack resources, knowledge building, knowledge deployment, subsidy, mobilization, standard setting, innovative directive, user training, user technical support, IT manager ability, organizational size and earliness in adoption.

TABLE-2: ORGANIZATIONAL FACTORS RELATED TO INTRANET ADOPTION AND ACCEPTANCE

Characteristics	Description	Studies
Top management support	Relates to the top management support for and favorable attitude toward intranet manifested by sufficient allocation of resources (fund, human resources etc) and willingness to accept risk, while encouraging and promoting the intranet implementation effort.	Zolla (1998); Phelps and Mok (1999); Young (2000); Tang (2000); Al-Gharbi and Atturki (2001); Eder and Igbaria (2001); Bajwa and Ross (2002); Wilkinson et al., (2002); Fong (2003); Masrek et al. (2008)
User participation and involvement	Relates to users taking part in some intranet development and implementation activities which can be direct or indirect, formal or informal, performed alone or in a group	Zolla (1998); Phelps and Mok (1999); Young (2000); Tang (2000); Al-Gharbi and Atturki (2001); Bajwa and Ross (2002); Wilkinson et al., (2002)
IT infrastructure (flexibility)	Defined as a set of IT resources and organizational capabilities that are shared across the organization and that provide the foundation on which IT applications are developed and business processes are supported	Zolla (1998); Lai and Mahapatra (1998); Eder and Igbaria (2001); Bajwa and Ross (2002);
User technical Support / Facilitating conditions	Denotes the degree to which an individual feels there is organizational and technical infrastructure in place to support using the intranet	Lai and Mahapatra (1998); Young (2000); Duane and Finnegan (2000); Chang (2003); Chang (2004); Masrek et al (2008)
Champion Presence	Managers to actively and rigorously promote the intranet, building support, overcoming resistance, and ensuring that the intranet is successfully implemented	Zolla (1998); Bajwa and Ross (2002)
Social Norms	Relates to customary rules of behaviour that coordinate interactions among people.	Chang (2003); Chang (2004); Baptista et al., (2006); Masrek et al (2008)
Culture	Describes the pattern of basic assumptions - invented, discovered, or developed by a given group as it learns to cope with its problems of external adaptation and integral integration - that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems (Schein, 1985)	Zolla (1998); Ruppel and Harrington (2001); Wilkinson et al., (2002)
Functional Integration	Denotes the degree of interdependence among the various business units and functions and the extent of cooperation and coordination among business units and functions that are required for developing new product or services	Tang (2000); Bajwa and Ross (2002); Windrum and Berranger (2003); Masrek et al. (2008)
Slack Resources	Refers to the degree to which a pool of resources involving funds and human is perceived to be in excess.	Tang (2000); Al-Gharbi and Atturki (2001); Bajwa and Ross (2002);
Knowledge building	Signifies the availability of knowledge necessary to develop and sustain the intranet and the application of the intranet	Damsgaard and Scheepers (1999); Butler (2003)
Knowledge deployment	Interprets adoption purposes i.e. the purposes of intranet adoption	Damsgaard and Scheepers (1999); Butler (2003)
Subsidy	Relates to subsidizing critical activities essential for the diffusion and innovation of the intranet	Damsgaard and Scheepers (1999); Butler (2003)
Mobilization	Describes the encouraging and decentralized actors and organizations to think about the intranet in the right way in order to facilitate increased usage	Damsgaard and Scheepers (1999); Butler (2003)
Standard setting	Relates to making the intranet practice official and defines the scope of options for the actors involved	Damsgaard and Scheepers (1999); Butler (2003)
Innovative directive	Addresses the guidelines that are meant to control both the production and use of the intranet	Damsgaard and Scheepers (1999); Butler (2003)
User training	Providing users with sufficient education and exposure on how to use and operate the intranet	Tang (2000)
IT manager ability	Refers to the IT manager skills and competencies especially on their IT background and experiences	Tang (2000)
Organizational Size	Defined as the number of equivalent full-time salaried employees in the organization	Eder and Igbaria (2001)
Earliness in adoption	Indicates the relative earliness of adoption within a population of potential intranet adopters.	Eder and Igbaria (2001)

Since the present study evaluated intranet usage at the user-level perspective, the appropriate and relevant characteristics (variables) from the aforementioned list are top management support, grassroot support (user participation / involvement), user technical support, champion presence, social norms, culture, functional integration, slack resources, user training and IT manager ability. Organizational size and earliness in adoption are not relevant as they are more appropriate for the firm-level perspective. The remaining characteristics, knowledge building, knowledge deployment, subsidy, mobilization, standard setting and innovative directive which are actually extracted from King's et al., (1994) taxonomy of institutional factors in information technology innovation are also not appropriate as they are more relevant for institutional or organizational perspectives.

TECHNOLOGICAL FACTORS

Various theories provide different innovation characteristics that are influential in determining IT adoption. The connotation of these innovation characteristics is based on individual belief on a particular technology (i.e., object of the innovation). The Theory of Reasoned Action or TRA (Fishbein and Ajzen, 1975) describes beliefs as the individual's cognitive evaluation of the consequences of a particular behaviour. According to Agarwal (2000), beliefs recur as an important construct in each of the major theoretical paradigms that have been used to understand acceptance behaviour. Technology Acceptance Model or TAM (Davis, 1989) categorizes two object-based beliefs being perceived ease of use and perceived usefulness. Diffusion of Innovation or DOI (Rogers, 1983; 1995) outlines five object-based beliefs, namely, relative advantage, compatibility, complexity, trialability and observability. Others such as the Kwon and Zmud (1987) framework suggest three: compatibility, relative advantage and complexity, while IS Success Model (DeLone and McLean, 1992) delineates two: perceived information quality and perceived systems quality. Building upon these theories and models, various studies have demonstrated that technology (i.e., intranet) characteristics that were found to be significant predictors include perceived usefulness, perceived ease of use, information quality, systems quality, service quality, relative advantage, compatibility, complexities, results demonstrability, trialability and task-technology fit. Table-3 depicts various intranet characteristics that were found to be influential in determining intranet adoption and acceptance.

TABLE-3: INTRANET CHARACTERISTICS RELATED TO ADOPTION AND ACCEPTANCE

Characteristics	Description	Studies
Perceived usefulness	The individual's perception concerning the degree to which using the intranet will improve his / her job performance	Phelps and Mok (1999); Horton <i>et al.</i> (2001); Weitzel and Hallahan (2003); Chang (2004); Lee and Kang (2005); Baptista <i>et al.</i> , (2006)
Perceived ease of use	The individual's perception concerning the amount of effort required to use the intranet	Phelps and Mok (1999); Horton <i>et al.</i> , (2001); Weitzel and Hallahan (2003); Chang (2004)
Information quality	Refers to measure of information and data for desired characteristics such as accuracy, precision, currency, reliability, completeness, conciseness, relevance, understandability, meaningfulness, timeliness, comparability and format	Myerscough (1998); Phelps and Mok (1999); Young (2000); Tang, (2000) CIBA Solutions (2002); Fong (2003); Welch and Pandey (2005); Deltour (2005), Sugianto and Tojib (2007) ; Masrek <i>et al.</i> (2009)
Systems Quality	Refers to measures of the information processing systems itself which include convenience of access, flexibility of system, integration of system, response time, realization of user expectation, reliability, ease of use, ease of learning and usefulness	Myerscough (1998); Phelps and Mok (1999); Young (2000); Deltour (2005); Sugianto and Tojib (2007); Masrek <i>et al.</i> (2009);
Service Quality	The extent to which the intranet service meets users' needs or expectations. The SERVQUAL (Parasuraman <i>et al.</i> , 1988, 1991) instrument measures service quality in terms of tangibles, reliability, responsiveness, assurance and empathy of the intranet.	Phelps and Mok (1999); Cody and Hope (1999) and Miller (2004); Sugianto and Tojib (2007); Masrek <i>et al.</i> (2009)
Relative advantage	Signifies the degree to which the intranet is perceived as being better than the idea it supersedes	Weitzel and Hallahan (2003)
Compatibility	Refers to the ability in which the intranet works within the existing environment (economic, social, and convenience).	Weitzel and Hallahan (2003)
Complexity	Relates to the degree to which the intranet is perceived as relatively difficult to understand or use	Weitzel and Hallahan (2003)
Results Demonstrability	Concentrates on the tangibility of using the intranet including their observability and communicability.	Weitzel and Hallahan (2003)
Trialability	Refers to the ability of the user to experience the intranet without having to fully adopt	Weitzel and Hallahan (2003)
Task-technology fit	Relates on how well the intranet functionalities fits the needs and requirements of the users.	Wilkie (2005); Masrek <i>et al.</i> (2009)

INDIVIDUAL CHARACTERISTICS

Numerous studies have demonstrated that when IT adoption, diffusion or implementation is assessed at the individual-level perspective, individual characteristics such as demographics, self-efficacy, attitude, personal IT innovativeness etc are also significant predictors (see Jeyaraj *et al.*, 2006). Within the domain of intranet studies, individual characteristics that had been investigated by previous researchers include age, experience, computer attitude, computer anxiety, self efficacy and personal IT innovativeness (Table- 4). Weitzel and Hallahan (2003) discovered that other than computer attitude, individual traits comprising computer anxiety, computer self-efficacy and personal IT innovativeness appeared to have little predicting power towards intranet adoption. The authors argued that this could be due to the professional and educated nature of the staffs plus the fact that many of them have long experiences in using computers. Young (2000) however found that computer self efficacy was a significant predictor of intranet adoption. Chang (2004) showed that both age and experience were also significant in determining intranet adoption by students in a university environment.

TABLE-4: INDIVIDUAL CHARACTERISTICS RELATED TO INTRANET ADOPTION AND ACCEPTANCE

Characteristics	Description	Studies
Age	Refers to demographic information that shows how long user has existed	Chang (2004)
Experience	Denotes the duration or level of an individual's prior use of computers and information systems	Chang (2004)
Computer Attitude	Indicates the user's affect, or liking, for information systems and for using information systems	Weitzel and Hallahan (2003)
Computer Anxiety	Defined as the tendency of individuals to be uneasy, apprehensive, or fearful about current or future use of computers	Weitzel and Hallahan (2003)
Computer Self-efficacy	Refers to individuals' judgments of their capabilities to use computers (intranet) in diverse situations such as in problem solving and decision making or accomplishing one job task	Young (2000); Weitzel and Hallahan (2003)
Personal IT Innovativeness	Indicates the individual willingness to try out any new information technology	Weitzel and Hallahan (2003)

ENVIRONMENTAL FACTORS

When the purpose of the study is to investigate the IS adoption and acceptance at the firm-level perspectives, environmental characteristics would be definitely embraced as predictors or determinants. Technology adoption model such as Technological-Organizational-Environmental or TOE model (Tornatzky and Fiescher, 1990) which is widely adopted in IS studies have explicitly included environmental characteristics as important determinants to adoption. The literature on intranet suggests that environmental characteristics that have bearing upon intranet adoption and acceptance are environmental uncertainty, customer's pressure, supplier's pressure and vendor availability (Table-5).

TABLE-5: ENVIRONMENTAL CHARACTERISTICS RELATED TO INTRANET ADOPTION AND ACCEPTANCE

Characteristics	Description	Studies
Environmental Uncertainty	Indicates the degree of uncertainty in the environment which arise from heterogeneity of products and services, dynamism of the environment, and perceived environmental competitiveness in the environment	Bajwa and Ross (2002); Windrum and Berranger (2003)
Customer pressure	Signifies the influence on the firm from the imposition by customers	Bajwa and Ross (2002); Windrum and Berranger (2003)
Supplier pressure	Relates to the influence on the firm from the imposition by supplier and business alliances	Bajwa and Ross (2002)
Vendor availability	The availability of vendor in providing and supplying intranet technologies	Bajwa and Ross (2002)

CONCLUSION

This conduct of this study has been to investigate from the extant literature factors that influence individual usage of the intranet. Based on our reviews, it was found that four groups of factors were found to be influential in determining individual intranet usage. The findings of this review should be useful for researchers intending to investigate the topic. The variables identified in the study can be empirically tested in diverse intranet implementation setting using either quantitative, qualitative or mixed method approach.

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THE BRANDING OF A COUNTRY AND THE NIGERIAN BRAND PROJECT

DR. ANTHONY .A. IJEWERE
ASSOCIATE PROFESSOR
DEPARTMENT OF BUSINESS ADMINISTRATION
UNIVERSITY OF BENIN
BENIN CITY, EDO STATE

E.C. GBANDI
LECTURER
DEPARTMENT OF BUSINESS ADMINISTRATION
BENSON IDAHOSA UNIVERSITY
BENIN CITY, EDO STATE

ABSTRACT

Country branding is about using strategic marketing to promote a country's image, products, and attractiveness for tourism and foreign direct investment. Country branding implies that countries behave, in many ways, just like brand. They are perceived in certain ways by large groups of people both at home and abroad; they are also associated with certain qualities and characteristics. Country branding is therefore a vital tool with the aim of positioning the country internally and internationally as a good destination for trade, tourism and investments. This paper discusses the concept of country branding, the relevant of country's branding and how to build a country's brand. It examines the role of country of origin, culture and brand auditing in country's branding. It also take a look at the four dimension of state branding and the country brand project of three countries; Spain, South Africa and Nigeria. Finally, it made suggestions on how Nigeria could achieve a successful branding.

KEYWORDS

Branding, Re-Branding, Country Branding, National Project, National Image.

INTRODUCTION

The branding of a country is a complex and difficult undertaking; we need to consider the separation of components while still recognizing their interdependence. In branding a country, the number of target groups is vast, and reaching them necessitates adapting the messaging without becoming contradictory. The core statement must remain clear and unique, unifying the country as a destination.

Creating a better image for a country is often far cheaper and always infinitely harder than people imagine. It's about creating a feasible yet inspirational long-term vision for the development of the country and pursuing that aim through good leadership, economic and social reform, imaginative and effective cultural, political and trading relations, transparency and integrity, infrastructure, education, taxation and so forth: in other words, substance. The substance is then expressed, over many years, through a series of symbolic actions which bring it memorably, effectively and lastingly to the world's attention.

LITERATURE REVIEW

Research on country branding is not new. For the past 40 years, numerous studies have been carried out on the so-called 'country of origin effect': the effect of national image on products and country as a brand, product, and beyond (Kotler and Gertner, 2002; Papadopoulos and Heslop, 2002; Olins, 2002 and Gilmore, 2002)

During the 90s, Philip Kotler dealt with the topic of place branding and marketing in four books: The Marketing of Nations (actually a book on economic development and government policy rather than on marketing), Marketing Places Europe (on how to attract investments, industries, residents and visitors to cities, communities, regions and nations in Europe), Marketing Asian Places, and Marketing for Hospitality and Tourism (Simon Anholt, 2003:229)

Another significant contribution to the field is National Image and Competitive Advantage by Eugene and Israel, (2001). In addition to reviewing the theoretical underpinning of country image for products, they provide useful insight as to how it can be managed by countries, industries and firms. One of their central points is that country image is product specific. What's much more recent, however, is the coining of the term "brand state" or "state branding." (Jaffe and Nebenzahl, 2001).

The September 2001 publication in Foreign Affairs of the article "The Rise of the Brand State" by Peter Van Ham was a turning point, attracting a great deal of attention both from the academic community and the world of practitioners, and bringing about further research on the multidimensional nature of state branding (van Ham, Peter 2001).

In April 2002, The Journal of Brand Management devoted a special issue to the topic of 'Branding the Nation' bringing together contributions from the leading experts in the field, including scholars (Kotler, Papadopoulos), consultants (Anholt, Ollins) and practitioners. It is to this day the most comprehensive and up-to-date set of papers on state branding (<http://www.imc.org.za/main/resources.stm>)

Simon Anholt, one of the leading international marketing thinkers, has written about state branding in the collective work "Destination Branding", and more recently authored the book Brand New Justice, in which he argues that developing countries can increase their competitiveness and therefore reduce economic disparity through effective branding (Simon Anholt, 2003)

Equally important is the work of Wally Ollins, whose book Trading Identities establishes a linkage between state branding and companies going global. (Wally Olins, 2002).

Finally, the International Marketing Council of South Africa (IMC) has put together a number of case studies of how countries around the world (of India, Britain, Brazil, Thailand, Spain, Germany and others) have approached the promotion of their national image (<http://www.imc.org.za/documents/brandingsa.stm>).

WHAT IS COUNTRY BRANDING?

Country branding according to (Zaharia, 2003) is an international political marketing, practiced by the public and associative organisations of a certain country, with the purpose of promoting its image abroad.

Country branding is about using strategic marketing to promote a country's image, products, and attractiveness for tourism and foreign direct investment (FDI). It also implies that countries "behave, in many ways, just like brands; they are perceived in certain ways by large groups of people both at home and abroad; they are also associated with certain qualities and characteristics." (Anholt, 2003).

A country brand is therefore, consider to be a sum of abstract symbols, that generate common perceptions, and images that combine a large number of products and services, which, despite their diversity, have a number of common attributes, desired or not. (Dinnie, 2002)

Marketing a country is not entirely new; in fact, numerous countries have traditionally promoted their image for tourism. However, the current process of globalization has underlined the need for countries to brand themselves on four different dimensions (public diplomacy, tourism, exports, foreign direct investment) and in an integrated manner (Papadopoulos and Heslop, 2003:310).

Compared to products and services branding, country branding is the process whereby a country actively seeks to create a unique and competitive identity for itself, with the aim of positioning the country internally and internationally as a good destination for trade, tourism and investments. In this regard, countries such as South Africa, Wales, Spain, Colombia, Ireland have succeeded in attracting FDIs and tourists to their countries as a result of carefully managed country branding programmes (Nworah, 2005)

With the rising trend of globalisation and the breaking down of international barriers of trade, country branding is no longer a choice but a necessity, it is no longer conceived as a function to be performed individually by the state, associations or individual private companies, but as an integrative and concerted effort by all interested stakeholders.

THE RELEVANT OF COUNTRY BRANDING

State branding is relevant because consumers and investors continue to rely heavily on country images to make their economic decisions. Brands or images have become a shortcut to a purchasing decision. Effective state branding not only serves to reinforce positive images but also helps to fight negative ones by shaping new images and associations.

Equally important, branding has become a central tool of country competitiveness because having a bad reputation or none at all seriously affects a country's ability to compete. Thus, effective branding of a country can give it a competitive advantage in world markets and this, opens many opportunities for developing countries.

BUILDING THE COUNTRY BRAND

A largely used definition of national branding is "the way a country or a nation is perceived by the audience ("Nation branding", www.disinfopedia.org). We can add that this particular audience is formed by two categories. The foreigners represent often the side that receives the most efforts, while the other one is composed by the nation's own people.

Any marketing strategy, to be applied in building a nation brand has to take into account its costumers, setting its target, and it should search not only for international recognition, but as well, a consistency that would involve appreciation on a national scale. Thus, an important amount of influence might be placed equally on all the segments involved in this process: the participants, the emitters and the consumers.

Creation and promotion of brand image is a task that lasts ten to twenty years (thus, it should occur regardless of political change and focus on significant aspects that differentiate and create the competitive advantage).

Country brand building and management is not a finite process, but a perpetual one. This is probably the most important aspect that must be acknowledged by all those involved, in spite of ubiquitous pressure for immediate results. The branding effort is efficient if its results are evaluated regularly and the promoting strategy adapted permanently to the reality of life.

Brymer (2003) noted that factors that influence the country image such as tourism, foreign investment, governmental policy, participation in international bodies, exports, local companies and publicity, economic development, immigration and Diaspora, work force recruitment, public figures, cultural and artistic representations, language, religion, culture, sporting performance, movies and documentaries, as well as citizen interaction with visitors, critical events etc. are only partially controllable by the authorities.

Olins, a specialist in country marketing and country branding states that a governmental program for the country brand launch should comprise of a number of stages (Olins, 2002). Anholt, another well-known expert in country marketing states another series of stages (Anholt, 2002), also (Domeisen, 2003).

Even if a country does not consciously use its name as a brand, people still link images with it, images that can be activated by simply mentioning the country's name. It's very likely that a country's image influences people's decisions regarding purchasing, investment, relocation and travelling amongst other things.

More and more governments start to understand that no country will be able to ignore the way other countries see it. A strong brand is viewed as a highly valuable national asset. In a time of uncertainties, an efficient nation brand creation and promotion process is like an antidote to negative publicity.

All countries communicate in the same time. They send millions of messages daily through political actions or through the lack of them, through popular culture, through products, services, sport, behaviour, art, architecture and others. Gathered together they become a nation's image, what it feels, what it wants, what it believes in (Fosher, 2003).

In order to create an attractive image for a country, a certain balance is kept, between different elements. Strong brands, that have good awareness, have made sure that other channels of communication (cultural, politic) filled the spaces around commercial brands (products or companies).

Because countries are very different in brand functionality (utility), experts concluded that it is best for it to concentrate on the brand's emotional dimension (Dinnie, 2002).

The country brand must rely on reality, not only perceptions, it must be distinctive, centered, easy to recognize, coherent and attractive.

Most successful brands aren't born over night, they rely on reality, on a state of spirit, which they include and promote. Thus, the brand is organic and can develop on its own. Still, in order to reach maximum potential, it must be guided.

A country brand promotion strategy can not be based on lies or the visible distortion of reality (e.g. promoting Germans as passionate, emotional and flexible will have little success) Gilmore, (2002).

Country marketing should be an augmentation of what already exists in the country, not a figure of one's imagination. People can feel quite clearly the spirit and values of a certain place; they develop certain spiritual and emotional links towards it. Thus, if the correct "nerve" is touched, the created link can prove to be quite strong.

A country that has problems, but presents itself publicly as a country where those problems don't exist or are insignificant, has all the chances in letting people down, as the target audience (tourists, investors) will probably face those exact problems.

Most of the time it's not enough to take into account what exists in a country. One must also see the potential of its competitive advantages. Practically, the branding process can occur while the country develops, as certain initiatives can make the country differentiate itself even more.

The country brand, if appropriately built, relies on target audiences, on relevant macro tendencies, on central components and on its competitive position. Thus, the brand could be a guide in what the country should promote.

A well structured and implemented building of a country's brand will lead to a national identity of the brand and if it is well promoted as well as has the desired outcome, leads to the global success of the brand, that will, on its turn, develop the "effect" of "resetting" of the brand ingredients (people, culture, history, present state of being etc.) Dinnie, (2002)

To be efficient, the country brand has to be accepted by the nation, and it has to be inspiring. The country brand represents more than images and symbols. It is the proof of collective will to offer and deliver that attractive and competitive "selling proposition".

The nation brand used as an anchor, can help build the loyalty of the people. Every citizen must live the brand, must follow the brand values. The behaviour and actions of the citizens, both at home and when going abroad will always have a powerful impact on the country image. Obtaining and maintaining peoples' loyalty is an important challenge for every country. It can be seen as a migration of peoples' minds from the skeptical and uninformed stage to the informed, confident and proud stage.

SIMILARITY BETWEEN COUNTRY BRANDING AND PRODUCT BRANDING

The American Marketing Association defines a brand as a "name, term, sign, symbol, or design, or a combination of them intended to identify the goods and services of one seller or group of sellers and to differentiate them from those of the competition." (Kotler, and Gertner, 2002:249). It follows that just as a

brand name may be the only common element linking otherwise unrelated products together, a country name is a symbol that joins together a broader range of products and services.

A country resembles more to a company than to a product; in other words, a company may not be a primary brand, but a manager of a group of sub-brands. The country brand is more like an umbrella, ensuring that the customers they are purchasing are from a reliable source, which guarantees quality. Exactly as corporate brands, country brands stand on certain values, qualifications and emotional levers within the consumers' minds.

Branding a country differs subtly from branding a corporation and substantially from branding a product. Country branding is starting to develop a world of its own. As field practitioners gain experience, the similarities with corporate marketing fade away.

We define a country's image as the collection of convictions, ideas and impressions that people have regarding that country. Nonetheless, one must also consider the image elements from a marketing perspective: awareness, content, intensity, clarity, history.

Most country brands are actually stereotypes, extreme reductions of reality, which aren't always that accurate, as they are based more on exceptions rather than models (patterns), on impressions rather than facts. Stereotyping grows stronger, aided by companies that try to convince local consumers to purchase local products.

Similar with products and services, the country image has more facets and can contain large amounts of information, both factual and affective.

THE ROLE OF COUNTRY OF ORIGIN IN THE PERCEPTION OF PRODUCTS AND SERVICES

As products and services have increasingly standardized core features, marketers often turn to country associations to differentiate their brand. Country of origin has therefore become central to product evaluation, along with price, brand name, packaging and seller.

Country of origin can be defined as the country that a consumer associates with a certain product or brand as being the 'home country' of the brand (Honda identified as a Japanese product), regardless of where the product is actually produced (for example Honda assembled in the US). Products bearing a 'made in Germany', 'made in Switzerland' or 'made in Japan' labels are commonly regarded as high quality, due to the reputation of these countries as top world manufacturers and exporters. This nuance is important 'because of the increased sourcing of production by multinational firms and their use of global, standardized advertising for their products (Eugene D. Jaffe and Israel D. Nebenzhal, 2001)'. In fact, one can argue that the only time we really stop to separate country of origin, country of manufacture, country of assembly is when we are buying expensive items or products that fall under the category of "fair-trade."

Consumers continue to associate and evaluate given product lines (e.g. cosmetics, furniture, cars and fashion articles) with specific countries. French perfumes, German cars, Japanese electronics, are just some of the examples where national image is synonymous with quality, workmanship, durability, style or taste. In fact, research has shown that the country of origin effect is product specific- the importance of country of origin is greater in the purchase of cars, clothing and Electronics (Eugene D. Jaffe and Israel D. Nebenzhal, 2001).

THE ROLE OF CULTURE IN PROMOTING A COUNTRY'S IMAGE

The role of culture in promoting and sustaining a country's brand image has been eloquently emphasized by Simon Anholt, who argues that culture is 'uniquely linked to the country, and dignifying'. Equally, important, culture can be an important revenue earner through national and international cultural events like concerts, exhibitions, competitions and festivals, but most importantly, through language (Anholt, 2003).

Cultural and language organizations like the British Council, the Goethe Institute, Alliance Francaise, and more recently Instituto Cervantes play a central role in enriching a country's brand image and making that image sustainable over time. The tools they can use include film festivals, presentations, concerts, art exhibits, and student exchanges, among others.

"Adding culture and heritage to the mix is simply one way to ensure that all conversations between countries do not descend into mere advertising, and that there is still cultural exchange on a global scale, intelligent dialogue, sharing of insights and learning" (Anholt, 2002: 49).

THE ROLE OF COUNTRY BRAND AUDITING

Brand auditing involves continuous monitoring of perceptions and images of a country based on information gathering through opinion polls, research and analysis. Measuring the existing country image and using this knowledge to improve it seems vital.

Since successful country branding requires long-term planning and multi-stakeholder participation, it seems only natural for country brand auditing to be under the responsibility of the same body in charge of the overall country branding effort.

An important issue in country branding is evaluating and tracking the effect of critical events on national image: Health crisis (i.e. SARS and AIDS), Natural disasters (i.e. floods and earthquake) and wars (i.e. Balkan countries, Rwanda, Somali and DR Congo) and Terrorism (Skuba, 2002).

In this respect, both politicians and academic worldwide agree that the US led war in Iraq has had a very negative impact on its image worldwide, especially in Arab and Muslim countries, a view backed by the latest study on global attitudes from the Pew Research Center. Despite the fact that the large majority of the Spanish population opposed the war in Iraq but strongly support the fight against terrorism, Spain's image has also been weakened by the support of the Aznar government for the war in Iraq and close alignment with the Bush administration. (<http://peoplepress.org/reports/display.php3>)

COUNTRY BRANDING STRATEGIES

We will examine the strategies otherwise called 'branding project' adopted by three countries; Spain, South Africa and Nigeria, in the process of branding their respective countries.

SPAIN'S BRANDING PROJECT (PROYECTO MARCA ESPANA)

Most experts agree that post-Franco Spain is one of the most successful examples of national branding, especially as a tourist destination. As the nation took off economically and democracy strengthened, Spain was able to convey this image of change on the international scene. The key to this success was a tourism marketing campaign launched in 1982 on the occasion of the World Soccer Cup held in Spain. The campaign used Joan Miro's sun design to symbolize the modernization of Spain. This logo has since become Spain's tourism logo.

Also in the late 1980s, the government launched Tour Espana to brand and market Spain. The renowned Spanish artist Juan Miro Painted the sun logo used in all of Spain's advertisements and travel posters, twinned up with the slogan "Everything Under the Sun". "The advertisements could be for anything; monuments, national parks, beaches, our cities-but they all had the 'Everything Under the Sun' logo, "And thus the brand was created". (<http://www.tourspain.es/TourSpain/Home?Language=en>)

Three years into the campaign, Spain began to make in more tourists every year than there were Spaniards living in their own country: in 1990, Spain (population: 40 million) welcomed just over 40 million tourists. Today, around 60 million visitors stop by every year.

Through the initiative "Proyecto Marca Espana" public and private stakeholders have come together to articulate an overall branding strategy to align image of the country abroad with its current economic, social and cultural reality. This involved prominent institutions such as Real Instituto Elcano (Spain's major international relations think tank), the Spanish Association of renowned brands, the Spanish Association of Communication Executives (DIRCOM), the Spanish Agency for Export Promotion (ICEX-Ministry of Economy), and the Spanish Ministry of Foreign Affairs (Noya, 2004).

The aim of this initiative was to gather all existing information and data on the image of Spain abroad; carry out series of roundtables discussions featuring public/private institutions and individuals most directly concerned with the brand Spain to reflect on the problems of Spain's image and based on the conclusions reached, put forth a number of recommendations to better position and communicate brand Spain to the rest of the world.

Major Recommendations reached was to set up a government agency or entity to lead this effort, or alternatively a "Brand Spain Committee" which would include not only the original task-force participants but also the Spanish Tourism Agency, Instituto Cervantes, all cultural agencies charged with promoting Spanish culture abroad, Spanish National TV, Chambers of Commerce.

Secondly, that government should create a permanent Auditing office to monitor and track Spain's image abroad and lastly, that government should provide public diplomacy training to the Spanish Foreign Service.

Today, Spain is seen as one of the most successful branded country in the world. (<http://www.realinstitutoelcano.org/analisis/388.asp>)

SOUTH AFRICA BRANDING PROJECT (PROUDLY SOUTH AFRICA)

The South African story is an interesting one, after the peaceful fall of the apartheid regime in 1994; the new South African government was caught in a dilemma: Emotionally, the entire world wanted to support it. Economically, corporations' skepticism of black Africans' ability to manage their own economies spoke against new investment, particularly given the success of the country's white Afrikaaner business community in building a solid economy despite sanctions against their regime.

While many credits the South African government (first of President Nelson Mandela, then of Thabo Mbeki) with the turnaround, the business community was in the driver's seat from day one, helping formulate, fund and launch a comprehensive branding campaign that has revitalized South Africa at home and upgraded its image abroad. (<http://www.imc.org.za/documenta/brandingsa.stm>)

In 2001, the government formed the international Marketing Council of South Africa (IMC) for the sole purpose of addressing the gap that existed between the reality of South Africa and the way the world perceived the country; The IMC rolled out the campaign "South Africa: Alive with Possibility" to widespread acclaim and gas only improved it in the past three and a half years. (www.safrika.info)

According to Yvonne Johnson, chief executive of IMC, her organization is an independent body with a government mandate to carry out its mission, not just another arm of the state bureaucracy. We are given free reign to carry out our job as we see fit, the government does not dictate to us in any way. We do not have ministers calling up and telling us to say this and that. This freedom to act has been the key to our success. To properly brand a country, you need an independent body of marketers working round the clock. "In building the new brand, we had to consider all the aspects of our society before we came up with the brand. Although our history has caused us to be divided, we found core values that are common to all South Africans. We all wanted our country to move forward so that we could provide a better life for our children," (Johnston, 2002).

The IMC's initial round of funding came from the government, but the council has since set up a private funding arm to allow South African businesses to contribute to the effort as well. According to Johnston (2002), the support of the South Africa people (and business leaders in particular) has been an essential element in the campaign's success. The message has to be targeted inward before it is taken outside. The campaign focus was on the country first.

The IMC has also given birth to or inspired a number of complimentary campaigns, including, "Proudly South African," which promotes SA companies, products and services. Companies that meet the standards set by Proudly South African can use the logo to identify themselves, their products and services. Similarly, South Africa: The Good News is a private organization dedicated to spreading good news about the country over the internet and in print publications. Today we have seen a distinct shift within South Africans who believe in their country and the possibilities for the future. (<http://www.dfa.gov.za/departments/stratplan03-05/stratplan03.pdf>)

THE NIGERIA BRANDING PROJECT

Nigeria, the self styled giant of Africa, with an estimated population of over 200 million people and also a privileged position as the 6th largest producer and exporter of crude oil in the world. Such large abundance of human and material resources in the country have been variously described as a curse by certain commentators, their reason being that the proceeds from the sales of the natural resources only sponsors the corrupt and lavish lifestyles of successive regimes in the country, these regimes have consistently failed to invest such proceeds back into the country, and have also failed to improve existing social systems and infrastructures, factors necessary to attract foreign investors.

Also in 2004, the United Nations Conference on Trade and Development (UNCTAD) at a public forum in Lagos Nigeria concluded that Nigeria's poor external image is denying it much needed foreign investment (FDI) to accelerate its economic growth. Also in 2004, Transparency International Corruption Perceptions Index ranked Nigeria as the 3rd most corrupt country in the world in a survey of 146 countries, coming only ahead of Haiti (the most corrupt country) and Bangladesh (the 2nd most corrupt country). Nigeria's current position is only a slight improvement from its previous positions as the 2nd most corrupt and the most corrupt country in the world in 2003 and 2002 respectively. According to Peter Eigens, the Chairman of Transparency International... "Corruption robs countries of their potentials... Corruption in large-scale public projects is a daunting obstacle to sustainable development, and results in a major loss of public funds needed for education, health care and poverty alleviation, both in developed and developing countries" (Nworah, 2005).

Nworah, (2004) identified other problems facing Nigeria nation as bribery and corruption, Unemployment, poor infrastructural development, over dependence in the oil sector for federal income and revenue, inordinate desire for imported goods, poor work ethics and maintenance culture, increasing citizens dissatisfaction and disaffection with the government, political structures and politicians, corporate and large scale organizational irresponsibility, inadequate funding of the educational, health and other key sectors, neglect of the agricultural and other non-oil productive/manufacturing sectors, continued manufacture of poor quality, fake and substandard goods and services, poorly regulated capital and financial market, tribal, ethnic and religious squabbles, homelessness, poverty and hunger, poor maintenance culture, poor planning, lack of security and disregard for human life and property, armed and pen robbery and others.

EFFORTS MADE TO RE-BRAND NIGERIA

In an attempt to address the multifarious problems which have created a bad image for Nigeria, each successive administration has one time or the other instituted a corrective plan aimed at solving some of the identified social menace. For example, in 1976 the Murtala administration enacted the "Investigation of Assets" decree while the shagari administration launched a similar version known as "Ethic Revolution". Also in 1983, the Buhari-Idaigbon administration launched the war against indiscipline while the Babangida administration in 1986 launched a reformation plan known as the Mass Mobilization, Social and Economic Reconstruction (MAMSER).

In his quest to attract foreign investors and also to re-integrate Nigeria into the global community, after years in the cold as a pariah caused by the economic policies and the human rights violations of past military juntas.

President, Olusegun Obasanjo during his tenure as the president of Nigeria, in recognition of the failure recorded with the previous measures by past administrations, embark on public and economic diplomac tour all over the world as soon as he was sworn-in in May, 1999. In 2002, he established the Economic and Financial Crime Commission (EFCC). The president also inaugurated an International Investment Advisory Council, headed by Nigeria's case is also made more difficult because of its multi-ethnic composition, the cultural, language and religious differences make any wholesale agreement impossible as the citizens still have primordial attachments to their immediate and core ethnic regions, long years of political and religious bickering between the 3 major ethnic groups (Yoruba, Hausa and the Igbos) have made reaching a national consensus in major issues (including the image project) almost impossible.

THE WAY FORWARD

In line with Brymer (2003) steps in the country branding process, the Nigeria image could be rebranded with the following process;

1. The cooperation and involvement of representatives of governments, business, the arts, education and the media. This does not yet seem to be happening in Nigeria's case, because all the relevant stakeholders are still not singing with one voice.

2. Determining and carrying out an image perception audit both nationally and internationally. There wasn't any reported image audit carried out by the Nigerian government before the launching of the image project. The government's decisions had been loosely based on the several negative media reports both locally and internationally.
3. Consultation with opinion leaders and carrying out of a country SWOT analysis. Again, the Nigeria government is managing the image project top down, a large majority of the country's opinion leaders still have not heard of the project and do not believe in it.
4. Creating a strategy using known professional models. Most importantly, involvement the citizens in the project, through carefully crafted communication messages that will sell the image project first to the citizens, who would then sell the country to the outside world, this is a huge error on the part of the government because it should have tried to sell the image project to the millions of Nigerians in the Diaspora who are in better positions to represent Nigeria in their different countries of residence.
5. Designing a program to make the strategy tangible through improvement programs and campaigns and series of testimonial advertisements in the international media. So far, this has not yet been done and the effectiveness of such testimonials is also doubtful.
6. Creating a system to link together the different organizations and departments that can be part of the brand. This is not the case with the Nigeria image Project. More so, the project is being perceived as 'another government white elephant project' and so has continued to create dissents and cynicism amongst the citizens.
7. Finally, letting actions count. Although the Nigeria government has carried out some political and economic reforms, these may still not be enough to restore the confidence and faith of both its citizens and the potentials investors, as the facts on the ground still leaves much to be desired.

It must be said however, that putting all these steps into practice, and hiring professional branding experts to manage such a program may still not guarantee that the country will attract investors, nor will the country experience the desired image change. This is because of the existence of other extenuating factors in the environment; these factors may include global economic downturn like we are presently experiencing all over the world.

CONCLUSION

Country as a brand affords us a useful metaphor to express that many of the techniques of product marketing are applicable to marketing a country. Even more helpful, as Anholt argues, is to think of 'country as a corporate brands', more like a holding company which manages a group of interrelated sub-brands. Knowing your relative competitive position is critical to national branding. This means countries must choose the markets and the segments in which to compete prior to designing their brand strategy. Successful country branding does not stop with the launching of a successful campaign.

It requires constant tracking of your brand image, flexibility to adapt to the unexpected and careful monitoring of your competitors. Moreover, for a country brand to be sustainable overtime, the country must deliver on its promises.

Finally, country branding presents developing countries especially Africa to distinct themselves from the continent brand effect and a unique opportunity to reverse the brain drain that has hampered so much of their development.

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THE RELATIONSHIP BETWEEN THE INTERNAL AUDIT FUNCTION AND CORPORATE GOVERNANCE: EVIDENCE FROM JORDAN

DR. YUSUF ALI KHALAF AL-HROOT
ASST. PROFESSOR
ACCOUNTING DEPARTMENT
FACULTY OF ECONOMICS AND ADMINISTRATIVE SCIENCES
JERASH UNIVERSITY
JORDAN

ABSTRACT

This study aims to analyze the relationship between internal audit function and corporate governance. The sample was selected randomly, Results based of responses from questionnaire sent to chief audit executives, internal audit supervisors, internal auditors, assistant auditors. With respect to the internal audit function's relationship with corporate governance, threats identified include: using the internal audit function as a stepping stone to other positions; having the chief executive officer (CEO) or chief finance officer (CFO) approve the internal audit function's budget and provide input for the internal audit plan. With respect to the relationship with the audit committee, significant threats identified include CAEs not reporting functionally to the audit committee; the audit committee not having sole responsibility for hiring, dismissing and evaluating the CAE; and not having all audit committee members or at least one member qualified in accounting; audit committee not holding the required number of meetings, according to the instructions of governance in Jordan. Also the study found that internal auditors in Jordan did not do professional development; as stated in the standard -1230 professional development and they have lack of knowledge about the standards and raising the threat of the internal audit function.

KEYWORDS

Audit committees, corporate governance, internal audit, Jordan.

INTRODUCTION

Internal auditing is one of the cornerstones of corporate governance, along with the board of directors, senior management, and external auditing. Because of internal auditors' unique position within the organization, they provide audit committee members with valuable assistance by giving objective assurance on governance, risk management, and control processes. The Institute of Internal Auditors (IIA) defines internal auditing as follows: "Internal auditing is an independent, objective assurance and consulting activity designed to add value and improve the organization's operations. It helps an organization to accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance process", and the IIA defines Objectivity as: An impartial, unbiased mental attitude and avoidance of conflicts of interest, allowing internal auditors to perform engagements in such a manner that they have an honest belief in their work product and that no significant quality compromises are made" (IIA, 2011). The increased importance of the internal audit function in enhancing corporate governance also has been reinforced indirectly through legislation, such as the Sarbanes Oxley Act (2002) in the USA and the Corporate Governance Code for Shareholding Companies Listed on the Amman Stock Exchange (2004) in Jordan. Although this legislation does not specifically address the corporate governance role of the internal audit function, it provides for the expanded accountability requirements of stakeholders, like the board (including the audit committee) and management. This, in turn, would suggest an expanded role for the internal audit function given that it comprises an integral component of the network of parties having corporate governance responsibilities (Al Kashef, 2000).

OBJECTIVE OF THE STUDY

The objective of this study is to draws on both agency and institutional theory to examine the independence of the internal audit function in relationship to the audit committee (as a sub committee of the board) and management, so the study seeks to answer the following questions:

Q1: To what extent is the relationship between internal audit function and corporate governance in Jordanian companies?

Q2: Does the relationship between the audit committee and the internal audit function in Jordanian companies provide for independence of internal audit?

LITERATURE REVIEW

The much publicized corporate collapses of the past few years have focused global attention on the needed for strong corporate governance. Simultaneously, the Sarbanes-Oxley Act of 2002 and the new expanded role of internal audit preoccupied researchers and scientists. Paape et al. (2003), explores the relationship between internal audit and corporate governance. The survey data are collected from the largest companies of 15 European Union countries. To accomplish the survey 332 questionnaires were sent; of which one hundred and five were answered (response rate 32%). The basic result of this research is the differences during internal auditors work and the perception of the role of internal auditors to corporate governance by country. Hence, it is a fact that there is lack of internal audit and audit committee on 50 companies and business managers are unaware of the recommendations and regulations on corporate governance. Finally, compliance with regulations and procedures viewed as the main purpose of internal audit, while the implementation of operational controls is considered as the main contributor of internal control. Research on the relationship between audit committee and internal audit was conducted by Goodwin (2003). The survey used questionnaire, addressed to internal auditors of financial institutions (public and private sectors) from Australia and New Zealand, who were members of the Institute of Internal Auditors. More precisely, 370 questionnaires were sent and 120 responses were received, giving an overall response rate of 32%. Of the responses, it is concluded that independence and accounting experience have a complementary impact on audit committee relations with internal audit. Hence, the differences observed between the two countries and the private and public sectors are stressed. One year later, Leung et al. (2004), investigated the role of internal audit in corporate governance in Australia. Questionnaires were sent to internal auditors and directors of Australian financial institutions. Research objectives were the identification of internal audit's objectives, the determination of the internal control' nature and the importance of corporate governance within the economic units. The main output from their research was the fact that the culture and the support of the Board of Directors are key factors that directly affects internal audit's effectiveness. In this context, Gramling et. al. (2004) explored the relationship between internal audit and corporate governance. The most important finding of this study was the catalytic role of internal auditing in the effective corporate governance. More recently, Christopher et. al. (2010) presented a critical analysis of the independence of the internal audit function through its relationship with management and the audit committee. Results are based on a critical comparison of responses from questionnaires sent out to Australian chief audit executives (CAEs) versus existing literature and best practice guidelines. With respect to the internal audit function's relationship with the audit committee, significant threats identified include CAEs not reporting functionally to the audit committee; the audit committee not having sole responsibility for appointing, dismissing and evaluating the CAE; and not having all audit committee members or at least one member qualified in accounting. In the same period, Sarens and Christopher (2010) explored the association between corporate governance guidelines, risk management and internal control practices. Data for the study were collected through a questionnaire that was sent out to chief audit executives in Australia and Belgium. The paper finds that the weaker focus of the Belgian corporate governance

guidelines on risk management and internal control is associated with less developed risk management and internal control systems in Belgian companies than in Australian companies. Finally, Ibrahim El-Sayed Ebaid (2011) explore the nature and characteristics of internal audit function in Egyptian listed firms and assess its ability to fulfil its role in corporate governance. The study has been carried out through a questionnaire survey. The results showed that internal audit function in Egyptian listed firms, in its current status, faces many difficulties that affect negatively its effectiveness in corporate governance. Therefore, extensive efforts should be made to enhancing the internal audit profession in Egypt.

HYPOTHESES OF THE STUDY

The first hypotheses: To what extent is the relationship between internal audit function and corporate governance in Jordanian companies?

The second hypotheses: Does the relationship between the audit committee and the internal audit function in Jordanian companies provide for independence of internal audit?

METHODOLOGY

DATA COLLECTION AND SAMPLE

A questionnaire was used to collect data; it was pre-tested by a number of colleagues for review and approval before distribution. The questionnaire comprises of questions including closed, open ended questions and yes, no questions. The sample was selected randomly, The sample was employed 150 respondents in different sectors (Jordanian Companies was available from the Amman Stock Exchange as of 11 march 2012) and a total of 121 responses were received from 67 company, representing a rate of 80.6 percent.

SAMPLE PROFILE

The following table 1 gives a general overview of the sample surveyed in term of the demographic information.

TABLE1: DEMOGRAPHIC INFORMATION

Demographic object	The valid items	Frequency N=121	Percent
Qualifications	PhD	0	0%
	Master degree	2	1.7%
	Bachelor's degree	116	95.9%
	Others	3	2.5%
Total		121	100%
Professional certificate	CIA	3	2.5%
	CPA	2	1.7%
	CMA	3	2.5%
	JORDAN CPA	4	3.3%
	OTHERS	0	0%
	WITHOUT CERTIFICATION	109	90%
Total		121	100%
Functional level	Chief executive auditor	67	55.4%
	Internal audit supervisor	32	26.4%
	Internal auditor	14	11.6%
	Assistant auditor	8	6.6%
Total		121	100%
Experience	1-5 years	64	52.9%
	6-10 years	46	38%
	More than 10 years	11	9.1%
Total		121	100%

Table 1 provides the number of respondent holding Master degree 2 of the sample and none of the respondent holding PhD Degree; this indicates that the companies are discouraging the employees to have a high degree of qualification. The majority of respondents have professional certificate CIA with a percentage of 2.5 %, CPA holders 1.7 %, this indicates that the companies don't care about the professional certifications. **In other words**, corporate governance or audit committee should reconsider the method of appointment , as we see most of the respondents is a chief executive auditor or internal audit supervisor with a percentage 55.4% and 26.4% respectively, this indicates un mindful of companies to have qualified employees in the internal audit department .A large number of respondents experience less than five years with a percentage 52.9% , this maybe indicates a cause weakness in the internal audit department .

ANALYSIS AND DISCUSSIONS

ANALYSIS PROCEDURE

The major statistical tools which were used in this study are central tendency (mean), percentage analysis.

RESULTS

TABLE 2: TO WHOM DOES THE CAE/INTERNAL AUDIT DIRECTOR REPORT?

	Functionally		Administratively	
	Responses	Response Percent	Responses	Response Percent
Audit Committee (AC)	65	53.7%	21	17.4%
AC and CEO	26	21.5%	11	9.1%
AC and CFO	11	9.1%	41	33.9%
AC, CEO and CFO	7	5.8%	9	7.4%
AC, CEO,CFO and BOD	9	7.4%	3	2.5%
CEO Only	3	2.5%	34	28.1%
Others	0	0.0%	2	1.7%
Total	121	100.0%	121	100.0%

Table 2 provides an overview of the reporting relationships of the responding internal audit functions. It is shown that, in only 53.7 percent of cases, the internal auditor function reports functionally to the audit committee, as recommended by the IIA. 28.1 percent of the respondents indicated an administrative reporting relationship with the CEO only. About 33.9 percent of the respondents indicated that they report administratively to the audit committee and CFO. It should be noted that there is no consensus as to whether reporting administratively to the audit committee or CFO threatens the internal audit function's independence. These results indicate that best practice guidelines in this regard are not being applied consistently. Table 3 shows that, consistent with recommended best practices, in over half of the cases (66.1 and 53.7 percent) respectively, the audit committee is mandated to appoint, dismiss and evaluate the head of the

internal audit function, while a further 33.8 and 46.3 percent indicated that the audit committee carries out these duties in conjunction with the CEO, CFO or board of directors. Nevertheless, in 33.8 and 46.3 percent of companies, this responsibility lies with the CEO and/or CFO, which is a significant threat against the independence of the internal audit function. One could question whether the internal audit function could be independent if the continuity of the CAE's position is significantly determined by senior management. If there is a significant risk of being dismissed, it is reasonable to assume that the CAE would be biased towards management and would avoid sensitive issues in audit reports.

TABLE 3: WHO IS RESPONSIBLE FOR?

	Hiring, dismiss the CAE?		Evaluating the CAE performance?	
	Responses	Response Percent	Responses	Response Percent
Audit Committee	80	66.1%	65	53.7%
CEO	17	14.0%	34	28.1%
CFO	16	13.2%	18	14.9%
Others	8	6.6%	4	3.3%
Total	121	100.0%	121	100.0%

As shown in Table 4, all respondents reported that their internal audit function was placed at the corporate/group level, as opposed to being placed at the intermediate or local level. This is in line with best practice guidelines. While this indicates that, in practice, internal audit functions are well placed in the hierarchy with respect to maintaining independence.

TABLE 4: WHAT IS THE HIERARCHICAL LEVEL OF YOUR INTERNAL AUDIT FUNCTION?

	Responses	Response Percent
Corporate group level	121	100%
Intermediate level	0	0
Local level	0	0

As shown in table 5 when asked if it is common for internal auditors to move to other functions within the company, 72 percent of the respondents stated that there is a culture within the organization for internal audit staff to move to other management functions within the organization. This is corroborated by 87 percent (55%, 32%) of the respondents as shown in table 6 indicating that, on average, internal auditors stay between two and four years in the internal audit function, a long-term commitment was rare; in 61 percent of the companies, internal auditors stay less than four years. These results confirm that the internal audit function often is used as a training ground or a stepping stone for future managers to further their careers. An argument for this practice is that it also can be seen as an added value of the internal audit function. Internal auditors often are well-trained people, having a profound understanding of the different functional domains within the company. Therefore, it is not surprising that they are viewed as potential candidates for management positions. What is of concern, however, is the effect that this might have on the independence of the internal audit function, as it raises the question as to whether the internal auditor can raise reports against management independently and objectively, knowing that he or she is dependent on management for future career moves. It is reasonable to assume that internal auditors, to some extent, will be biased when performing an audit engagement in which the auditee is their potential future boss, given that they already have specific career plans in mind.

TABLE 5: IS IT COMMON FOR INTERNAL AUDITORS TO MOVE TO OTHER FUNCTIONS WITHIN THE COMPANY?

	Responses	Response Percent
Yes	87	72%
No	34	28%
No Comments	0	0%

TABLE 6: ON AVERAGE HOW MANY YEARS DOES AN INTERNAL AUDITOR STAY WITHIN YOUR INTERNAL AUDIT FUNCTION?

	Responses	Response Percent
Less than 2	7	6%
Between 2-4	67	55%
Between 5-7	39	32%
Between 8-10	5	4%
More than 10	3	3%

Another noted potential negative influence as shown in table 7 on the independence of the internal audit function is the possibility for management to influence the budget of internal audit function. In 32.2 percent of the companies, only the audit committee or the board of directors approves the internal audit budget. According to IIA Standards, this should be the best way to guarantee the independence of the internal audit function. On the other hand, in 36.3 per cent of the companies, the CEO or CFO is responsible for approving the internal audit budget. The internal audit function's independence is threatened in these companies. It can be assumed that CEOs or CFOs who do not want the internal audit function to focus on specific areas in their company (e.g. areas in which they know there are control deficiencies or, even worse, in which they want to hide fraud) have the power to impose significant budget constraints on the internal audit function, thus forcing it to reduce its auditing scope.

TABLE 7: WHO APPROVES THE INTERNAL AUDIT BUDGET?

	Responses	Response Percent
AC	31	25.6%
BOD	8	6.6%
CEO	17	14.0%
CFO	27	22.3%
AC & CEO	16	13.2%
AC & BOD	6	5.0%
AC & CFO	12	9.9%
BOD & CFO & CEO	4	3.3%
Corporate secretary	0	0.0%
Others	0	0.0%
Did not respond	0	0.0%
TOTAL	121	100.0%

It is recommended that input from the CEO and CFO be solicited, given their ability to identify high risk areas in which audits are warranted, the CAE and the audit committee should have sufficient autonomy to determine final priorities. As soon as the CEO and CFO become too heavily involved in determining the orientation of the internal audit function, its independence is indirectly threatened. In this study, the survey results indicate that, in 80.9 and 82.6 percent respectively of the cases, the CEO and/or CFO provide input for the internal audit planning. The results suggest that, in almost approaching to half of the cases,

both CEO and CFO (42.1 percent) have a strong impact upon the planning. This would indicate a threat to the internal audit function's independence, especially if combined with other indirect threats, like the CAE and audit committee not having the independence to determine final priorities.

TABLE 8: WHO GIVES INPUT FOR THE INTERNAL AUDIT PLANNING?

	The CEO		The CFO	
	Responses	Response Percent	Responses	Response Percent
Strongly agree	51	42.1%	51	42.1%
Somewhat agree	47	38.8%	49	40.5%
Neither agree or disagree	9	7.4%	7	5.8%
Strongly disagree	6	5.0%	5	4.1%
Somewhat disagree	5	4.1%	4	3.3%
No response	3	2.5%	5	4.1%
Total	121	100%	121	100%

As shown in table 9 it was found that, in more than half of companies (49.6 percent), people within the organization perceive internal auditors to be partners. A sufficient degree of acceptance and appreciation of the internal audit function is crucial to allow for internal audit findings and recommendations to have an impact. Nevertheless, it can be argued that a culture in which the internal audit function is considered too much a "partner" may put additional indirect pressure on internal auditors to work closely with management to achieve a "common goal" rather than to act as an independent body providing assurance on risk management, control and governance.

TABLE 9: People within the organization perceive internal auditors as their partners?

	Responses	Response Percent
Strongly agree	11	9.10%
Somewhat agree	49	40.5%
Neither agree or disagree	33	27.3%
Strongly disagree	19	15.7%
Somewhat disagree	9	7.40%
Total	121	100%

Aspects relative to the composition of the audit committee were examined. Table 10 and Table 11 shows that all responding companies have an audit committee. According to Table IV, audit committee membership ranges from 3 to 9 members, with a mean of 3.8 (standard deviation 1.51). On average, 59 percent of the audit committee members are independent (standard deviation 1.25). In addition to the independence of audit committee members, prior research has identified that member backgrounds are of importance. It was found that, on average, 53 percent of the audit committee members have an accounting background (standard deviation 0.44). It is worth mentioning that over half of the members have an accounting background. These results indicate that, while there is a trend towards moving to best practices that promote independence, with regards to having suitably independent and qualified members on the audit committee, this is not consistently applied.

TABLE 10: DOES YOUR COMPANY HAVE AN AUDIT COMMITTEE?

Yes	121	100%
No	0	0

TABLE 11: INFORMATION ABOUT AUDIT COMMITTEE?

questionnaire items	Min	max	mean	st.dev
Number of audit committee members (n=121)	3	9	3.8	1.51
Independent audit committee members (n=121)	2	6	2.06	1.25
Audit committee with accounting background (n=121)	1	2	1.23	0.44
Audit committee time spent on internal audit topics (n=121)	8	85	21.9	14.36

Except for one case, all CAEs are invited regularly to audit committee meetings TABLE 12. These formal contacts enable them to present and discuss the internal audit plan, results and recommendations, as well as the follow-up of agreed action plans. It should be noted that this is a basic condition for the independence of the internal audit function.

TABLE 12: IS THE CAE REGULARLY INVITED TO THE AUDIT COMMITTEE MEETINGS?

Yes	116	95.9%
No	5	4.1%
	121	100.0%

In a large majority of cases (81.8 percent), as shown in table 13 the audit committee seems to provide input for the planning of the internal audit function. We can assume that, this input is quite significant. Compared to the input given by management, the audit committee's involvement strengthens the independence of the internal audit function. This is especially true given the (more or less) independent status of the audit committee and its growing monitoring responsibilities. A close relationship with the internal audit function would benefit both parties. On one hand, it strengthens the internal audit function's independence; on the other hand, it provides audit committee members with the necessary support to fulfill their responsibilities.

TABLE 13: THE CAE HAS REGULAR PRIVATE CONTACTS WITH THE AUDIT COMMITTEE (CHAIR OR INDIVIDUAL MEMBERS)

	Responses	Response Percent
Strongly agree	54	44.6%
Somewhat agree	45	37.2%
Neither agree or disagree	7	5.8%
Strongly disagree	9	7.4%
Somewhat disagree	6	5.0%
Total	121	100.0%

TABLE 14: THE AUDIT COMMITTEE (AC) GIVES INPUT FOR THE INTERNAL AUDIT PLANNING

	Responses	Response Percent
Strongly agree	53	43.8%
Somewhat agree	58	47.9%
Neither agree or disagree	2	1.7%
Strongly disagree	3	2.5%
Somewhat disagree	4	3.3%
No response	1	0.8%
TOTAL	121	100.0%

CONCLUSION

This study critically examined the relationship between the internal audit function and corporate governance in Jordan, using data collected from internal auditors on the Jordanian companies. More specifically, this study analyzed to what extent the relationships between the internal audit function and corporate governance body creates threats to independence. In addressing the first research question, potential independence threats stemming from the relationship with management were examined. The first independence threat refers to the well-known practice of using the internal audit function as a training ground and stepping stone for future managers. Although there are arguments supporting this practice, it can be argued that internal auditors will not be able to operate objectively and independently when they are dependent upon their auditors for future career moves. The second independence threat identified refers to approval of the internal audit budget. This study revealed that Jordanian companies exist at which the CEO or CFO is responsible for approving the internal audit budget. This may be considered a serious threat to the independence of the internal audit function, as imposing budget constraints is a powerful tool with which management can reduce the scope and impact of the internal audit function. The third independence threat relates to senior management being heavily involved in developing the internal audit plan. While senior management's input is essential for setting internal audit priorities, the CAE and audit committee should monitor the impact of senior management's input. If their requests are considered unconditional priorities, internal auditors are viewed as management consultants, which invariably threaten the independence of the internal audit function. Thus threatening the independence of the internal audit function. While some of these individual threats may not necessarily create a major threat to the internal audit function's independence on their own, the collective effect of these practices has the potential to significantly threaten independence. Based on a global score, taking into account all threats discussed, it can be concluded that the majority of the internal audit function in this study are confronted by a combination of indirect independence threats resulting from their relationship with management. In addressing the second research question, potential independence threats stemming from the relationship between the internal audit function and the audit committee were examined, and a number of independence threats resulting from this relationship identified. The first independence threat relates to non-compliance with best practices recommending the internal audit function to report functionally to the audit committee and administratively to the CEO. It was found that this practice is not applied consistently and, hence, can be considered a potential independence threat.

LIMITATIONS

The research is restricted to Amman city which is Jordan's capital, the results are not applicable to other State or Country.

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PROPOSED FRAMEWORK FOR IMPROVING THE PAYMENT SYSTEM IN GHANA USING MOBILE MONEY

MENSAH KWABENA PATRICK
LECTURER
DEPARTMENT OF COMPUTER SCIENCE
UNIVERSITY FOR DEVELOPMENT STUDIES
NAVRONGO, GHANA

DAVID SANKA LAAR
LECTURER
DEPARTMENT OF COMPUTER SCIENCE
UNIVERSITY FOR DEVELOPMENT STUDIES
NAVRONGO, GHANA

ALIRAH MICHAEL ADALIWEI
EX. STUDENT
UNIVERSITY FOR DEVELOPMENT STUDIES
NAVRONGO, GHANA

ABSTRACT

In recent times, the National Communication Authority's (NCAs) figures suggest that there has been tremendous increase in the number of people who use mobile phones in Ghana. Majority of these subscribers basically use their phones for making calls, sending text messages and surfing through the internet. With the increase in the number of mobile users, the number of unbanked still remains significantly high. This problem led to the introduction of Mobile Banking by some of the Mobile Network Operators (MNO). The aim was to reduce the number of unbanked, reduce the amount of time wasted in the bank during transactions, and to make it easier for relatives to remit to their families back at home. However, there is no framework to guide interoperability, no legal framework to protect both customers and MNOs who provide these services, and a low level of interest is shown by subscribers. This paper therefore seeks to propose a framework that will improve interoperability, protect customers and service providers, improve general subscriber interest, and help bring more services onboard the Mobile Banking market.

KEYWORDS

Automated Teller Machine (ATM), Mobile Network Operator (MNO), Subscriber Identification Module (SIM), Short Message Service (SMS).

INTRODUCTION

Statistics from the NCA suggest that as at December 2011, over 21 million Ghanaians out of a total population of 24 million (Google, 2012) people, were using mobile phones (NCA, 2012). Out of this population, only 2.2 million people (Ghana Government, 2012) had bank accounts. An estimated 80% of the population is unbanked (PWC, 2012). The introduction of Mobile Money into the Ghanaian economy by mid-2009 (MTN, 2012) was seen as a means of increasing cashless transactions since the banking system in Ghana has numerous challenges (Ghanaweb, 2012) that serve as disincentives for the unbanked.

Mobile Money is a technology that allows users of mobile phones to transact business using their mobile phones as a tool (Ayo, Ukpere, Oni, Omote and Akinsiku, 2012). These transactions can be in the form of Person-to-Person transfer of money, transactions between a person and the bank, purchasing of goods and services using the phone among others.

Successes chalked by M-PESA (Sultana, 2011) in Kenya, has led to a change in how other Developing countries perceive Mobile Commerce. Currently, services onboard the Mobile Money market in Ghana include Person-to-Person transfer of money, Person to Bank transactions and Bank to Person transactions. Mobile Commerce is still in the early stages of development in Ghana, as a result there is no central database to keep track of all Mobile transactions, and the predominant means for transacting Mobile Commerce is via Short Message Services (SMS) even though the Mobile Network Operators offer other services such as Enhanced Data for GSM Evolution (EDGE), Multimedia Message Services (MMS) and Wireless Application Protocol (WAP). Most notable among Mobile commerce in Ghana is Mobile Banking. Banks such as Zenith, Ghana Commercial Bank, Ecobank, GTBank, Intercontinental Bank, among others offer Mobile banking in one way or the other. The potential that Mobile Money in the form of Person to Person transactions offers is currently not fully exploited.

Challenges facing the Mobile Money market in Ghana include lack of full interoperability between the major players in the industry. Customers with a Mobile bank account in Bank A cannot transact business with Bank B and subscribers with MNO A cannot also transact business with users of MNO B (except for some few Banks and MNOs). Patronage of these services even among the over 80% mobile phone subscribers is also very low. In addition, Ghana does not have a robust regulatory framework that will define the relationship between the financial, telecom and the private sectors (Ghana Government, 2012).

This paper therefore, seeks to develop a framework that will contribute to solving the legal and interoperability issues in order to improve subscriber patronage of Mobile commerce in Ghana. As a consequence, the country's payment system which includes salaries, savings and loans, taxes, utility bills, purchase of goods and services, etc. can be brought on board for ease and convenience of the customer. This will be made possible through a simple and available Information Technology (IT) facility such as SMS.

REVIEW OF LITERATURE AND RELATED WORK**BACKGROUND**

According to the Bank of Ghana (BoG, 2012), payment system is the entire matrix of institutional infrastructure arrangements and processes in a country for initiating and transferring monetary claims in the form of commercial and central bank liabilities. The concept of Virtual money (Adaliwei, 2011) has made it possible to transact business with electronic cards such as Credit cards, Debit cards, ATM cards, Smart cards, etc. They are collectively referred to as virtual accounts or digital wallets. Mobile money falls under virtual money, and has proved to be economically successful in developing countries such as Kenya (Sultana, 2011).

Mobile Payment Systems (MPS) enable transactions to be effected (initiated, activated or confirmed) using a mobile device or more commonly, the mobile phone. Other devices capable of effecting mobile payments include Personal Digital Assistants (PDAs), Smartphones (combination of PDA and mobile phone technologies), Laptops, and Point of Sale devices. Mobile Payment Systems (MPS) have gained prominence in the major global economies as a result of the search for ease and convenience in business transactions.

TYPES OF MOBILE PAYMENT SYSTEMS

- i. Account-based payment systems: This mainly involves having an account with the Payment Service Provider (PSP) as a result of subscribing to the payment system. Examples include; Mobile phone based payment systems, Smart card payment systems and Credit-card payment systems.
- ii. Point of Sale (POS) payment systems: This form of payment deals mainly with proximity payment systems where another automated device is needed to read customer account details in the process of transactions. They could either be Automated POS payments or Attended POS payments.
- iii. Mobile wallets: In this system, the subscriber has a mobile wallet into which virtual money is stored. From this wallet all transactions are made.

MOBILE PAYMENT SOLUTIONS

These are classified according to the type of payment effected, and based on the technology adopted to implement the solution:

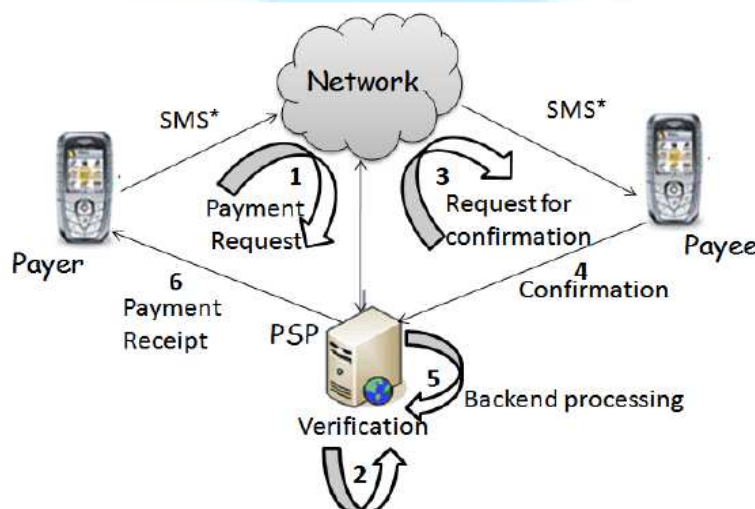
- i. Bank Account based M-Payment: Banks have millions of customers and telecommunication operators also have several million customers. If they both collaborate to provide an m-payment solution, it is a win-win situation for both parties. In this model, the bank account is linked to the mobile phone number of the customer. When the customer makes an m-payment transaction with a merchant, the bank account of the customer is debited and the value is credited to the merchant account.
- ii. Credit Card based M-Payment: In the credit card based m-payment model, the credit card number is linked to the mobile phone number of the customer. When the customer makes an m-payment transaction with a merchant, the credit card is charged and the value is credited to the merchant account. Credit card based solutions have the limitation that it is heavily dependent on the level of penetration of credit cards in the country.
- iii. Telecommunication Company Billing of M-Payments: Customers may make payments to merchants using their mobile phones, these may subsequently be charged to the mobile phone bills of the customer. The customer then settles the bill with the telecommunication company. This may be further classified into prepaid airtime (debit) and postpaid subscription (credit).

The mobile technology landscape provides various possibilities for implementing m-payments. Essentially, a GSM mobile phone may send or receive information (mobile data service) through three possible channels –Short Message Service (SMS), Unstructured Supplementary Services Delivery (USSD) or Wireless Application Protocol/General Packet Radio Service (WAP/GPRS). The choice of the channel influences the way m-payment schemes are implemented. Secondly, an m-payment client application may reside on the phone or else it may reside in the subscriber identity module (SIM).

Mobile payment can be done in two modes or payment scenarios - Remote Payments and Proximity Payments (Near Field Communication Technology). In remote payment, the payer and the payee could be at remote locations, for example, a customer places an order from his home to a retail store. Proximity payment involves a transaction where both the payer and payee have to be within the same vicinity, for example, when a customer (payer) buys a cup of coffee from a vending machine (payee).

The Basic Architecture for Remote and Proximity M-Payment Systems (Agarwal, Khapra, Menezes and Uchat, 2011) are depicted in Figure 1 and Figure 2 respectively:

FIGURE 1: REMOTE M-PAYMENT SYSTEM



Source: Agarwal, Khapra, Menezes and Uchat, 2011

FIGURE 2: PROXIMITY M-PAYMENT SYSTEM



Source: Agarwal, Khapra, Menezes and Uchat, 2011

The main difference between the two systems is that, in the remote m-payments, the customer first sends the payment request to the PSP over a wireless network by using a remote wireless technology (Infrared, Bluetooth, RFID or NFC). The PSP then forwards this request to the payee. However, in proximity m-payments, the customer directly sends the payment request to the payee typically using a short-range wireless technology. The payee then forwards this payment request to the PSP over a wireless network.

RELATED WORK

Tobbin, and Kuwornu, (2011) proposed a mathematical model of consumer behavior towards the adoption of Mobile Money Transfer in Ghana. It established that, apart from Perceived Ease of Use and perceived usefulness, Perceived Trust, Trialability and Perceived Risk significantly affect Behavioural Intention towards the adoption and use of Mobile payment by subscribers. Bucyana and Tudor Sikanartey (2009) took a survey on the Mobile money revolution in Ghana. Most significant among their findings included the fact that Mobile Payment is an incentive for improved business transactions since it serves as a unique platform to bring convenience in business dealings. In a presentation organized by Enhancing Financial Innovation & Access (EFInA), Dela (2011), gave a talk on Branchless banking and mobile payments regulatory framework in Ghana. She emphasized that Mobile money services have the potential to accelerate remittances and payment services in Ghana, and that its innovative nature has the potential to reduce the number of unbanked people in the country. She reiterated the need for a legal framework to protect all parties involved in the Mobile payment system.

The above observations have motivated us to propose a framework which will serve as a guide to implement a nationwide Mobile Payment system with the following aims:

- i. Encouraging cashless transactions and reducing the amount of money people carry with its attendant problems.
- ii. Improve interoperability between existing operators and those that are yet to join.
- iii. Protect both customers and service providers via a legal framework.

THE PAYMENT SYSTEM IN GHANA

The payment system in Ghana covers the following areas: Payment instruments used to initiate and direct transfer of funds, Network arrangements for transacting and clearing payment instruments, institutional players in the system, market conventions and regulations, and legal and regulatory framework (GhanaCedi, 2012). The Bank of Ghana (BoG), the commercial banks, and customers are the stakeholders in the Payment system. The Act that gives the BoG the legal backing to supervise the Payment system was passed in 2003 (Act 662), it is "for the establishment, operation and supervision of electronic and other payment, clearing and settlement systems; to provide for the rights and responsibilities of transacting and intermediating parties and for other related matters" (Hesse, 2010).

The Ghanaian economy is characterized by huge flow of physical cash. Almost every transaction carried out by the unbanked deals with physical cash. For instance, cocoa farmers in the Western Region of Ghana harvest their produce in December every year. On selling their produce to the clerks, 90% of them convey the money to their villages where there is no form of security. The incidence of crime and armed robbery increases during this period since unscrupulous people know that the cocoa farmer will always carry money on him when traveling. There have been occasions when banks in cocoa farming areas report shortage of money due to high demand. During such periods, farmers who need to transact monetary business have no option but to wait till the banks get cash. Aside farming, other areas of the informal sector such as private enterprises performs almost 80% of their transactions using physical cash, even though majority of them have bank accounts. They only deal with their banks when at the end of sales; they proceed to the bank to make a deposit or under circumstances when they need a loan.

The formal sector is made up of the majority of people who are banked in the country. This is so because salaries are paid through bank accounts. The major problem with this sector is that, it is cumbersome (Ghanaweb, 2012) to fulfill all the requirements for opening a new account at the bank. To most people, it does not make sense to queue at the bank to withdraw money that belongs to them; since as a matter of fact, there can be long intolerable queues in Ghanaian banks and ATMs. The high illiteracy rate in the country is a hindrance to reducing the number of the unbanked. The few who master courage to go for a bank account will have to get someone who can read and write before they can complete the complex bank forms.

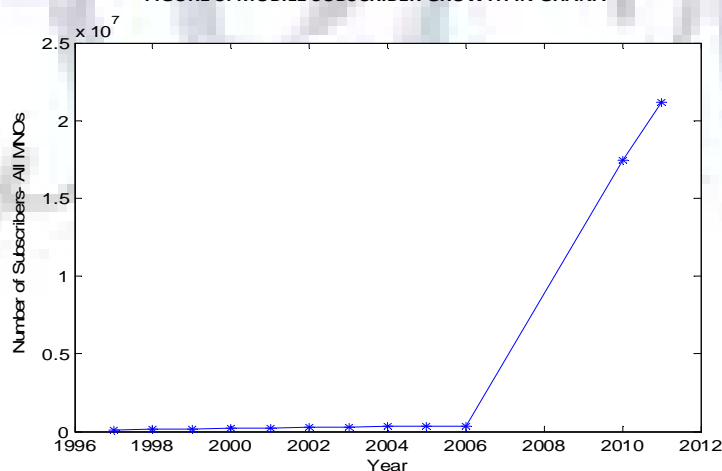
Even though different forms of electronic payments exist, for most of them, one must have a bank account (e.g. ATM), before one can use them. Most prominent among these electronic payments is e-Zwitch (Hesse, 2010). In an attempt to develop a cashless economy, the BoG through Ghana Interbank Payment & Settlement Systems Limited (GhIPSS) introduced electronic clearing and payment system designed to established a common platform to link the payment systems of all banking and financial institutions in Ghana. The system uses biometric identification, and is also the only requirement for registration of new users. Users do not need to be account holders of a bank before they register for e-Zwitch. It can be used to carry out all forms of transactions including payment of utility bills, etc.

Other forms of money transfer such as the Post Office system, Bus system, etc. exist; where the payer sends the money to the payee via the Post Office or a bus respectively. On remittances, the major player in the Ghanaian market is Western Union, even though one cannot send money outside Ghana through the same medium. Other services for receiving remittances from abroad are also in existence, the only requirement is that, the payee must produce a valid Identification Card and also be able to reproduce a secret code originating from the payer. Due to these and many more, the Payment system in the country is dominated by cash transactions instead of virtual money and digital wallets.

THE MOBILE PAYMENT SYSTEM IN GHANA

Currently, Ghana has 27 commercial banks (PWC, 2012) over 125 Rural banks (ARB, 2012) Credit Unions and Savings and Loans Companies. Most of these banks have gone into agreement with MNOs to operate Mobile Payment services. Ghana's MNO market is highly competitive since figures from NCA suggest that the number of subscribers seems to grow exponentially each year (refer to Figure 3). Presently, there are five MNOs with the sixth one fully registered as an MNO but yet to start commercial operations.

FIGURE 3: MOBILE SUBSCRIBER GROWTH IN GHANA



Source: NCA, 2012

The following are the most prominent Mobile Payments services that the collaboration between some of the banks and MNOs has generated:

i. *MTN Money*: MTN launched Mobile Money in July 2009 in partnership with 9 banks. Subscribers can use the service without the need to open or have a bank account (MTN, 2012). The system enables users to issue the following transactions:

- *Mobile banking*: Balance enquiries from bank accounts of subscriber's in partner banks.
- *Purchasing/recharging* mobile airtime.
- *Money transfer* between customers, merchants and from merchant to customer or vice versa.
- *Payment of utility bills* e.g. Digital Satellite Television (DStv) bills, electricity bills, water bills etc.
- *Mi-Life or M-Insurance* is a mobile insurance policy in which subscribers can initiate claims, queries and make premium payments using their mobile phones. Premium payments are deducted from the m-wallet monthly and customers are notified via SMS after which their insurance cover is renewed (Tellez, 2011). As at October 2009, MTN Money had over 20,000 customers with 1,200 (Leishman, 2009) authorised Merchants across the country.

ii. *Airtel Money*: Initially introduced by Zain-Africa as Zap, the service was one of the most promising in African mobile money. After Bharti Airtel took over from Zain, Zap became Airtel money and has still gained preference by mobile phone users and subscribers. Airtel money is Airtel's mobile money/mobile banking system. Airtel Ghana closed 2010 with nearly 2,000,000 subscribers (NCA, 2012), placing 5th in the ranking of MNOs according to subscriber base. Airtel money currently records more than 11 official merchants and has registered sales outlets with a good fraction of them offering the payment service to subscribers. Airtel is also linked up with a number of banks and financial institutions including Databank Brokerage Limited, Ecobank, StanChart and UBA for effective transaction and mobile banking for subscribers. Airtel money can be used to perform the following transactions:

- Loading subscribers' Airtel mobile airtime and data bundles.
- Inland money transfer among users, merchants and non-subscribers.
- General merchandise and purchases.
- Payment of utility bills and other charges where the system is accepted.
- SMS banking as aided by partner banks and financial institutions.

iii. *TxtnPay*: Introduced by Afric Xpress, a New York based company operating in Africa for the first time starting with Ghana. Txtnpay commenced operations in 2009 as a mobile phone-based secure payment system that enables users to send money to anyone with the mobile phone, pay bills, buy prepaid airtime, and check their bank balance and purchase goods and services. The txtnpay wallet is funded by buying electronic cash at any approved agency or making transfer from one's bank account (TxtnPay, 2012). The service is universal on all MNOs for user convenience and subscriber portability. As at February 2010 (Owusu, 2010) Afric Xpress had processed over 500,000 transactions under the txtnpay service through purchases and payments, money transfer within and outside Ghana, and Mobile banking. Txtnpay is currently partnered with a number of banks, internet cafes and other outlets. The service has over 400 (Owusu, 2010) agents on its nationwide network.

iv. *Tigo Cash*: Tigo cash is a Mobile Payment system introduced by Millicom Gh. Ltd., operators of the Tigo network. It was launched in November 2010 to complement the efforts of other MNOs and PSPs geared towards raising a cashless Ghanaian market and mobile wallet services for the unbanked. Tigo has partnership with banks such as ADB, UBA, Fidelity and Ecobank to enable subscribers benefit from its mobile banking services.

CONTRIBUTION OF THIS PAPER

Ghana has the potential to utilise the power of Information and Communication Technology in the form of mobile phones to enhance the saving culture of her citizens. Majority of Ghanaians use mobile phones as depicted in Figure 3, however, few of these phone users have bank accounts. There are frantic efforts by MNOs to use Mobile money to improve the culture of saving in the citizenry. These efforts are impeded by the lack of comprehensive framework that will help boost the interest of subscribers, define the role of MNOs in the financial sector, protect both customers and MNOs, and improve the entire payment system in the country.

This paper therefore, proposes a framework that will utilise SMS to enable customers take advantage of the benefits of using Mobile money. This will reduce the long queues that are found at the banks and ATMs, increase the number of subscribers using mobile money due to its simplicity (only SMS) and interoperability, and through a proposed legal framework, make both MNOs, banks and customers safe to transact business using mobile money. This framework takes into account lots of services that can be brought into the Mobile money market which will ultimately improve the entire payment system in the country.

STATEMENT OF THE PROBLEM

The unbanked in Ghana are more than those with bank accounts. Even with the few people that have bank accounts, it is common to see a lot of people queue at the banks and ATMs just to withdraw cash. This is so because the payment system is dominated by transactions that use physical cash. Fortunately, majority of the people use mobile phones making it ideal to use Mobile commerce in place of cash transactions. However, problems of interoperability, lack of rigorous legal framework, and low levels of interest shown by subscribers (partly due to complexity and cost of transacting business with existing Mobile money services) are hindering the progress of this quest.

OBJECTIVES OF THIS PAPER

The main objective of this paper is to improve the payment system currently existing in Ghana through the use of Mobile Money. This can be achieved if the following are fulfilled:

- Increasing cashless transactions that takes place in the country.
- Proposing both operational and legal frameworks for mobile money which will eventually result in:
 - A boost in customer interest in mobile money due to its simplicity and interoperability as compared to current ones.
 - A clear definition of the roles MNOs are supposed to play in the payment system of the country.

THE PROPOSED FRAMEWORK

This framework seeks to eliminate the long and stressful queues at the banks and ATMs in the country and also provide a simple, cheap and secure way of sending money better than existing transfers.

SMS paths are not shown in Figure 4. Only transactional paths are shown labeled. The parties involved in this framework include:

- Bank of Ghana (BoG); supervises the payment system of the country.
- All MNOs in Ghana
- All Financial institutions including Rural Banks and Credit Unions.
- Agents representing MNOs in locations that are accessible to customers.
- Senders (e.g. customers, employers, etc.).
- Recipients (e.g. supermarkets, schools, revenue authorities, insurance companies, etc.)

The instruments involved include:

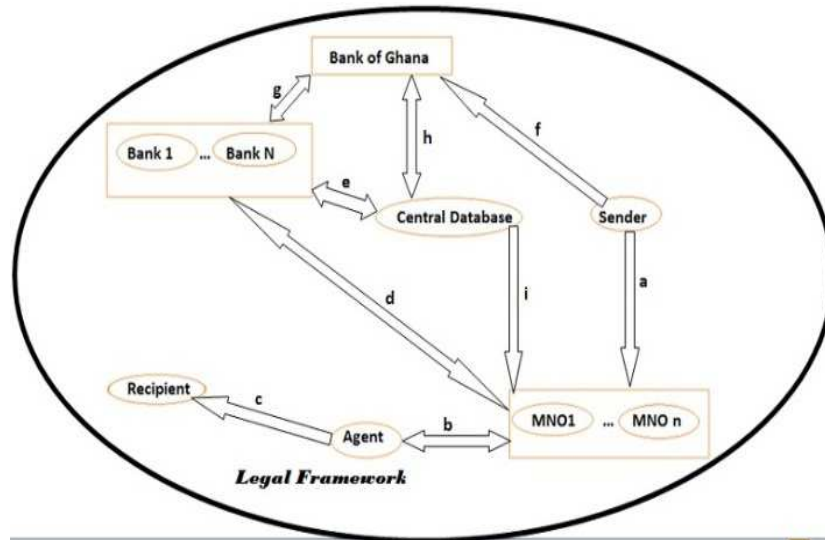
- Mobile phones
- Registered SIM card
- National ID card

The procedure involved in transferring money is divided into three categories (refer to Figure 4.):

1. Person-to-Person transfer via MNO accounts:

- a) The sender must have an account with the MNO with sufficient fund for the transfer. Sender sends SMS to the MNO providing their national ID number, the receiver's phone number and how much they want to transfer,. The receiver must not necessarily be a subscriber to the MNO on which the transfer is taking place. The MNO sends SMS to the receiver to contact the nearest agent.
- b) The agent sends SMS containing his identification, the ID of the receiver, phone number of the receiver, and the amount to be withdrawn to the MNO. The MNO debits the sender's account of the amount to be withdrawn, and credits the agent's account with it.
- c) The MNO sends SMS to the sender, receiver, and agent indicating that the transfer has been completed. The agent then gives the money to the receiver.
- d) The MNO sends the details of the transaction (via a secure connection) to its account holding bank. Only successful transactions are sent.

FIGURE 4: ARCHITECTURE OF THE PROPOSED FRAMEWORK



- e) The bank commits the record of the transaction into a central database that is accessible to all MNOs, Banks, and the Bank of Ghana which serves as the supervisory body.

2. Person-to-Person transfer through the bank:

- a) The sender must have an account with the bank with sufficient funds for the transfer. Sender sends SMS to the MNO indicating how much they want to transfer, their national ID number, their bank account number and the receiver's phone number. The receiver must not necessarily be a subscriber to the MNO or have an account with the bank.
- d) The MNO verifies with the bank either the sender has sufficient funds in his/her account. If so, the MNO authorizes the bank to debit the sender's account of the said amount and credit the account of the MNO with it. The MNO sends SMS to the receiver to contact the nearest agent.
- b) The agent sends SMS containing his identification, the ID and phone number of the receiver, and the amount to be withdrawn to the MNO. The account of the agent with the MNO is credited with the amount transferred. SMS is sent to sender, agent, and receiver to indicate the success of the transaction.
- c) The agent pays the receiver.
- d) Steps d) and e) for procedure 1) are repeated for successful transactions.

3. Remittance:

- f) The sender sends the money to the transferring company with the receiver's phone number and national ID card number. All remittances to Ghana must be acknowledged by the Bank of Ghana.
- g) BoG notifies the bank that is into partnership with the transferring company of the transfer.
- d) The bank notifies the MNO to which the receiver is a subscriber of the transfer, and subsequently transfers the amount to the account of the MNO. The MNO sends SMS to the receiver to contact the nearest agent.
- b) The agent sends SMS containing his identification, the ID and phone number of the receiver, and the amount to be withdrawn to the MNO. The account of the agent with the MNO is credited with the amount transferred. SMS is sent to sender, agent, and receiver to indicate the success of the transaction.
- c) The agent pays the receiver.
- d) Steps d) and e) for procedure 1) are repeated for successful transactions.

A mobile money subscriber of a given MNO by our framework can also deposit money to their accounts with the MNO or the bank. As stated earlier, this will reduce the long queues at the ATMs and the banking halls in the country. To deposit money into one's MNO account:

- i. The account owner must be a subscriber to the MNO.
- ii. The customer goes to see an agent. S/he gives their national ID number, phone number, and the amount they want to deposit to the agent.
- iii. The agent sends this information to the MNO and request for an equivalent amount of e-money to be transferred to the customer's account.
- iv. The agent collects the customer's money.
- v. The account of the agent is debited with the amount of e-money credited to the customer's account.
- vi. An SMS is sent to both the agent and the customer to signify a successful transaction.
- vii. Steps d) and e) for procedure 1) are carried out if the transaction is successful.

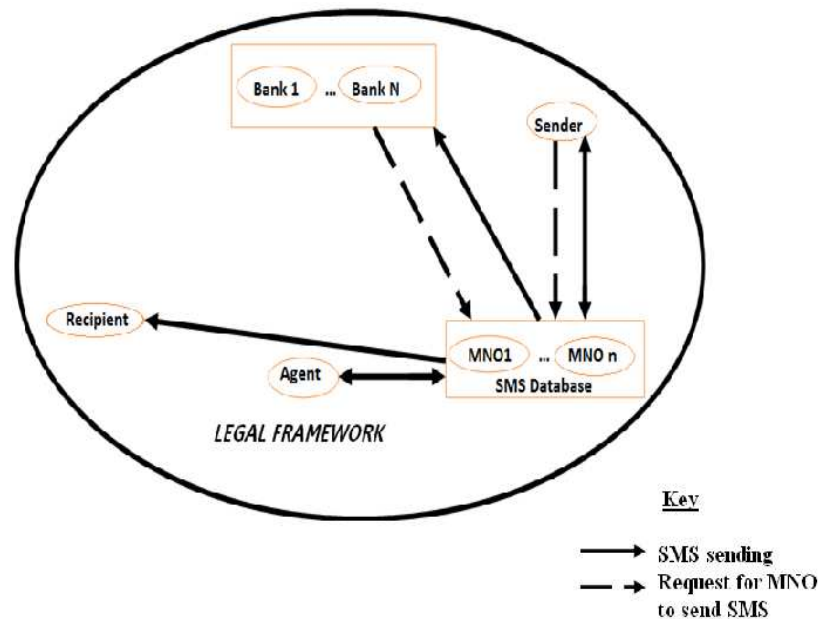
To deposit money to one's bank account:

- i. The customer must be an account holder in the bank.
- ii. The customer goes to see an agent. S/he gives their national ID, phone number, bank account number, and the amount to the agent.
- iii. The agent sends this information to the MNO and request for an equivalent amount of money to be transferred to the customer's bank account.
- iv. The MNO checks the authenticity of the account with the account holding bank. If it exists, the amount is credited to the account of the customer, and debited from the account of the MNO. At the level of the MNO, the agent's account is debited and credited to the MNO.
- v. The agent collects the customer's money and steps d) and e) for procedure 1) carried out.

All the above processes must take place in a well-structured, all inclusive legal framework.

The flow of messages (SMS) is depicted in Figure 5. We use SMS as the base case, since every mobile phone in Ghana has the SMS facility. Other forms of message sending such as MMS, Emails, etc. can be substituted for SMS if the customer's mobile phone supports that feature and also if they are willing to use that feature of their phone for transaction. The MNO will simply take the format for the first request from the customer for subsequent transactions until the customer request for a change in the mode of interaction. It must be made clear that the use of a Mobile money application on either the subscriber's phone or SIM is also supported in this framework. In that case, Fig. 5 depicts the flow of communication, and not just SMS.

FIGURE 5: MESSAGE (SMS) PATHS FOR THE FRAMEWORK



The sender sends SMS to his MNO indicating the amount they want to transfer and to whom. SMS is sent to the receiver to contact the nearest agent. The agent identifies himself to the MNO by means of SMS. After the transaction is completed, SMSs are sent to all parties involved to indicate successful transactions. If a customer wants to pay their electricity bill using funds in their bank account, they must use the SMS services of the MNO to which they subscribe to (dotted lines) as a carrier, to send the request to the bank. The bank performs the operation and uses the MNO as a carrier to send notification via SMS to all parties that the transaction has been completed successfully.

All these must occur in a well-structured legal framework.

LEGAL FRAMEWORK

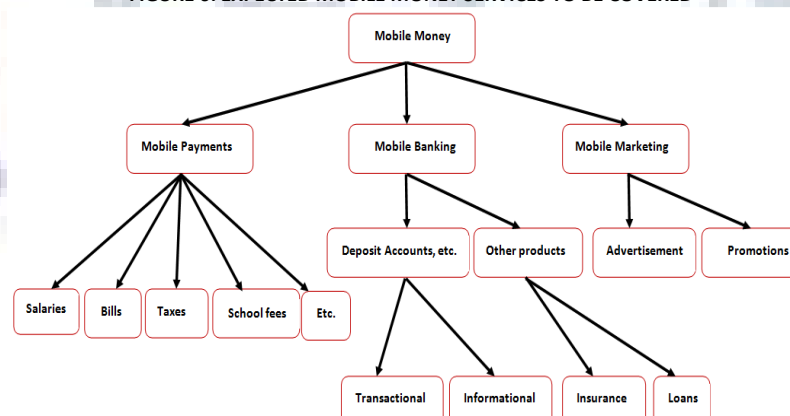
Ghana has well-defined regulations that govern the payment system, with BoG serving as the supervisory body and enforcer of these regulations. However, the country lacks a regulatory framework that will promote the inclusion of the unbanked, define the relationship between the banks, and MNOs (Ghana Government, 2012) and also, define the role of MNOs in the payment system of the country. Stringent regulations must be passed to protect both service providers and customers. We propose the following regulations:

1. Anti-Money Laundering, Combating the financing of terrorism and Drug trafficking: The amount of money that can be transferred or saved per day, per month, and per year for each customer must be clearly specified. Proper foreign exchange controls must impose limits on the amount of money a customer can transfer or receive. This will avoid people using the service as a channel to transfer huge sums of monies for other purposes. Proper Know Your Customer (KYC) procedures must be enforced to reduce these types of crimes.
2. Regulations to define the role of MNOs in Ghana's payment system and the relationship between all Mobile Money service providers: This will enhance interoperability between the various service providers and enable them to know where their limits are.
3. Data privacy: Data privacy laws will protect customer information, and prevent MNOs and Banks from using it for purposes other than those that have been agreed to by the customer.
4. E-commerce regulations: These will protect the customer from losing their money through no fault of theirs. They must also protect service providers from unnecessary lawsuits that will have negative impact on their services. The necessary regulations must be enacted to prepare the grounds for smooth operation.
5. Tax regulations: The laws on tax can be made to give some percentage off for Service providers. This will enable service providers to reduce their charges to motivate the unbanked to join.
6. Regulations for healthy competition: Anti-competitive practices must be strongly discouraged to provide a level playing ground for all service providers.

EXPECTED OUTCOME

Figure 6 depicts what the Mobile money landscape will look like on implementing our framework.

FIGURE 6: EXPECTED MOBILE MONEY SERVICES TO BE COVERED



The customer should be able to pay their bills, taxes, purchase items, and pay their wards school fees just by sending an SMS. They should also be able to contract loans, check their account balance, deposit money and insure their property using the service. On the other hand, MNOs and cooperate society can also benefit by means of promotional sales and the advertisement of their products via the service. People may deposit their money with MNOs to help reduce the

issue of theft and arm-robbery in our society since people will stop carrying large sums of monies while travelling. Cocoa farmers will have an alternate source of income when their banks run out of money during cocoa seasons as they may have opened an account with one or many MNOs.

CONCLUSION AND SCOPE FOR FURTHER WORK

In this paper, we proposed a framework for implementing Mobile Money system in Ghana that will introduce interoperability between MNOs, and reduce the number of the unbanked. The only instrument required by a customer to carry out transactions is a mobile phone that can send SMS. Since the majority of Ghanaians possesses mobile phones, our framework will help reduce the stress and long queues at the banks and ATMs. A legal framework has also been proposed to protect both the customer and Mobile Money service providers.

Our interest will now be geared towards developing a prototype of the Central Database that will make Mobile Money transaction information available to all banks and MNOs, to enhance interoperability. This is the area where we want to concentrate our future research efforts.

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**A COMPARATIVE STUDY ON PUBLIC SECTOR BANKS (VS) PRIVATE SECTOR BANKS
(A CASE STUDY ON STATE BANK OF INDIA, CANARA BANK VS CITY BANK, ICICI BANK)**

V. SRI HARI

SR. LECTURER

**DEPARTMENT OF MANAGEMENT STUDIES & RESEARCH
NAGARJUNA COLLEGE OF ENGINEERING & TECHNOLOGY
BANGALORE**

DR. B. G SATYA PRASAD

DIRECTOR

**GTIMS & RESEARCH
BANGALORE**

VIKAS JAIN

LECTURER

**DEPARTMENT OF MANAGEMENT STUDIES & RESEARCH
NAGARJUNA COLLEGE OF ENGINEERING & TECHNOLOGY
BANGALORE**

DR. D. L. SREENIVAS.

PROFESSOR & DEAN

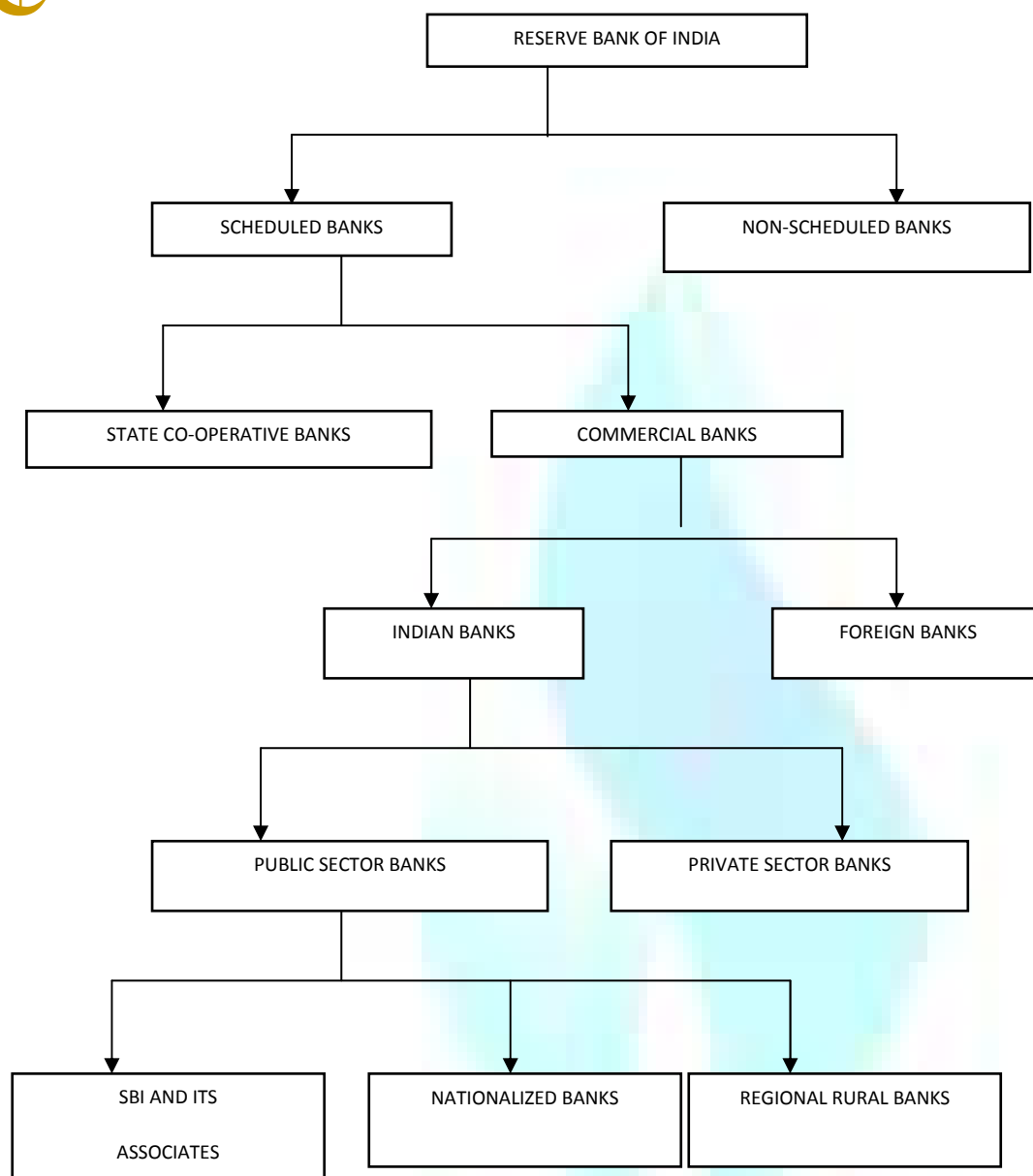
**DEPARTMENT OF MANAGEMENT STUDIES
KS SCHOOL OF ENGINEERING & MANAGEMENT
BANGALORE**

ABSTRACT

In recent years the Banking Industry has been undergoing rapid changes, reflecting a number of underlying developments. The most significant has been advances in communications and information technology, which have accelerated and broadened the dissemination of financial information while lowering the costs of many financial activities. Public Sector Banks and Private Sector Banks play an important role in economic development of the country. These are banking financial institutions and they are also social organizations rendering savings, investments in the form of deposits and security and providing their needful helps to the society members to borrow loans at affordable interest rates. Public Sector Banks and Private Sector Banks have had the distinction of being recognized as banking institutions, which provides satisfying services to its customers or account holders. As a result of this the customers expects the best of services from the banking institution. This article focuses on how far Public Sector Bank Vs Private Sector Bank is doing their business in a banking industry after liberalization and banking reforms. And what is the impact of functioning of their banking operations due to the competition in banking industry. How far Public Sector Banks or Private Sector Banks are successful in facing these challenges? What are the trends observed in the performance of Public Sector and Private Sector Banks? This article is a modest effort to compare public and private sector banks on the basis of major parameters. With Reference to State Bank of India, Canara Bank (Vs) CITY Bank, ICICI Bank.

KEYWORDS

public sector banks, private sector banks, banking industry.

INTRODUCTION**CLASSIFICATION OF BANKS****EVOLUTION**

- **1949 – REGULATION**
Banking Companies Act.
- **1955 – NATIONALIZATION PHASE – I**
State Bank of India.
- **1959 – NATIONALIZATION PHASE – II**
SBI Subsidiaries.
- **1961 – INSURANCE TO DEPOSITS**
Deposit Insurance Corporation.
- **1968 – SOCIAL CONTROL**
National Credit Council.
- **1969 – NATIONALIZATION PHASE – III**
14 Commercial Banks.
- **1971 - CREDIT GUARANTEE**
Credit Guarantee Corporation.
- **1975 – NEW RURAL BANKS**
Regional Banks.
- **1980 NATIONALIZATION PHASE – IV**
6 Commercial Banks.
- **1985 – RE-ORGANISATION OF BANKING**
Private Banks.
- **1991 BANKING REFORMS**

COMPANY PROFILE

STATE BANK OF INDIA is the largest state-owned banking and financial services company in India, by almost every parameter - revenues, profits, assets, market capitalization, etc. The bank traces its ancestry to British India, through the Imperial Bank of India, to the founding in 1806 of the Bank of Calcutta, making it the oldest commercial bank in the Indian Subcontinent.

CANARA BANK is a state-owned financial services company in India. It was established in 1906, which makes it among the older Indian banks. As on 2009 November, the bank had a network of 2861 branches, spread across India.

CITIBANK, a major international bank, is the consumer banking arm of financial services giant Citigroup. Citibank was founded in 1812 as the City Bank of New York. Citigroup is the third largest bank holding company in the United States by domestic deposits, after Bank of America and JP Morgan Chase.

ICICI BANK (FORMERLY. INDUSTRIAL CREDIT AND INVESTMENT CORPORATION OF INDIA) is a major banking and financial services organization in India. It is the second largest bank in India and the largest private sector bank in India by market capitalization.

STATEMENT OF THE PROBLEM

Public Sector Banks and Private Sector Banks play an important role in economic development of the country. These are banking financial institutions and they are also social organizations rendering savings, investments in the form of deposits and security and providing their needful helps to the society members to borrow loans at affordable interest rates. Public Sector Banks and Private Sector Banks have had the distinction of being recognized as banking institutions, which provides satisfying services to its customers or account holders. As a result of this the account holders expects the best of services from the banking institution. This Paper focuses on how far Public Sector Bank Vs Private Sector Bank is doing their business in a banking industry after liberalization and banking reforms. And what is the impact of functioning of their banking operations due to the competition in banking industry.

OBJECTIVES OF THE STUDY

1. To evaluate the financial performance or Profitability position of the said banks.
2. To evaluate the financial position of the said banks.
3. To Offer suggestions to improve the banking business of Public Sector banks to compete with Private sector banks in coming years.

METHODOLOGY

Only secondary data is applicable to the study. The secondary data is collected through annual reports, websites and the companies brochures , comprehensive reference were made from the reference books, journals and magazines and soon. Ratio Analysis is used as a tool to analyze and interpret the performance and position of the said banks. To analyze the performance and position of the said banks the five years financial statements from Mar07 to Mar11 are used in this article work. I.e. Balance Sheets, P/L A/c's and Cash Flow statements

LIMITATIONS OF THE STUDY

- Since the paper work is carried out for a very short period exhaustive findings could not be made.
- Most of the data is taken from the published sources.

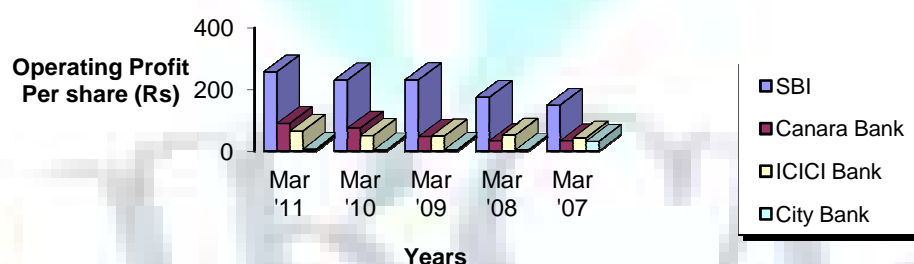
ANALYSIS AND INTERPRETATIONS

TABLES AND CHARTS/ GRAPHS SHOWING FINANCIAL RATIOS ANALYSIS

TABLE 1: OPERATING PROFIT PER SHARE (Rs.)

Operating Profit Per Share (Rs)	Mar '11	Mar '10	Mar '09	Mar '08	Mar '07
SBI	255.39	229.63	230.04	173.61	147.72
Canara Bank	89.40	73.99	47.02	33.29	33.15
ICICI Bank	64.08	49.80	48.58	51.29	42.19
City Bank	6.24	3.56	4.61	3.31	31.38

Chart 1. Operating Profit Per share (Rs)



Source: Dion Global Solutions Limited, <http://www.moneycontrol.com>

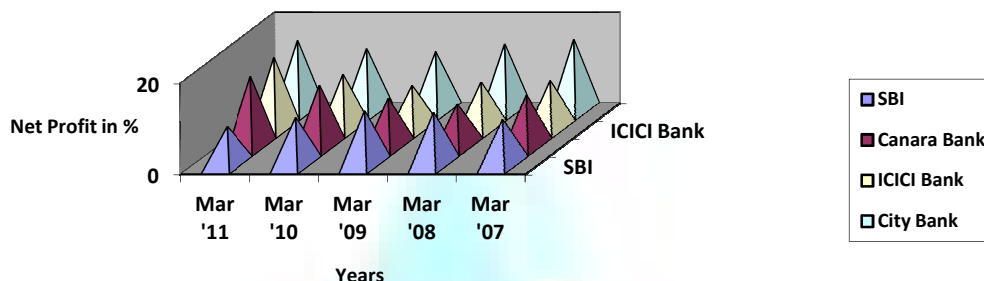
INTERPRETATION: From the above table and graph we can summarize that the Operating Profit Per Share (Rs) of the said banks from Mar 07 to Mar 11 indicates it is in Positive trend. Whereas on a comparative basis we can interpret that public sector banks as shown good performance when compare to private sector banks. I.e. SBI and Canara bank as performed quite good in terms of Operating Profit per share from Mar 07 to Mar 11. On the other way the City bank Operating profit Per share as come down to 6.24 from 31.3. Even though recently the city bank Operating Profit Per Share as increased from Rs.3.56 to Rs.6.24. Overall the performance of city bank is not satisfactory when compare to public sector banks like sbi and canara bank.

INFERENCE : The City bank Operating profit Per share as come down to 6.24 from 31.3. Even though recently the city bank Operating Profit Per Share as increased from Rs.3.56 to Rs.6.24. Overall the performance of City bank is not satisfactory when compare to Public sector banks like SBI and Canara bank. Private Sector banks performance in this aspect need to be improved i.e. CITY bank.

TABLE 2: NET PROFIT MARGIN (%)

Net Profit Margin (%)	Mar '11	Mar '10	Mar '09	Mar '08	Mar '07
SBI	8.55	10.54	12.03	11.65	10.12
Canara Bank	15.65	13.77	10.89	9.61	11.60
ICICI Bank	15.91	12.17	9.74	10.51	10.81
City Bank	15.72	13.94	13.26	14.96	15.98

Chart 2.Net Profit Margin (%)



Source: Dion Global Solutions Limited, <http://www.moneycontrol.com>

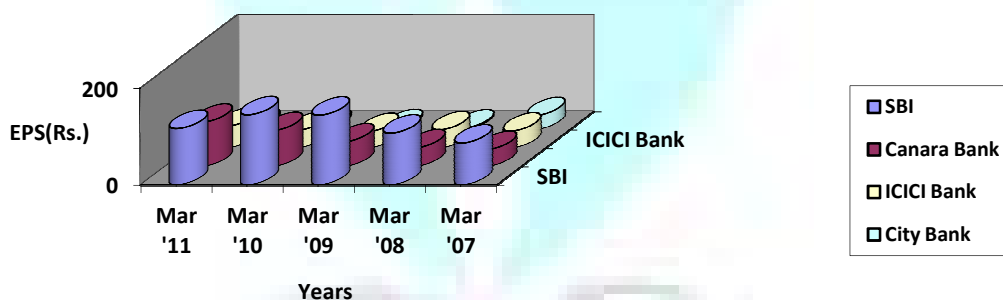
INTERPRETATION: The above table and graph indicates that the Net Profit Margin of the said banks from Mar 07 to Mar 11. We can analyze the Profitability position of the said banks. This is the key aspect of the performance of the said banks. On a comparative basis we can summarize that the SBI Net Profit Margin as come down in Mar 11 i.e. 8.55% from Mar 10, 10.54% on the other side the Canara bank Net profit Margin is showing positive sign and even Private sector banks Net Profit Margin is good and increasing year by year. Finally the Public sector banks like SBI has to take right strategy to improve and to regain the market share and Net profit Margin in the coming Years.

INFERENCE: The Public sector bank like SBI has to hunt right strategy to improve and to regain the market share and Net profit Margin in the coming Years.

TABLE 3: EARNINGS PER SHARE (Rs.)

Earnings Per Share (Rs)	Mar '11	Mar '10	Mar '09	Mar '08	Mar '07
SBI	116.07	144.37	143.67	106.56	86.29
Canara Bank	90.88	73.69	50.55	38.17	34.65
ICICI Bank	44.73	36.10	33.76	37.37	34.59
City Bank	5.31	3.83	3.82	3.18	28.50

Chart 3.Earning Per Share(Rs.)



Source: Dion Global Solutions Limited, <http://www.moneycontrol.com>

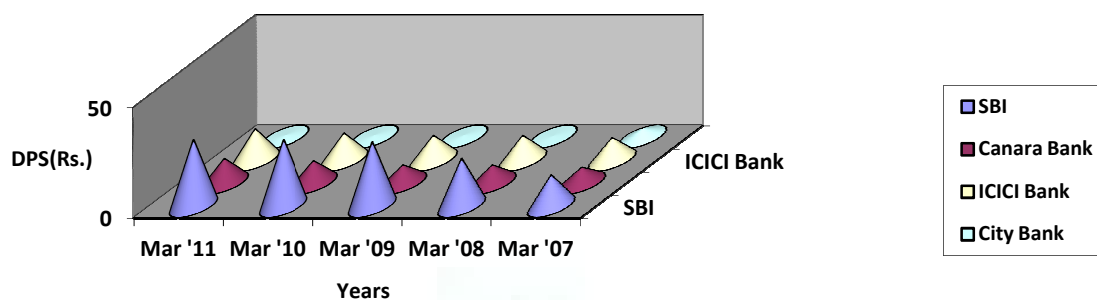
INTERPRETATION: The above table highlights Earning per share of the said banks in terms of EPS (Rs) position and depicts that all four banks is able to match the shareholders expectations. On the comparative basis we can analyze and make out that the EPS (Rs) Position of SBI is reduced when compare to previous year i.e. 144.37 in Mar10 to 116.07 per share which is not good from shareholders point of view. On the other way Canara Bank EPS (Rs) position is sound. In case we analyze the Private Sector banks EPS (Rs) position i.e. ICICI and City Bank both the banks have performed well and satisfied shareholders dreams. Finally the City Bank EPS (Rs) position is positive on a comparative basis the EPS (Rs) is in single digit therefore it is recommended to improve the EPS (Rs) Performance so that the market per share can be improved in coming years.

INFERENCE: The EPS (Rs) Position of SBI is reduced when compare to previous year i.e. 144.37 in Mar10 to 116.07 per share which is not good from shareholders point of view. The City Bank EPS (Rs) position is positive on a comparative basis the EPS (Rs) is in single digit therefore it is recommended to improve the EPS (Rs) Performance of City bank so that the market price per share can be improved in coming years.

TABLE 4: DIVIDEND PER SHARE (Rs.)

Dividend Per Share	Mar '11	Mar '10	Mar '09	Mar '08	Mar '07
SBI	30.00	30.00	29.00	21.50	14.00
Canara Bank	11.00	10.00	8.00	8.00	7.00
ICICI Bank	14.00	12.00	11.00	11.00	10.00
City Bank	0.85	0.75	0.75	0.50	4.00

Chart 4.Dividend Per Share(Rs.)



Source: Dion Global Solutions Limited, <http://www.moneycontrol.com>

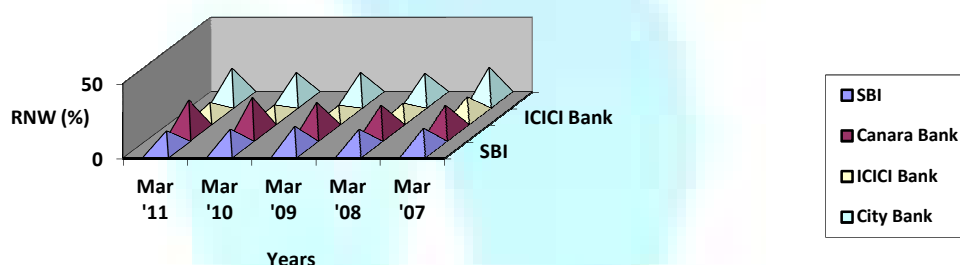
INTERPRETATION: The above table and graph explains the Dividend per share of the said banks. On a comparative basis Public sector banks have shown good performance in distributing dividend which is a return to the shareholders investment i.e. SBI and Canara Bank which is Rs.30 and Rs.11 per share respectively. This is satisfactory and quite rewarding to the shareholders of the respective banks. On the other way the Private sector banks ICICI Bank and City bank's Dividend per share is Rs.14 and 0.85 per share. Finally the Dividend distribution of Private sector banks is still underpaid. Therefore it can be suggested to improve the present dividend position of ICICI Bank and City Bank in coming years.

INFERENCE: The Private sector banks ICICI Bank and City bank Dividend per share is Rs.14 and 0.85 per share. Finally the Dividend distribution of Private sector banks is still underpaid. Therefore it can be suggested to improve the present dividend distribution position of ICICI Bank and City Bank in coming years.

TABLE 5: RETURN ON NET WORTH (%)

Return on Net Worth (%)	Mar '11	Mar '10	Mar '09	Mar '08	Mar '07
SBI	12.71	13.89	15.74	13.72	14.50
Canara Bank	22.43	24.09	20.64	18.86	18.78
ICICI Bank	9.35	7.79	7.58	8.94	13.17
City Bank	21.36	18.50	18.47	17.94	22.03

Chart 5.Return on Net worth (%)



Source: Dion Global Solutions Limited, <http://www.moneycontrol.com>

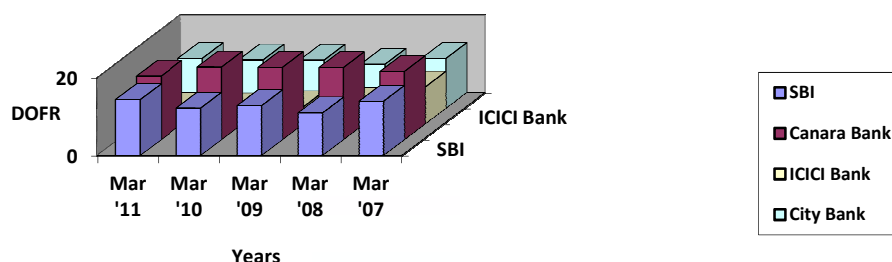
INTERPRETATION: The above table which explains Return on Net worth (%) of the said banks is quite satisfactory of the Public sector banks. This is more than Banking Industry standard 10%. On a comparative basis Public sector banks performance is good i.e. Canara bank which is 22.43% in the year Mar.11 and SBI is 12.71%. On the other way the Private sector banks performance in this aspect i.e. ICICI and City Bank is good. The City Bank position is 21.36% in the year Mar.11 which is quite rewarding in the case of ICICI bank the ratio as come down to 9.35%.Which is dissatisfactory. Therefore it can be suggested to improve the present Return on net worth ratio performance of ICICI Bank in coming years.

INFERENCE: The City Bank Return to Net worth is 21.36% in the year Mar.11 which is quite rewarding in the case of ICICI bank the ratio has come down to 9.35%. This is dissatisfactory. Therefore it can be suggested to improve the present Return on net worth ratio performance of ICICI Bank in coming years.

TABLE 6: TOTAL DEBT TO OWNERS FUND

Total Debt to Owners Fund	Mar '11	Mar '10	Mar '09	Mar '08	Mar '07
SBI	14.37	12.19	12.81	10.96	13.92
Canara Bank	16.39	18.71	18.62	18.57	17.55
ICICI Bank	4.10	3.91	4.42	5.27	9.50
City Bank	12.83	12.46	12.42	11.33	12.85

Chart 6. DEBT TO OWNERS FUNDS



Source: Dion Global Solutions Limited, <http://www.moneycontrol.com>

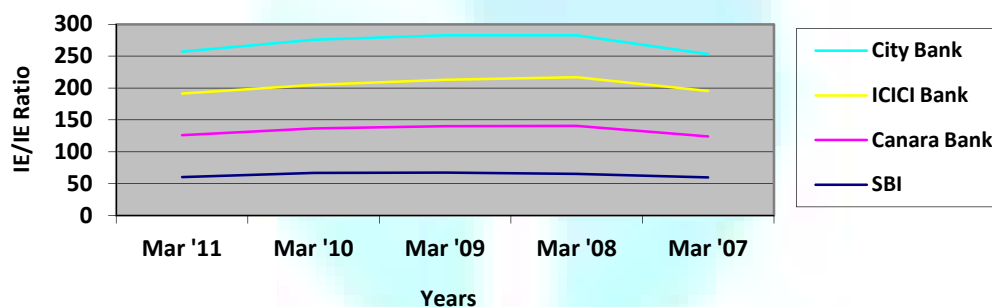
INTERPRETATION: Table Debt to owner's funds ratio explains the debt equity ratio position of the said banks. This ratio is a comparison of Debt to owners funds i.e. equity. And it explains the long term financial position of the said banks. As per banking industrial standard the ratio must be in the proportion of 2:1 in the case of all four banks the ratio is more than the standard. If you take Public sector banks performance i.e. SBI and Canara Bank the ratio is 14.37 and 16.39 respectively in the case of Private sector banks i.e. ICICI and City Bank the ratio is 4.10 and 12.83 respectively. This reveals that all the banks have adopted excessive trading on equity. This is high risk for the banks and the Public sector banks i.e. SBI and Canara Bank are running under high risk. The Management have to look on this current issue.

INFERENCE: Public sector banks performance i.e. SBI and Canara Bank the ratio is 14.37 and 16.39 respectively in the case of Private sector banks i.e. ICICI and City Bank the ratio is 4.10 and 12.83 respectively. This reveals that all the banks have adopted excessive trading on equity. This is high risk for the banks and the Public sector banks i.e. SBI and Canara Bank are running under high risk. The Management has to look on this current issue.

TABLE 7: INTEREST EXPENDED/ INTEREST EARNED

Interest Expended / Interest Earned	Mar '11	Mar '10	Mar '09	Mar '08	Mar '07
SBI	60.04	66.66	67.28	65.23	59.35
Canara Bank	66.08	69.71	72.44	75.09	64.57
ICICI Bank	65.29	68.44	73.09	76.28	71.14
City Bank	65.53	70.92	69.84	65.90	58.13

Graph 7. Interest Expended/Interest Earned



Source: Dion Global Solutions Limited, <http://www.moneycontrol.com>

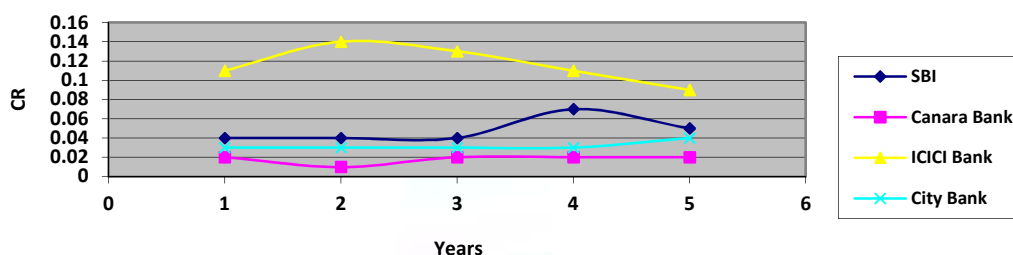
INTERPRETATION: The above table and graph explains the comparison of expenses with income of the said banks. I.e. Interest paid with Interest earned. The four banks ratio is good and performance is in the same range. I.e. more than 60 on a comparative basis we can interpret that both Public sector banks i.e. SBI and Canara bank as well as private sector banks i.e. ICICI and City bank has to strive hard to reduce the interest cost so that the profit can be increased in the coming years.

INFERENCE: The four banks ratio is good and performance is in the same range. I.e. more than 60 on a comparative basis we can interpret that both Public sector banks i.e. SBI and Canara bank as well as private sector banks i.e. ICICI and City bank as to strive hard to reduce the interest cost so that the profit can be increased in the coming years.

TABLE 8: CURRENT RATIO

Current Ratio	Mar '11	Mar '10	Mar '09	Mar '08	Mar '07
SBI	0.04	0.04	0.04	0.07	0.05
Canara Bank	0.02	0.01	0.02	0.02	0.02
ICICI Bank	0.11	0.14	0.13	0.11	0.09
City Bank	0.03	0.03	0.03	0.03	0.04

Graph 8.Current Ratio



Source: Dion Global Solutions Limited, <http://www.moneycontrol.com>

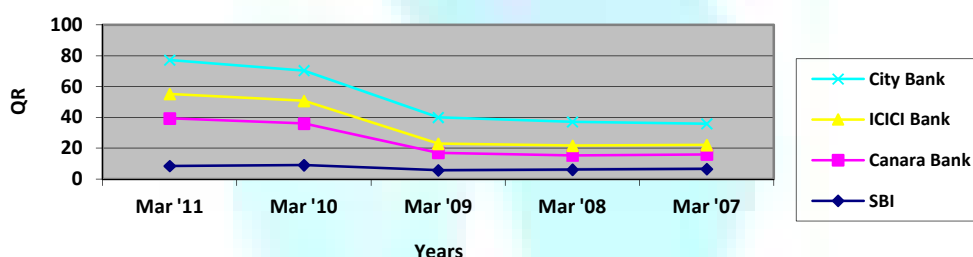
INTERPRETATION: The above table and graph explains the working capital position i.e. short term financial position of the said banks. Current ratio is a comparison of Current Assets with Current liabilities. As per banking industrial standard the ratio must be in the proportion of 2:1. If you go through the above table and graph we can analyze and interpret that the ratio performance of all four banks is more than the requirement due to CRR and SLR requirements time to time. The Comparative analysis of Public sector with Private Sector banks i.e. SBI, Canara bank VS ICICI and City Bank the ICICI bank ratio is 0.11 which is quite high in the Mar11. In this regard it can be advisable to the management of ICICI bank to invest excess funds to improve the liquidity position in the coming years.

INFERENCE: The Comparative analysis of Public sector with Private Sector banks i.e. SBI, Canara bank VS ICICI and City Bank the ICICI bank ratio is 0.11 which is quite high in the Mar11. In this regard it can be advisable to the management of ICICI bank to invest excess funds to improve the liquidity position in the coming years.

TABLE 9: QUICK RATIO

Quick Ratio	Mar '11	Mar '10	Mar '09	Mar '08	Mar '07
SBI	8.50	9.07	5.74	6.15	6.52
Canara Bank	30.86	26.98	11.29	9.17	9.49
ICICI Bank	15.86	14.70	5.94	6.42	6.04
City Bank	22.03	19.69	17.02	15.42	13.84

Graph 9.Quick Ratio



Source: Dion Global Solutions Limited, <http://www.moneycontrol.com>

INTERPRETATION: The above table and graph explains the working capital position i.e. short term financial position of the said banks. Quick ratio is a comparison of quick Assets with quick liabilities. As per banking industrial standard the ratio must be in the proportion of 1:1. If you go through the above table and graph we can analyze and interpret that the ratio performance of all four banks is more than the requirement due to CRR and SLR requirements time to time. The Comparative analysis of Public sector with Private Sector banks i.e. SBI, Canara bank VS ICICI and City Bank the Public sector banks i.e. Canara Bank Ratio in the year Mar11 is 30.86 and the SBI is 8.50. On the Other way the Private sector banks i.e. ICICI and City bank ratio in the year Mar11 is 15.86 and 22.03 respectively. It can be advisable to invest excess funds so that the banks can enhance their liquidity position in coming years.

INFERENCE: The Comparative analysis of Public sector with Private Sector banks i.e. SBI, Canara bank VS ICICI and City Bank the Public sector banks i.e. Canara Bank Ratio in the year Mar11 is 30.86 and the SBI is 8.50. On the Other way the Private sector banks i.e. ICICI and City bank ratio in the year Mar11 is 15.86 and 22.03 respectively. It can be advisable to invest excess funds so that the banks can enhance their liquidity position in coming years.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

FINDINGS

1. The City bank Operating profit Per share as come down to 6.24 from 31.3. Even though recently the city bank Operating Profit Per Share as increased from Rs.3.56 to Rs.6.24. Overall the performance of City bank is not satisfactory when compare to Public sector banks like SBI and Canara bank.
2. On a comparative basis we can summarize that the SBI Net Profit Margin as come down in Mar 11 i.e. 8.55% from Mar 10, 10.54% on the other side the Canara bank Net profit Margin is showing positive sign and even Private sector banks Net Profit Margin is good and increasing year by year.
3. The EPS (Rs) Position of SBI is reduced when compare to previous year i.e. 144.37 in Mar10 to 116.07 Mar 10 per share which is not good from shareholders point of view. The City Bank EPS (Rs) position is positive on a comparative basis the EPS (Rs) is in single digit.
4. The Private sector banks ICICI Bank and City bank Dividend per share is Rs.14 and 0.85 per share. Finally the Dividend distribution of Private sector banks is still underpaid.
5. The City Bank Return to Net worth is 21.36% in the year Mar.11 which is quite rewarding in the case of ICICI bank the ratio has come down to 9.35%. This is dissatisfactory.
6. Public sector banks performance i.e. SBI and Canara Bank the debt to owner's funds ratio is 14.37 and 16.39 respectively in the case of Private sector banks i.e. ICICI and City Bank the ratio is 4.10 and 12.83 respectively. This reveals that all the banks have adopted excessive trading on equity. This is high risk for the banks and the Public sector banks i.e. SBI and Canara Bank are running under high risk.
7. The four banks interest expended/interest earned ratio is good and performance is in the same range. I.e. more than 60 on a comparative basis
8. The Comparative analysis of Public sector with Private Sector banks i.e. SBI, Canara bank VS ICICI and City Bank the ICICI bank Current ratio is 0.11 which is quite high in the Mar11.

RECOMMENDATIONS

1. Private Sector banks performance in Operating Profit per Share ratio need to be improved i.e. CITY bank in coming years.
2. The Public sector bank like SBI has to take right strategy to improve and to regain the market share and Net profit Margin in the coming Years.
3. It is recommended to improve the EPS Rs) Performance of City bank so that the market price per share can be improved in coming years.
4. It can be suggested to improve the present dividend per share distribution position of ICICI Bank and City Bank in coming years.
5. It can be suggested to improve the present Return on net worth ratio performance of ICICI Bank in coming years.
6. The Management of SBI and Canara Bank has to look upon to current debt to owner's funds ratio.
7. ICICI and City bank as to strive hard to reduce the interest cost so that the profit can be increased in the coming years.
8. It can be advisable to invest excess funds so that the banks like SBI, Canara bank and ICICI, City bank can enhance their liquidity position in coming years.

CONCLUSION

While public sector banks i.e. SBI and Canara bank are in the process of restructuring, private sector banks i.e. ICICI and City bank are busy consolidating through mergers and acquisitions (the sector has been recently opened up for foreign investments). Public Sector Bank's need to improve in the services like ATM's, Credit and Debit cards. They lack behind in providing facilities like loans and other accounts. These branches are not interlinked with each other and working hours are less. In case of Private sector banks i.e. ICICI and City banks customers are not aware of the facts and hidden costs in view, as there are various products and facilities provided by the banks.

All four banks are performing well and striving hard to compete in the current competitive Indian banking sector. Public sector Banks i.e. SBI and Canara banks are performing well. In fact recent statistics says SBI has lost its market share and Canara bank is performing well in all most all parameters. Whereas Private sector banks i.e. ICICI and City bank are also doing well. In fact City bank has adopted an ethical ways to collect dues from customers which is quite not acceptable.

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DATA MINING APPLICATION IN TRANSPORT SECTOR WITH SPECIAL REFERENCE TO THE ROAD ACCIDENTS IN KERALA

DR. JOHN T. ABRAHAM
DIRECTOR (ACADEMIC)
MOUNT ZION COLLEGE OF ENGINEERING
KADAMMANITTA

SWAPNA K. CHERIAN
ASST. PROFESSOR
DEPARTMENT OF COMMERCE
MSM COLLEGE
KAYAMKULAM

ABSTRACT

Data mining is widely applied in business applications including market segmentation, customer profiling, fraud detection, evaluation of retail promotions, credit risk analysis insurance policy, and in some military operations. The authors make use of the various concepts for analyzing and deriving the data with regard to the occurrence of accidents, death rate, injuries in relevance to transport of Kerala by both objective and subjective methods. Analysis is performed using LISp-Miner which is an academic project for support research and teaching of knowledge discovery in databases.

KEYWORDS

Data mining, transport, Knowledge discovery.

INTRODUCTION

Data mining can be defined as the non-trivial extraction of implicit, previously unknown, yet potentially useful information from data, and may be defined as the science of extracting useful information from large data sets or databases. Data-mining has the ability to discover patterns stored within historical data and is now considered a catalyst for enhancing business process by avoiding failure patterns and exploiting success patterns. With the help of data mining, derived knowledge, relationships and conclusions are often represented as models or patterns. The process is known as knowledge discovery in databases (KDD). Properly analyzing data and detecting these patterns is therefore of great importance to businesses. State Transportation Agencies (STAs) maintain their own project databases in many places. Data mining can provide a great tool for discovering the wealth of information contained in transport data. The term "KDD" is generally employed to describe the whole process of extraction of knowledge from data and the term "data mining" is often used exclusively for the discovery stage of the KDD process.

Data mining does not replace traditional statistical techniques. But, it is an extension of statistical methods. Statistical methods alone cannot automatically reveal all the possible hidden relationships within the database. A complex relationship indicating a job overhead increases proportionally with the number of change orders during a season of high productivity projects can be hidden within the projects database and can be detected using data mining techniques.

This paper describes a research effort undertaken to explore the applicability of data mining to a potential application in the transport industry. The goal was to discover any hidden rules of patterns stored within the data. Data mining was used to reveal unknown patterns and trends in the database of paving projects. Several data mining techniques have been developed over the last decade. Generally, the data mining techniques can be categorized in four categories, depending on their functionality: classification, clustering, numeric prediction, and association rules. The main difference between the different techniques is in the way they extract information (algorithms and methods used) and how results (knowledge discovery/rules) are expressed.

Classification is a data mining function that assigns items in a collection to target categories or classes. The goal of classification is to accurately predict the target class for each case in the data. For example, a classification model could be used to identify loan applicants as low, medium, or high credit risks. A classification task begins with a data set in which the class assignments are known. Clustering is a data mining (machine learning) technique used to place data elements into related groups without advance knowledge of the group definitions. Popular clustering techniques include k-means clustering and expectation maximization (EM) clustering. The ultimate goal of data mining is prediction - and predictive data mining is the most common type of data mining and one that has the most direct business applications. The process of data mining consists of three stages: (1) the initial exploration, (2) model building or pattern identification with validation/verification, and (3) deployment. In data mining, association rule learning is a popular and well researched method for discovering interesting relations between variables in large databases. Piatesky-Shapiro [1] describes analyzing and presenting strong rules discovered in databases using different measures of interestingness.

ANALYTIC METHODS

The core of all KDD processes is the use of analytic methods. The input to the analytic procedures is the prepared data, and the output is discovered knowledge. Analytic methods include regression analysis, discriminatory analysis, cluster analysis, decision trees and association rules. The data mining technique used in this research is association learning. In association learning, the goal is to discover any interesting patterns in the data by discovering association rules. Association rules differ from classification rules in two ways: they can predict any attribute (not just the group or class), and they can predict more than one attribute's value at a time. A typical association rule is represented in the following way:

Cause₁, Cause₂ => Result (or consequence)

That is, if Cause₁ and Cause₂ hold then Result (the association rule) applies, for n% of cases with x% confidence.

Each rule extracted is usually provided with a confidence level and a support. The confidence is the statistical value presenting the probability of a certain rule and the support is the number of cases/projects in which the rule is found. A pattern is defined as several identical or similar rules indicating a trend. Most of the data mining techniques use statistical tests when constructing rules or patterns and also for correcting models that depend too strongly on particular records in producing the rules and patterns (Feldens 2002). Since the goal when analyzing the dataset collected here was to detect any potentially useful patterns, association learning was he data mining technique selected to analyze the dataset collected in this paper.

The goal of the techniques in association rule is to detect relationships or associations between specific values of categorical variables in large data sets. LISp-Miner is an academic project for support research and teaching of knowledge discovery in databases. It is suitable namely for students, pilot and mid-size KDD projects. The core of the system is several KDD procedures capable to give answers to various both standard and non-standard analytical questions. There are also modules to solve some additional tasks.

SIGNIFICANCE OF PUBLIC TRANSPORT

Buses are one of the most important public transport services prevailing in India. It is the main source of linkage with Urban and Rural areas. In areas where railways have not reached, the main connectivity of remote area with towns and cities are made possible only because of public transport systems. These public transport systems are predominantly owned and operated by public agencies and by the state government. The state Road Transport Corporation introduced in 60s and 70s has paved the way in connecting villages and towns across the country.

India has a network of National Highways connecting all major cities and state capitals. As of 2005 India has a total of 66590 Km of national highway. Under National Highways Development project (NHDP) work is progressing to equip some of the important national highways into four lane. This authority opines that about 65% of the freight and 80% of the passenger traffic is carried by roads. The national highways carry about 40% of total road traffic even though only 2% of the road network is covered by highways. Vehicles grow at an average rate of 10.16% per annum. About 40 % of the villages in India lack access to all weather road and remain isolated during monsoon. As per 2009 estimate the total road length in India is 3320410 Kms which makes Indian road network the third largest road network in the world.

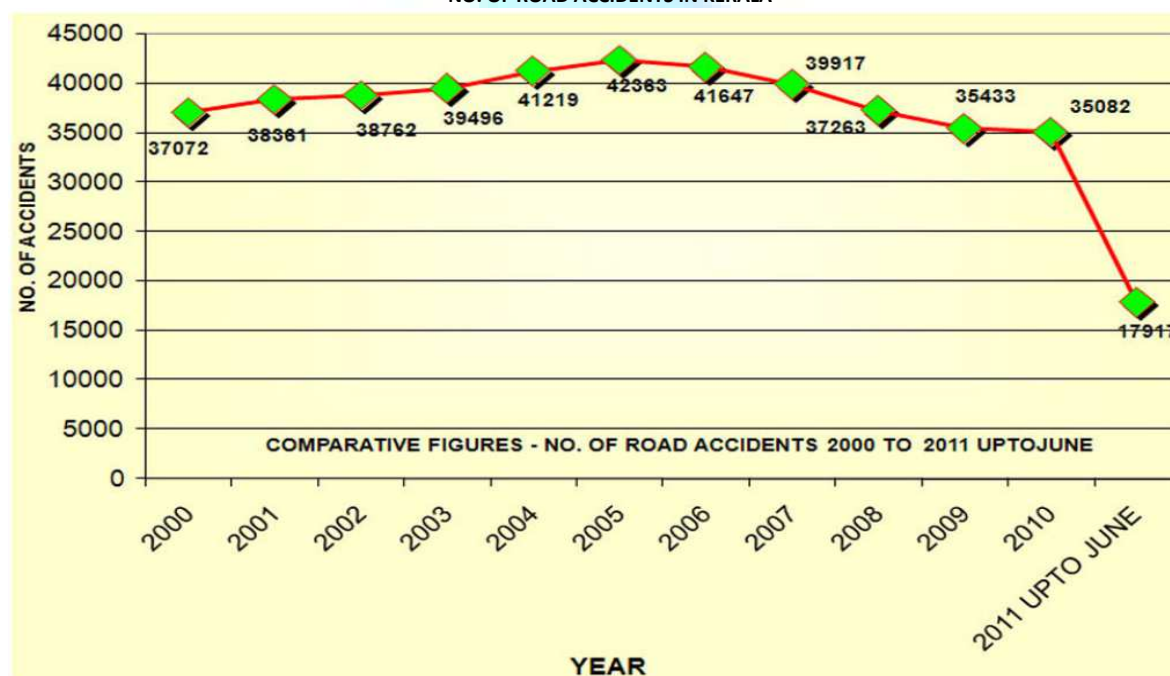
As per the road accident data published by the National Transportation Planning and Research Centre (NATPAC), Kerala has become the second most accident-prone State in the country. Almost an average of 12 persons die per day due to road accidents. In a square kilometer of area, the road accidents in Kerala is three times more than the national average. Considering the density of population and the area of the state, the occurrence of road accidents in Kerala is the highest in the country.

YEAR-WISE ACCIDENT OCCURRENCE TABLE

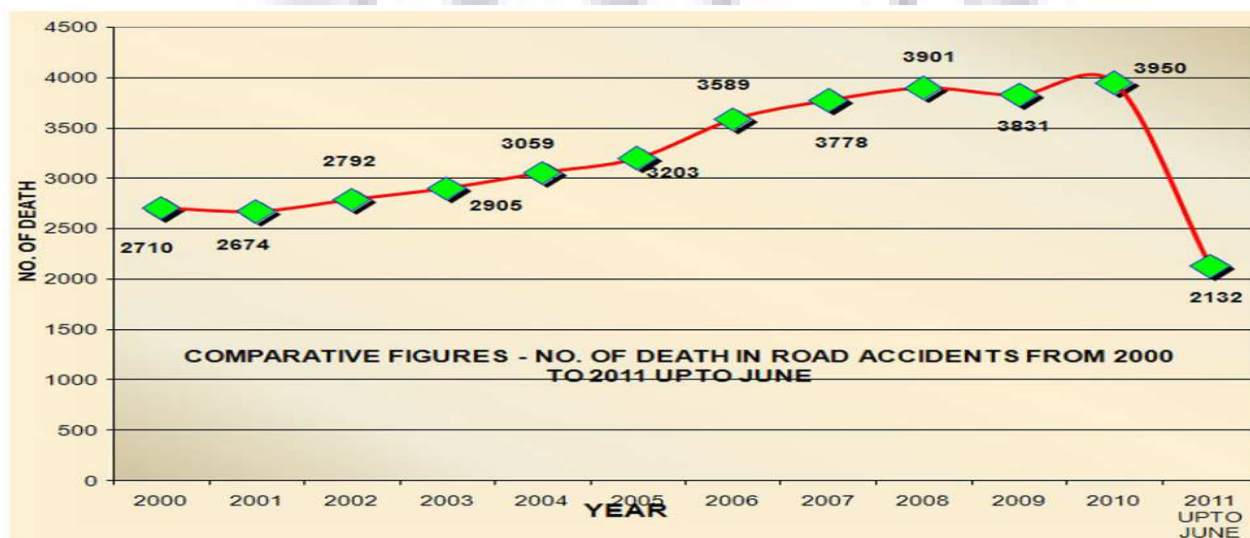
Field	Data type	Meaning
Rec-ID	Text	Primary Key
Year	Numeric	The Calendar Year
NOA	Numeric	No. of Accidents
NOD	Numeric	No. of Deaths
NOI	Numeric	No. of Injured

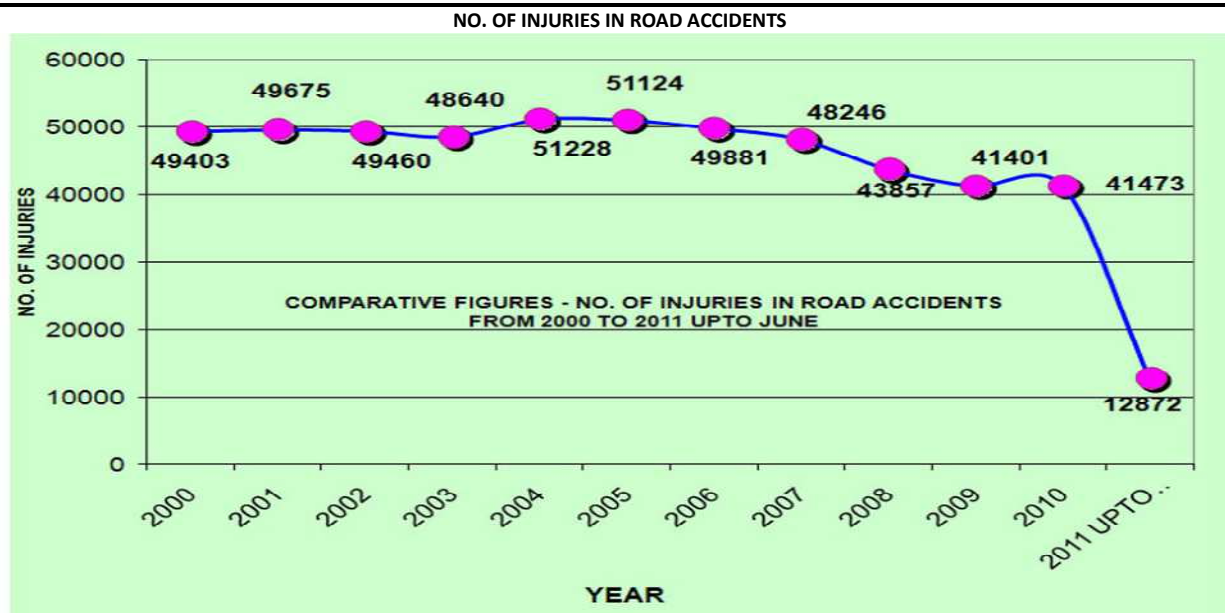
Association rules are generated and hypotheses are created with attributes, and must therefore be collected in a simple data table.

NO. OF ROAD ACCIDENTS IN KERALA



NO. OF DEATHS IN ROAD ACCIDENTS





CONCLUSION

The "long term" Pattern has a higher deposited value, and can be used for modifying timetables for adjusting the driving time between bus schedules. The statistics of accidents divulge much interesting statistical information. About 35082 accidents were recorded in the database in the year 2010. The greatest number of accidents during the day may be assumed to have occurred during the rush hour. The greatest number of accidents occurred in early morning hours. On the other hand, the total number of accidents in the evening, and at night, is below twenty per hour, appreciably fewer than in other hours of the day.

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RURAL MARKETS-A NEW FORCE FOR MODERN INDIA

RICHARD REMEDIOS
PRINCIPAL
S.V.E.T. COMMERCE & MANAGEMENT COLLEGE
SARU SECTION ROAD
JAMNAGAR

ABSTRACT

Research firms have started conducting surveys, academicians published papers and business had made inroad on the area called rural market. The word on everybody lips are - "The real India lives in the village". Rural Marketing is not an uncommon psychology anymore. There has been a radical change in the way marketers are framing their strategies for rural parts of India. It is startle-ting to point out here that Rural Marketing has witnessed unprecedented growth with increasing purchasing power of the people living in rural India. Consumers hailing from these parts are unquestionably growing "fashionable" in their taste. The present research paper consists of the study understanding emerging trends in Rural Marketing in Indian context. India being a developing economy has opened-up flood gates for ample opportunities for producers and marketers to tape and explore potential consumers living in rural India. For understanding the different trends surfacing in the area of rural marketing, I have heavily relied on secondary data comprising of articles from the pages of newspaper, magazines and periodicals. Different business websites have been good source of information for drawing clear-cut picture of rural marketing. In Present paper researcher has focused on the changing face of rural India from the eyes of marketer's perspectives as the Indian Rural Market is extremely fragmented, having small number of players on the seller's side and large number of player on the buyer side.

KEYWORDS

fashionable, opportunities, psychology, surveys.

INDIAN RURAL MARKETS: BRIEF OVERVIEW

Rural India accounts for almost 70 per cent of the population as the recent Census 2011 indicates that of the 1.21 billion population, 833 million live in rural India. The clan has been exposed to new communication technologies and a plethora of services which has strengthened its aspirations to become an urbanised society. According to a recent Technopak report, rural Indian economy is highly supported by increasing disposable income, Government initiatives and schemes and favourable demographics. As a result, the rural segment of the Indian economy is growing at a pace of 8-10 per cent per annum and is anticipated to add new consumption of US\$ 90 billion-100 billion over 2012-2017 to the current base of US\$ 240 billion-250 billion. Moreover, the growth of rural India is largely attributed by increasing awareness about need of education. According to the ASER (2012) report, private school enrolment in rural India has enhanced by 5.5 per cent points over past six years. The literacy rate has also gone up by 68.91 per cent in rural India. From the strict marketing point of view, the market structure in India is dichotomous having rural and urban markets. But many do not occur with this needs, aspirations, beliefs and attitudes will also be the same. The fact, however, separate marketing strategies to be distinctively developed to suit the rural and urban market behavior. Conditions existing in urban market at present can also be analyzed in this context. First, the urban markets have almost reached a saturation level that further tapping them with a high profit margin has become difficult. Secondly, competition is becoming tough in urban markets compelling many firms to incur heavy costs in promotional expenditure. Thirdly, the awareness level of urban consumers is high and hence product features have to be changed often. Needless to say this process needs a huge investment which will have a negative impact on profitability. Thus, except perhaps for easy reach the urban markets have become as oasis.

SIGNIFICANCE OF RURAL MARKETS

The rural markets are estimated to be growing fastly compared to the urban markets. The potentiality of rural markets is said to be like a „woken up sleeping giant“. These facts are sustained in a study of market growth conducted by various researches. In recent years, rural markets have acquired significance in countries like China and India, as the overall growth of the economy has resulted into substantial increase in the purchasing power of the rural communities. On account of the green revolution in India, the rural areas are consuming a large quantity of industrial and urban manufactured products. In this context, a special marketing strategy, namely, rural marketing has taken shape. Sometimes, rural marketing is confused with agricultural marketing – the later denotes marketing of produce of the rural areas to the urban consumers or industrial consumers, whereas rural marketing involves delivering manufactured or processed inputs or service to rural producers or consumers.

A number of factors have been organized as responsible for the rural market boom to come into existence:

1. Increase in population and hence increase in demand.
2. A marked increase in the rural income due to agrarian prosperity.
3. Standard of living is also increasing in rural areas.
4. Large inflow of investment for rural development programmer from government and other sources.
5. Increased contact of rural people with their urban counterparts due to development of transport and wide communication network.
6. Increase in literacy and educational level and resultant inclination to sophisticated lives by the rural folks.
7. Inflow of foreign remittances and foreign made goods into rural areas.
8. Change in the land tenure systems causing a structural change in the ownership patterns and consequent changes in the buying behavior.
9. Rural markets are laggards in picking up new products. This will help the companies to phase their marketing efforts. This will also help to sell inventories of products out dated in urban markets.

WHAT MAKES RURAL MARKETS ATTRACTIVE?

Rural markets has following arrived and the following facts substantiate this:

- 742 million people
- Estimated annual size of the rural market - FMCG Rs. 65,000 Crores - Durables Rs. 5,000 Crores - Agri-inputs (incl. tractors) Rs. 45,000 Crores - 2/4 Wheelers Rs. 8,000 Crores
- In 2001-02, LIC sold 55% of its policies in rural India.
- Of two million BSNL mobile connections, 50% in small towns/villages.
- Of the six lakh villages, 5.22 lakh have a Village Public Telephone (VPT)
- 41 million Kisan Credit Cards issued (against 22 million credit-plus-debit cards in urban) with cumulative credit of Rs. 977 billion resulting in tremendous liquidity.
- Of 20 million Rediff mail groups, 60% are from the small towns. 50% transactions from these towns on Rediff online shopping site.

CHANGING RURAL CONSUMER

Rural market differs by geography, occupation, social and cultural factors. This in turn influence of product design, promotion, pricing and use of channels. There is need to develop positioning and product variant according to geography and social grouping.

The product offering in rural market need to reflect the product use-situation. The changing behavior of a segment of rural market suggests an initial entry strategy of mimicking the urban marketing programme. The product and packaging are to be creatively used for developing and delivering value. The product attribute and feature should reflect the environment of that consumer.

STRATEGIES

Dynamics of rural markets differ from other market types, and similarly rural marketing strategies are also significantly different from the marketing strategies aimed at an urban or industrial consumer. Rural markets and rural marketing involve a number of strategies, which include:

- 5.1. Client and Location specific Promotion: It involves a strategy designed to be suitable to the location and the client.
- 5.2. Joint or Co-operative Promotion strategy: It involves participation between the marketing agencies and the client.
- 5.3. 'Building of Inputs': It denotes a marketing strategy, in which several related items are sold to the target client, including arrangements of credit, after sale service, and so on. Management of demand involves continuous market research of buyer's needs and problems at various levels so that continuous improvements and innovations can be undertaken for a sustainable market performance.
- 5.4. Developmental marketing: It refers to taking up marketing programmes keeping the developmental objective in mind and using various managerial and other inputs of marketing to achieve these objectives.
- 5.5. Media, both traditional as well as the modern media: It is used as a marketing strategy.
- 5.6. Unique Selling Promotion (USP): It involves presenting a theme with the product to attract the client to buy that particular product. For examples, some of famous Indian Farm equipment manufacturers have coined catchy themes, which they display along with products, to attract the target client that is the farmers.
- 5.7. Extension Services: It denotes, in short, a system of attending to the missing links and providing the required know-how. Ethics in Business Form, as usual, an important plank for rural markets and rural marketing. Partnership for sustainability involves laying and building a foundation for continuous and long lasting relationship.

OPPORTUNITIES

1. Infrastructure is improving rapidly - In 50 years only 40% villages connected by road, in next 10 years another 30%.
2. More than 90% villages electrified, though only 44% rural homes have electric connections.
3. Rural telephone density has gone up by 300% in the last 10 years; every 1000+ population is connected by STD.
4. Social Indicators have improved a lot between 1981 and 2001
5. Number of "pucca" houses doubled from 22% and 41% and "Kuccha" houses halved (41% to 23%)
6. Rural literacy level improved from 36% to 59%

PROBLEMS RELATED TO RURAL MARKETING

1. **BARTER SYSTEM:** In a developing country like India, even today the barter systems i.e. exchange of goods for goods exists. This is a major obstacle in the way of development of rural marketing.
2. **UNDERDEVELOPED PEOPLE & UNDERDEVELOPED MARKETS:** The agricultural technology has tried to develop the people and market in rural areas. Unfortunately, the impact of the technology is not felt uniformly through out the country. Some districts in Punjab, Haryana or western Uttar Pradesh where rural consumer is somewhat comparable to his urban counterpart, there are large areas and groups of people who have remained beyond the technological breakthrough. In addition, the farmers with small agricultural land holdings have also been unable to take advantage of the new technology.
3. **LACK OF PROPER PHYSICAL COMMUNICATION FACILITIES:** Nearly 50 percent of the villages in the country do not have all weather roads. Physical communication to these villages is highly expensive. Even today, most villages in eastern part of the country are inaccessible during monsoon season.
4. **INADEQUATE MEDIA COVERAGE FOR RURAL COMMUNICATION:** A large number of rural families in own radios and television sets there were also community radio and T.V. sets. These have been used to diffuse agricultural technology to rural areas. However the coverage relating to marketing inadequate.
5. **MANY NLANGUAGES:** The numbers of languages vary from state to state, region to region. This type of distribution of population warrants appropriate strategies to decide the extent of coverage of rural market.
6. **MARKET ORGANISATION & STAFF:** The size of the market organization and staff is very important, to manage market system effective control. However the existing organizational setup particularly at district and block level needs to be strengthened in order make the services on various aspects available to the farmers timely and also easily accessible to them.

EMERGING TRENDS IN RURAL MARKETS

1. **ONLINE RURAL MARKET:** Rural people can use the two-way communication through on-line service for crop information, purchases of Agri-inputs, consumer durable and sale of rural produce online at reasonable price. Farm information online marketing easily accessible in rural areas because of spread of telecommunication facilities all over India. Agricultural information can get through the internet if each village has small information office.
2. **INFORMATION THROUGH LOCAL AGRICULTURE INPUT DEALERS:** Most of the dealers have direct touch with the local farmers: these farmers need awareness about pests, disease, fertilizers, seeds, technology and recent developments. For this information, farmers mostly depend on local dealers. For development of rural farmers, the government may consider effective channel and keep information at dealers, for farmer education hang notice board and also train the dealer recent changes and developments in agriculture.
3. **COST BENEFIT ANALYSIS:** Cost benefit can be achieved through development of information technology at the doorsteps of villagers: most of the rural farmers need price information of agri-produce and inputs. If the information is available farmers can take quick decision where to sell their produce, if the price matches with local market farmer no need to go near by the city and waste of money and time it means farmers can enrich their financial strength.
4. **NEED BASED PRODUCTION:** Supply plays major role in price of the rural produce, most of the farmers grow crops in particular seasons not through out the year, it causes oversupply in the market and drastic price cut in the agricultural produce. Now the information technology has been improving if the rural people enable to access the rural communication, farmers awareness can be created about crops and forecasting of future demand, market taste. Farmers can equate their produce to demand and supply they can create farmers driven market rather than supply driven market. If the need based production system developed not only prices but also storage. If the need based production system developed not only price but also storage cost can be saved. It is possible now a days the concept of global village.
5. **MARKET DRIVEN EXTENSION:** Agricultural extension is continuously going through renewal process where the focus includes a whole range of dimensions varying from institutional arrangements, privatization, decentralization, partnership, efficiency and participation. The most important change that influences the extension system is market forces. There is a need for the present extension system to think of the market driven approach, which would cater the demands of farmers.
6. **PROCESSING INDUSTRY:** India is the second largest producer of fruits and vegetables in the world with an annual production of more than 110 million tones of fruit and vegetable only 1.3 percent of the output is processed by the organized sector commercially, the reason higher consumption in fresh form. However,

as the packaging transportation and processing capacities increase the market for processed fruits and vegetables is projected to grow at the rate of about 20% per annum. 100% export oriented units (EOU) and joint venture units required improving the processing industry.

7. RURAL AGRI-EXPORTS: Rural products, raw fruits and vegetable, processing goods have the potential market in Asian, Europe and Western countries.

DECISION IMPLICATIONS

Marketers can target consumers according to their unmet needs on price or product features and develop new markets through unique positioning. The product and packaging are to be creatively used for developing and delivering value. The product attributes and features. Marketers can use product and package design to influence perception. The size, shape and color are important cues that a rural marketer can use to communicate effectively and create a favorable attitude. Distinct colors, designs and symbols help the illiterate rural consumer identify the brand. The ability to leverage strengths either in distribution or costs is important to deliver the value offering. Value and not price is important in rural markets. It is relative value that is important and so the launch price of a new product has to take into account the price of substitute products. In the case of nonessential items for which the consumer pays a large sum, demand for quality and preference for a brand name suggests offering a high priced model in addition to offering a stripped down version. In the case of high-priced durables, the market potential can be enlarged through hiring the product. The presence of a large number of consumers has implications for package size of non-durables.

EXAMPLES

- Godrej recently introduced three brands of Cinthol, fair glow and Godrej in 50-gm packs, priced at Rs 4-5 meant specifically for Madhya Pradesh, Bihar and Uttar Pradesh – the so-called Bimaru states.
- Hindustan Lever, among the first MNCs to realize the potential of India's rural market, has launched a variant of its largest selling soap brand, Lifebuoy at Rs 2 for 50 gm.
- Coca-Cola has also introduced Sunfill, a powdered soft-drink concentrate. The instant and ready-to-mix Sunfill is available in a single-serve sachet of 25gm prices at Rs 2 and multi serve sachet of 200 gm prices at Rs. 15.
- LG Electronics defines all cities and towns other than the seven metros cities as rural and semi-urban market. To tap these unexplored country markets, LG has set up 45 area offices and 59 rural/remote area offices.
- ICICI BANK customized their rural ATMs, so they can operate biometric authentication. ICICI rural ATMs are battery operated so that power failure is not issue. Bank of India introduced Bhumiheen credit cards for providing credit card facilities to landless farmers.
- Nokia develop affordable mobile phones for rural markets with unique features such as local language capabilities, present time/call limits etc.
- Philips developed „free power radio. This radio does not require power and battery also. It runs on simple winding of level provided in the set. The price of this attractive set is Rs.995.

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ASSESSMENT OF TRAINING NEEDS AND EVALUATION OF TRAINING EFFECTIVENESS IN EMPLOYEES OF SELECT ITes COMPANIES AT BANGALORE

DR. ANITHA H. S.
PROFESSOR & CHAIRPERSON
DEPARTMENT OF COMMERCE
DAVANAGERE UNIVERSITY
DAVANAGERE

SOWMYA K. R.
LECTURER
DEPARTMENT OF COMMERCE
VIVEKANANDA COLLEGE
BANGALORE

ABSTRACT

The ITes industry, which is a rapidly growing industry in India, is not an exclusive of the industry affected by the Innovative HR trends, moreover it is the mainly the cause and effected industry for the innovations in HRM. It is necessary to upgrade and restructure every time to withstand and face the situations. Training is one such instrument which can be used to upgrade. Training is the process of acquiring and improving the skills, knowledge, and attitudes required for job performance; it is an investment an organization makes in itself. While training can take many forms, the desired end is generally the same: improved performance of job-related tasks. Further, the quality of the training output is only as good as the training data input. The purpose of evaluating training is quite simply to establish whether the training objectives have been met and, if so, whether this has resulted in solving the problem addressed by those objectives. This can be done with the help of various techniques and the choice of the suitable technique is dependent on the nature of the organization and area of training. It concludes that training is only a comma not a full stop. Training is an investment not an expense. Despite any recession, it should be maintained, as a continuous process to ensure organizations has to remain competitive and productive.

KEYWORDS

ITes, Training Need Assessment, Training Effectiveness Evaluation

INTRODUCTION

Human Resource Management is concerned with the planning, acquisition, training and developing of human beings for getting the desired objectives and goals set by the organization. The employees have to be transformed according to the organizations' & global needs with the help of an organized activity called Training. Since training involves time, effort and money an organization should be very careful while designing a training program. The objectives and need for training should be clearly identified and the method or type of training should be chosen according to the needs and objectives established. Once this is done accurately, an organization can evaluate the training program so as to know whether the amount and time invested on training has turned into an investment or it was a total expenditure for an organization.

The training need assessment and evaluation of its effectiveness is a critical activity for the training and development function. Designing a training and development program starts with the need assessment and ends with evaluation of its effectiveness. To be effective and efficient, all training programs must start with a needs assessment. Long before any training occurs, the training manager must determine the who, what, when, where, why and how of training. Conducting an assessment is a way to collect information that can be used to decide what type of development will be perceived as relevant and useful. An assessment enables a conversation to take place that helps in answering questions like what skills and knowledge are required to be more effective.

To know the success of the training, evaluation is essential. The evaluation of training forms the ending part of the training cycle. It is the function of evaluation to assess whether the learning objectives originally identified have been satisfied and any deficiency rectified. Evaluation is the analysis and comparison of actual progress versus prior plans, oriented toward improving plans for future implementation. It is essentially required because training cost is very significant in any business. Most of the organizations are prepared to incur these cost because they expect that their business to benefit from employees development and progress. Whether business has benefited can be assessed by the evaluation of training.

Today's diversified workforce in knowledge-based industries such as the ITes witnesses its evolving job demands and its changing skills and knowledge that are quite different from manufacturing industries. Today's society is enmeshed in an information revolution and the goal is not to train workforce to adapt to existing jobs, rather the goal is to enable the workforce to adapt to changing jobs. Hence, it is very essential to know the training need of the employees in the ITes sector as well as the effectiveness of the training as perceived by those employees.

RESEARCH METHODOLOGY

STATEMENT OF RESEARCH PROBLEM

The Indian ITes sector has witnessed significant transformation over the past decade. Indian Government is making assiduous efforts for promoting ITes. The country is well positioned to derive benefits from the ITes market and become a key hub for ITes services. It is true that there is no shortage of human resource for the ITes in India but at the same time we should also required to accept the truth that, the eligible and highly equipped human resource are in scarce. Hence, the training for the human resource for making them well equipped and to fill the gap of their performance level is very essential. All the ITes companies are investing a lot for training and development of the human resource. Nevertheless, it will not ensure the overcoming the gap in performance. The right training, for right person at right time is the need of the hour. Hence, the present study of "Assessment of training needs and Evaluation of training effectiveness in employees of select ITes at Bangalore" is an effort to minimize the training cost and maximizing the positive results. This research problem has been further simplified in the following specific research questions. i.e.,

1. What are the techniques and policies adopted by the ITes companies to assess the training needs of the employees of different categories? And what is the opinion of employees about those techniques and policies?
2. What are the tools and techniques implemented by the ITes companies to measure the effectiveness of the training on employees?
3. What suggestions can be offered to strengthen the policies and practices of assessment of training need and evaluation of its effectiveness in employees?

OBJECTIVES OF THE STUDY

1. To study the techniques and policies adopted by the ITes companies to assess the training needs of the employees.
2. To assess the tools and techniques implemented by the ITes companies to measure the effectiveness of the training on employees.

3. To offer suggestions to strengthen the policies and practices of assessment of training need and evaluation of its effectiveness in employees of ITes companies.

RESEARCH HYPOTHESIS

1. H0: While assessing the training need ITes companies are not giving importance for the needs of the individual employees.
H1: ITes companies are assessing the training need based on the analysis of individual employees.
2. H0: Training objectives of the ITes companies is independent of the need assessment practices.
H1: Training objectives of the ITes companies tend to influence the need assessment practices.
3. H0: Training evaluation practices of ITes companies are not influenced by the training objectives.
H1: Training evaluation practices of ITes companies are influenced by the training objectives.

SCOPE OF THE STUDY

The present study confines its analysis with regard to the assessment of training need and evaluation of training effectiveness in employees of only 50 popular ITes companies situated in Bangalore. The term ITes companies as used in this study restricts itself to the IT enabled service companies which includes BPO, KPO, Call centre, LPO and Medical transcription and does not include the IT companies.

Again, the study confines itself to the training need assessment and evaluation of training effectiveness, which does not include the executive development programs, and other stages of training process. The study covers a period of 3 years from 2007-2008 to 2009-2010.

METHODOLOGY OF THE STUDY

The study is based on the survey method. Two sets of questionnaires (one for employees of ITes companies and another for HR manager/team leader/trainer) are prepared to get comprehensive information about the training need assessment and evaluation of training effectiveness.

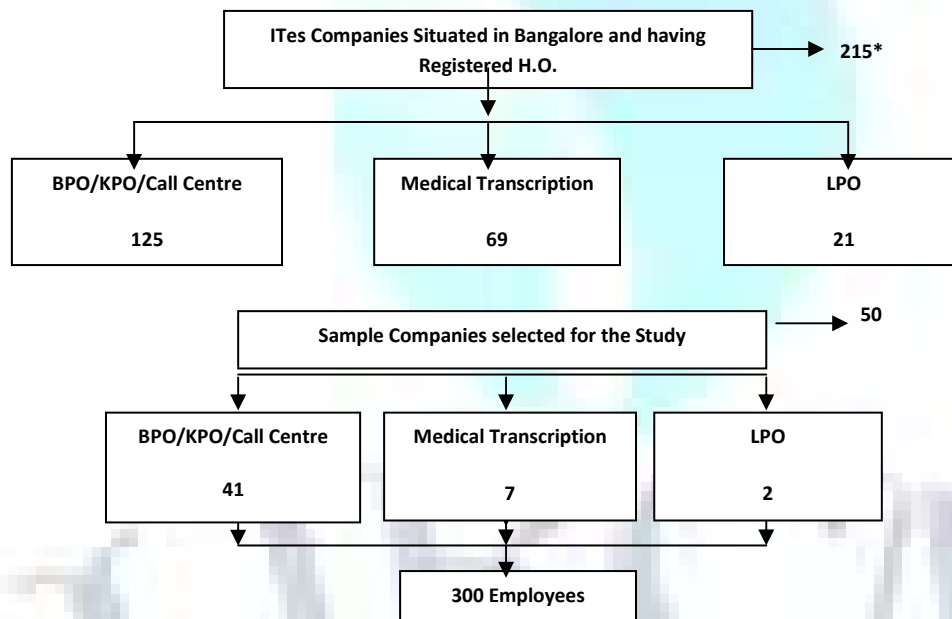
SOURCES OF THE DATA

In this study, both primary and secondary data has been collected and used. Primary data was collected from the employees, H.R. managers and from the trainers of the ITes companies through personal interviews and questionnaires. Secondary data has been collected from the published and unpublished reports by the companies, authorities, authors and magazines, business dailies, internet etc, and various institutions, which directly or indirectly deal with the ITes companies to strengthen the analysis and arguments.

TECHNIQUES OF DATA COLLECTION

In this study convenience sampling method is adopted coupled with the judgment. The reason behind this method is the informants. The informants are companies, employees and managers. There are 215 ITes companies are situated in Bangalore and having their registered head office.

SAMPLING FRAME FOR CONDUCTING SURVEY



Out of the 50 respondent ITes companies belonging to the 3 different categories, 300 employees have been selected as the sample respondents. The questionnaire has been given to the 300 respondents, but the reply received only from 278 respondents, out of which 6 were incomplete and 2 were did not attended any training program yet. Hence, the valid response is only from 270 respondents, the profile of which has been given in the following tables.

TABLE 1: CHARACTERISTICS OF THE SAMPLE

Variable	Classification	No. of Respondents	Percentage
Age (years)	21-25	138	51.1
	26-30	114	42.2
	31-35	15	5.6
	36-40	3	1.1
Gender	Male	192	71
	Female	78	29
Marital Status	Married	67	25
	Unmarried	203	75
Educational level	Below Graduate	30	11
	Graduate	72	27
	Post Graduate	164	60
	Professional	4	2
Nature of work	Accounts	72	27
	Finance	67	25
	Eng & Design	77	28
	Medical Transcription	42	16
	Legal Processing	12	4

RESEARCH ANALYSIS

TABLE NO. 2: INFLUENCE OF TRAINING OBJECTIVES ON TRAINING NEED ASSESSMENT METHOD ADOPTED BY THE RESPONDENT COMPANIES

Training Objectives	TNA Method						Total
	Performance Appraisal	Peer appraisal	Competency assessment	Skill & Knowledge audit	Written test	Self appraisal	
1.Competency	15	7	23	8	8	18	79
2.Productivity	19	7	23	8	8	13	78
3.Future challenge	15	7	15	8	8	2	53
Total	49	21	61	24	24	31	210

 $t=11.62041656, p=0.311263371, d.f=10, \text{chi test}=0.822557613$

Source: Field Survey

Note: Total number of respondents is 50 Companies.

TABLE NO. 3: INFLUENCE OF TRAINING OBJECTIVES ON THE TRAINING EVALUATION METHODS

Training Objectives	Method of Training evaluation			Total
	Observation	Questionnaire	Interview	
1.Cometency	33	22	11	66
2.Productivity	32	15	10	57
3.Facing future challenge	7	15	2	24
Total	72	52	23	147

 $t=9.921769, p=0.041766, d.f=4, \text{chi test}=0.27056$

Source: Field Survey

Note: Total number of respondents is 50 organizations.

TABLE NO.3: TRAINING EVALUATION OBJECTIVES OF THE ORGANIZATIONS AND THE CRITERIA FOR EVALUATING THE TRAINING PROGRAM

Training Evaluation Objectives	Criteria for Evaluation					Total
	No. of employee trained	No. of Training Program held	Cost of training per employee	Efficiency	Performance to schedule	
1.Feedback	19	15	43	20	26	123
2.Research	8	0	8	0	8	24
3.Control	0	8	8	8	0	24
4.Power game	7	0	0	0	0	7
5.Interventions	7	8	8	8	0	31
Total	41	31	67	36	34	209

Source: Field Survey

Note: Total number of respondents is 50 organizations

TABLE NO.4: TRAINING EVALUATION OBJECTIVES OF THE ORGANIZATIONS AND THE METHOD OF TRAINING EVALUATION

Training Evaluation Objectives	Method of Training evaluation			Total
	Observation	Questionnaire	Interview	
1.Feedback	42	30	12	84
2.Research	8	0	1	9
3.Control	0	8	1	9
4.Power game	7	7	1	15
5.Interventions	7	15	2	24
Total	64	60	17	141

Source: Field Survey. Note: Total number of respondents is 50 organizations

SUMMARY OF FINDINGS, SUGGESTIONS AND CONCLUSION

1. Training need assessment can be done in multi level viz., at organizational, job and individual level. 7 companies have adopted multilevel assessment which is the better option other than which, most of the companies have preferred assessing the training needs at individual level through competency

assessment and performance appraisal and review method. Moreover, 42 companies conduct personal analysis for identifying the performance problems of the employees. From this, it is clear that, the respondent ITes companies are highly concerned about need of the individual employees rather than the organizational or job. **From this, the 1st alternative hypothesis H1: ITes companies are assessing the training need based on the analysis of individual employees have been proved and the null hypothesis has been rejected.**

2. The identification of the right training need even depends upon the person who makes the assessment. Out of 50 respondent organizations, the training need assessment work is assigned mainly to the managers and team leaders who are in regular touch with the employees instead of the training professionals or any other heads.
3. It is always advisable to the any organizations conducting training need assessment at multi level to get the proper perspective. But most of the respondent organizations analyze only job and related task that need to be learned. And few in addition with that go for analyzing the organizational goals and objectives as well as the capabilities of the employees.
4. Out of 50 organizations 42 conduct personal analysis for identifying the performance problems of the employees. And this personal analysis is done by most of those companies through performance appraisal. Once the training need has been identified, 60% of the respondent organizations go for finding possible causes and solutions rather than recommending directly for training which is always better from the cost, time and effort of management as well as the employee point of view.
5. Most of the respondent companies are determining the individual training need by the competency assessment and performance appraisal and review method. And the respondent employees of the opinion that these two methods are highly suitable one. In addition to these two methods, employees are also preferred Skill and Knowledge Audit/SWOT analysis as a highly suitable technique of training need assessment. One has to consider here that, the training objectives of the respondent organizations do not have any impact on the training need assessment practices. And the same has been proved with the help of Chi- square test, where the table value is > the calculated value ($18.31 > 11.62041656$) at 5% level of significance. Hence, **the alternative hypothesis 2: Training objectives of the ITes companies tend to influence the need assessment practices has been rejected and the null hypothesis Training objectives of the ITes companies is independent of the need assessment practices has been accepted.**
6. Out of 50 respondent organizations 43(86%) companies evaluate the training programs based on the cost of training per employee than the performance, efficiency of the training programs, the number of training program held or the number of employees trained. It clearly tells that, the cost factor is the highly influential factor in the training program evaluation.
7. All the 50 respondent companies evaluate the training programs for the purpose of getting feedback. Other than this, having intervention with the training programs to take corrective actions is the purpose of training evaluation in 15 companies. These objectives have very less influence over the criteria of training evaluation.
8. Almost all the respondent organizations are evaluating the training programs up to 4 levels viz., Reactions, Learning, Behaviour and results and 43 companies are evaluating even at the 5th level called ROI. It should be noted here that, those 43 companies which are calculating the ROI are the one which consider the cost of training per employee as the criteria for training evaluation.
9. Most of the organizations consider trainee reactions and feed back in the form of filled in questionnaire as the sources of evaluating effectiveness of the training programs.
10. On the job assessment and Pre and post test is the most widely used method to measure the extent of knowledge, skill and attitude has changed. And all the respondent organizations use on the job observation for measuring the extent of behavior changes of the organization. Quality inspection is the most preferred method of knowing the results of the training.
11. Training evaluation can be done at any stage of implementation of the training program. 50% of the respondent organizations evaluate training programs before, during and after the training implementation. And few evaluate at any one stage. It shows the importance given by the organizations for the training evaluation.
12. Training evaluation can be done by observation, questionnaire or interview techniques. Most of the respondent companies adopted observation method during the implementation of the training program as well as after the implementation of the training for evaluating the effectiveness of training programs. The important aspect to be noted here is that, the application of any one of the above three techniques are influenced by the training evaluation objectives ($t=9.921769 > 9.49$). Hence **the 3rd alternative hypothesis Training evaluation practices of ITes companies are influenced by the training objectives has been accepted and there by the null hypothesis has been rejected.**
13. 270 respondent employees have given the preferential rank for the organizational factors which are influencing the success of the training programs. Based on the WAS organizational culture is highly influencing factor (WAS 4.15) where as the influence of reward system is less(WAS 2.75). And if the overall influence of the organizational factors is considered, employees are of the opinion that all the listed organizational factors have an average impact (WAS 3.48) on the effectiveness of the training program.
14. Employees are of the opinion that, the personal factors have higher influence (WAS 4.07). And , amongst the listed 7 personal factors, Desire for growth (WAS 5.1) Previous Training(WAS 4.52), Comfort level (WAS 4.4), Relationship B/W training Program and personal objectives(WAS 4.37) , Benefits expected(WAS 4.14) and family situation (WAS 3.08) have more influence than the personal problems which is just an influencing factor(WAS 2.95).
15. Employees feedback about the training program in lickerts 5 point scale shows that, all the aspects of training program are good(WAS 3-4).

SUGGESTIONS

1. There should be continuous training for ensuring efficiency of employees, updating the skills of the employees for present and future job roles. The effectiveness of training depends on the constant efforts of adjusting training, aligning it, making field manager perceive its effectiveness and transforming it to participants'. Being training is an essence of HRD, proper care should be taken to increase its effectiveness.
2. The HR manager needs to move beyond the traditional methods for identification of training need such as performance appraisal and questionnaire. Otherwise, in addition to these methods group discussion which involves employees as well as their supervisors or team leaders should be made where in the essential training need can be identified.
3. Whatever the method used to identify training needs, at least the following three points must be kept in view:
 - a. These methods should be used in combination; that is, there should never be reliance on only one method.
 - b. They may be used to identify training needs of each of the various groups of employees.
 - c. They should be applied to individual employees since training needs will vary with the individual employee.
4. The HR manager should work towards fulfilling both the organizational and individual goals of the employees. As the turnover in the industry is high, there is no meaning in finding only the individual need and providing training and making them efficient. The organizational need should also be considered at this point.
5. Innovative training tools, modified training modules and strategies at par with changes in the business and market situation is a way towards success for any organizations. Employees must make most effective use of training programs by jointly working out their individual growth plans with the organization and aligning their learning plans with their growth plans.
6. The effects of Internet technology on employee training are indeed profound, however, technology should be seen as a tool, not a strategy or final goal. The Internet cannot, in and of itself, improve the quality of the learning and the content trainer put on it. Organisations need to use Internet technology combined with high quality, effective learning to maximize learning and retention levels. People who believe technology will totally replace great teachers in front of classrooms of highly motivated learners are as misguided as those who believe the Internet is a passing fad. The blended learning solution, i.e., a mixture of classroom and Web-based training is the most effective and comprehensive learning strategy.
7. Trainers have to consider the preferred style of the trainees. Training is more about the trainer's delivery than the trainee's learning. Hence, the importance should be given for the relevance for trainees. Instead of teaching concepts, making employees know how to use them in their work context is very essential.

8. It is strongly recommended that, in addition to providing training to the employees in those areas which are highly relevant to perform their work in a better way, organizations should provide training in general skills as well as administrative skills which are very essential to perform all around .
9. Employees retain about 50% to 60% of what they learn in a formal training workshop. Often, employees forget what they have learned within two months of the workshop. Therefore, access and opportunities to learn should be available to anyone, anywhere, and at any time within an organization. Organizational learning is as much about what happens outside formal learning programs as it is about the programs themselves.
10. In order to use training as a defense tool, companies must verify that each and every worker received training. All companies experience turnover and absenteeism problems, which undermine training effectiveness. Therefore, companies should receive written or electronic training verifications and audit those verifications periodically to ensure defensible training.
11. The first thing that many organizations do to reduce cost during tough times is to cut down on training or a total freeze on training. This can be avoided if organizations try to identify what is lacking in their current training initiatives and implement creative training methodologies.
12. Training evaluation, finding the return on investment and follow up programs need to be taken a bit more seriously.
13. Evaluation of training effectiveness should not be treated only as a corrective measure for the existing training programs offered by the organization, but also as a pro-active measure for making future training programs effective. Only an effective training facilitates in improving the human resource of the organization making them adaptable to changes that take place in their business environment.
14. Training is neither a panacea for all ills nor it is a waste of time. What is required is an insight into what training can or cannot do, and skill in designing and executing training successfully and cost-effectively.

CONCLUSION

In ITes industry, Human Resource is one of the disciplines which drives business for competitiveness. To achieve this training is very important. Competent employees will not remain competent forever. Their skills can deteriorate; technology may make their skills obsolete; the organization may move into new areas, changing the type of jobs that exist and the skills necessary to do them. Management has not overlooked this reality. In order to train the employees the **training need analysis** is necessary for enabling them to provide quality services to the customers both inside and outside. However, **evaluation** has often been overlooked or not implemented to its full capacity. Training is a critical component in any organization's strategy, but organizations do not always evaluate the business impact of a training program. Given the large expenditures for training in many organizations, it is important to develop business intelligence tools that will help companies improve the measurement of training effectiveness. These tools need to provide a methodology to measure, evaluate, and continuously improve training, as well as the organizational and technical infrastructure to implement the methodology.

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JOB HOPPING AND EMPLOYEE TURNOVER IN THE TELECOM INDUSTRY IN THE STATE OF TAMIL NADU

L.R.K. KRISHNAN
RESEARCH SCHOLAR
BHARATHIAR UNIVERSITY
COIMBATORE

DR. SETHURAMASUBBIAH
PROFESSOR & HEAD
DEPARTMENT OF SOCIAL WORK
BHARATHIAR UNIVERSITY
COIMBATORE

ABSTRACT

This research titled "A Study of Job Hopping and Employee Turnover in the Telecom industry in State of Tamil Nadu" is an attempt to understand the problems from the perspective of the organization and its employees. It aims to identify the factors for job hopping in the Indian environment more specifically to the State of Tamil Nadu (India), in the telecom service industry. This phenomenon deserves an in-depth study to ascertain the elements that initiate, sustain and aggravate job hopping. The functional and dysfunctional aspects of the phenomena have also been probed and studied. This industry has been part of India's growth story and continues to occupy the primary attention of job seekers and professionals for career advancement and hence was considered as a choice for undertaking the study. The State of Tamil Nadu (India) was identified to confine the study to a manageable boundary to ensure effectiveness, validity and reliability. The research efforts were directed to build up a body of primary knowledge based on inputs collected from the research participants and takes note of the internal and external factors that impact the decision of job hoppers.

KEYWORDS

Job hopping, Employee Turnover, Employee Attrition, Employee Value Proposition, LRK Job Hopping Model.

INTRODUCTION

A person changing jobs frequently is termed as a job hopper. Job hopping by employees has existed ever since the inception of the industry. An employee leaving an organization that did not meet his expectations when an alternative position became available in another organization was considered normal (India Attrition Study, 2008).

The attrition rates on account of employee job hopping were insignificant compared to attrition due to normal causes such as superannuation, death etc., and remained so till the onset of economic liberalization. With significant changes to the composition of the players at the market place and changed rules of the game, employee job hopping has emerged as a concern of consequence to Indian telecom organizations. The organizations had to endure the predators stalking their ranks. This sector is now dominated by multinationals and has aggressively set a foothold to consolidate their position, owing to emerging opportunities. Employees with specialized skill and experience are being courted by employers to join their ranks at terms that are supposedly more luring than their current pay packages. This has resulted in a lot of mobility of employees from one organization to another. Organizations that are severely impacted by job hopping trends are trying to institutionalize various measures for employee retention. Emergence of commercial pacts as the basis for organization membership has had disturbing effect on the scene. But as every other phenomenon that emerges, it has to be understood, probed and managed. This piece of research seeks to provide a contribution towards this end. Work in today's organization is characterized by increasing complexity, rapid change and competitive business environments. In such a turbulent environment the organizations are facing a gradual shift in traditional employment relationships. Organizational loyalty is reported to be in decline as employee turnover increase, average job tenure falls and employees go job hopping.

CONSEQUENCES OF JOB HOPPING

Drop in productivity, increase in training costs, impact on work culture are a series of aspects associated with job hopping. A series of rapid, random and pointless moves will show up as annoyances on the resume. Employers view such contenders as lacking in loyalty, trust and self-motivation. Quick moves from one job to other raise big questions for prospective employers as to one's staying power and ability to withstand challenges, as well as accept accountability. Employer may question the candidate's committed to a particular organization. The future employers, who are probably looking for a long term employee, might not be impressed with the job hopping tendencies. They might perceive that one has become a job hopper may be because of inability to get along with colleagues or employers. Job hopping does not leave substantial time to acquire sufficient experience and hands-on skills. In many cases, after innumerable hops, one may find oneself at the same place where they first started. The consequences of frequent job change are many, but the most affected area is loyalty with the organization. People living in the modern world are overwhelmed by job opportunities in so much that they live with the false notion that there is always something better. Thus their dissatisfaction towards the work at hand grows while their coveting after something else accumulates.

EMPLOYEE TURNOVER AND ATTRITION

Employee Turnover is defined as the ratio of the number of workers that had to be replaced in a given time period to the average number of workers.

$$\text{Employee Turnover Rate} = \frac{\text{Total Number of People Exiting over period} \times 100}{\text{Average Total Number Employed over this period}}$$

The attrition rate of an organization has an important bearing on its outcomes. An analysis of the changing paradigms, the cost of employee turnover, the employee perspectives and the new retention methodologies have become imperative for the organizational frontline people managers. People managers have a broader influence on the environment in which the employees carry out their work and are the primary link between the employees and the organization. Employee turnover (ET) is often utilized as an indicator of corporate performance and can easily be observed negatively towards the organizations efficiency and effectiveness. ET is a natural outcome of doing business, yet can be very harmful in large numbers. There is a strong evidence to support the fact that cultural flavors have impacted attrition regionally.

Turnover has been defined as movements across membership boundaries of social systems. People switch jobs because they have an urge to try out new things or simply because it is fun doing so. Ghiselli termed this phenomenon as HOBO syndrome. He described the hobo syndrome as the periodic itch to move from job in one place or to some other job in some other place. Ghiselli, argued that the wanderlust is derived from instinctive impulses and does not seem to result from organized logical thought, but rather from the internal impulsiveness of individuals (Judge, T.A. and Watanabe, S., 1995). The second part of job hopping consists of social influences or turnover culture. Turnover culture makes hopping from one job to the other an acceptable behavior. Although, both down- sizing and voluntary turnover have been topics of great interest in the organization literature, little research has addressed the possible relationship between the two.

Shocks created by downsizing event itself and the severity of downsizing, pushes employees towards deliberate judgments about their jobs and perhaps to voluntarily quit their jobs (Rilovick, 2005).

Organizations are interested in being successful and employ several resources in an effort to attain that success. Arguably, people are the most important resource of any organization, making the most significant contribution to its success. However, when people decide to leave voluntarily, the overall effectiveness of the organization may decrease for several reasons. Functional turnover, when low performing employees are fired or when older employees retire, is a necessary and beneficial process. Dysfunctional turnover, when productive employees decide to leave an organization is the type of turnover that organization should take steps to avoid (Abelson and Baysinger, 1984). In the best of worlds, employees would love their jobs, like their coworkers, work hard for their employers, get paid well for their work, have ample chances for advancement, and flexible schedules so they could attend to personal or family needs when necessary. But then there is the real world. And in this real world, employees do leave, either because they want more money, are unable to adjust to the working conditions/the culture, their coworkers/bosses, or just want a change.

Employee Turnover can also be classified as under:

- Voluntary Turnover - which is initiated at the choice of the employee
- Involuntary Turnover - where the employee has no choice in his/her termination (E.g. Long-term sickness, death or employer initiated termination)

Employee Turnover can be beneficial to produce some value or dysfunction if organizations lose employees they would like to retain. The traditional theory of how employees make the decision to leave a job focuses on employee's level of satisfaction/dissatisfaction with their current employment and perceived ease of finding new employment.

There are many types of employee attrition (Towbridge, 2006) as mentioned below:

- Market Driven – based on the demand for a particular skill or ability in temporarily low supply countered by employers by increased wages, better benefits, escaping by relocation or site migration or relaxing hiring standards
- Workload or Stress Driven – occurs when there are not enough of the right people and overload of work and too much stress causes discontent, making the employees quit
- Process Driven-triggered by variables associated with job design and/or the organization such as lack of job clarity and ambiguity in role and responsibility or fear of obsolescence with rapidly changing technology
- Society Driven- Societal factors like peer pressure, ego clashes with spouse, family conditions, overall lifestyle and many more
- Personality Driven - They may range from emotional stability to the level of introversion and extroversion, from interpersonal relations to self-discipline

Employee turnover normally brings decreased productivity. People leave the organization, causing others to work harder contributing to higher employee turnover, increase in costs and drop in revenue. This often forces additional cost reductions and austerity measures in an organization. This in turn makes working more difficult, causing the best performers to explore alternate career options.

Employee Attrition can be defined as the reduction in staff and employees in a company through normal means, such as retirement and resignation. Attrition is commonly thought of as people leaving or terminating employment, but there can be two distinctly different types of attrition (Lawrence, 2003).

- Empty Chair Attrition- is a simple process wherein an employee leaves an organization
- Warm Chair Attrition- Employees quit from working/contributing but stay on. This refers to the phenomenon where a loss of workplace productivity results because employees dislike their jobs and just wait for the right time to quit and move with "Warm Chair Attrition". It results in:
 - ✓ Absenteeism
 - ✓ People "attend" work but productivity drops
 - ✓ People begin to focus more on their next job than their present job
 - ✓ People become negative and can affect the performance of others
 - ✓ When unemployment rates rise, the employees have made the mental decision to leave-but there are fewer opportunities

Hence, attrition poses serious problems and merits further research and analysis. Attrition and job hopping can occur in our country either due to economic recession, mergers or acquisitions in the normal course. The career is very lucrative as this sector is booming, and offers an individual a variety of options. The penetration of the rural markets has thrown open opportunities and challenges for employers on the talent attraction and retention front. The current era is about reducing head count costs and managing a lean and mean organization. However, no organization would like its top performers and critical resources to leave when they are needed the most. High end talent is always lofty on aspiration and losing them to competition would be a high business risk. Therefore, identifying talent, drawing up career and succession plans, providing job rotation and sponsoring for training and management development programs would be essential to reduce organizational attrition rates.

One of the greatest strategies of war has been the strategy of attrition warfare, defined in military dictionary as the cumulative destruction of the enemy's material assets by superior fire power. This historical concept has now found its way to the corporate board rooms where organizational managers try to stay ahead of the competition by resorting to the poaching of their competitor's talent pools. There are three specific knowledge types that are under attack through such an attrition strategy (APQC, 2003):

- Cultural Knowledge
- Historical Knowledge
- Functional Knowledge

EMPLOYEE VALUE PROPOSITION AS A RETENTION MEASURE

Employee Value Proposition (EVP) is a term used to denote the balance of the rewards and benefits that are received by employees in return for their performance at the workplace. Employee Value Proposition (EVP) is defined as a set of associations and offerings provided by an organization in return for the skills, capabilities and experiences an employee brings to the organization. The EVP is an employee-centered approach that is aligned to existing, integrated workforce planning strategies because it has been informed by existing employees and the external target audience. An EVP must be unique, relevant and compelling if it is to act as a key driver of talent attraction, engagement and retention. It has become closely related to the concept of employer branding, in that it is being used to define the underlying 'offer' on which an organization's employer brand marketing and management activities are based. In this context, the EVP is often referred to as the Employer brand proposition. The value proposition should identify the unique people policies, processes and programs that demonstrate the organization's commitment to employee growth, management development, ongoing employee recognition, community service, etc. Contained within the value proposition are the central reasons that people will choose to commit themselves to an organization.

REVIEW OF RELATIONSHIP BETWEEN JOB HOPPING, INDIVIDUAL CAREER AND ORGANIZATION SUCCESS

The current generation which believes in quick results is, impatient, and driven by short term goals and motivated to earn quick money. They are very eager to enhance their skills and competencies and seek job enrichment and growth in quick succession. They fail to understand the contradiction of personal priorities vs business challenges. Remaining on a one sidetrack and not giving enough time to an organization has its own ill effects on both the employee and the organization. Job hopping impacts the stability of business operations, productivity and has a bearing on manpower and other indirect cost. Organization which has strong employee retention processes normally enjoys good business results, owing to enhanced employee commitment. Employee career growth and progression cannot be expected at the cost of business results. Employees need to demonstrate commitment backed with superior performance to avail career growth and other rewards in an organization. Only when the discretionary efforts of employees are at the highest level, organization benefits resulting in organization growth and success. It is therefore imperative that employees understand and commit to organizations progress to avail long term benefits. Job hopping is a phenomenon which impacts both employee and the organization. The linkage between employee's willingness to stay and organization success is direct and tangible in many ways.

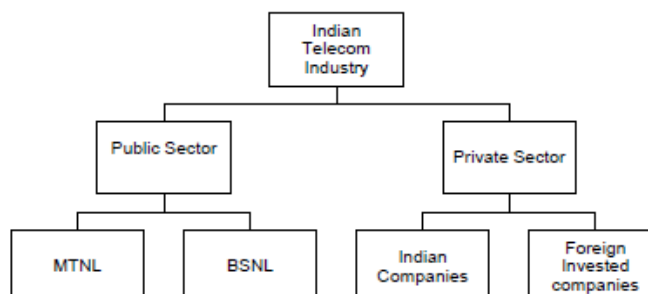
THE INDIAN TELECOM INDUSTRY

The Indian telecom industry has undergone significant structural transformation since its liberalization in the 1990's. During the last fifteen years, the industry has evolved into a multi-segment, competitive market from a small supplier-dominated market having public sector monopoly (Preethi et al., 2009). Government Telecom and Communication policies have played a crucial role in shaping the structure of this sector over the last fifteen years. National Telecom Policy 1994 and 1999 has contributed to the overall development and growth of this industry segment.

CURRENT STRUCTURE OF THE INDIAN TELECOM INDUSTRY

Currently, both public and private sector players are actively catering to the rapidly growing telecommunication needs in India. Private participation is permitted in all segments, including ILD, DLD, basic cellular, internet, radio paging, et al. The broad structure of the telecom industry (in terms of service providers) is depicted in Figure 1:

FIGURE 1: STRUCTURE OF THE TELECOM INDUSTRY IN INDIA



SEGMENTS IN THE TELECOMMUNICATION INDUSTRY

The telecom services in India can be divided into two broad segments, wire line services and wireless services. The wire line segment, which accounted for a major share at the start of the current decade, has witnessed a decline in its subscriber base in the last 5 years. Other telecommunication services such as internet services, broadband services, VSAT, have also evolved gradually and have become an integral part of the Indian telecom industry. The industry classification is as under:

- Wire line services (Fixed line telephone and Broadband)
- Wireless service: [Mobile Phone - GSM (2G, 3G and 4G) and CDMA (1x and HSD – Wireless Data Cards)]
- Internet services
- Public Mobile Radio Trunked Services (PMRTS)
- Global Mobile Personal Communication by Satellite (GMPCS)
- Very Small Aperture Terminals (VSAT)
- Mobile Value Added Services

CHALLENGES IN THE TELECOMMUNICATION INDUSTRY IN INDIA

The industry is currently facing huge challenges owing to shortage of growth in traditional services. Emerging markets are also seeing decreasing growth rates and lower voice ARPU (Average revenue per customer). On the other hand mobile data is the new frontier, but while volumes of data and applications are exploding, revenues are decreasing and competition is increasing. Service providers need to find new revenue streams in VAS and enterprise services. There is an opportunity around cloud computing. The operators need to transform to attract customers and also take the benefit from the mobile Internet. With a move to 3G networks and a resulting simplification there is a future for vendors and Information Technology (IT) service providers. All this will positively impact the Indian economy. The market in India is at an inflexion point following the arrival of 3G. The hyper-competitiveness is likely to flatten out in terms of subscriber growth over the next two years. The proliferation of smart devices and availability of high speed data access will result in new service consumption patterns. Operators seeking to monetize this shift will need to support a broader application and services portfolio with better subscriber segmentation capabilities. We have to wait and see the impact of 3G on the Indian landscape.

With fierce competition and concentration of the subscribers and the network in the urban and semi urban markets, the mobile phone operators are going through a tough phase, lack of significant growth in the customer base, drop in revenue per subscriber, high cost of project rollout, high capital deployment, increase in cost of manpower and other inputs is leading to the low profit regime. The cost of rolling out networks in rural areas which would expand the customer base significantly but would not provide for Return of Investment (ROI) in the short/medium term will be an impediment to meet the capital-debt repayment. The perceived crisis therefore can be classified as follows;

- Steep increase in license fee owing to 3G auctions
- High cost of capital deployment for roll out of new technologies and expansion in rural markets
- Cost of equipment are on the rise
- Revenue per subscriber is dropping significantly
- Incremental growth of subscribers not very significant
- Shortage of skilled and experience manpower to address the growth and technology needs
- Cost of Input including manpower cost is on the rise
- Too much competition owing to too many players resulting in crowding, price wars and hence lower revenues
- Expansion of highways and other road infrastructure is resulting in damaging to the telecom infrastructure that has been laid in terms of optical fiber cable (OFC) etc., resulting in network outages
- Broadband penetration in India is still very low when compared to the rest of the world, but catching up slowly in India and in Tamil Nadu in particular
- Education with specific focus is yet to gain prominence considering the fact that it has opened up to privatization in 1994. Shortage of skilled and trained manpower is a nightmare in some segments, resulting in the cost of training

Hopefully the NTP 2012 will augur well for the industry and for the subscriber at large. The industry contributes significantly to the job market, the GDP and the economy and hence must be categorized as an Infrastructure business for gaining special status. By overcoming the perceived crisis, organizations will grow and consolidate in the years to come.

TELECOM MAJORS IN THE STATE OF TAMIL NADU

- BSNL : A Government owned – Public Sector Organization
- Bharti Airtel: Bharti Group in tie up with Singapore Telecom is a leading player in the country with pan India presence
- Reliance Communications: A Reliance Group entity that enjoys a pan India presence

- Vodafone: Vodafone India is a subsidiary of Vodafone Group Plc India and is a multinational company
- Tata Teleservices- Tata Communications is a wholly owned enterprise of the Tata Group providing wire line services and Tata Docomo is a venture with partnership with Docomo Japan and provides wireless services
- Idea Cellular- Is a Aditya Birla Group company
- Aircel: The leading shareholder is the Maxis group from Malaysia
- MTS Mobile: Systema from Russia in partnership with Shyam telecom is a recent entrant
- Videocon Telecom: An Indian business house with diverse interests has also joined the bandwagon for providing mobile telephone services in India

PERCEIVED JOB OPPORTUNITIES AT THE MARKETPLACE

The job trends in this industry have shown phenomenal growth in the last decade. With so many new entrants and existent players expanding their operations, the revolution in India has been quite exceptional and a big employment generator. The government has issued new licenses and allowed new companies to commence operations. This has led to more and more jobs being created in this domain. With the mushrooming of the number of operators, we have witnessed significant growth in the infrastructure, subscriber base and the revenues over the past 5-8 years. There is a hiring spree, since the organizations had to quickly launch and roll out their services. Widespread job hopping for higher salary and bigger roles is the current trend. Employee retention has become a very big challenge for the existing operators who have their operations running since 1996 or 2001.

ATTRITION IN THE INDIAN TELECOM INDUSTRY

The industry has been expanding and jobs mushrooming by the minute and hence it has all boiled down to attracting, managing and retention of talent. There is a scarcity of qualified and trained manpower to meet the growing needs. The Indian economy has been growing at a sturdy pace of 8% annually and has surely placed an enormous strain on the existing talent pool in terms of various job opportunities. Conducive business environment, favorable demographic outlook and the political stability enjoyed by the country have contributed to the growth, resulting in the increase in job options (Slideshare, 2011). Shortage of skilled manpower has caused deep concerns in this space and with increasing workforce complexity the challenges have been mounting. The game changer, attrition in an organization seems to decide outcomes. The changing paradigms, the cost of employee turnover, employee perspectives and new retention methodologies are worth studying for any practicing HR manager. Liberalization, Globalization and Privatization in the telecom space has provided job hoppers with multiple options. With more and more players at the marketplace, the pressure in terms of attracting and retaining the right talent is a challenge. The employment scenario is very promising and is creating employment opportunities and adding more and more people to its workforce. There is a huge demand for trained and qualified engineers and other professionals. The trends indicate that the attrition rates of 20 to 30 percent and hence the HR's primary strategic function is to retain the talent and focus on employee engagement. With the launch of 3G and 4G services, the organizations are going for high skill recruitments. There is a huge demand for new projects, setting up of new services, expansion of coverage areas, network installations, maintenance etc., are providing employment opportunities. Job hoppers are cashing in the current scenario.

RANGE OF PAST STUDIES

Severance pay, loss of productivity, recruitment, replacement, and training are all concepts that demand a significant amount of time and attention by human resource professionals. In the pressure to keep operating costs low Human resource departments (HRD) face tremendous pressures to develop and maintain a productive workforce. Therefore, a great deal of research has focused on employee turnover in an effort to understand the factors that contribute to an increase or decrease in its occurrence. The study of turnover has a rich theoretical history in which multiple models have been advanced to understand this complex decision (Hom and Griffeth, 1995). Most of these models are based on the premise that if an individual is unhappy with a job and finds another job, they are likely to leave the current job. Thus, the focus of most turnover models is on job attitudes (job satisfaction or job commitment) as the primary drivers of turnover (March and Simon, 1958). Other models have added variables, such as the individual's expectations about the job, ease of movement, expected benefits from quitting, organizational structure, job search, and availability of alternatives, in an attempt to explain additional variance (Porter and Steers, 1973) (Steers and Mowday, 1981). While turnover models have increasingly become more complex, the most variance is still explained by some of the originally proposed variables, which are job attitudes (job satisfaction and job commitment), job alternatives, and job search (Griffeth, Hom and Gaertner, 2000; Hom and Griffeth, 1995). As will be seen in the range of past studies on turnover, in spite of the intuitively appealing additions to the turnover models, these models have been unable to explain substantial variance in turnover. More recently, Mitchell and Lee (2001) suggested an alternative approach to turnover that goes beyond job satisfaction and commitment.

An increasing number of models that accurately predict employee turnover provide early detection of unanticipated turnover, particularly for high performance employees. Meanwhile, accurate prediction models also leave managers with adequate time to deal with turnover related management issues (Chao, 2007). Generally, two forms of employee turnover exist, involuntary turnover and voluntary turnover. Involuntary turnover is frequently defined as movements across organizational boundaries, over which employee is only slightly affected often due to dismissal, downsizing, compulsory retirement etc (Price, 1977). In contrast, voluntary turnover is defined as movements across organizational boundaries, over which the employee is heavily affected, the representation forms of withdrawal from an organization often categorized with absenteeism and lateness.

In accordance with the above definitions, involuntary turnover is most often initiated by organizational changes and institutional constraints, and it easy to understand the scope and affections for the organization. However, employers find it especially difficult to precisely predict the withdrawal forms, the affection and the timing of voluntary turnover in an organization, such as the number of individuals leaving, which individuals are leaving, and how individuals are leaving. In other words, the employers have to understand the damages resulting from high performance employees leaving and also the benefits resulting from poor performance employees leaving (Dalton and Todor, 1982), in addition to the methods of withdrawal used by departing employees. Therefore, the voluntary turnover modeling methodology and a novel predictive approach have attracted considerable attention during recent decades. Job performance has become an increasingly popular influence or decision related to employee turnover and should be viewed as the initiated discrete choice of each employee. Job hopping and employee turnover are consistent with a time based variable that has some relationship with the career stage, work and family. Age also decides the role of a family life cycle. Hang and Chao suggested the logit and probit models to predict voluntary employee turnover (Chao, 2007).

Turnover among high technology professional employees is among the most frequently discussed problems in contemporary labor markets such as India. Existing career mobility models fail to explain the job choice decision of Job hoppers for whom participation in cutting – edge projects may hold more appeal than long-term employment. Organizations are struggling to manage the skilled labor shortage by training unskilled and semi-skilled resources. Hired professional often leave their companies for gaining higher salary using the experience gained in the previous employment. Despite contextual, relational, epistemological dimensions to turnover as well as its organizational significance both the labor market and physiological school have significance in the Job-hopping and employee turnover research. Research indicates that there are two approaches to employee turnover i.e., Economic and Physiological. Carsten and Spector, 1987 in a test of Muchinsky and Morrow's, 1980 "Multi disciplinary model" (Muchinsky and Morrow, 1980) have found evidence that there is relationship between job satisfaction and turnover, in that the economy acts as a releaser and during high economic activity and industrial growth the growth of opportunities in the market triggers Job hopping and employee turnover (Spector and Carsten, 1987). Kirschenbaum and Rita (1999) make the case of "Perceived job opportunity", it would be better to use an objective measure of opportunities based on a model of interaction between the local labor market, occupational opportunity and organization size. There is a well established body of knowledge of literature in addition to the literature on commitment concerning motivation to suggest that for at least some individuals pay is not the sole motivating factor. If it is allowed that motivation has some link with job choice then pay will not be the sole criterion used when people decide on selecting a job, or when they decide to leave.

OBJECTIVES OF THE STUDY

This research is aimed at generating an understanding into the process of employee job hopping that has been on an upward trend in the recent years. It is a major concern to this industry in India, owing to the number of new operators in the recent past and also due to the behaviors and attitudes of the new generation employees. The research efforts are directed to build a body of primary knowledge about this social phenomenon based on inputs from the participants of the process i.e., the employees who leave the job from one employer to another for gainful employment. Organization that these employees leave, the organizations that accept these employees into their fold and the influencing factors in the environment and everything else that interactively surrounds these participants and affects their action through direct or indirect influence on their behavior will be studied.

The following are the objectives of the study:

- To profile job hoppers in terms of age, gender and tenure in the organization, function/roles, qualification, total experience, location and company wise
- To analyze the employee turnover trends of Chennai vs. Rest of Tamil Nadu (ROTN)
- To understand the impact of the problem of employee turnover
- To understand what motivates people to stay or leave an organization - the push and pull factors in play
- To suggest remedial measures for controlling the negative trends

SCOPE OF THE STUDY

This study was conducted on all the permanent employees of the eight private sector telecom organizations operating in the geography of Tamil Nadu. The employee turnover in terms of role/function, time spent in the organization, location, qualification, total experience, age and gender was profiled. This research was carried out through the period May 2009 to March 2012 and seeking responses from the employees, HR managers, senior leaders in the industry, as the primary data and from various other sources like management journals, research papers, manuals, books, TRAI official reports, internet web sites, headhunters and recruitment consultants operating and supporting these eight companies in the State, members of the National HRD Network (HRD), National Institute of Personnel Management (NIPM) and Indian Society for Training and Development (ISTD) as the Secondary Data (also includes the Exit Interview Feedback analysis).

NATURE OF THE PROBLEM

The purpose of this study is to understand the cause and effect relationship between the various organizational, process and personal factors that lead to job hopping and employee turnover. To this effect, the specific problems are mentioned below:

- Erosion of talent resulting from the loss of high performers and critical resources and the average - low performers and de-motivated employees staying back
- Employee turnover at the junior and middle management level is quite high
- Overall productivity takes a hit because of the outflow of the top performers and critical resources and learning curve effect (Pindyck et al., 2003) of the new entrants
- Lack of motivation and low morale leads to an increase in employee turnover
- Recruitment and training cost increase drastically due to employee turnover
- Difficulty in retaining the skillful and the younger lot of employees who have the skills which are in great demand
- Employee turnover levels in some specific businesses affect the morale, motivation level and productivity of the team. Morale deficiencies affect the organizational performance and sometimes, result in the 'ripple effect'
- Employee turnover implies certain direct costs such as recruitment, training costs and other costs incurred during the vacancy period. Besides these, it also results in indirect costs due to lowered employee morale, quality of handholding and transfer of information. Also when employees leave the existing workplace equilibrium is upset and crisis management leaves less scope for development activities

THE KEY RESEARCH QUESTION

"Is there a possibility by proactive HR initiatives to manage job hopping and employee turnover in the telecom industry in Tamil Nadu?"

To answer this question the following research objectives were also taken up;

- To investigate whether the trends are impacting organizations differently
- To investigate whether this social phenomena has any broader dimensions and can be managed for the betterment of individual careers, corporate success and stability in the society.

IMPORTANCE OF THE STUDY

The field of Human resource management (HRM) faces a significant dilemma, while evidence, theory and practical demands are increasing the visibility and credibility of human capital as a key to organization success, the measure used to articulate the impact of their decision remains still a grey area. Moreover, there is a rapidly-growing body of books and articles suggesting that the key to competitive advantage lies with the organization's human resources. HRM must focus on outcome, rather than solely on programs, activities and costs are becoming well established. Intellectual capital is widely suggested as an emerging key to the organization success that is not reflected in standard accounting and financial reports.

People are the most important asset and the key differentiator to organizations success. From a managerial perspective the attraction and retention of high quality employees is more important today than ever before with more than 50 years of research attention on the subject and over 1500 publication articles on leading business journals world over. This phenomenon continues to occupy mainstream research for finding alternate solutions. Volunteering employee turnover is one of the most studied behaviors in management research (Griffith, Hom and Gartner, 2000; March and Simon, 1958). Retaining employees remains a primary concern for many organizations during days of intellectual property, as intellectual capital has become a critical component of wealth creation. In HR research and practice, employee retention or turnover involves the question of organization employee movement. Exit of employees who have relatively high human capital value and choose to exit, can cause serious loss and impairment, especially when the attrition is on the rise. This study will also help establish what unique value proposition the industry can offer its employees, in terms of compensation, work environment, learning and development, to ensure that the problem of attrition of the critical resources and top performers is controlled or minimized.

HYPOTHESES

- | | |
|--------------|---|
| Hypothesis 1 | There is a positive relationship between job satisfaction and employees decision to stay in an organization |
| Hypothesis 2 | Alternate employment opportunities are positively associated with job hopper's intentions to exit an organization |
| Hypothesis 3 | HR Policies and Practices have a direct bearing on employee intention to stay in an organization |
| Hypothesis 4 | Age and total work experience have a direct influence on the employee's intention to stay in their current organization |
| Hypothesis 5 | Knowledge workers intention to job hop is influenced by the training initiatives and scope for innovation at work |
| Hypothesis 6 | Pay and benefits is a motivating factor for job hoppers for selecting a job or continue to stay in the current organization |
| Hypothesis 7 | High potential employees, top performers and critical resources exit their current organization for better career prospects if there is no differential treatment |

Hypothesis 8 The industry growth is creating multiple job opportunities in rural markets – however, employees prefer to remain in home location and do not explore growth prospects resulting in relocation

RESEARCH METHOD

This research is a blend of theoretical and empirical work and is descriptive in nature and has been carried out with specific objectives resulting in definite conclusions. The sample was drawn from the eight employers (Airtel, Vodafone, Idea, Aircel, Reliance Communications, Tata Teleservices/ Tata Docomo /Tata Communications (all group companies clubbed), MTS Mobile and Videocon), all private telecom operators representing 98% of the industry in the State. The population is approximately 4200 permanent employees (excludes associate employees, outsourced, managed services employees, consultants and retainers, trainees (GET's/MT's)) who are currently working in the targeted organizations. This population was used to draw a sample for studying the trends and the pilot study was conducted by administering the questionnaire on 400 employees and 144 employees responded. For this phase, simple random sampling method was adopted. The responses were adequate and the exercise was completed in a time frame of 90 days. The research was conducted in two phases; Exploratory phase and Validation phase

DATA COLLECTION & ANALYSIS

A sample of 1120 from a universe of 4200 permanent employees (as on 1st October, 2011) was the size of the sample for the final research and a stratified sampling method was adopted. The stratified sampling method was followed as it would have more statistical efficiency. The questionnaires were distributed through email, e-survey, and also through direct interview method. In all 430 responses were received of which 12 responses were rejected, which were not meeting the response criteria, resulting in 418 clean responses at a response rate of 37% and accounting for 9.95% of the universe of employees.

The data generated during the course of the research has been utilized to test eight popular beliefs held concerning job hoppers. The various tests and analysis performed with the raw data using SPSS (Statistical Package for Social Sciences) are as follows:

- Factor Analysis
- Cronbach's Alpha reliability tests
- Chi-square test
- Pearson's Correlation technique
- One-sample Kolmogorov – Smirnov test
- Non- Parametric tests such as Mann Whitney test and Kruskal-Wallis test
- Comprehensive Comparative Analysis of demographic data

The analysis of primary data involved Descriptive, Inferential and Predictive statistics. Non-Parametric tests have been used to validate the hypotheses. The data from the research stands to negate one of the eight hypotheses. The findings of the research have been presented in the research report after statistical validation. Each query has generated responses from the employees, leading to employees subscribing to certain views, which has resulted in conclusive empirical evidence in the area of research.

CONCEPTUAL FRAMEWORK

At the conceptual level, employee job hopping can be thought of a decision process that makes an employee to voluntarily terminate his present employment with an organization to join another organization to pursue his career ambition. The decision process is conscious and is driven by the causes that reside in his personality and his membership of the present organization and the alternative avenues of employment that are available to him.

The decision rests on the balancing act of values that an employee perceives that he stands to derive from the alternate organizational membership. The impetus for employee job hopping emanates from dissatisfaction with current position and eminent promise of a bright future elsewhere. The personality of an individual is a sum of his convictions, values, experience and expectations. It is reflected in the way he views his acts and of those around him in the work place. The personality constructs of an individual decide how well he can integrate in any given situation personally, socially and organizationally. And it is the degree of integration with his surrounding that determines his level of satisfaction or sense of belonging. While a proportion of his experience is likely to reinforce his perceived belief others may push him to look elsewhere. Since the experience is an on- going process, its composition is fluid.

SAMPLING DESIGN

This study encompasses both primary and secondary research sources. The inferences from the primary data and the secondary sources have also been examined. To control the variation in the composition of the employees the sample was drawn from all the leading telecom service organizations in the State of Tamil Nadu, proportionately to the size and scale of operations and the manpower strength. The population of the study had individual employees as the major component. The sampling method used for the pilot study was a simple random method and for the final phase of the research the stratified random sampling method was adopted. The primary data was collected through a structured questionnaire from the target universe applying the stratified sampling method.

TARGET POPULATION AND SAMPLING UNITS

Target population for the purpose of this study is defined as all the permanent employees working in the eight private sector telecom organizations in the State of Tamil Nadu. Individual employees from each of the organizations were drawn up based on the Age, Designation, and Function - role, Work experience, Education qualifications, Gender, Current location and Company to ensure the sample represents the total universe in most respects.

SELECTION OF THE SAMPLE

Eight leading telecom players from the State has been sampled. The balance was left out purely on the grounds of size of the employee base, recently commenced operation and hence no trends on job hopping or employee turnover could be predicted or established. "For most purposes n=30 is sufficient, provided the universe is not exceedingly asymmetrical" (Boyd et. al., 2005). 100 is a medium sized sample and 300 is a larger sample. More than 5% sample size is an appreciable proportion of the sample universe. Eight of the organizations were identified for drawing the sample, which by itself is representative of the universe of employees. It was decided to sample all these organizations to have a normal distribution for the samples collected. A minimum sample size was decided for each organization based on its size of operations and the manpower strength. The final survey resulted in 430 responses of which 12 responses were rejected since they did not meet the response criteria, resulting in a total of 418 clean responses, which is a large sample. Each organization sampled had employees between 200-1100 employees (sampling frame) and a sample size of 418 employee represented 9.95% of the universe (37% of the target 1120 employees responded), which is an appreciable sample (Appendix 6).

QUESTIONNAIRE DESIGN

The questionnaire was designed to ensure the following:

- Maintaining focus: It is important to refer to the research questions that defined the focus of the research
- Gaining and retaining the respondent's interest on the subject matter
- Stress Confidentiality: To ensure the confidentiality of the responded is maintained owing to the stress it would create by releasing confidential personal views

Contact Method: Respondents were contacted in person, by a telephonic interview, e-survey and e-mail.

Research tool used for the analysis of data was SPSS (Statistical Package for the Social Sciences).

Frequency Tables: The study involved profiling the exits in terms of Gender, Age - Experience band wise, Qualification, Function/Role, Location-Company wise. For this profiling, frequency Tables, percentages, averages and charts (Bar chart) were used with the help of SPSS.

RESEARCH INSTRUMENT

The research instrument used in this study was developed by the researcher and involved questions seeking a variety of responses concerning job hopping, turnover intentions, satisfaction levels and with an effort to capture various responses associated with the intention of an employee to stay or exit an organization (Appendix 1).

A researcher cannot avoid having data contaminated by some form of bias. However, bias can be reduced and objectivity enhanced. Subjectivity refers to the extent to which a judgment is based on individual personal impressions, feelings, assumptions, beliefs, values and opinions rather than external facts (Leedy and Ormrod, 2001). Without sacrificing the objectivity in this study, this research used a non-standardized instrument and also used the triangulation method of data collection by obtaining information using secondary sources to corroborate the questionnaire survey. The instrument uses a Likert response scale to measure responses on an interval level using a 1 to 5 rating and that range from strongly agree to strongly disagree (Trochim, 2006). This research adopted the pragmatist view of treating Likert scale as an interval scale as it is being followed by most social researchers. Some questions did not follow the standard Likert scale and were close ended for soliciting responses. The questionnaire was designed covering all the major aspects that go into the decision for an employee to decide to stay or quit an organization. It was made easy to solicit quick but precise responses to aid the study appropriately.

PILOT STUDY

A pilot study of the measurement instrument was necessary to validate the items as well as the scale for making the necessary changes. Moreover, constructing a valid instrument is an ongoing process. In this study, the questionnaire was pilot tested on 400 employees using a simple random method however after the desired follow up only 144 responses were collected. The feedback received from the pilot study enabled the researcher to modify the questionnaire to make it more consistent and relevant to test the hypotheses.

FINAL SURVEY

The research instrument was sent by e-mail to the target sample directly, by email and also through online survey portal to seek their responses. Despite a regular follow up only 1% of the employees responded back and hence the employees were contacted by e-mails, phone calls, SMS etc., for seeking their support for completing the questionnaire in a reasonable time. There was some need for privacy and hence employees of the target companies preferred the email, e-survey and telephone option rather than face to face interview at the work place, to ensure confidentiality and also the flexibility to take time and complete the questionnaire at one's own convenience.

REASON FOR SELECTION OF THE TELECOM INDUSTRY AND THE STATE OF TAMIL NADU

The possible effects of specific industries, the size of workforce and the category of employees can affect the outcome in such studies. In order to control the industry-specific effects, the current study focuses on the private sector telecom organizations. It is appropriate for studying the phenomena since it is a buoyant-sunrise industry and having experienced considerable growth over the last one decade and also contributing significantly to the gross domestic product (GDP). It is also playing a significant role in shaping the life- style of the youth in the country and is also important in terms of job creation in the knowledge and technology space. Telecom industry has been part of the growth story in India and continues to occupy the primary attention as regards job seekers and professionals for career advancement. In view of the nature and complexities, it was found desirable to choose this industry part of the study. The researcher has also spent more than a decade as a practicing HR professional from the industry and found it pertinent to study the trends and to understand the phenomena, suggest possible options for tackling the problem from a long term perspective. The State of Tamil Nadu was identified to confine the study to a manageable boundary to ensure the effectiveness, validity and reliability of the study.

ASSUMPTIONS

This study was conducted on all the permanent employees of the leading telecom companies operating in the geography of Tamil Nadu. The employee turnover in terms of Role/Function, time spent in the organization, location, qualification, total experience, age and gender was profiled.

- The chosen sample size of 1120 employees and responses from 418 employees represents the organizations/industry in the State
- The sample includes the permanent employees and represents the universe of employees
- The data has been collected from genuine sources and the observations and conclusions are based on the first-hand information and analysis
- The study is assumed to benefit the organizations in understanding the reasons why critical resources and top performers leave, controlling and reducing the impact
- The study also includes a comparative analysis of the HR policies and practices of the target organizations
- The key questions defined as part of the study broadly covers the main challenges at this point in time
- The social phenomenon that has been probed has significant impact on the individuals, organizations and the society

LIMITATIONS

This study is limited to the permanent employees of the eight leading private sector telecom organizations operating in the State of Tamil Nadu and does not consider the managed services operator employees, outsourced resources, consultants, trainees [Graduate Engineer Trainees (GET) or Management Trainees (MT)] or retainers. The lack of published literature on the topic of research was a challenge. The literature survey provided tremendous insights on the overall trends. However, most of the past studies have been undertaken overseas (USA and in Europe). The senior leaders and HR managers were a bit wary to share some of their thoughts and opinions to ensure confidentiality which was also an impediment in some ways. Another handicap was that the organizations had multiple offices in Chennai and ROTN which made it impossible to cover the spread physically by travelling to all the places which hindered face to face administrating of the questionnaire. The challenge faced by the researcher was that employees were hesitant to part with the information pertaining to their organization, owing to sensitivities. Percentage of senior level and top management employees who participated in this study is not significant when compared to the junior and middle management employees. Please refer appendix 3 for the experience profile of the respondents of the survey. Involuntary turnover or attrition was not considered part of this study or its impact on voluntary turnover. Government operators, equipment manufacturers, managed service operators and other service operators not part of main stream have not been covered. Host of other variables and factors that go into the decision of a job hopper might not have been covered, owing to the magnitude of the social phenomenon may be considered part of the effort for future research. This study also does not cover the impact of non-work domain on job hopping.

ANALYSIS OF PRIMARY DATA

Primary Data was collected by the researcher specifically for the research project during the period January 2010 - December 2011. The statistical analysis presented in this report has been done after processing large amount of data collected through primary sources.

The questionnaire was designed to solicit responses against seven variables (inclusive of demographic details) classified as under:

- Job satisfaction/dissatisfaction levels
- Alternate job opportunities
- HR policies and practices
- Training and innovation at work
- Pay and benefits
- Attrition of top performers & HIPOs
- Location preference

The analysis of Skewness and Kurtosis of the questionnaire responses is shown in Table 1.

TABLE 1: QUESTIONNAIRE RESPONSE – ANALYSIS OF SKEWNESS AND KURTOSIS

Questions	N		Mean	Mode	Std. Deviation	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
	Valid	Missing							
Q1	418	0	2.02	2	0.827	0.993	0.119	1.758	0.238
Q2	415	3	2.13	2	0.805	0.894	0.12	1.517	0.239
Q3	417	1	2.48	2	1.014	0.361	0.12	-0.738	0.238
Q4	417	1	2.01	2	0.855	0.947	0.12	1.043	0.238
Q5	415	3	2.13	2	0.811	0.882	0.12	0.907	0.239
Q6	416	2	2.18	2	0.924	0.64	0.12	-0.166	0.239
Q7	409	9	2.27	1	1.382	0.725	0.121	-0.841	0.241
Q8	416	2	2.36	2	1.006	0.565	0.12	-0.488	0.239
Q9	417	1	2.45	2	1.042	0.702	0.12	-0.155	0.238
Q10	417	1	2.12	2	0.991	1.048	0.12	0.851	0.238
Q11	399	19	3.06	4	1.16	-0.258	0.122	-1.131	0.244
Q12	407	11	2.09	2	0.887	0.927	0.121	0.737	0.241
Q13	413	5	2.24	2	0.915	1.033	0.12	1.049	0.24
Q14	409	9	2.16	2	0.861	0.243	0.121	-0.696	0.241
Q15	406	12	2.64	2	0.979	0.491	0.121	-0.492	0.242
Q16	394	24	2.79	2	1.269	0.501	0.123	-0.893	0.245
Q17	415	3	3.16	4	1.101	-0.602	0.12	-0.901	0.239
Q18	408	10	2.2	2	0.977	0.744	0.121	-0.073	0.241
Q19	407	11	2.31	2	0.875	0.847	0.121	0.344	0.241
Q20	413	5	2.68	4	1.32	0.121	0.12	-1.343	0.24
Q21	406	12	2.35	2	0.985	0.588	0.121	-0.416	0.242
Q22	404	14	2.35	2	0.953	0.533	0.121	-0.223	0.242
Q23	399	19	2.86	3	1.493	0.374	0.122	-0.891	0.244
Q24	393	25	2.5	1	1.385	0.607	0.123	-0.701	0.246

STATISTICAL ANALYSIS

The major tests undertaken for testing the reliability and validity of the research instrument and also to test the hypotheses are as under:

Cronbach's Alpha Reliability Test - was done to test reliability and validity of the instrument. Reliability of Scale, Output of reliability enabled creation of scores and Bar charts. This test was performed to check whether the various questions in the instrument (24 questions) could be grouped to arrive at the seven broad variables (Appendix 5).

Factor Analysis technique (used for reducing dimensions between questions) was adopted wherever the Cronbach's Alpha reliability test turned negative. Based on the factor analysis test results the groups were re-classified.

One of the most popular reliability statistics in use today is Cronbach's alpha (Cronbach, 1951). It determines the internal consistency or average correlation of items in a survey instrument to gauge its reliability and is also a measure of internal consistency, that is, how closely related a set of items are as a group. Cronbach's alpha is not a statistical test - it is a coefficient of reliability (or consistency). Summated scales are often used in survey instruments to probe underlying constructs that the researcher wants to measure. These may consist of indexed responses to dichotomous or multi-point questionnaires, which are later summed to arrive at a resultant score associated with a particular respondent.

Cronbach alpha test results are as under:

- Group 1 (Job Satisfaction Variable) – Q5, Q11, Q12 and Q14 were grouped and initially Cronbach alpha produced a negative result indicating the inter-item correlation was multidirectional and the variables were moving in different directions (resulting in negative score). Therefore, Q11 (question was inversely related with other questions in the group) had to be reverse-coded. The test was performed again and a positive score emerged indicating that inter-item correlation was unidirectional and all the variables were moving in the same direction. Implying that the questions could be grouped and the research instrument was tested for reliability and validity
- Group 2 (Perceived Alternate Job Opportunities Variable) – Q10 and Q22 were grouped and Cronbach Alpha test turned positive
- Group 3 (HR Policies and Practices variable) – Q13 and Q17 were tested for Grouping and Cronbach Alpha test turned negative. Therefore, Q17 (question was inversely related with other question in the group) had to be reverse-coded. The test was performed again and a positive score emerged indicating that inter-item correlation was unidirectional and all the variables were moving in the same direction. Implying that the questions could be grouped and the research instrument was tested for reliability and validity
- Group 4 (Training and Innovation variable) – Q1, Q12, Q14, Q16, Q23 and Q24 were tested for Grouping. Factor analysis test was performed and since the questions were multi-dimensional, they could not be grouped. Only Q1 and Q14 were possible for grouping as per factor analysis test and thereafter the Cronbach Alpha test was performed and it turned positive
- Group 5 (Pay and Benefits variable) – Q2, Q9 and Q18 were grouped and Cronbach Alpha test turned positive
- Group 6 (Retention of HIPO's, Critical resources and Top Performers variable) – Q7, Q15 and Q16 were grouped and Cronbach Alpha test turned positive
- Group 7 (Location Preference variable) – Q8, Q20 and Q21 were tested for grouping and Cronbach Alpha test turned negative. Therefore, Q21 (question was inversely related with other questions in the group) had to be reverse-coded. The test was performed again and a positive score emerged indicating that inter-item correlation was unidirectional and all the variables were moving in the same direction. Implying that the questions could be grouped and the research instrument was tested for reliability and validity

Q3, Q4, Q6 and Q19 has no linkage to the hypotheses and could not be grouped.

Chi-square test (Appendix 4) results are as under:

- Group 8 – Q23 and Q24 – Test revealed that P Value is smaller than 0.05 and hence the association amongst the variables is significant
- Group 9 – Q7 and Q16- Test revealed that the P value is greater than 0.05 and hence the association amongst the variables is not significant
- Group 10 – Q23 and Q7 - Test revealed that P Value is smaller than 0.05 and hence the association amongst the variables is significant
- Group 11 – Q24 and Q7 - Test revealed that P Value is smaller than 0.05 and hence the association amongst the variables is significant
- Group 12 – Q23 and Q16- Test revealed that P Value is smaller than 0.05 and hence the association amongst the variables is significant
- Group 13 – Q24 and Q16 - Test revealed that P Value is smaller than 0.05 and hence the association amongst the variables is significant

The outcome of the reliability tests enabled the researcher to calculate the scores through SPSS for each of the seven variables.

PEARSON'S CORRELATION TEST

After arriving at the scores, the Pearson's Correlation Technique was used to compare the scores (Table 2). Correlation is a statistical technique that can show whether and how strongly pairs of variables are related. An intelligent correlation analysis can lead to a greater understanding of your data. In order to evaluate the correlation between variables, it is important to know this "magnitude" or "strength" as well as the significance of the correlation (Croarkin, Filliben and Heckert, 2010).

INTERPRETATION OF CORRELATION TEST

- Job Satisfaction score has a direct correlation with HR Policies and Practices, Training and Innovation, Pay and Benefits and Locations scores
- Alternate Job Opportunities score has a no correlation with other scores
- HR Policies and Practices score has a direct correlation with Job Satisfaction, Training and Innovation, Pay and Benefits and Retention of HIPOs scores
- Training and Innovation score has a direct correlation with Job Satisfaction, HR Policies and Practices, Pay and Benefits and Retention of HIPOs scores
- Pay and Benefits score has a direct correlation with Job Satisfaction, HR Policies and Practices, Training and Innovation and Retention of HIPOs scores
- Retention of HIPOs score has a direct correlation with HR Policies and Practices, Training and Innovation and Pay and Benefits scores
- Location score has a direct correlation with Job Satisfaction score

TABLE 2: PEARSON'S CORRELATION OF VARIABLES

Item		Job Satisfaction	Alternate Job Opportunity	HR Policies and Practices	Training and Innovation	Pay and Benefits	Retention of Critical and HIPOS	Location Preference
Job Satisfaction Score	Pearson Correlation	1	0.042	.238**	.459**	.115*	0.087	-.240**
	Sig. (2-tailed)		0.39	0	0	0.019	0.076	0
	N	418	417	418	418	418	417	415
Alternate Job Opportunity Score	Pearson Correlation	0.042	1	0.021	-0.002	0.034	-0.086	0.049
	Sig. (2-tailed)	0.39		0.671	0.969	0.483	0.08	0.322
	N	417	417	417	417	417	416	414
HR Policies and Practices Score	Pearson Correlation	.238**	0.021	1	.251**	.225**	.163**	-0.09
	Sig. (2-tailed)	0	0.671		0	0	0.001	0.068
	N	418	417	418	418	418	417	415
Training and Innovation Score	Pearson Correlation	.459**	-0.002	.251**	1	.274**	.167**	-0.079
	Sig. (2-tailed)	0	0.969	0		0	0.001	0.107
	N	418	417	418	418	418	417	415
Pay and Benefits Score	Pearson Correlation	.115*	0.034	.225**	.274**	1	.117*	-0.069
	Sig. (2-tailed)	0.019	0.483	0	0		0.017	0.159
	N	418	417	418	418	418	417	415
Retention of Critical and HIPOS Score	Pearson Correlation	0.087	-0.086	.163**	.167**	.117*	1	-0.095
	Sig. (2-tailed)	0.076	0.08	0.001	0.001	0.017		0.053
	N	417	416	417	417	417	417	414
Location Preference Score	Pearson Correlation	-.240**	0.049	-0.09	-0.079	-0.069	-0.095	1
	Sig. (2-tailed)	0	0.322	0.068	0.107	0.159	0.053	
	N	415	414	415	415	415	414	415

ONE- SAMPLE - KOLMOGOROV- SMIRNOV TEST

This test was undertaken to check whether the scores had a normal distribution and the interpretation of the data indicates that the scores did not follow a normal distribution and hence T-test was not possible (P is less than 0.05 data does not follow normal distribution) (Table 3). Therefore, non parametric tests were undertaken:

TABLE 3: ONE-SAMPLE KOLMOGOROV-SMIRNOV TEST

Tem	N	Normal Parameters ^{a,b}		Most Extreme Differences			Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
		Mean	Std. Deviation	Absolute	Positive	Negative		
Job Satisfaction Score	418	2.3291	0.54424	0.12	0.12	-0.072	2.454	0.000
Alternate Job Opportunity Score	417	2.223	0.73258	0.212	0.212	-0.133	4.328	0.000
HR Policies and Practices Score	418	2.5395	0.77599	0.249	0.249	-0.15	5.098	0.000
Training and Innovation Score	418	2.0885	0.67095	0.163	0.163	-0.134	3.323	0.000
Pay and Benefits Score	418	2.2715	0.62763	0.151	0.151	-0.086	3.079	0.000
Retention of Critical and HIPOS Score	417	2.5524	0.75204	0.137	0.137	-0.069	2.805	0.000
Location Preference Score	415	3.1518	0.87977	0.131	0.125	-0.131	2.675	0.000

NON-PARAMETRIC TESTS (KRUSKAL WALLIS & MANN WHITNEY TEST)

The **Mann Whitney Test** was used to compare two groups such as Male/Female, Chennai/ROTN and **Kruskal- Wallis Test** was used to compare when there are more than two groups such as Functions, Experience Band, Age Band and Companies.

As part of these tests, the scores were compared with the demographic data (Appendix 2) to test the effect of demography (Table 4-10).

TABLE 4: KRUSKAL-WALLIS TEST – TESTING EFFECT OF AGE ON SCORES

Sino	Null Hypothesis	Sig	Decision
1	The distribution of Job Satisfaction score is the same across categories of Age	0.838	Retain the null hypothesis
2	The distribution of Alternate Job Opportunity is the same across categories of Age	0.239	Retain the null hypothesis
3	The distribution of HR Policies and Practices is the same across categories of Age	0.048	Reject the null hypothesis
4	The distribution of Training and Innovation is the same across categories of Age	0.058	Retain the null hypothesis
5	The distribution of Pay and Benefits is the same across categories of Age	0.125	Retain the null hypothesis
6	The distribution of Retention of HIPO is the same across categories of Age	0.211	Retain the null hypothesis
7	The distribution of Location Score is the same across categories of Age	0.001	Reject the null hypothesis

Asymptotic significances are displayed. The significance level is .05

TABLE 5: MANN-WHITNEY TEST – TESTING EFFECT OF GENDER ON SCORES

Sino.	Null Hypothesis	Sig	Decision
1	The distribution of Job Satisfaction score are the same across categories of Gender	0.016	Reject the null hypothesis
2	The distribution of Alternate Job Opportunity are the same across categories of Gender	0.865	Retain the null hypothesis
3	The distribution of HR Policies and Practices are the same across categories of Gender	0.378	Retain the null hypothesis
4	The distribution of Training and Innovation are the same across categories of Gender	0.446	Retain the null hypothesis
5	The distribution of Pay and Benefits are the same across categories of Gender	0.909	Retain the null hypothesis
6	The distribution of Retention of HIPO are the same across categories of Gender	0.776	Retain the null hypothesis
7	The distribution of Location scores are the same across categories of Gender	0.908	Retain the null hypothesis

Asymptotic significances are displayed. The significance level is .05

TABLE 6: KRUSKAL-WALLIS TEST – TESTING EFFECT OF EXPERIENCE ON SCORES

Sino	Null Hypothesis	Sig	Decision
1	The distribution of Job Satisfaction score is the same across categories of Experience	0.017	Reject the null hypothesis
2	The distribution of Alternate Job Opportunity is the same across categories of Experience	0.494	Retain the null hypothesis
3	The distribution of HR Policies and Practices is the same across categories of Experience	0.153	Retain the null hypothesis
4	The distribution of Training and Innovation is the same across categories of Experience	0.122	Retain the null hypothesis
5	The distribution of Pay and Benefits is the same across categories of Experience	0.235	Retain the null hypothesis
6	The distribution of Retention of HIPO is the same across categories of Experience	0.008	Reject the null hypothesis
7	The distribution of Location Score is the same across categories of Experience	0.000	Reject the null hypothesis

Asymptotic significances are displayed. The significance level is .05

TABLE 7: MANN-WHITNEY TEST – TESTING EFFECT OF EDUCATIONAL QUALIFICATION ON SCORES

Sino	Null Hypothesis	Sig	Decision
1	The distribution of Job Satisfaction score is the same across categories of Educational Qualification	0.951	Retain the null hypothesis
2	The distribution of Alternate Job Opportunity is the same across categories of Educational Qualification	0.196	Retain the null hypothesis
3	The distribution of HR Policies and Practices is the same across categories of Educational Qualification	0.827	Retain the null hypothesis
4	The distribution of Training and Innovation is the same across categories of Educational Qualification	0.993	Retain the null hypothesis
5	The distribution of Pay and Benefits is the same across categories of Educational Qualification	0.356	Retain the null hypothesis
6	The distribution of Retention of HIPO is the same across categories of Educational Qualification	0.857	Retain the null hypothesis
7	The distribution of Location Score is the same across categories of Educational Qualification	0.358	Retain the null hypothesis

Asymptotic significances are displayed. The significance level is .05

TABLE 8: KRUSKAL-WALLIS TEST – TESTING EFFECT OF COMPANIES ON SCORES

Sino	Null Hypothesis	Sig	Decision
1	The distribution of Job Satisfaction score is the same across categories of Company	0.000	Reject the null hypothesis
2	The distribution of Alternate Job Opportunity is the same across categories of Company	0.086	Retain the null hypothesis
3	The distribution of HR Policies and Practices is the same across categories of Company	0.000	Reject the null hypothesis
4	The distribution of Training and Innovation is the same across categories of Company	0.092	Retain the null hypothesis
5	The distribution of Pay and Benefits is the same across categories of Company	0.000	Reject the null hypothesis
6	The distribution of Retention of HIPO is the same across categories of Company	0.000	Reject the null hypothesis
7	The distribution of Location Score is the same across categories of Company	0.000	Reject the null hypothesis

Asymptotic significances are displayed. The significance level is .05

TABLE 9: KRUSKAL-WALLIS TEST – TESTING EFFECT OF FUNCTION ON SCORES

Sino	Null Hypothesis	Sig	Decision
1	The distribution of Job Satisfaction score is the same across categories of function	0.099	Retain the null hypothesis
2	The distribution of Alternate Job Opportunity is the same across categories of function	0.355	Retain the null hypothesis
3	The distribution of HR Policies and Practices is the same across categories of function	0.248	Retain the null hypothesis
4	The distribution of Training and Innovation is the same across categories of function	0.993	Retain the null hypothesis
5	The distribution of Pay and Benefits is the same across categories of function	0.446	Retain the null hypothesis
6	The distribution of Retention of HIPO is the same across categories of function	0.926	Retain the null hypothesis
7	The distribution of Location Score is the same across categories of function	0.003	Reject the null hypothesis

Asymptotic significances are displayed. The significance level is .05

TABLE10: MANN-WHITNEY TEST – TESTING EFFECT OF LOCATION ON SCORES

S/no	Null Hypothesis	Sig	Decision
1	The distribution of Job Satisfaction score is the same across categories of location	0.980	Retain the null hypothesis
2	The distribution of Alternate Job Opportunity is the same across categories of location	0.073	Retain the null hypothesis
3	The distribution of HR Policies and Practices is the same across categories of location	0.540	Retain the null hypothesis
4	The distribution of Training and Innovation is the same across categories of location	0.787	Retain the null hypothesis
5	The distribution of Pay and Benefits is the same across categories of location	0.163	Retain the null hypothesis
6	The distribution of Retention of HIPO is the same across categories of location	0.854	Retain the null hypothesis
7	The distribution of Location Score is the same across categories of location	0.396	Retain the null hypothesis

Asymptotic significances are displayed. The significance level is .05

The interpretation of the non parametric tests has been captured (Table 4-10) and the inferences are elaborated as under:

- Job satisfaction scores are not the same across categories of Gender, Experience and Company scores but the job satisfactions scores are the same across Locations, Functions, Age and Qualification scores
- Alternate Job Opportunity Scores are the same across categories of Gender, Location, Function, Age, Experience, Qualification and Company scores
- HR Policies and Practices Scores are not the same across Company & Age but are the same across categories of Gender, Location, Function, Experience and Qualification scores
- Training and Innovation Scores are the same across categories of Gender, Location, Function, Age, Experience, Qualifications and across Company
- Pay and Benefits Scores are not the same across categories of Company but are the same across Gender, Location, Function, Age, Experience and Qualification scores
- Retention of HIPO's, Critical and Top Performers Scores are not the same across categories of Experience and Company but are the same across Gender, Location, Function, Age and Qualification scores
- Location Scores are not the same across categories of Age, Experience, Function and Company, but are the same across Gender and Qualification scores

COMPREHENSIVE COMPARATIVE ANALYSIS

Comprehensive Comparative Analysis was performed using the demographic data and comparing with the scores of the seven variables and the inferences drawn are shown below (Table 11) (Appendix 2).

- **Gender**- Females had a longer tenure when compared to males in all the eight organizations. Females had also less job changes when compared to males (Table 11)
- **Professional Qualification** – Professionals showed a higher tendency to leave or Job hop when compared to Non-professionals. The number of Job changes of professionally qualified employees was higher than non-professionals (Table 11)
- **Function** – Employees from Technical, Customer Service Delivery and Other functions had shown more stickiness to an organization. Whereas, Sales and Marketing employees had shown least stickiness and were more prone to leave. The employees from Sales and Marketing function had more job changes and Customer Service Delivery (CSD) the least (Table 11)
- **Location** – Rest of Tamil Nadu (ROTN) employees had a higher average tenure than compared to Chennai employees and consequently, less number of job changes in comparison to employees based in Chennai (Table 11)
- **Company wise trend**- Employees associated with Co 2 and Co 1 had shown more stickiness to their current organization and their average tenure in the organization was also high. Similarly, employees of Co 4 had shown least stickiness to their current organization and their average tenure in the organization was also the least. Data also revealed that employees of Co 7, Co 4, Co 5 and Co 6 had the highest number of job changes and Co 8 and Co1 employees had the least number of job changes (Table 11).

TABLE11: ANALYSIS OF TENURE OF RESPONDENTS IN THE PRESENT ORGANIZATION AND JOB CHANGES

Item		Tenure in the present Organization	Total job changes
		Mean	Mean
Age	21-25	2.06	1.8
	26-30	3.01	2.3
	31-35	3.42	3.52
	36-40	3.8	4.37
	41-45	6.03	3.47
Gender	F	4.69	2.35
	M	3.21	3.08
Exp	< 5y	2.41	1.81
	6-10 Y	3.46	2.92
	11-15 Y	3.05	4.21
	16-20 Y	4.41	4.33
Qualification	Non-Prof	3.7	2.88
	Professional	3.11	3.12
Company	Co 1	3.98	2.57
	Co 2	4.27	2.96
	Co 3	2.4	3.16
	Co 4	1.83	3.74
	Co 5	2.71	3.67
	Co 6	3.07	3.63
	Co 7	2.65	4.64
	Co 8	3.3	2.21
Function	CSD	3.98	2.7
	Sales & Mktg	2.68	3.35
	Technical	3.52	2.75
	Other Functions	4.11	2.86
Location	Chennai	3.28	3.06
	ROTN	3.39	2.99

FINDINGS

The findings of the study are based on the valuable inputs derived from the primary research survey which have been analyzed and studied. Significant indications point towards multiple causes and effects in the decision of a job hopper or employee's decision to stay or exit an organization. No single factor can be singled out as the reason for employee's exit. Based on the empirical evidence generated as part of this study, it is pertinent for organizations to work on various retention measures to keep employees motivated and productive at all times. The key findings of this study indicate that:

- Female employees have a longer tenure and less job changes
- With age and experience, the average tenure in an organization increases, which indicates that with experience / maturity, employees look for stability and try and balance all other expectations
- Professionals are more prone / susceptible to job hopping and are high on aspiration when compared to the non-professional employees (employees not having professional degrees or qualifications)
- Location: Employees in upcountry, non-metro/ district headquarters or ROTN were less prone to job hopping when compared to employees based in Chennai. This could be attributed to the alternate job opportunities in the Chennai or probably employees from ROTN were more contented and stable in comparison.
- Consequently, the average tenure of employees based in ROTN was marginally higher than employees based in Chennai
- While analyzing the various functions and the employee's tendency to job hopping. It was found that sales and marketing employees were highly prone to job hopping and consequently their stickiness to their respective organizations was low. Also, it was found that the average tenure of sales and marketing employees was less compared to the other functions. The number of job changes was also high when compared to various other functions

On careful analysis of the job hopping trends between various companies the following observations were recorded:

- In Co 2 and Co 1 the average tenure of employees in the organization was high when compared to the rest of the companies

This could be attributed to progressive HR policies and practices in the organization which governed employee relationships. On the whole, these organizations were employers of choice, owing to their work culture.

On the other side of the spectrum:

- In Co 4 the tenure of employees in the organization was very low. Also employees in Co 3, Co 7 and Co 5 had low tenures in the current organization
- Employees working in Co 7, Co 4, Co 5 and Co 6 had many job changes when compared with the rest

INTERPRETATION OF COMPANY SCORES ON OTHER SCORES

Job satisfaction varies from company to company and same is the case with HR policies and practices, pay and benefits, retention of HIPO's, critical resources and location, which indicates that every organization has a unique work culture, management approach and people practices which in turn have a direct impact on employees. An organization's proactive efforts-qualifies it to be an employer of choice or vice-versa and thereby having a direct impact on employee motivation and intention to stay.

It was observed that the seven variables had direct impact on all the companies. Therefore, organizations which managed employees with delivery of superior employee value proposition (EVP) had a better chance of motivating and retaining employees.

HYPOTHESES TEST RESULTS

Hypothesis 1: There is a positive relationship between job satisfaction and employees decision to stay in an organization

The non parametric tests (Table 4-10) reveal that the distribution of the job satisfaction score is the same across age, qualification, function and location scores and not the same across gender, experience and company scores. This indicates that though there is a relationship between job satisfaction and intention to stay, the propensity however varies with gender, experience and the organization the employee works for. Hence the hypothesis is retained. The tabulated responses post grouping reveal the strength of the feedback received on the factor of job satisfaction (Appendix 5 – Group 1).

Hypothesis 2: Alternate employment opportunities are positively associated with job hopper's intentions to exit an organization

The non parametric tests (Table 4-10) clearly reveal that the distribution of the alternate job opportunities score is the same across all the variables. This indicates that despite all measures taken by employers for retention, alternate job opportunities attract job hoppers to consider other options and exit for better prospects. Hence the hypothesis is retained. The nature of the responses tabulated reveals the strength of the response supporting the hypothesis (Appendix 5 – Group 2).

Hypothesis 3: HR Policies and Practices have a direct bearing on employee intention to stay in an organization

The non parametric tests (Table 4-10) reveal that the distribution of HR policies and practices score is the not the same across age and company scores but the same across gender, experience, qualification, function and location scores. It is implied that HR policies and practices have a direct bearing on employee intention to stay and the impact varies with the age group of 23-38 years and the company they are currently associated with. Hence the hypothesis is retained. The nature of the responses tabulated reveals the strength of the response supporting the hypothesis (Appendix 5 – Group 3).

Hypothesis 4: Age and total work experience have a direct influence on the employee's intention to stay in their current organization

The non parametric test (Table 4-10) indicates that the distribution of the age score is not the same across HR policies and location scores but the same across job satisfaction, alternate job opportunities, training and innovation, pay and benefits, HIPOs score. The findings of the study reveal that employee's intention to stay in the current organization varies from one organization to another.

The tests further reveal that the distribution of the experience score is not the same across the job satisfaction, HIPOs and location scores but the same across alternate job opportunities, HR policies, training and innovation, pay and benefits scores. This implies that with experience, the job satisfaction, retention of HIPOs and location preference are impacted. The average tenure and job changes of the respondents are depicted in Table 11.

It is therefore clear that age and experience has direct influence on employees plan to stay in the current organization and hence the hypothesis is retained.

Hypothesis 5: Knowledge workers intention to job hop is influenced by the training initiatives and scope for innovation at work

The non parametric test (Table 4-10) reveal that the distribution of training and innovation score is the same across age, gender, experience, qualification, company, function and location scores. This indicates that training initiatives and innovation at work, influences knowledge workers and hence the hypothesis is retained. The nature of the responses tabulated reveals the strength of the response supporting the hypothesis (Appendix 5 – Group 4).

Hypothesis 6: Pay and benefits is a motivating factor for job hoppers for selecting a job or continue to stay in the current organization

The non parametric tests (Table 4-10) reveal that the distribution of pay and benefits score is the same across age, gender, experience, qualification, function and location scores and not the same across company score. The test results imply that employees lay emphasis on pay and benefits and this factor varies from company to company indicating that if job satisfaction is achieved through progressive HR policies, investments on training and innovation at work etc, employees balance pay and benefit priorities. However, it still remains a motivating factor for job hoppers for selecting a job or deciding to continue in the current organization and hence the hypothesis is retained. The nature of the responses tabulated reveals the strength of the response supporting the hypothesis (Appendix 5 – Group 5).

Hypothesis 7: High potential employees, top performers and critical resources exit their current organization for better career prospects if there is no differential treatment

The non parametric tests (Table 4-10) indicate that the distribution of HIPOs score is the same across age, gender, qualification, function and location scores and not the same across experience and company scores. The test and the tabulation of responses indicate (Appendix 5 – Group 6) that while differential treatment is expected by the HIPOs, top performers and critical resources, it is not a very high impact factor when compared to the other variables. The findings reveal that

the companies which follow sound people practices and reward and recognize HIPO's have a better chance of retaining talent. The tests also reveal that with experience the HIPOs expectations differ - however, differential treatment is the key to engage and retain top talent – hence the hypothesis is retained.

Hypothesis 8: The industry growth is creating multiple job opportunities in rural markets – however, employees prefer to remain in home location and do not explore growth prospects resulting in relocation

The non parametric tests (Table 4-10) reveal that the distribution of the location score is not the same across age, experience, company and function scores and the same across gender and qualification scores. The tabulation of the responses (Appendix 5 – Group 7) reveals that there is no significant location preference highlighted by the respondents, indicating that location does not have a major influence in the decision to stay or leave. Conclusive trends have not been established in the study that employees prefer home location rather than moving to rural markets for growth prospects and hence this hypothesis is rejected.

THE KEY RESEARCH QUESTION ANSWERED

In order to answer the key research question, eight research hypotheses were tested. The key research question addressed in this thesis was “Is there a possibility by proactive HR initiatives to manage job hopping and employee turnover in the telecom industry in Tamil Nadu?” A two-way approach was taken to answer these questions. Firstly, a questionnaire survey of the employees was carried out to quantitatively answer the questions and to verify the hypothesized relations.

Second, a review of the secondary literature available on the subject undertaken by various social scientists, researchers was studied and their qualitative and quantitative outcomes were carried forward to understand the social phenomena and its impact on individuals, organizations and the society at large. The result of these findings provided strong evidence of the presence of job hopping tendencies by employees. The different perspectives of individuals, groups and organizations were understood to suggest measures to tackle this issue and relevant tests were performed for establishing a positive relationship between the seven variables.

Thus, it is possible to characterize that organizations that commit to long range efforts in employee development, provide excitement on and off the job, hold on to employees for a longer duration as compared to others. A review of the secondary data revealed that job satisfaction, scope for innovation at work, skill development opportunities, progressive HR policies and practices can surely hold on to job hoppers for a longer duration and expect higher levels of productivity. The investigation provided evidence for the presence of dimensions of job satisfaction, progressive HR policies and practices, differential treatment for top performers, continuous skill development, as possible factors that could help the intent of staying longer in an organization. The literature review also reveals that there is a growing body of knowledge with references to numerous studies from 1970's onwards, concerning employee turnover in organizations. Various perspectives, concepts, theories and models were put forward and an attempt was made to further strengthen the well established foundations within the perspectives of this research.

IMPACT OF JOB HOPPING AND EMPLOYEE TURNOVER ON INDIVIDUALS, GROUPS, ORGANIZATION AND SOCIETY

Emotions are contagious at the workplace and individual behaviors impact groups and the organizations in totality. Group behavior is shaped by the attitudes and behaviors of the individuals. From the study of the various models and range of past studies it is very pertinent to note that job hopping impacts at various levels i.e., individuals, groups, organization and the society.

Frequent job changes results in disturbing the eco-system in the family. Movement from one place to another, calls for adjustments on various fronts, building new relationships which could be stressful. Every new assignment would involve a gestation period, learning and contributions for making a mark, which means work related stress, which could also spill over to the family. The society is also impacted by the job hopping trends in terms of delayed marriages, couples living away from their spouses and children, individuals living away from the home, their eating habits, health and welfare are all impacted. Lack of stability at work also impacts non work values and attitudes. Broken marriages owing to lack of job stability or delaying the decision to raise a family etc., are all factors that are impacted by job hopping trends. Too frequent job changes result in mid-career crisis, resulting in reduction or no options after 12-20 years of work experience and precipitating early retirement or change in vocation, profession or career paths. Short-term pay-offs have long-term negative results and job hopping trends have cascading impact on society. Mid-career crisis result inability to pay back loans, borrowings or plan for investments in a house, increase in medical costs owing to break in health policies, etc. Spending patterns and economic status of individuals are altered by the job hopping trends and the current status of employment of individuals. Stability at work or in employment drives home long term results and well being of individuals, organizations and the society at large. Frequent movement of employees has an impact on the continuity of business operations, productivity of employees, opportunity cost, increases in hiring, training and induction costs etc. Whenever employees leave an organization they carry with them the historical knowledge, functional and cultural knowledge of the organization, which takes a long time to replenish. Employee turnover surely impacts customer delivery and delight. Organization's growth and success would largely depend on stable, motivated and highly engaged employees.

DIRECTIONS FOR FUTURE RESEARCH

Similar studies could be undertaken for a larger audience i.e., covering the whole of India. Since bulk of the responses were gathered from participants below the age group of 35 years or below 12 years of work experience it would be relevant to organize an industry- company sponsored study which covers middle, senior and top management to further strengthen the outcomes of the current study. The current trends and context could have impacted the outcomes partially since the current time frame has seen the industry going through a difficult phase. A similar study in a much more robust economic situation could produce further insights. Research involving more complex variables and linkages could be undertaken to further assess the impact. A study involving all the constituents be it Government, equipment manufacturers, outsourced and managed service partners could be undertaken to have a larger perspective of this social phenomenon. It would also be appropriate to include non work domains part of the future research to study its impact across the country.

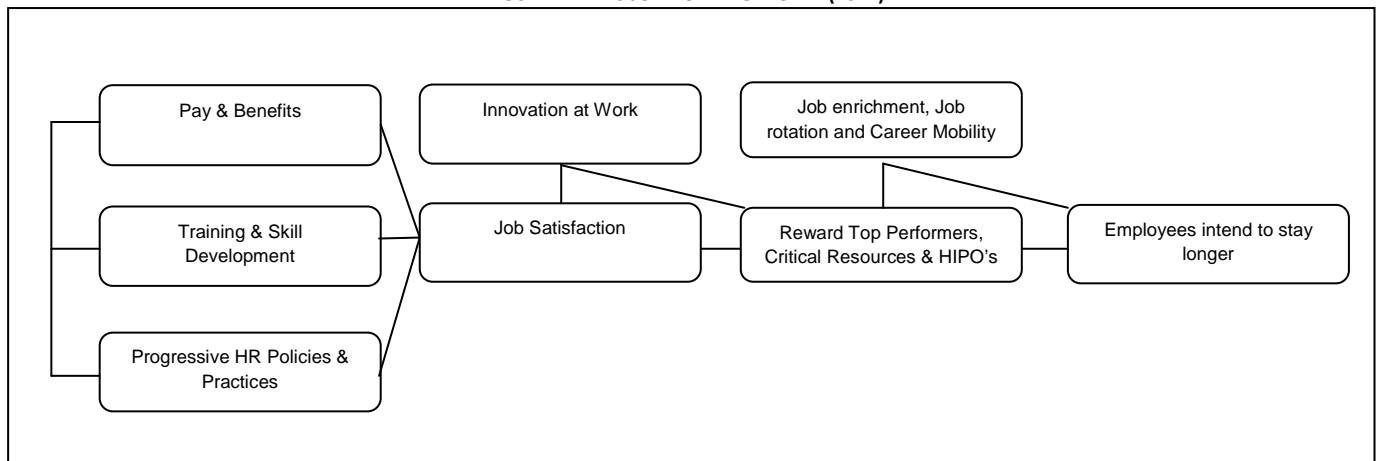
THEORETICAL AND EMPIRICAL CONTRIBUTIONS

As part of the study various employee turnover models have been researched and insights have been gathered to co-relate with the primary research findings. There is a common trail in all the trends and the empirical contributions are relevant to the current context. The empirical contributions could significantly aid management, leaders and HR managers in the organizations to further strengthen their people agenda, to manage the impact of this social phenomenon. These empirical findings provide for various insights which could be used to tailor- make HR strategy in the organizations for better performance and results. The research contributions are relevant from the context (present time frame) since the industry is going through a very difficult phase on four counts.

- Regulatory
- Market conditions (Drop in revenues)
- Technology Trends
- Attrition and Employee turnover

Respective organizations can take the essence of this empirical research work for strengthening their people practices. The model proposed by the researcher based on the research undertaken and on its findings is reproduced as follows (Figure 2):

FIGURE 2: LRK'S JOB HOPPING MODEL (2012)



INTERPRETATION OF THE MODEL

- Organizations need to structure their compensation and benefits to be attractive and competitive
- Provide adequate training on the job and skill development post settling down of the employees, to bridge the gap between the employee's performance and the expected standards
- Flexible and progressive HR policies will provide an upward thrust to the employees in scaling their performance and provide a superior contribution with higher levels of discretionary efforts
- This will ensure job satisfaction and provide a sound platform for innovation and risk taking and experimentation at work
- Differentiate the top performers, critical resources and HIPO's and reward and recognize them suitably based on their relative performance. This will create a performance culture in the organization and also create stickiness for the employees to stay back
- Offering them job rotation-enrichment and career mobility will enhance the chances of them staying longer. This model for employee retention is developed based on the findings of this study and also has several linkages with the range of past studies discussed earlier

CONCLUSION

This piece of research has established the clear linkage of job satisfaction and the employee's intention to stay. Job satisfaction is impacted by a range of reasons not restricted to the perspectives covered in this study. The knowledge workers in the present day world are looking at continuously upgrading their skills and competencies and therefore look forward to support in this connection. Failing to do so by employer's, results in dissatisfaction and exit of employees. Lack of reward and recognition or investment on training and development will trigger top performers / critical resources to exit, since they are able to generate multiple alternate job options with better terms. While pay and compensation might not be the only factor for dissatisfaction at the work place, it plays a significant role in the employee's intention to stay. With possible alternate job options on the rise, organizations need to create stickiness by implementing progressive people practices which are flexible and provide for innovation at work. Employers need to create an environment where employees could look forward to committing long term relationships based on trust and well being of all.

The analysis of data and its findings enabled the researcher to address the key question of the study with the help of theoretical and empirical evidence. The empirical evidence indicates a clear linkage between job satisfaction and employee intention to stay. Job satisfaction is impacted by a range of factors be it investments in training and skill development, innovation at work, implementation of progressive HR policies and practices, reward and recognition for critical, top performers and high potential employees and finally, pay and benefits matching the trends. The uniqueness of the factors that go in making of the decisions on job hopping can possibly be explained in terms of the career aspirations of the employees. The final research findings are significant in the sense that they are first hand information based on primary data. The data generated offers multiple possibilities for applying the information in a constructive manner for those who wish to see changes at the organizational and personal level or to pursue further study on the subject. The data can also be used to develop profiles of organizations and employees to assist in coping with job hopping. The empirical findings provides for various insights which could be used to tailor make HR strategy in the organizations for better performance and results. Respective organizations can take the essence of this empirical research work for strengthening their people practices. A combination of primary and secondary research makes this a substantial piece of research in job hopping, which could be useful for organizations to manage this phenomenon for superior business results. This research also provides a theoretical overview of the different motives of job hopping and highlights all the impacted elements of social capital in research. The real test of the information and knowledge provided through this research endeavor is in its end use for managing job hopping. While the researcher has spared no efforts in making this study as authentic, elaborate and related to the industry – market trends, there could be further scope for extending the boundaries of the research. Finally, by the findings of this study the researcher hopes to provide various insights and approaches that could be adopted for managing job hopping and employee turnover, for the well being of organizations and its employees.

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APPENDIX

APPENDIX 1: QUESTIONNAIRE – ADMINISTERED ON EMPLOYEES (RESEARCH INSTRUMENT)

Survey on Job Hopping and Employee Turnover in Telecom in the State of Tamil Nadu

I solicit your free and fair response to this questionnaire survey		
Name:	Age	Current Organization/Title/Function
Location	Qualification	Total Experience
Gender (M/F)	Marital Status	No of Children (if applicable)

1. How do you rate your on-the- job training and Induction experience in the current organization?
 - ☐ Excellent
 - ☐ Good
 - ☐ Average
 - ☐ Poor
 - ☐ Very Poor
2. How would you rate the current job offer in comparison to your previous or other job offers?
 - ☐ Excellent
 - ☐ Good
 - ☐ Average
 - ☐ Poor
 - ☐ Very Poor
3. Do you agree that employees are changing jobs too often and lack commitment to the Job and the Organization?
 - ☐ Strongly agree
 - ☐ Agree
 - ☐ Neutral
 - ☐ Disagree
 - ☐ Strongly disagree
4. Do you feel valued and recognized for your contribution in the organization?
 - ☐ Strongly agree
 - ☐ Agree
 - ☐ Neutral
 - ☐ Disagree
 - ☐ Strongly disagree
5. Did your Job content and role influence your decision to stay and pursue your career at the current workplace?
 - ☐ Strongly Agree
 - ☐ Agree
 - ☐ Neutral
 - ☐ Disagree
 - ☐ Strongly Disagree
6. Were you attracted at the time of joining for a long term career at the current organization?
 - ☐ Strongly agree
 - ☐ Agree
 - ☐ Neutral
 - ☐ Disagree
 - ☐ Strongly Disagree
7. What were the challenges in the Work Environment?
 - ☐ High work Pressure -long hours at work - Poor HR policies and work culture
 - ☐ Low compensation and no rewards and recognition
 - ☐ No investment on training and self development
 - ☐ No job satisfaction or innovation at the work place
 - ☐ No differential treatment for top performers and critical resources
8. Do you feel that there are a lot more career opportunities emerging in your organization based in rural and semi-urban areas?
 - ☐ Strongly Agree

- ☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly disagree
9. Are you satisfied with the compensation and benefits offered to you by your current employer?
- ☐ Strongly Agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly Disagree
10. Do you believe that there are adequate alternate-attractive career options in the industry matching your experience and profile?
- ☐ Strongly Agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly disagree
11. Do you find your job repetitive and monotonous and with no challenges?
- ☐ Strongly Agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly Disagree
12. With such large amounts of money at stake as compensation, would you stress more on your career priorities such as Job-Role, Progressive HR policies-work culture, Investment on your Training and Development and location of choice?
- ☐ Strongly agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly disagree
13. Do you find the HR policies and practices in the current organization employee friendly and supportive of your career ambitions?
- ☐ Strongly Agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly Disagree
14. How often have you engaged in Innovation at the Work Place?
- ☐ Very Often
☐ Often
☐ To some extent
☐ Never
15. Were you satisfied with the employee retention measures implemented in your Organization?
- ☐ Strongly agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly disagree
16. What aspects of the current job you had expected that was not offered by your employer?
- ☐ Exposure to Cutting Edge Technology and roll out of new projects
☐ Role Enhancement and Growth
☐ Location of my choice
☐ Scope for skill development and training on the job
☐ Better pay and benefits vis-à-vis competition and Progressive HR policies
17. Did Company HR Policies or Procedures make your job difficult and demoralize you?
- ☐ Strongly Agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly Disagree
18. Do you believe that the critical and top performing resources in your organization are rewarded and compensated adequately?
- ☐ Strongly Agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly disagree
19. Was the culture of the organization supportive of your plans to stay and grow?
- ☐ Strongly Agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly disagree
20. Would you prefer to stay in your home location rather than grow and move to a smaller town or rural area?
- ☐ Strongly Agree
☐ Agree
☐ Neutral
☐ Disagree

- ☐ Strongly disagree
 21. Moving to a smaller town or to a rural area on a bigger assignment motivated you to stay in the Organization?
☐ Strongly Agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly Disagree
 22. Competition companies constantly poach or contact the critical resources and high potential employees in your organization?
☐ Strongly Agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly Disagree
 23. Least Satisfying about the current Job?
☐ Pay and Benefits-lack of rewards and recognition
☐ Work Location
☐ Role/Job responsibility/job content
☐ Organization Culture, work environment and HR policies
☐ Reporting Manager/Boss - Company brand and image
☐ Lack of training and self development
 24. Primary Reason for wanting to exit the organization?
☐ Low Salary, lack of rewards and recognition
☐ Role / Job responsibility / Job content
☐ Reporting Manager/Boss
☐ Work Location
☐ Organization Culture, work environment and HR policies
☐ Lack of training and self development

APPENDIX 2: DEMOGRAPHIC SUMMARY OF RESPONDENTS

DISTRIBUTION OF RESPONDENTS - GENDER-COMPANY WISE

Gender	Co 1	Co 2	Co 3	Co 4	Co 5	Co 6	Co 7	Co 8	Total	%
Female	14	5	1	3	2	3	1	3	32	8%
Male	118	46	49	26	35	57	10	45	386	92%
Total	132	51	50	29	37	60	11	48	418	100%

DISTRIBUTION OF RESPONDENTS - FUNCTION-COMPANY WISE

Function	Co 1	Co 2	Co 3	Co 4	Co 5	Co 6	Co 7	Co 8	Total	%
Customer Service Delivery	16	15	2	1	5	8	1	9	57	14%
Sales & Marketing	39	20	25	18	29	24	6	27	188	45%
Technical	41	11	12	4	2	17	1	5	93	22%
Other Functions	36	5	11	6	1	11	3	7	80	19%
Total	132	51	50	29	37	60	11	48	418	100%

DISTRIBUTION OF RESPONDENTS - QUALIFICATION-COMPANY WISE

Qualification	Co 1	Co 2	Co 3	Co 4	Co 5	Co 6	Co 7	Co 8	Total	%
Professional	93	29	32	15	22	39	10	26	266	64%
Non-Professional	39	22	18	14	15	21	1	22	152	36%
Total	132	51	50	29	37	60	11	48	418	100%

DISTRIBUTION OF RESPONDENTS - LOCATION-COMPANY WISE

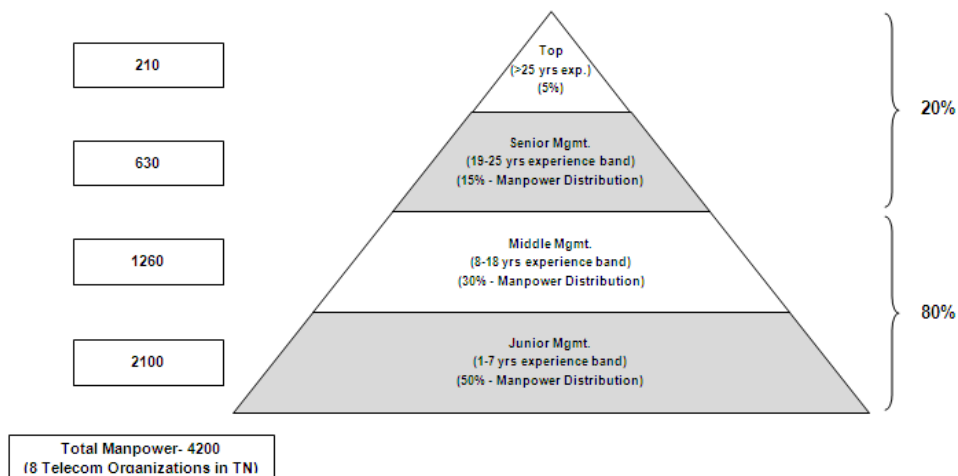
Location	Co 1	Co 2	Co 3	Co 4	Co 5	Co 6	Co 7	Co 8	Total	%
Chennai	85	34	31	11	12	39	7	26	245	59%
Rest of Tamil Nadu	47	17	19	18	25	21	4	22	173	41%
Total	132	51	50	29	37	60	11	48	418	100%

COMPANY WISE SAMPLE SIZE & RESPONDENTS SUMMARY

Company	Sample Size	%	Responses	%	Hit Rate (Response against Sample)
Co 1	227	20%	132	32%	58%
Co 2	87	8%	51	12%	59%
Co 3	98	9%	50	12%	51%
Co 4	78	7%	29	7%	37%
Co 5	273	24%	37	9%	14%
Co 6	161	14%	60	14%	37%
Co 7	43	4%	11	3%	26%
Co 8	153	14%	48	11%	31%
Total	1120	100%	418	100%	37%

APPENDIX 3: DISTRIBUTION OF RESPONDENTS – AGE-EXPERIENCE WISE

Age	Experience	Count	%	Overall		
21-25	< 5y	20	100%	Experience	Count	%
	6-10 Y	0	0%	< 5y	101	24%
	11 -15 Y	0	0%	6-10 Y	190	45%
	16-20 Y	0	0%	11 -15 Y	111	27%
	Sub Total	20	100%	16-20 Y	16	4%
26-30	< 5y	76	44%	Total	418	100%
	6-10 Y	93	54%			
	11 -15 Y	3	2%			
	16-20 Y	0	0%			
	Sub Total	172	100%			
31-35	< 5y	4	3%			
	6-10 Y	93	58%			
	11 -15 Y	63	39%			
	16-20 Y	0	0%			
	Sub Total	160	100%			
36-40	< 5y	0	0%			
	6-10 Y	3	6%			
	11 -15 Y	40	78%			
	16-20 Y	8	16%			
	Sub Total	51	100%			
41-45	< 5y	1	7%			
	6-10 Y	1	7%			
	11 -15 Y	5	33%			
	16-20 Y	8	53%			
	Sub Total	15	100%			
Total		418				



DISTRIBUTION OF MANPOWER – LEVEL WISE – TARGET ORGANIZATIONS – TN

APPENDIX 4: CHI SQUARE TEST – GROUPING OF QUESTIONNAIRE RESPONSES

	Response Options	Q24						
		1	2	3	4	5	6	
		Count	Count	Count	Count	Count	Count	
Q23	1	58	12	5	10	5	0	
	2	20	27	8	20	2	1	
	3	14	49	16	8	2	2	
	4	5	8	5	20	14	1	
	5	11	6	18	5	9	2	
	6	10	1	4	1	1	1	
	Response Options	Q16						
		1	2	3	4	5		
		Count	Count	Count	Count	Count		
	Q7	1	17	71	29	16	25	
		2	11	33	16	12	20	
		3	4	23	9	6	3	
4		9	18	14	9	5		
5	5	12	6	6	9			
	Response Options	Q23						
		1	2	3	4	5	6	
		Count	Count	Count	Count	Count	Count	
	Q7	1	32	28	39	18	35	9
		2	37	23	19	4	8	2
		3	6	11	10	8	6	4
4		8	10	15	15	4	2	
5	10	8	11	9	0	1		
	Response Options	Q24						
		1	2	3	4	5	6	
		Count	Count	Count	Count	Count	Count	
	Q7	1	53	40	25	25	18	3
		2	42	30	8	4	6	1
		3	5	11	9	15	1	1
4		12	12	13	10	6	0	
5	8	13	3	11	2	2		
	Response Options	Q23						
		1	2	3	4	5	6	
		Count	Count	Count	Count	Count	Count	
	Q16	1	13	5	11	7	10	0
		2	25	29	54	24	18	6
		3	7	33	13	10	9	1
4		11	8	11	7	3	7	
5	37	5	3	4	7	4		
	Response Options	Q24						
		1	2	3	4	5	6	
		Count	Count	Count	Count	Count	Count	
	Q16	1	12	15	6	7	5	0
		2	39	53	22	20	17	4
		3	16	17	11	22	5	0
4		11	17	9	6	3	2	
5	41	5	3	7	3	0		

APPENDIX 5: GROUP WISE RESPONSE TABLE – CHRONBACH ALPHA TEST

Response	Q5	Q11 (Rev. Coded)	Q12	Q14	Total	Sum of Strongly Agree and Agree	
1	74	25	95	100	294	1102	68%
2	251	165	224	168	808		
3	55	57	48	117	277		
4	33	112	36	24	205		
5	2	40	4	0	46		
Total	415	399	407	409	1630		

Group 1 - Job Satisfaction

Response	Q10	Q22	Total	Sum of Strongly Agree and Agree	
1	110	69	179	575	70%
2	209	187	396		
3	51	92	143		
4	34	50	84		
5	13	6	19		
Total	417	404	821		

Group 2 - Alternate Job Opportunities

Response	Q13	Q17	Total	Sum of Strongly Agree and Agree	
1	66	13	79	530	64%
2	240	211	451		
3	60	59	119		
4	36	93	129		
5	11	39	50		
Total	413	415	828		

Group 3 - HR Policies and Practices

Response	Q1	Q14	Total	Sum of Strongly Agree and Agree	
1	106	100	206	599	72%
2	225	168	393		
3	68	117	185		
4	12	24	36		
5	7	0	7		
Total	418	409	827		

Group 4 - Training and Innovation

Response	Q2	Q9	Q18	Total	Sum of Strongly Agree and Agree	
1	75	60	93	228	872	70%
2	238	204	202	644		
3	79	75	55	209		
4	17	60	53	130		
5	6	18	5	29		
Total	415	417	408	1240		

Group 5 - Pay and Benefits

Response	Q7	Q15	Q16	Total	Sum of Strongly Agree and Agree	
1	171	31	48	250	692	57%
2	94	188	160	442		
3	46	97	74	217		
4	58	77	50	185		
5	40	13	62	115		
Total	409	406	394	1209		

Group 6 - Retention of HIPO's

Response	Q8	Q20	Q21 (Rev. Coded)	Total	Sum of Strongly Agree and Agree	
1	74	105	5	184	551	45%
2	199	102	66	367		
3	67	55	65	187		
4	70	122	201	393		
5	6	29	69	104		
Total	416	413	406	1235		

Group 7 – Location Preference

APPENDIX 6: SAMPLE AND RESPONSE CONSTRUCT

Company	Sample Size		Chennai		RoTN		Male		Female		CSD		S&M		Technical		Others	
	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%
Co 1	227	20%	143	63%	84	37%	205	90%	22	10%	29	13%	70	31%	62	27%	66	29%
Co 2	87	8%	57	66%	30	34%	82	94%	5	6%	17	20%	45	52%	17	20%	8	9%
Co 3	98	9%	59	60%	39	40%	92	94%	6	6%	5	5%	48	49%	23	23%	22	22%
Co 4	78	7%	22	46%	26	54%	44	92%	4	8%	2	4%	33	69%	7	15%	6	13%
Co 5	273	24%	180	59%	123	41%	284	94%	19	6%	40	13%	129	43%	78	26%	56	18%
Co 6	161	14%	103	64%	58	36%	153	95%	8	5%	17	11%	75	47%	49	30%	20	12%
Co 7	43	4%	21	49%	22	51%	40	93%	3	7%	2	5%	23	53%	8	19%	10	23%
Co 8	153	14%	94	61%	59	39%	138	90%	15	10%	26	17%	87	57%	9	6%	31	20%
Total	1120	100%	679	61%	441	39%	1038	93%	82	7%	138	12%	510	46%	253	23%	219	20%

SAMPLE CONSTRUCT

Company	Response		Chennai		RoTN		Male		Female		CSD		S&M		Technical		Others	
	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%
Co 1	132	32%	85	64%	47	36%	118	89%	14	11%	16	12%	39	30%	41	31%	36	27%
Co 2	51	12%	34	67%	17	33%	46	90%	5	10%	15	29%	20	39%	11	22%	5	10%
Co 3	50	12%	31	62%	19	38%	49	98%	1	2%	2	4%	25	50%	12	24%	11	22%
Co 4	29	7%	11	38%	18	62%	26	90%	3	10%	1	3%	18	62%	4	14%	6	21%
Co 5	37	9%	12	32%	25	68%	35	95%	2	5%	5	14%	29	78%	2	5%	1	3%
Co 6	60	14%	39	65%	21	35%	57	95%	3	5%	8	13%	24	40%	17	28%	11	18%
Co 7	11	3%	7	64%	4	36%	10	91%	1	9%	1	9%	6	55%	1	9%	3	27%
Co 8	48	11%	26	54%	22	46%	45	94%	3	6%	9	19%	27	56%	5	10%	7	15%
Total	418	100%	245	59%	173	41%	386	92%	32	8%	57	14%	188	45%	93	22%	80	19%

RESPONSE CONSTRUCT

GROWTH AND RESPONSE OF AGRICULTURE TO TECHNOLOGY AND INVESTMENT IN INDIA (A STUDY OF POST GLOBALIZATION PERIOD)

SONALI JAIN

ASST. PROFESSOR

DEPARTMENT OF HUMANITIES

MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY

BHOPAL

H.S. YADAV

PROFESSOR

DEPARTMENT OF REGIONAL PLANNING & ECONOMIC GROWTH

BARKATULLAH UNIVERSITY

BHOPAL

TANIMA DUTTA

ASST. PROFESSOR

CHITRANSH AD PG COLLEGE

BHOPAL

ABSTRACT

Agriculture plays the important role in the development of the country. A large number of studies reveal that the agricultural development during the post independence period has not been very smooth rather it has been highly variable in terms of growth of output and its contribution to the national income. The variability is attributed to a large number of factors. The factors which have been identified for agricultural growth mostly related to the policies with reference to investment and technology. The growth and response of agricultural variables of yield, production and contribution to GDP are analyzed with linear and exponential growth measures and the use of production function taking bivariate and stepwise regression analysis. The results show that there is an increase during the period with a declining rate. The three variables respond significantly i.e., irrigation, power consumption and fertilizer used to agricultural GDP, production and yield.

KEYWORDS

Agriculture, Growth, Response, Deceleration.

INTRODUCTION

Agriculture sector has played pivotal role in the process of economic development and hence Indian planners have emphasized on the development of agricultural and allied sector right from the beginning of the economic planning process (Manoj Kamat et. al., 2007). As a result though it witnessed more than four fold increase in foodgrains production over time, but gradually in the general economic development process the sector lost its focus due to its corroding contribution in the national income (Lewis, 1954 and Syrgrnin, 1988). The share of agriculture to Gross Domestic Product in India declined from 55 percent in 1951 to the level of 13.52 percent in 2007-08 but employment in the sector remained unchanged. New economic policy of 1991 followed by the compulsions of WTO brought further structural changes in the Indian agriculture. The performance of the economy is though crucially depended on agriculture but the sector experienced the sharp deceleration in terms growth terms in recent past.

REVIEW OF LITRATURE

Tripathi and Prasad (2009) showed that growth of agriculture and its sub sectors except forestry have experienced continuous decline during the post – WTO period. Similar results of declining growth rate in Indian agriculture were observed by other agriculture economists since the 1990s, especially during the last several years (Alagh 2004; Bhalla 2004; and Gulati 2004), and agricultural production has started experiencing a decline in recent years (Bhalla 2006 and Vaidyanathan 2010). Bhalla (2007), Suri (2006) and Jayati Ghose (2001) found in their empirical studies that the most important reason for the deceleration in the growth of agriculture during the 1990s is decline in the public and overall investment in agriculture and withdrawal of subsidies from increasing the charges of water, electricity, fertilizer and other farming inputs. Kalirajan et.al. (2001) give two other important reasons for the slowing the output growth are there was no major breakthrough new high yielding variety seeds and decline in the environmental quality of land which reduced the marginal productivity of the modern inputs.

The share of gross capital formation in agriculture has also declined. The study of Biswajit Dhar and Murli Kallumal (2004) concluded that the through out the 1990s the share of agriculture in Gross Capital Formation has remained in single digits, which explains the slacking of growth momentum during the past decades.

OBJECTIVE OF THE STUDY

The declining contribution of agriculture and stagnating foodgrains production are the cause of concern to the agricultural economists. Present paper intends to explore the growth trends in agriculture and the general response to agricultural technology and investment in agriculture sector. The main objectives of the present study are:

- To measure the growth trends of foodgrains production and yield after the globalization and
- To estimate the responsiveness of agricultural GDP, foodgrains production and yield to technology and investment.

RESEARCH METHODOLOGY

The study is based on secondary data, obtained from the handbook on Indian Statistics published by Reserve Bank of India and the Ministry of Agriculture, for the period of 1990-91 to 2007-08. The growth rates are estimated with the help of linear, exponential and quadratic functions. Modified Cob Douglas production function is used for the measurement of responsiveness like other studies of Kata (1990), Chadha (1978), Bagi (1980), Mathur, Pattanayak and Nayak (2005), Das and Sircar (2006) and M.K. Sekhon et. al. (2010).

RESULTS & DISCUSSION**GROWTH OF PRODUCTION OF FOODGRAINS**

The production of foodgrains in India was 50 million tons in 1950 and faced acute shortage of foodgrains until mid – sixties. It is the Green Revolution during sixties only which brought foodgrains situation to a comfortable level but the growth gradually slowed down. The foodgrains production is increased during the post globalisation period but the pace of growth declined. The production of foodgrains was 168.38 million tons in 1991-92 which increased and reached the level of 199.44 in 1996-1997. In the ninth five year plan (1997 – 2002) government emphasized on building of the food stock to meet the increasing the demand and succeeded to increase but the production of foodgrains from 192.96 million tons at beginning and reached to 212.85 million tons at the end of the plan. In the next five year foodgrains production constantly increased to reach 230.78 million tons in 2007 – 08. The table gives the production of major crops.

TABLE 1: PRODUCTION OF MAJOR CROPS FROM 1990-91 TO 2007-08 (In million tons)

Year	Paddy	Wheat	Coarse Cereals	Total Cereals	Pluses	Oilseeds	Foodgrains
1990-91	74.29	55.14	32.70	162.13	14.26	18.61	176.39
1991-92	74.68	55.69	25.99	156.36	12.02	18.60	168.38
1992-93	72.86	57.21	36.59	166.66	12.82	20.11	179.48
1993-94	80.30	59.84	30.82	170.96	13.30	21.50	184.26
1994-95	81.81	65.77	29.88	177.46	14.04	21.34	191.50
1995-96	76.98	62.10	29.03	168.11	12.31	22.11	180.42
1996-97	81.74	69.35	34.10	185.19	14.24	24.38	199.44
1997-98	82.53	66.35	30.40	179.29	12.98	21.32	192.26
1998-99	86.08	71.29	31.34	188.70	14.91	24.75	203.61
1999-00	89.68	76.37	30.33	196.39	13.42	20.72	209.80
2000-01	84.98	69.68	31.08	185.74	11.08	18.44	196.81
2001-02	93.34	72.77	33.38	199.48	13.37	20.66	212.85
2002-03	71.82	65.76	26.07	163.65	11.13	14.84	174.77
2003-04	88.53	72.16	37.60	198.28	14.91	25.19	213.19
2004-05	83.13	68.64	33.47	185.23	13.13	24.35	198.36
2005-06	91.79	69.35	34.07	195.20	13.39	27.98	208.60
2006-07	93.35	75.80	33.92	203.08	14.20	24.29	217.28
2007-08	96.69	78.57	40.75	216.02	14.76	28.83	230.78

Source: Agricultural Statistics at a Glance 2010, Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India.

TABLE 2: GROWTH RATE OF PRODUCTION OF MAJOR CROPS

Crops	Equations	b ₀	b ₁	b ₂	R ²
Rice	Linear	98.9033 (20.35)	1.4329		0.560
	Quadratic	98.8544 (9.54)	1.4476	-0.0008	0.560
	Exponential	99.4127 (19.20)	0.0126		0.545
Wheat	Linear	103.073 (37.96)	2.0025		0.703
	Quadratic	94.8813 (24.56)	4.4599	-0.1293	0.766
	Exponential	103.463 (38.74)	0.0169		0.708
Coarse Cereals	Linear	89.8559 (3.84)	0.9410		0.194
	Quadratic	100.565 (3.64)	-2.2717	0.1691	0.327
	Exponential	89.9301 (3.59)	0.0092		0.183
Cereals	Linear	98.4960 (29.68)	1.5276		0.650
	Quadratic	97.8485 (13.95)	1.7218	-0.0102	0.650
	Exponential	99.0444 (29.08)	0.0135		0.645
Pulses	Linear	91.7174 (0.38)	0.2330		0.023
	Quadratic	95.9239 (0.50)	-1.0289	0.0664	0.063
	Exponential	91.5303 (0.31)	0.0023		0.019
Oilseeds	Linear	100.075 (6.83)	2.0020		0.299
	Quadratic	112.097 (4.15)	-1.6046	0.1898	0.356
	Exponential	101.580 (5.14)	0.0154		0.243
Foodgrains	Linear	97.9469 (25.87)	1.4230		0.618
	Quadratic	97.6937 (12.13)	1.4989	-0.0040	0.618
	Exponential	98.4362 (25.13)	0.0127		0.611

Value in bracket is 'F' value

The growth trends show higher growth rates in superior crops compared to coarse grains. The production of pulses and oilseeds has increased marginally with high fluctuations during the study period. The growth rates of the production of superior crops are statistically significant. The growth rate of pulses and oilseeds are not significant. The quadratic function shows the deceleration trends for the production of all major crops.

GROWTH OF YIELD OF FOODGRAINS

The increase in production of agriculture depends only on the growth in the yield because the other two factors i.e.; land availability and multiple utilization of land are mostly constant. The yield of crops radically changed and increased many folds in the post green revolution period with the introduction of chemical fertilizer, and high yielding variety seeds.

The general conclusion about the yield of different crop is that it has not changed significantly during the post globalisation period. In 1991 the average yield of foodgrains was 1380 Kg per hectare that increased marginally only to the level of 1854 Kg. per hectare in 2007 -08 despite the several efforts. The close look at the yield of different crops shows that there is a significant change in yield of wheat and rice but the yield of coarse grains, pulses and oilseeds have almost remained unchanged.

TABLE 3: YIELD OF MAJOR CROPS AND TOTAL FOODGRAINS (Kg./hectare)

Year	Rice	Wheat	Coarse Cereals	Total Cereals	Pulses	Oilseeds	Total Foodgrains
1990-91	1740	2281	900	1571	578	771	1380
1991-92	1751	2394	778	1574	533	719	1382
1992-93	1744	2327	1063	1654	573	797	1457
1993-94	1888	2380	939	1701	598	799	1501
1994-95	1911	2559	929	1763	610	843	1546
1995-96	1797	2483	940	1703	552	851	1491
1996-97	1882	2679	1072	1831	635	926	1614
1997-98	1900	2485	986	1775	567	816	1552
1998-99	1921	2590	1068	1856	634	944	1627
1999-00	1986	2778	1034	1925	635	853	1704
2000-01	1901	2708	1027	1844	544	810	1626
2001-02	2079	2762	1131	1980	607	913	1734
2002-03	1744	2610	966	1753	543	691	1535
2003-04	2077	2713	1221	1983	635	1064	1727
2004-05	1984	2602	1153	1903	577	885	1652
2005-06	2102	2619	1172	1968	598	1004	1715
2006-07	2131	2708	1182	2020	612	916	1756
2007-08	2203	2785	1415	2146	638	1086	1854

Source: Agricultural Statistics at a Glance 2010, Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India.

TABLE 4: GROWTH RATE OF YIELD OF MAJOR CROPS

Crops	Equations	b ₀	b ₁	b ₂	R ²
Rice	Linear	98.8346 (32.18)	1.2724		0.668
	Quadratic	101.007 (15.81)	0.6206	0.0343	0.678
	Exponential	99.3201 (31.14)	0.0114		0.661
Wheat	Linear	103.252 (29.27)	1.0435		0.647
	Quadratic	97.4040 (23.05)	2.7979	-0.0923	0.755
	Exponential	103.303 (29.81)	0.0094		0.651
Coarse Cereals	Linear	93.4090 (33.96)	2.4975		.680
	Quadratic	100.322 (18.14)	0.4234	0.1092	.707
	Exponential	94.9612 (34.45)	0.0212		.683
Cereals	Linear	100.220 (76.22)	1.7159		0.826
	Quadratic	99.0342 (36.26)	2.0715	-0.0187	0.829
	Exponential	100.878 (77.14)	0.0148		0.828
Pulses	Linear	98.7245 (2.20)	0.4023		0.121
	Quadratic	97.9922 (1.05)	0.6220	-0.0116	0.123
	Exponential	98.6132 (2.18)	0.0039		0.120
Oilseeds	Linear	96.9673 (11.43)	1.6922		0.417
	Quadratic	100.154 (5.53)	0.7361	0.0503	0.425
	Exponential	97.8201 (10.54)	0.0145		0.397
Foodgrains	Linear	100.866 (64.04)	1.6094		0.800
	Quadratic	98.7326 (31.48)	2.2495	-0.0337	0.808
	Exponential	101.393 (64.10)	0.0140		0.800

Value in bracket is 'F' value

The growth rates calculated for the yield of crops show similar trends to that of production of the crops. The growth rates of pulses and oilseeds are not significant rather they show deceleration in yield over time.

RESPONSE TO TECHNOLOGY AND INVESTMENT

Development of agriculture depends on a prevailing economic, demographic, technological conditions and policies pursued by state. The growth of agriculture is not only depends on irrigation and fertilizer but it is also the combination of the other factors (A. Vadhiyanathan, 2010). The declining contribution of agriculture to GDP and stagnating yield and production of foodgrains are attributed to a large number of factors but investment is the prime factor which affects the technological use of inputs in agriculture. The post globalization period is said to be characterized by both the conditions and therefore, the conditions of marginalization are observed. The response of agricultural GDP, yield and production of foodgrains towards investment and technology are estimated with the help of bivariate and stepwise regression model.

TABLE 5: BIVARIATE REGRESSION ANALYSIS OF AGRICULTURAL GDP

Name of independent variable	α	β	t	R ²
Gross irrigated Area	- 7.590	4.80*	15.55	0.937
Fertilizer consumption	- 2.397	2.27*	11.74	0.895
Electricity consumption	- 2.514	2.22*	7.92	0.797
High yielding variety seeds	- 0.427	1.259*	11.85	0.897
Capital formation	- 2.328	2.27*	8.74	0.826
Investment	0.275	0.911*	12.44	0.906
Plan outlays	0.955	0.606*	12.45	0.906

*1 percent level of significant

The bivariate production function for the agricultural GDP shows positive response to technological and investment variables. Technological variables namely irrigation, consumption of fertilizer, consumption of electricity and High Yielding Variety seeds show the positive relationship with the agricultural GDP and also significant at 1 percent level of significance. Of these variables gross irrigated area shows the highest elasticity ($\beta = 4.80$) and the consumption of fertilizer and High yielding variety seeds give the 89 percent explanation to the total variance but fertilizer consumption have higher level of elasticity ($\beta = 2.27$) in comparison to High Yielding Variety seeds ($\beta = 1.259$). Although the consumption of electricity has lower level of explanation but it has high response ($\beta = 2.22$) to the agricultural GDP. The macro economic variables which are government plan expenditure and investment explain 90 percent of the total variance with relatively low level of the β coefficient. The β coefficients for both the variables are 0.606 and 0.911 respectively. Though the capital formation only explain the 82 percent of the total variance but it has the higher level of elasticity ($\beta = 2.27$). The result of the analysis indicates that proper investment in the agriculture sector with optimum utilization of the technology will give higher level of returns and growth to agriculture.

TABLE 6: STEPWISE REGRESSION ANALYSIS OF AGRICULTURAL GDP

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.967(a)	.934	.930	.05311
2	.984(b)	.968	.964	.03806
3	.995(c)	.991	.989	.02131
4	.995(d)	.990	.989	.02157

a Predictors: (Constant), gia

b Predictors: (Constant), gia, capital formation

c Predictors: (Constant), gia, capital formation, electricity consumption

d Predictors: (Constant), capital formation, electricity consumption

COEFFICIENTS (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-7.486	.654		-11.446	.000
	gia	4.757	.315	.967	15.104	.000
2	(Constant)	-4.171	.949		-4.397	.001
	gia	2.847	.526	.579	5.413	.000
	capital formation	.275	.068	.430	4.020	.001
3	(Constant)	-1.684	.682		-2.469	.027
	gia	.574	.489	.117	1.172	.261
	capital formation	.375	.042	.587	8.937	.000
	electricity consumption	.903	.155	.359	5.817	.000
4	(Constant)	-.910	.172		-5.276	.000
	capital formation	.416	.024	.650	17.274	.000
	electricity consumption	1.048	.095	.417	11.083	.000

a Dependent Variable: agri GDP

To avoid the problems of collinearity stepwise regression analysis is carried out to find out the core variables which affect the growth of agricultural gross domestic product. The result of the stepwise analysis shows that the gross irrigated area, capital formation and consumption of electricity for the purpose of agriculture are the most important variable for the growth of agricultural GDP. All these variables together explain 99.1 percent of the total variance. It clearly indicates that withdrawal of governmental investment will adversely affect the agricultural output.

The growth of gross value of agricultural output is the result of the increasing yield per hectare and contribution of foodgrains to the total output of agriculture covers major part of it. Though the yield of different crops vary significantly between the superior and course grain. Yet, it is assumed that the average yield of the foodgrains is also the result of aggregate technological inputs and investment in agriculture sector. The log linear bivariate regression analysis results reveal that the technological variable such as irrigation, fertilizer consumption, electricity and the coverage of high yielding variety seeds have the positive bearing and elasticities provide high level of explanation to the variability in the yield of foodgrains. Irrigation emerges as highest explanatory variable followed by fertilizer consumption and high yielding variety seeds. The bearing of investment in agriculture and plan outlays also shows high level explanation to the yield. The coefficients of (R^2) and 't' values also confirm the significant relationship.

TABLE 7: BIVARIATE REGRESSION ANALYSIS OF YIELD OF FOODGRAINS

Name of the independent variable	α	β	t	R ²
Gross irrigated Area	0.298	0.850*	12.136	0.902
Fertilizer consumption	1.242	0.390*	8.263	0.810
Electricity consumption	1.244	0.370*	5.880	0.683
High yielding variety seeds	1.587	0.212*	7.732	0.788
Capital formation	1.822	0.102*	7.712	0.788
Investment	1.273	0.380*	6.301	0.712
Plan outlays	1.698	0.157*	8.799	0.828

*1 percent level of significance

In the stepwise regression irrigation emerge as a sole variable which affect the yield of the foodgrains. It means that irrigation is the most important variable for increasing the yield of the foodgrains. It explains the 85 percent of the total variance and regression coefficient is significant at 1 percent level of significance.

The production of foodgrains also reveals similar result. The increase in yield per hectare is directly related to increasing foodgrains output because the area under cultivation and double cropped area have remained constant during this period.

TABLE 8: BIVARIATE REGRESSION ANALYSIS OF PRODUCTION OF FOODGRAINS

Name of the independent variable	α	β	t	R ²
Gross irrigated Area	0.318	0.831	7.89*	0.795
Fertilizer consumption	1.247	0.379	6.201*	0.706
Electricity consumption	1.282	0.345	4.395*	0.547
High yielding variety seeds	1.597	0.200	5.354*	0.641
Capital formation	1.823	0.093	5.047*	0.614
Investment	1.310	0.353	4.589*	0.568
Plan outlays	1.696	0.150	6.112*	0.70

* 1 percent level of significance

The bivariate regression analysis results confirms the fact that the technological and investment variables have positive bearing on the increasing foodgrains output. The close examination of the results reveals that the coefficients of foodgrains production come out to be lower than the coefficient of yield. The variance explained individually by all the variables varies between 50 to 80 percent, though the order of explanation remains mostly unchanged. The core variable for the production and yield of foodgrains is gross irrigated area in stepwise regression and it gives same level of explanation to bivariate regression analysis.

CONCLUSION

The post globalization period is marked with the deceleration in agricultural growth foodgrains production, contribution to GDP, yield of different crops. Oilseeds and pluses show no change in terms of yield and production. The technological and investment variables show a positive bearing on the foodgrains production with significant response. Bhalla and Singh (2001) have also noted that the investment in irrigation and tubewells, and additional use of fertilizers and HYV seeds have helped in raising the productivity. They also found higher production elasticities to fertilizers, tubewells, tractors and irrigation. Desai and Nambodiri (1997) have also found that factors like HYV seeds and fertilizer have greater influence on the growth of agricultural productivity in India. Mathur and Das (2006) also concluded that the investment by government in agriculture sector, subsidy, agricultural prices and usage of electricity are the significant factors that decide the production flow of Indian agriculture. The results of the present analysis identify the irrigation; fertilizer and power consumption are the most important variables to which agriculture responds in India.

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DAY OF THE WEEK EFFECT IN INTERNATIONAL MARKET: A CASE STUDY OF AMERICAN STOCK MARKET

DR. BAL KRISHAN

PROFESSOR

DEPARTMENT OF COMMERCE
HIMACHAL PRADESH UNIVERSITY
SHIMLA

DR. REKHA GUPTA

ASST. PROFESSOR

GOVERNMENT P. G. COLLEGE
UNA

ABSTRACT

The main purpose of this study is to find out the impact of the days of week effect on international stock market. For these purpose seven countries indices are chosen which cover two continents. Leven test, Robust test and independent student t- test are used for this purpose. Leven test statistics shows there are no differences in the volatility of county indices' returns across the days of the week. Robust test and t test statistics shows that majority of companies have insignificant difference between mean return of days of the week.

KEYWORDS

international market, American stock exchange.

INTRODUCTION

Thus, a number of studies have documented evidence in support of anomalous pattern of daily returns in the international and Indian stock markets. Some literature in this context indicates considerably higher returns on Friday and the lowest on Monday as compared to other days of the week in Indian stock market. Some studies deny its existence. These studies indicates that day of the week effect vanished after the introduction of rolling settlement. Day of the week effect is also documented for other stock markets around the world. Among them **Jaffe and Westerfield (1985)** investigate the weekend effect in four developed markets, namely Australia, Canada, Japan and U.K. The result indicates the existence of weekend effect in all countries studied. Contrary to previous studies of the U.S. market, the lowest mean returns for both Japanese and Australian stock markets were found to be on Tuesday. In India, impact of trading settlement system on the weekend effect was conducted by **Amanulla and Thiripalraju (2001)**. They have found evidence to support weekend effect during the period of ban on carry-forward transactions. It also noticed consistent positive returns on Wednesday a phenomenon never been reported elsewhere. It is expected from an investor to look at the return of the stock while buying it. But there is also other condition that can't underestimate is the volatility of the stock price. It is very important know if high volatility of stock price is related with high volatility for a given day. If investors could identify a certain pattern for the day; they could revise their position in the stock market to avoid high volatility in their portfolio. **Kiyamaz and Berument (2003)** report that volatility varies by the day of the week for developed. **Nath and Dalvi (2005)** documented the impact of introduction of rolling settlement in India on the daily returns and noted the Monday and Fridays were critically significant trading days. It noticed that even after compulsory rolling settlement Friday continues to be the most significant trading day of the week for return propagation. **Ramesh and Kiran (2007)** has noticed day of the week effect was noticed in the sense that Mondays and Fridays were critically significant trading days before introduction of the rolling settlement. On the whole, the study documented evidence on the subject that anomalous returns pattern on the Indian bourses has dissipated after the introduction of rolling settlement. **Chander and Mehta (2007)** also the studies of some structural changes in the market leading to or removing some anomalous pattern in the stock prices, are of interest to investors and analysts. The present study was conceptualized to scrutinize whether anomalous patterns yield abnormal return consistently for any specific day of the week even after introduction of the compulsory rolling settlement of Indian bourses. Three market series viz. BSE sensex, S&P CNX Nifty and S and P CNX 500 were observed on daily basis for ten years viz 1. Pre -rolling settlement period, April 1997- December 2001 and 2. Post rolling settlement period, January 2002- March 2007 to discern evidences in this regard. Contrary to developed capital markets, the results reported in this study documented lowest Friday returns in the pre- rolling settlement period as credible evidence for the weekend effect. The findings recorded for post -rolling settlement period were in harmony with those obtained elsewhere in the sense that Friday returns were highest and those on Monday were the lowest. It implied that arbitrage opportunities existed have disappeared consequent to the rolling settlement on the whole , the study noted stock markets moved more rationally and anomalous return pattern noted earlier could not sustain , in the past rolling settlement period. **Satish and Sonal (2009)** have examined three types of anomalies namely Monday Effect, Friday Effect and Day of the week effect. The data has been collected for the period from January 2007 to December 2008 for three indices: BSE-200, CNX-100 and CNX-500. The results of this study show that the anomalies do not exist in the Indian stock market and this market can be considered as information ally efficient. It means that it is not possible to earn abnormal returns constantly that are not commensurate with the risk. Although the mean returns on Monday are negative whereas the mean returns on Friday are positive but t-test results conclude that there is insignificant difference between the returns on Monday and other week days.

DATA

The list of stock markets consists of seven countries from two continents. The name of all the sample countries and their respective stock indices are mentioned in appendix-I. Daily average equity price (Highest and Lowest price) indices of all the sample countries are obtained over a period of six years starting from April 2003 to March 2009. All the relevant data have been collected from national and international websites. Though the daily returns of most of the sample countries are matched by the calendar date, the trading sessions of the stock exchanges of those countries may not completely overlap across the market.

OBJECTIVES

The object of this study is to test the day of the week effect in North and South American stock market.

HYPOTHESES

The present study aims to examine the day of week variation in stock returns and their volatility. In order to fulfil the objectives, following hypothesis is considered:

- There are no differences in the volatility of stock indices across the day of week;

$$H_0: \sigma_{\text{MON}}^2 = \sigma_{\text{TUE}}^2 = \sigma_{\text{WED}}^2 = \sigma_{\text{THU}}^2 = \sigma_{\text{FRI}}^2$$

$$H_A: \sigma_{\text{MON}}^2 \neq \sigma_{\text{TUE}}^2 \neq \sigma_{\text{WED}}^2 \neq \sigma_{\text{THU}}^2 \neq \sigma_{\text{FRI}}^2$$

$$\sigma_i^2 = \text{variance of day of the week returns}$$

- There are no differences in the average return on stock indices across the day of the week ;
- H₀: $\bar{X}_{\text{MON}} = \bar{X}_{\text{TUE}} = \bar{X}_{\text{WED}} = \bar{X}_{\text{THU}} = \bar{X}_{\text{FRI}}$
H_A: $\bar{X}_{\text{MON}} \neq \bar{X}_{\text{TUE}} \neq \bar{X}_{\text{WED}} \neq \bar{X}_{\text{THU}} \neq \bar{X}_{\text{FRI}}$
 \bar{X}_i = Average return of day of the week
- The null hypothesis posits that specific day return has no difference with other days of the week.
- H₀: $\bar{X}_{\text{SPECIFIC DAY}} = \bar{X}_{\text{OTHER DAYS OF THE WEEK}}$
H_A: $\bar{X}_{\text{SPECIFIC DAY}} \neq \bar{X}_{\text{OTHER DAYS OF THE WEEK}}$
 \bar{X}_i = Average return of day of the week

METHODOLOGY

Following steps and methods are applied for this study:

- Average share price** of each company is obtained as:

$$\text{Share price} = \frac{P_H + P_L}{2}$$

where:

P_H = Highest market price during the day; and

P_L = Lowest market price during the day.

- The **daily return** of the S&P CNX Nifty and companies are calculated as:

$$R_t = \frac{(P_t - P_{t-1}) * 100}{P_{t-1}}$$

where:

R_t is the rate of return for the period t ; and

P_t and P_{t-1} are the price of two successive periods t and $t - 1$.

- Weekly returns** of the year are calculated as:

Specific day return = Average return of specific days in a year

- Levene's test** is employed for testing the equality of the variance of daily returns across days of the week. The Levene statistic is distributed as w statistic with $(J - 1, N - J)$ degree of freedom.

$$WW = \frac{\left\{ \sum_{j=1}^J n_j (D_{.j} - D_{..})^2 \right\} \left[\frac{(N - J)}{(J - 1)} \right]}{\left\{ \sum_{j=1}^J \sum_{i=1}^{n_j} (D_{ij} - D_{.j})^2 \right\} \left[\frac{(N - J)}{(J - 1)} \right]}$$

$$D_{ij} = |R_{ij} M_j|$$

where:

W is the result of the test;

R_{ij} is the return for week i and weekday j for $j = 1$ to 5 ;

M_j is the sample median return for weekday j computed over n_j weeks;

$$D_{.j} = \sum_{i=1}^{n_j} \frac{D_{ij}}{n_j}, \text{ which is the mean of the } D_{ij}; \text{ and}$$

$$D_{..} = \sum_{j=1}^J \sum_{i=1}^{n_j} \frac{D_{ij}}{N}, \text{ is the grand mean of } D_{ij}.$$

The significance of w is tested against $F(\alpha, k - 1, N - K)$ where F is a quintile of the F test distribution, with $k - 1$ and $N - K$ its degrees of freedom, and α is the chosen level of significance (usually 0.05 or 0.01).

- Robust test** calculates the **Brown-Forsythe** statistic to test equality of group means. This statistic prefers the F statistic. It is tested that mean in stock return is equal across all five days of the week or does it exhibit statistically significant differences. It is calculated by using SPSS 17.
- Independent t test** is tested whether mean differences of different samples are significant or not. It is used for measure the mean difference between specific day returns and other day's returns. To carry out the test, it calculates the statistic as follows:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S} * \sqrt{\frac{n_1 n_2}{n_1 + n_2}}$$

$$S = \sqrt{\frac{\sum (X_1 - \bar{X}_1)^2 + \sum (X_2 - \bar{X}_2)^2}{n_1 + n_2 - 2}}$$

where:

\bar{X}_1 is the mean of first sample;

\bar{X}_2 is the mean of second sample;

n_1 is the number of observations in the first sample;

n_2 is the number of observations in the second sample; and

S is the combined standard deviation.

RESULT AND DISCUSSION

For testing the volatility between days of the week return Levene statistics are presented in table-I. A close look at table indicates that all American country indices volatility between days of the week return are insignificant. Thus no country indices are significant at one and five per cent level. It reveals that for American indices, days of the week returns volatility have insignificant variation.

It can be cited from table-II that for 100 per cent of the American country indices the average return difference between the days of the week are insignificant. It depicts that country indices have insignificant difference between mean return of days of the week. Thus it depicts that day of the week effect does not exist in American stock market.

Independent t test is also used for each day in which specific day is considered as one group and other days are considered as second group. The results of t test are presented in table-III, IV, V, VI and VII for Monday, Tuesday, Thursday and Friday. According to this study American country indices results that there is insignificant difference between specific day and other days in a week. It reveals that null hypothesis is accepted in all the years.

In existing studies related to the different market index, daily investigation of the week has revealed that mean return on Friday is higher and on Monday is lower as compared to other days. All these studies are not based on recent year's data. While this study done on the recent data, which investigates five types of anomalies namely Monday, Tuesday, Wednesday, Thursday and Friday. The results show that no specific day is important as compared to other days; there is insignificant difference between specific day and other days. It reveals that all days are equally important for investor in American stock markets.

CONCLUSION

On the basis of the objective of the study the following results have been drawn:

- The result shows that north and south American country indices days of the week volatility have insignificant variation; and
- It also depicts that American country indices have insignificant difference between mean return of days of the week.

Numerous empirical investigations related to international and Indian stock market, however, provide evidence of having day of the week effect anomalies in the capital market. Some studies deny these anomalies in Indian stock market after introduction of rolling settlement. This study suggests the investors that all days in week are equally important. No specific day is important for purchasing and selling the securities for investor.

TABLE-I: LEVENE TEST FOR EQUALITY OF VARIANCE

Name of Countries	2003-04		2004-05		2005-06		2006-07		2007-08		2008-09	
	Levene Statistic	Sig.	Levene Statistic	Sig.	Levene Statistic	Sig.	Levene Statistic	Sig.	Levene Statistic	Sig.	Levene Statistic	Sig.
VENEZUELA	.568	.686	1.992	.097	.416	.797	.745	.562	.402	.807	.436	.782
PERU	.894	.468	1.946	.103	.997	.410	1.640	.165	.579	.678	.256	.906
ARGENTINA	.986	.416	1.121	.347	1.497	.203	1.093	.361	1.702	.150	.300	.878
BRASIL	1.076	.369	1.666	.159	1.155	.331	.507	.731	.390	.815	.281	.890
MEXICO	1.997	.095	2.555	.039	1.512	.199	.998	.409	1.844	.121	.263	.902
USA	.526	.717	1.552	.188	2.125	.078	1.214	.305	2.036	.090	1.194	.314
CANADA	.238	.916	2.493	.044	3.139	.015	.555	.696	.832	.506	.789	.533

TABLE-II: ROBUST TEST FOR EQUALITY OF MEAN

Name Of Countries	2003-04		2004-05		2005-06		2006-07		2007-08		2008-09	
	Statistic	Sig.	Statistic	Sig.	Statistic	Sig.	Statistic	Sig.	Statistic	Sig.	Statistic	Sig.
VENEZUELA	.329	.859	2.945	.022	.642	.633	2.203	.071	.841	.501	1.030	.393
PERU	.512	.727	.484	.747	.242	.914	1.182	.320	.792	.531	.528	.715
ARGENTINA	.424	.791	.624	.646	.307	.873	.667	.616	.467	.760	.658	.622
BRASIL	.745	.562	1.139	.339	.134	.970	1.079	.367	.193	.942	.292	.883
MEXICO	.183	.947	.517	.723	.674	.610	.651	.626	.198	.939	.455	.768
USA	.144	.965	.441	.779	.356	.840	1.436	.223	.086	.987	1.179	.321
CANADA	.711	.585	.612	.654	.645	.631	.180	.949	.910	.459	.500	.736

TABLE-III: INDEPENDENT T TEST STATISTIC FOR TESTING HOMOGENEITY OF DIFFERENCE BETWEEN MONDAY AND DIFFERENT DAYS OF THE WEEK

Name Of Countries	2003-04		2004-05		2005-06		2006-07		2007-08		2008-09	
	t value	p Value	t value	p Value	t value	p Value	t value	p Value	t value	p Value	t value	p Value
VENEZUELA	0.786512	0.432395	2.19482	0.029177	0.000766	0.999389	1.791434	0.074562	0.913915	0.361748	0.861621	0.389794
PERU	0.426843	0.669881	0.004616	0.996321	-0.95166	0.342217	1.514424	0.131251	1.474421	0.141718	-0.99942	0.318626
ARGENTINA	-0.21135	0.832796	-0.02447	0.980501	0.574259	0.566322	0.764471	0.445357	1.012612	0.3123	0.533184	0.59441
BRASIL	-0.80198	0.42337	1.671402	0.095991	-0.37641	0.70695	-0.32389	0.746313	-0.11324	0.909939	-0.06085	0.951526
MEXICO	-0.261	0.794322	0.4507	0.652594	-1.17496	0.241139	-0.18698	0.851838	0.719689	0.472422	-0.55539	0.579148
USA	0.156609	0.875684	0.530912	0.595968	-0.19012	0.849373	-0.52052	0.603183	-0.49959	0.61782	0.35991	0.71923
CANADA	-0.84035	0.401558	1.131748	0.25886	-0.22162	0.824839	0.095722	0.923826	1.079458	0.281476	0.744787	0.457148

TABLE-IV: INDEPENDENT T TEST STATISTIC FOR TESTING HOMOGENEITY OF DIFFERENCE BETWEEN TUESDAY AND DIFFERENT DAYS OF THE WEEK

Name Of Countries	2003-04		2004-05		2005-06		2006-07		2007-08		2008-09	
	t value	p Value	t value	p Value	t value	p Value	t value	p Value	t value	p Value	t value	p Value
VENEZUELA	0.15605	0.876133	1.605727	0.109706	-0.4437	0.657676	0.619158	0.536436	-1.73554	0.084026	-0.33061	0.741238
PERU	1.099788	0.27254	0.954065	0.341023	0.130054	0.896632	0.789286	0.430734	-0.36862	0.712746	0.8567	0.392491
ARGENTINA	1.001446	0.317632	-1.33581	0.182866	0.190766	0.848868	-1.15721	0.248368	-1.15104	0.250899	0.567569	0.57087
BRASIL	0.270195	0.787246	-1.03783	0.300432	0.107014	0.914868	-0.51074	0.610021	-0.72795	0.46739	-0.01019	0.991881
MEXICO	-0.38518	0.700451	-0.51624	0.606138	0.919109	0.358932	-0.5424	0.588054	-0.61817	0.537055	0.603042	0.54705
USA	0.04886	0.961071	-1.02611	0.305866	1.150182	0.251209	-0.99372	0.321366	-0.01582	0.98739	0.413273	0.679774
CANADA	0.154064	0.877691	0.161148	0.872111	1.284058	0.200607	-0.29075	0.771512	-0.50537	0.613765	0.908199	0.364708

TABLE-V: INDEPENDENT T TEST STATISTIC FOR TESTING HOMOGENEITY OF DIFFERENCE BETWEEN WEDNESDAY AND DIFFERENT DAYS OF THE WEEK

Name Of Countries	2003-04		2004-05		2005-06		2006-07		2007-08		2008-09	
	t value	p Value	t value	p Value	t value	p Value	t value	p Value	t value	p Value	t value	p Value
VENEZUELA	-0.03889	0.969011	-0.89591	0.371236	-1.27902	0.202166	-2.08185	0.038482	-0.08448	0.932749	-2.10318	0.036537
PERU	-0.21554	0.829532	-1.25203	0.211793	0.473574	0.636229	-1.7857	0.075427	-0.45298	0.650981	0.336875	0.736515
ARGENTINA	0.608813	0.543232	-0.18508	0.853324	-0.87648	0.381631	-0.82749	0.408804	-0.09064	0.927856	-1.21613	0.225154
BRASIL	1.214946	0.225601	-0.22713	0.820521	-0.25932	0.795613	-1.40625	0.160998	-0.01847	0.985282	0.459126	0.646559
MEXICO	-0.18857	0.85059	0.972788	0.331591	-0.2097	0.834071	-1.06214	0.289255	-0.07882	0.937242	0.956855	0.339603
USA	-0.63875	0.523588	0.808219	0.419762	-0.20591	0.837034	-1.12949	0.259822	-0.0401	0.968047	0.783196	0.434281
CANADA	1.106692	0.269549	0.042265	0.966322	-1.00022	0.318413	-0.6409	0.522239	-1.56742	0.118344	-1.18705	0.236413

TABLE-VI: INDEPENDENT T TEST STATISTIC FOR TESTING HOMOGENEITY OF DIFFERENCE BETWEEN THURSDAY AND DIFFERENT DAYS OF THE WEEK

Name Of Countries	2003-04		2004-05		2005-06		2006-07		2007-08		2008-09	
	t value	p Value	t value	p Value	t value	p Value	t value	p Value	t value	p Value	t value	p Value
VENEZUELA	0.102987	0.918065	-2.56334	0.011004	0.655654	0.512696	-1.50714	0.133172	0.574983	0.565883	1.46592	0.144036
PERU	-0.67577	0.499845	0.318423	0.750445	0.255261	0.798737	-0.53306	0.594493	-1.12177	0.263116	0.419218	0.675443
ARGENTINA	-0.52098	0.60287	0.98693	0.324663	-0.39816	0.690864	0.828692	0.408123	0.044678	0.964402	-0.19729	0.843773
BRASIL	0.456738	0.648279	0.722935	0.470448	-0.12872	0.897691	0.580195	0.562351	0.616047	0.538478	0.461794	0.646647
MEXICO	0.631044	0.528618	0.151255	0.879896	-0.50887	0.611293	0.633252	0.527179	-0.14056	0.888336	0.289754	0.772255
USA	0.447104	0.6552	0.160493	0.872627	-0.75292	0.452235	2.032481	0.043211	0.373834	0.708857	0.553813	0.580221
CANADA	0.638787	0.523578	-0.00538	0.995714	-0.52664	0.599026	0.216162	0.829056	0.007936	0.993675	0.311543	0.755665

TABLE-VII: INDEPENDENT T TEST STATISTIC FOR TESTING HOMOGENEITY OF DIFFERENCE BETWEEN FRIDAY AND DIFFERENT DAYS OF THE WEEK

Name Of Countries	2003-04		2004-05		2005-06		2006-07		2007-08		2008-09	
	t value	p Value	t value	p Value	t value	p Value	t value	p Value	t value	p Value	t value	p Value
VENEZUELA	-1.00671	0.315156	-0.27258	0.785419	0.961242	0.337431	1.073694	0.284105	0.214153	0.830623	0.015106	0.987961
PERU	-0.65112	0.515601	-0.01442	0.988503	0.091257	0.927364	0.041834	0.966667	0.476728	0.634002	-0.63385	0.526801
ARGENTINA	-0.87295	0.383572	0.503012	0.615413	0.513852	0.607821	0.288953	0.772873	0.097065	0.922758	0.314869	0.75314
BRASIL	-1.1598	0.247302	-1.10467	0.270447	0.664217	0.507194	1.647933	0.100732	0.206914	0.836262	-0.87608	0.381862
MEXICO	0.196298	0.844545	-1.06479	0.287991	0.987094	0.324559	1.095071	0.274597	0.088699	0.929396	-1.30793	0.19215
USA	-0.02088	0.983357	-0.49642	0.620051	0.057444	0.954239	0.537085	0.591709	0.186394	0.852293	-2.12235	0.034829
CANADA	-1.06202	0.289307	-1.31414	0.190043	0.419468	0.675324	0.582981	0.560487	0.852829	0.394612	-0.79479	0.427542

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APPENDIX

APPENDIX – I: NAME OF EQUITY INDEX OF DIFFERENT COUNTRIES

Serial. No	NAME OF COUNTRIES	NAME OF EQUITY INDEX
1	VENEZUELA	IBC
2	PERU	Lima General
3	ARGENTINA	MerVal
4	BRASIL	Bovespa
5	MEXICO	IPC AllShare
6	UK	FTSE 100 Financial Times
7	USA	S&P 500 (large cap)
8	USA	S&P 500 (large cap)

STOCHASTIC BEHAVIOR OF A TWO UNIT SYSTEM WITH PARTIAL FAILURE AND FAULT DETECTION

VIKAS SHARMA
RESEARCH SCHOLAR
DEPARTMENT OF STATISTICS
UNIVERSITY OF JAMMU
JAMMU

J P SINGH JOOREL
PROFESSOR
DEPARTMENT OF STATISTICS
UNIVERSITY OF JAMMU
JAMMU

ANKUSH BHARTI
RESEARCH SCHOLAR
DEPARTMENT OF STATISTICS
UNIVERSITY OF JAMMU
JAMMU

RAKESH CHIB
RESEARCH SCHOLAR
DEPARTMENT OF STATISTICS
UNIVERSITY OF JAMMU
JAMMU

ABSTRACT

In the present paper we proposed and analyzed a two unit (identical units connected in parallel and both are in operative mode) operative system with the concept of repair to the partially failed unit and fault detection of the completely failed unit to decide whether the failed unit needs repair or replacement. The failure time of an operative unit to partial, partial failure to complete failure and operative to complete failure is assumed exponentially distributed with different parameters. The fault detection time, repair time of complete failure and replacement time are assumed a general distribution but different parameters. The reliability analysis of this model has been carried out by using regenerative point technique.

KEYWORDS

parallel, replacement, exponential and general.

INTRODUCTION

In the present study a repairable system which consists of two units viz. Main unit and Helping unit has been analyzed. Both the units are working and the main unit may fail either completely or partially leading to complete failure whereas the helping unit is subjected to only complete failure with different types of failure rates. However, there exist many practical situations wherein the operative unit fails partially and if the repair is provided to the partial failed unit, it may become operative. Also after the complete failure of a unit it is sent for fault detection that is to find out whether the repair is possible or not. If it is found to be repairable then it should be sent for repair otherwise failed unit is replaced with a new unit. The concept of inspection and fault detection is widely used in literature, for describing the models, by several authors including Agarwal and Kumar [1], Agnihotri and Satsangi [2], [Mahmoud, et al [3], Malik [4], Naidu and Gopalan [5,6], Nakgawa [7,8] and Pour Darvish and Joorel [9].

In this model we consider a system composed of two identical units connected in parallel and both are in operative mode. The operative unit may fail partially or completely. However, a partially failed unit can also fail completely. The operative unit fails partially and if the repair is provided to the partial failed unit, it may become operative. Also after the complete failure of a unit it is sent for fault detection to decide whether the repair is possible or not. If it is found to be repairable then it should be sent for repair otherwise failed unit is replaced with a new unit. The probability that the failed unit goes for repair or replacement is fixed. The failure times of an operative unit to partial, partial failure to complete failure and operative to complete failure are assumed to be exponentially distributed with different parameters. The fault detection time, repair time of complete failure and replacement time are assumed a general distribution but different parameters.

NOTATIONS AND POSSIBLE STATES OF THE SYSTEM

O	:	Unit under operation.
O_{pr}	:	Unit failed partially and under repair.
O_{pw}	:	Unit waiting for repair after partial failure.
O_F	:	Unit under fault detection after its complete failure.
O_{Fw}	:	Unit waiting for fault detection after failure or all failure.
O_r	:	Failed unit under its repair.

O_{rep}	:	Failed unit under replacement.
O_{wrep}	:	Unit waiting for its replacement after complete failure.
α	:	Constant failure rate from operative to partially.
β	:	Constant failure rate from partial to complete.
γ	:	Constant failure rate from operative to complete.
δ	:	Constant repair rate of partial failed unit.
P	:	Prob. that failed unit goes for repair.
$q (1-p)$:	Prob. that failed unit goes for replacement.
$F(.)$:	Cdf of repair time distribution of fault detection.
$G(.)$:	Cdf of repair time distribution of complete failure unit.
$H(.)$:	Cdf of replacement unit.

Using these notations the various possible states of the system along with all possible transitions are presented in the Figure1. The states S_0, S_2, S_5 and S_7 are up states while $S_1, S_3, S_4, S_6, S_{12}$ and S_{13} are partially up states. The states S_8, S_9, S_{10}, S_{11} and S_{14} are down states. Further, all the states are regenerative states.

Possible States of the System: The system may be in one of the following state

$$\begin{aligned}
 S_0 &\equiv [O, O] & S_1 &\equiv [O_{pr}, O] & S_2 &\equiv [O, O_F] \\
 S_3 &\equiv [O_{pr}, O_{Fw}] & S_4 &\equiv [O_{pr}, O_{pw}] & S_5 &\equiv [O, O_{rep}] \\
 S_6 &\equiv [O_{pw}, O_F] & S_7 &\equiv [O, O_r] & S_8 &\equiv [O_{Fw}, O_F] \\
 S_9 &\equiv [O_F, O_{rep}] & S_{10} &\equiv [O_r, O_{Fw}] & S_{11} &\equiv [O_r, O_{rep}] \\
 S_{12} &\equiv [O_{pw}, O_r] & S_{13} &\equiv [O_{pr}, O_{rep}] & S_{14} &\equiv [O_{wrep}, O_{rep}]
 \end{aligned}$$

TRANSITION PROBABILITIES AND SOJOURN TIMES

The various steady state transition probabilities are as follows:

$$\begin{aligned}
 p_{01} &= \frac{\alpha}{\alpha + \gamma} & p_{02} &= \frac{\gamma}{\alpha + \gamma} & p_{14} &= \frac{\alpha}{(\alpha + \beta + \delta)} \\
 p_{25} &= q \tilde{F}(\alpha + \gamma) & p_{26} &= \frac{\alpha}{(\alpha + \gamma)} [1 - \tilde{F}(\alpha + \gamma)] & p_{27} &= p \tilde{F}(\alpha + \gamma) \\
 p_{28} &= \frac{\gamma}{(\alpha + \gamma)} [1 - \tilde{F}(\alpha + \gamma)] & p_{32} &= p_{102} = p_{145} = 1 & p_{41} &= \frac{\delta}{\beta + \delta} \\
 p_{43} &= \frac{\beta}{\beta + \delta} & p_{50} &= \tilde{H}(\alpha + \gamma) & p_{59} &= \frac{\gamma}{(\alpha + \gamma)} [1 - \tilde{H}(\alpha + \gamma)] \\
 p_{5,13} &= \frac{\alpha}{(\alpha + \gamma)} [1 - \tilde{H}(\alpha + \gamma)] & p_{68} &= 1 - \tilde{F}(\beta) & p_{6,12} &= p \tilde{F}(\beta) \\
 p_{6,13} &= q \tilde{F}(\beta) & p_{70} &= \frac{\delta}{(\alpha + \gamma + \delta)} & p_{7,10} &= \frac{\gamma}{(\alpha + \gamma + \delta)} \\
 p_{7,12} &= \frac{\alpha}{(\alpha + \gamma + \delta)} & p_{89} &= q & p_{8,10} &= p & p_{92} &= \int_0^{\infty} dH(t) \bar{F}(t) \\
 p_{9,11} &= p \int_0^{\infty} dF(t) \bar{H}(t) & p_{9,14} &= q \int_0^{\infty} dF(t) \bar{H}(t) & p_{11,5} &= \int_0^{\infty} dG(t) \bar{H}(t) \\
 p_{11,7} &= \int_0^{\infty} dH(t) \tilde{G}(t) & p_{12,1} &= \tilde{G}(\beta) & p_{12,10} &= [1 - \tilde{G}(\beta)] & p_{13,1} &= \tilde{G}(\delta) \\
 p_{13,5} &= [1 - \tilde{G}(\delta)] & & & & & &
 \end{aligned}$$

(1)

From these steady state probabilities the following relations can easily be verified:

$$\begin{aligned}
 p_{01} + p_{02} &= 1 & p_{10} + p_{13} + p_{14} &= 1 & p_{25} + p_{26} + p_{27} + p_{28} &= 1 \\
 p_{32} = p_{10,2} = p_{14,5} &= 1 & p_{41} + p_{43} &= 1 & p_{50} + p_{59} + p_{5,13} &= 1 \\
 p_{70} + p_{7,10} + p_{7,12} &= 1 & p_{89} + p_{8,10} &= 1 & p_{92} + p_{9,11} + p_{9,14} &= 1 \\
 p_{11,5} + p_{11,7} &= 1 & p_{12,1} + p_{12,10} &= 1 & p_{13,1} + p_{13,5} &= 1
 \end{aligned} \quad (2)$$

Mean Sojourn time

$$\begin{aligned}
 \mu_0 &= \frac{1}{\alpha + \gamma} & \mu_1 &= \frac{1}{\alpha + \beta + \delta} & \mu_2 &= \frac{1}{(\alpha + \gamma)} [1 - \tilde{F}(\alpha + \gamma)] \\
 \mu_3 &= \frac{1}{\delta} & \mu_4 &= \frac{1}{\beta + \delta} & \mu_5 &= \frac{1}{(\alpha + \gamma)} [1 - \tilde{H}(\alpha + \gamma)] \\
 \mu_6 &= \frac{1}{\beta} [1 - \tilde{F}(\beta)] & \mu_7 &= \frac{1}{\alpha + \gamma + \delta} & \mu_8 = \mu_{10} = \mu_{14} & \\
 \mu_9 &= \int_0^{\infty} \tilde{F}(t) \bar{H}(t) dt & \mu_{11} &= \int_0^{\infty} \bar{G}(t) \bar{H}(t) dt & \mu_{12} &= \frac{1}{\beta} [1 - \tilde{G}(\beta)] \\
 \mu_{13} &= \frac{1}{\delta} [1 - \tilde{G}(\delta)] & & & &
 \end{aligned} \quad (3)$$

MEAN TIME TO SYSTEM FAILURE

Let U_i be the random variable denoting time to system failure when the system starts from state S_i , $S_i \in E$ and let $\pi_i(t) = P[U_i \leq t]$ be the cdf of time to system failure for the first time when it starts operation from state S_i . To determine the distribution function, $\pi_i(t)$ we regard the failed states S_8, S_9, S_{10}, S_{11} and S_{14} as absorbing states. Using basic probabilistic arguments, the recursive relations among $\pi_i(t)$ can be easily developed and taking L.T of the relations and solving for $\tilde{\pi}_0(s)$, we get

$$\tilde{\pi}_0(s) = \frac{N_1(s)}{D_1(s)} \quad (4)$$

where

$$\begin{aligned}
 N_1(s) &= [\tilde{Q}_{01} \tilde{Q}_{14} (\tilde{Q}_{32} \tilde{Q}_{41} \tilde{Q}_{13} + \tilde{Q}_{32} \tilde{Q}_{43}) + (1 - \tilde{Q}_{14} \tilde{Q}_{41}) (\tilde{Q}_{01} \tilde{Q}_{13} \tilde{Q}_{32} + \tilde{Q}_{02})] \\
 &\quad \left[(1 - \tilde{Q}_{5,13} \tilde{Q}_{13,5}) (\tilde{Q}_{28} + \tilde{Q}_{26} \tilde{Q}_{28} + \tilde{Q}_{26} \tilde{Q}_{6,12} \tilde{Q}_{12,10} + \tilde{Q}_{27} \tilde{Q}_{7,10} \tilde{Q}_{12,10} + \tilde{Q}_{27} \tilde{Q}_{7,10}) \right] \\
 &\quad \left[+ \tilde{Q}_{25} \tilde{Q}_{59} + \tilde{Q}_{26} \tilde{Q}_{59} \tilde{Q}_{6,13} \right] \\
 &\quad \times (1 - \tilde{Q}_{14} \tilde{Q}_{41})
 \end{aligned}$$

and

$$\begin{aligned}
 D_1(s) &= (1 - \tilde{Q}_{01} \tilde{Q}_{10} - \tilde{Q}_{14} \tilde{Q}_{41}) \\
 &\quad \times \left\{ (1 - \tilde{Q}_{5,13} \tilde{Q}_{13,5}) (1 - \tilde{Q}_{14} \tilde{Q}_{41}) - (\tilde{Q}_{32} \tilde{Q}_{13} + \tilde{Q}_{14} \tilde{Q}_{32} \tilde{Q}_{43}) \right\} \\
 &\quad \times \left\{ [(1 - \tilde{Q}_{5,13} \tilde{Q}_{13,5}) (\tilde{Q}_{26} \tilde{Q}_{6,12} \tilde{Q}_{12,1} + \tilde{Q}_{27} \tilde{Q}_{7,12} \tilde{Q}_{12,1}) + \tilde{Q}_{25} \tilde{Q}_{5,13} \tilde{Q}_{13,1} + \tilde{Q}_{26} \tilde{Q}_{6,13} \tilde{Q}_{13,1}] \right\} \\
 &\quad - [\tilde{Q}_{01} \tilde{Q}_{14} (\tilde{Q}_{32} \tilde{Q}_{41} \tilde{Q}_{13} + \tilde{Q}_{32} \tilde{Q}_{43}) + (1 - \tilde{Q}_{14} \tilde{Q}_{41}) (\tilde{Q}_{01} \tilde{Q}_{13} \tilde{Q}_{32} + \tilde{Q}_{02})] \\
 &\quad \times \left[(1 - \tilde{Q}_{14} \tilde{Q}_{41}) (\tilde{Q}_{26} \tilde{Q}_{50} \tilde{Q}_{13,5} \tilde{Q}_{6,13} + \tilde{Q}_{25} \tilde{Q}_{50}) + (1 - \tilde{Q}_{5,13} \tilde{Q}_{13,5}) \right. \\
 &\quad \times (\tilde{Q}_{27} \tilde{Q}_{70} - \tilde{Q}_{27} \tilde{Q}_{70} \tilde{Q}_{14} \tilde{Q}_{41} \tilde{Q}_{13} + \tilde{Q}_{10} \tilde{Q}_{26} \tilde{Q}_{6,12} \tilde{Q}_{12,1} + \tilde{Q}_{10} \tilde{Q}_{27} \tilde{Q}_{7,12} \tilde{Q}_{12,1}) \\
 &\quad \left. + \tilde{Q}_{10} \tilde{Q}_{25} \tilde{Q}_{5,13} \tilde{Q}_{13,1} + \tilde{Q}_{10} \tilde{Q}_{26} \tilde{Q}_{6,13} \tilde{Q}_{13,1} \right]
 \end{aligned}$$

(For the sake of simplicity the argument 's' has been omitted from $\tilde{Q}_{ij}(s)$)

and Using $\lim_{s \rightarrow 0} \tilde{Q}_{ij}(s) \rightarrow p_{ij}$, and eq. (1) and eq. (2), we obtain the following limiting values of $N_1(s)$ and $D_1(s)$ on 's' approaches to zero

$$N_1(0) = (1 - p_{01}p_{10} - p_{14}p_{41})(1 - p_{14}p_{41})(p_{25}p_{59} + p_{26}p_{59}p_{13,5}p_{6,13}) \\ + (1 - p_{13,5}p_{5,13})(p_{28} + p_{26}p_{28} + p_{26}p_{6,12}p_{12,10} + p_{27}p_{7,10} + p_{27}p_{7,12}p_{12,10}) \\ (1 - p_{01}p_{10} - p_{14}p_{41})(1 - p_{14}p_{41})$$

and

$$D_1(0) = (1 - p_{01}p_{10} - p_{14}p_{41})(1 - p_{14}p_{41})(p_{25}p_{59} + p_{26}p_{59}p_{13,5}p_{6,13}) \\ + (1 - p_{13,5}p_{5,13})(p_{28} + p_{26}p_{28} + p_{26}p_{6,12}p_{12,10} + p_{27}p_{7,10} + p_{27}p_{7,12}p_{12,10}) \\ (1 - p_{01}p_{10} - p_{14}p_{41})(1 - p_{14}p_{41}) \quad (5)$$

On comparing the above expressions of $N_1(0)$ and $D_1(0)$, we observe that $N_1(0) = D_1(0)$ and thus $\tilde{\pi}_0(s) = 1$ as $s \rightarrow 0$, which implies that $\pi_0(t)$ is a proper cumulative distribution function.

Thus, Mean Time to System Failure (MTSF) when system starts operation with the entrance into S_0 is obtained as

$$E(T) = - \frac{d}{ds} \tilde{\pi}_0(0) = \frac{D_1'(0) - N_1'(0)}{D_1(0)} \quad (6)$$

where $N_1'(0)$ and $D_1'(0)$ are the derivatives of the numerator and denominator of $\tilde{\pi}_0(s)$ at $s \rightarrow 0$.

To obtain the numerator of MTSF defined by (6), we use the following results:

$$m_{ij} = -\tilde{Q}'_{ij}(s)_{s=0} = \frac{d}{ds} \int_0^\infty e^{-st} dQ_{ij}(t)_{s=0} \quad \text{and} \quad \sum_j m_{ij} = \mu_i$$

where m_{ij} is the mean elapsed time of the system in state S_i before transiting to state S_j .

Therefore, on arranging the coefficients of m_{ij} 's and also by using the above relations, the expression for $D_1'(0) - N_1'(0)$ can be written as:

$$D_1'(0) - N_1'(0) \\ = \mu_0 (1 - p_{14}p_{41}) \left\{ \begin{aligned} & p_{10}p_{25}p_{5,13}p_{13,1} + p_{10}p_{26}p_{13,1}p_{6,13} \\ & + (1 - p_{13,5}p_{5,13})(p_{10}p_{27}p_{7,12}p_{12,1} + p_{10}p_{26}p_{6,12}p_{12,1}) + (1 - p_{14}p_{41}) \\ & \left[p_{25}p_{50} + p_{25}p_{59} + p_{26}p_{50}p_{6,13}p_{12,10} + p_{26}p_{59}p_{6,13}p_{13,5} + (1 - p_{13,5}p_{5,13}) \right] \\ & \left[(p_{28} + p_{27}p_{70} + p_{26}p_{28} + p_{26}p_{6,12}p_{12,10} + p_{27}p_{7,10} + p_{27}p_{7,12}p_{12,10}) \right] \end{aligned} \right\} \\ + \mu_1 (1 - p_{14}p_{41}) \left[(p_{01} + p_{26}p_{613}p_{121} + p_{27}p_{712}p_{121}) \right. \\ \left. \left[(1 - p_{135}p_{513}) + p_{02}p_{25}p_{513}p_{131} + p_{02}p_{26}p_{613}p_{131} \right] \right] \\ + \mu_2 (1 - p_{01}p_{10} - p_{14}p_{41})(1 - p_{14}p_{41})(1 - p_{5,13}p_{13,5}) \\ + \mu_3 (1 - p_{01}p_{10} - p_{14}p_{41})(1 - p_{10} - p_{14}p_{41}) \\ \times [p_{25}p_{513}p_{131} + p_{26}p_{613}p_{131} + (p_{26}p_{612}p_{121} + p_{27}p_{712}p_{121})(1 - p_{513}p_{135})] \\ + \mu_3 p_{01}(1 - p_{10} - p_{14}p_{41}) \\ \times \left[(1 - p_{14}p_{41}) \left[p_{25}p_{50} + p_{26}p_{135}p_{50}p_{613} + p_{25}p_{59} + p_{26}p_{613}p_{59}p_{135} + \right. \right. \\ \left. \left. (p_{27}p_{70} + p_{28} + p_{26}p_{68} + p_{26}p_{612}p_{1210} + p_{27}p_{710} + p_{27}p_{712}p_{1210})(1 - p_{135}p_{513}) \right] \right] \\ + \mu_4 p_{14}(1 - p_{10} - p_{14}p_{41}) [p_{25}p_{513}p_{131} + p_{26}p_{613}p_{131} + (p_{26}p_{612}p_{121} + p_{27}p_{712}p_{121})(1 - p_{513}p_{135})]$$

$$\begin{aligned}
& + \mu_4 p_{01} p_{14} \left[\begin{aligned} & \left((1 - p_{14} p_{41}) \left[\begin{aligned} & p_{25} p_{50} + p_{26} p_{135} p_{50} p_{613} + p_{25} p_{59} + p_{26} p_{613} p_{59} p_{135} + \right. \right. \\ & \left. \left. (p_{27} p_{70} + p_{28} + p_{26} p_{68} + p_{26} p_{612} p_{1210} + p_{27} p_{710} + p_{27} p_{712} p_{1210}) \right] \right. \right. \\ & \left. \left. \times (1 - p_{135} p_{513}) \right) \right. \\ & \left. + p_{10} p_{25} p_{513} p_{131} + p_{10} p_{26} p_{613} p_{131} + (p_{10} p_{26} p_{612} p_{121} + p_{10} p_{27} p_{712} p_{121}) \right. \\ & \left. \times (1 - p_{135} p_{513}) \right] \\ & + \mu_5 (1 - p_{01} p_{10} - p_{14} p_{41}) (1 - p_{14} p_{41}) (p_{25} + p_{26} p_{613} p_{13,5}) \\ & + \mu_6 (1 - p_{01} p_{10} - p_{14} p_{41}) (1 - p_{14} p_{41}) (1 - p_{5,13} p_{13,5}) p_{26} \\ & + \mu_7 (1 - p_{01} p_{10} - p_{14} p_{41}) (1 - p_{14} p_{41}) (1 - p_{5,13} p_{13,5}) p_{27} \\ & + \mu_{12} (1 - p_{01} p_{10} - p_{14} p_{41}) (1 - p_{135} p_{513}) (1 - p_{14} p_{41}) (p_{26} p_{612} + p_{27} p_{712}) \\ & + \mu_{13} (1 - p_{01} p_{10} - p_{14} p_{41}) (1 - p_{14} p_{41}) (p_{25} p_{513} + p_{26} p_{613}) \end{aligned} \right] \quad (7)
\end{aligned}$$

Therefore, using (5) and (7) in (6), the mean time to system failure (MTSF) is obtained.

AVAILABILITY ANALYSIS

$A_i(t)$ is the probability that the system is in a up state at epoch 't' given that initially it was in up state S_i . Using basic probabilistic arguments, the recursive relations among $A_i(t)$ can be easily developed and taking L.T of the relations and solving for $A_0^*(s)$ we get

$$A_0 = \lim_{t \rightarrow \infty} A_0(t) = \lim_{s \rightarrow 0} s A_0^*(s) = \lim_{s \rightarrow 0} s \frac{N_2(s)}{D_2(s)} \quad (8)$$

which is an indeterminate form since the denominator of (8) becomes zero as $s \rightarrow 0$, which can easily be verified.

Therefore, on using L' Hospital's rule, the steady state availability, A_0 becomes

$$A_0 = \lim_{s \rightarrow 0} \frac{s N_2'(s) + N_2(s)}{D_2'(s)} = \frac{N_2(0)}{D_2'(0)} \quad (9)$$

Further on using the following relations:

$$\lim_{s \rightarrow 0} q_{ij}^*(s) = q_{ij}^*(0) = p_{ij} \quad \text{and} \quad -q_{ij}'(0) = m_{ij}$$

$$\text{also } Z_i^*(0) = \mu_i, i = 0, 1, 2, 3, 4, 5, 6, 9$$

The numerator and denominator of steady state availability of the system starting from state $S_0, S_0 \in E$, is thus becomes

$$N_2(0) = [(K_0 K_1 + K_2 K_{13}) K_3 + K_6 (K_0 K_4 + K_4)] K_7 + K_8 K_3 K_0 - [(K_{10} + K_{11} + K_{12}) K_0 + K_{13} K_{14}] K_3 K_8 - (K_{15} K_0 + K_{16} K_{14}) K_6 K_8 \quad (10)$$

and

$$\begin{aligned}
D_2'(0) = & \mu_0 (1 - p_{14} p_{41}) [(K_{17} K_0 + p_{10} K_{13}) K_3 + (K_{18} K_0 + p_{10} K_{16}) K_6] \\
& + p_{01} \mu_1 [K_3 K_0 - (K_{10} + K_{11} + K_{12}) K_0 K_3 - K_3 K_{13} K_{14} - (K_0 K_{15} + K_{14} K_{16}) K_6] \\
& + K_7 (K_3 K_{13} + K_6 K_{16}) \mu_1 + \mu_2 [K_{19} (K_0 K_{15} + K_{14} K_{16}) + K_7 (K_0 K_{18} + p_{10} K_{16})] \\
& + \mu_3 (p_{13} + p_{14} p_{43}) [(K_{17} K_0 + p_{10} K_{13}) K_3 p_{01} + (K_{18} K_0 + p_{10} K_{16}) K_6 p_{01} + K_{19} (K_3 K_{13} + K_6 K_{16})] \\
& + \mu_4 p_{14} [(K_{17} K_0 + p_{10} K_{13}) K_3 p_{01} + (K_{18} K_0 + p_{10} K_{16}) K_6 p_{01} + K_{19} (K_3 K_{13} + K_6 K_{16})] + \mu_5 K_0 K_6 K_7 \\
& + \mu_6 p_{26} K_3 (p_{1210} K_0 K_{19} + p_{121} K_{14} K_{19} + p_{10} p_{121} K_7) \\
& + \mu_7 K_0 K_7 (p_{26} p_{68} p_{89} p_{911} p_{117} K_3 + p_{27} K_3 + p_{28} p_{89} p_{911} p_{117} K_3 + p_{59} p_{911} p_{117} K_6) + \mu_8 K_0 K_3 K_{19} (p_{26} p_{68} + p_{28}) \\
& + \mu_9 K_0 K_{19} (p_{26} p_{68} p_{89} K_3 + p_{28} p_{89} K_3 + p_{59} K_6)
\end{aligned}$$

$$\begin{aligned}
& + \mu_{10} K_0 K_{19} \left[\begin{aligned} & p_{26} p_{612} p_{1210} K_3 + p_{26} p_{68} p_{810} K_3 + K_3 (p_{710} + p_{712} p_{1210}) \\ & \times (p_{26} p_{68} p_{911} p_{117} + p_{28} p_{89} p_{911} p_{117}) \\ & + p_{27} K_3 (p_{710} + p_{1210}) + p_{28} p_{810} K_3 + p_{59} p_{712} p_{911} p_{1210} K_6 \\ & + p_{59} p_{710} p_{911} p_{117} K_6 \end{aligned} \right] \\
& + \mu_{11} \left[\begin{aligned} & p_{59} p_{911} [K_0 K_{19} - (K_{10} + K_{11} + K_{12}) K_0 K_{19} - K_{13} K_{14} K_{19} - (K_0 K_{17} + p_{10} K_{13}) K_7] \\ & + (p_{26} p_{68} p_{89} p_{911} + p_{28} p_{89} p_{911}) [K_{19} (K_0 K_{15} + K_{14} K_{16}) + K_7 (K_0 K_{18} + p_{10} K_{16})] \end{aligned} \right] \\
& + \mu_{12} K_0 K_{19} [p_{27} K_3 + p_{712} p_{911} p_{117} K_3 (p_{26} p_{68} + p_{28} p_{89}) + p_{59} p_{712} p_{911} K_6] \\
& + \mu_{13} [p_{26} p_{613} K_3 (K_{14} K_{19} + p_{10} K_7) + p_{513} K_6 K_{14} K_{19}] \\
& + \mu_{14} \left[\begin{aligned} & p_{59} p_{914} [K_0 K_{19} - (K_{10} + K_{11} + K_{12}) K_0 K_{19} - K_{13} K_{14} K_{19} - (K_0 K_{17} + p_{10} K_{13}) K_7] \\ & + (p_{26} p_{68} p_{89} p_{914} + p_{28} p_{89} p_{914}) [K_{19} (K_0 K_{15} + K_{14} K_{16}) + K_7 (K_0 K_{18} + p_{10} K_{16})] \end{aligned} \right]
\end{aligned} \tag{11}$$

where

$$\begin{aligned}
K_0 &= (1 - p_{14} p_{41}) & K_1 &= \left[\begin{aligned} & \mu_2 + p_{26} \mu_6 + p_{26} p_{612} \mu_{12} + p_{26} p_{613} \mu_{13} \\ & + (p_{26} p_{68} p_{89} p_{911} p_{117} + p_{27} + p_{28} p_{89} p_{911} p_{117}) (\mu_7 + p_{712} \mu_{12}) \end{aligned} \right] \\
K_2 &= (\mu_1 + \mu_5 p_{14} + \mu_3 p_{13} + \mu_3 p_{14} p_{43}) \\
K_3 &= (1 - p_{59} p_{911} p_{115} - p_{513} p_{135} - p_{59} p_{914}) & K_4 &= (\mu_5 + p_{513} \mu_{13} + p_{59} p_{911} p_{117} \mu_7 + p_{712} \mu_{12}) \\
K_5 &= (p_{513} p_{131} + p_{712} p_{121}) (\mu_1 + \mu_5 p_{14} + \mu_3 p_{13} + \mu_3 p_{14} p_{43}) \\
K_6 &= [p_{25} + p_{26} p_{68} p_{89} (p_{914} + p_{911} p_{115}) + p_{613} p_{135} p_{26} + p_{28} p_{89} p_{914} p_{145} + p_{28} p_{89} p_{911} p_{115}] \\
K_7 &= [p_{01} p_{13} + p_{01} p_{14} p_{43} + p_{02} (1 - p_{41} p_{14})] & K_8 &= (\mu_0 - p_{14} p_{41} \mu_0 + p_{01} \mu_1 + p_{01} p_{14} \mu_4 + p_{01} p_{13} \mu_3 + p_{01} p_{14} p_{43} \mu_3) \\
K_{10} &= (p_{26} p_{612} p_{1210} + p_{26} p_{68} p_{89} p_{92} + p_{26} p_{68} p_{810}) \\
K_{11} &= (p_{26} p_{68} p_{911} p_{117} + p_{28} p_{89} p_{911} p_{117}) (p_{710} + p_{712} p_{1210}) & K_{12} &= (p_{27} p_{710} + p_{27} p_{1210} + p_{28} p_{89} p_{92} + p_{28} p_{810}) \\
K_{13} &= \left(\begin{aligned} & p_{26} p_{612} p_{121} + p_{26} p_{613} p_{131} + \\ & p_{26} p_{68} p_{712} p_{121} p_{89} p_{911} p_{117} + p_{27} p_{712} p_{121} + p_{28} p_{712} p_{121} p_{89} p_{911} p_{117} \end{aligned} \right) \\
K_{14} &= (p_{13} + p_{14} p_{43}) \\
K_{15} &= (p_{59} p_{92} + p_{59} p_{911} p_{712} p_{1210} + p_{59} p_{911} p_{117} p_{710}) & K_{16} &= (p_{513} p_{131} + p_{59} p_{911} p_{117} p_{712} p_{121}) \\
K_{17} &= (p_{26} p_{68} p_{89} p_{911} p_{117} p_{70} + p_{27} p_{70} + p_{28} p_{89} p_{911} p_{117} p_{70}) \\
K_{18} &= (p_{50} + p_{59} p_{911} p_{117} p_{70}) \\
K_{19} &= (1 - p_{14} p_{41} - p_{01} p_{10})
\end{aligned}$$

BUSY PERIOD ANALYSIS

$B_i(t)$ is defined as the probability that the system having started from regenerative state $S_i, S_i \in E$ at time $t = 0$ is under repair i.e. the repairman is busy. Using the definition of $B_i(t)$, $i = 0, 1, 2, 3, \dots, 14$ the recursive relations among $B_i(t)$ can be easily developed, taking their Laplace transform and solving them for $B_0^*(s)$, the steady state probability that the system is under repair with repairman when system starts from state S_0 , i.e. in the long-run the repairman, is given by

$$B_0 = \lim_{t \rightarrow \infty} B_0(t) = \lim_{s \rightarrow 0} s B_0^*(s) = \lim_{s \rightarrow 0} s \frac{N_3(s)}{D_3(s)} \tag{12}$$

Since the denominator of (12) becomes zero as $s \rightarrow 0$, thus on using L' Hospital's Rule and the results $\lim_{s \rightarrow 0} q_{ij}^*(s) = q_{ij}^*(0) = p_{ij}$, and

$$-q_{ij}^*(0) = m_{ij} \text{ also the expression for } B_0 \text{ becomes}$$

$$B_0 = \lim_{s \rightarrow 0} \frac{N_3(s)}{D_3'(s)} = \frac{N_3(0)}{D_3'(0)} \tag{13}$$

where

$$\begin{aligned}
N_3(0) = & p_{01}K_{25} \left[K_3K_0 - (K_{10} + K_{11} + K_{12})K_0K_3 + K_{13}K_{14}K_3 - (K_{15}K_0 + K_{16}K_{14})K_6 \right] \\
& + K_7K_0 \left[\frac{K_{20}K_3 + p_{25}K_{21} + p_{26}K_{22}K_3 + p_{26}p_{613}p_{135}K_{21}}{(p_{26}p_{68}p_{89} + p_{28}p_{89})(K_3K_{23} + K_{24}K_{21}) + K_{27}K_3} \right] \\
& + K_7K_{25} \left[\frac{K_3K_{28} + p_{25}K_{16} + p_{26}(K_{26}K_3 + p_{68}p_{89}K_{16}K_{24} + p_{135}p_{613}K_{16})}{K_3K_{28} + p_{28}p_{89}K_{16}K_{24}} \right] \quad (14)
\end{aligned}$$

The values $K_0, K_3, K_6, K_7, K_{10}, K_{11}, K_{12}, K_{13}, K_{14}, K_{15}$ and K_{16} are already defined.

$$\begin{aligned}
K_{20} = & p_{27}(\mu_7 + p_{710}\mu_{10} + p_{712}\mu_{12} + p_{712}p_{1210}\mu_{10}) \quad K_{21} = \mu_5 + p_{59}\mu_9 + p_{513}\mu_{13} + p_{59}p_{911}\mu_{11} + p_{59}p_{914}\mu_{14} \\
& + p_{59}p_{911}p_{117}(\mu_7 + p_{710}\mu_{10} + p_{712}\mu_{12} + p_{712}p_{1210}\mu_{10})
\end{aligned}$$

$$K_{22} = \mu_6 + p_{612}\mu_{12} + p_{612}p_{1210}\mu_{10} + p_{613}\mu_{13} + (\mu_8 + p_{810}\mu_{10})p_{68}$$

$$K_{23} = \mu_9 + p_{911}\mu_{11} + p_{914}\mu_{14} + p_{911}p_{117}(\mu_7 + p_{710}\mu_{10} + p_{712}\mu_{12} + p_{712}p_{1210}\mu_{10}) \quad K_{24} = p_{911}p_{115} + p_{914}$$

$$K_{25} = \mu_1 + p_{13}\mu_3 + p_{14}\mu_4 + p_{14}p_{43}\mu_3$$

$$K_{26} = p_{612}p_{121} + p_{712}p_{911}p_{117}p_{121}p_{68}p_{89} + p_{131}p_{613}$$

$$K_{27} = p_{28}(\mu_8 + p_{810}\mu_{10})$$

$$K_{28} = p_{27}p_{712}p_{121} + p_{28}p_{89}p_{712}p_{911}p_{117}p_{121}$$

and $D'_3(0)$ is same as $D'_2(0)$, which is given by (11).

GRAPHICAL REPRESENTATION OF MTSF

The repair time distributions of the complete failure of main unit, fault detection of main unit and replacement of failed unit of the system were assumed arbitrary while describing the system description. To study the behavior of its MTSF through graphical presentation, we assume that the repair time distributions

of these three variables are also exponentially distributed with parameters λ_1, λ_2 and λ_3 respectively. To plot the graphs of MTSF of the system, we consider three different cases for the various values of the failure and repair rates. In the first case, we fixed the values of $\beta = \gamma = \delta = \lambda_1 = \lambda_2 = \lambda_3 = 0.30$ and different values of $\alpha, 0 < \alpha \leq 1$. In the second case, $\beta = \gamma = \delta = \lambda_1 = \lambda_2 = \lambda_3 = 0.50$ and different values of $\alpha, 0 < \alpha \leq 1$, while in the third case, $\beta = \gamma = \delta = \lambda_1 = \lambda_2 = \lambda_3 = 0.80$ and different values of $\alpha, 0 < \alpha \leq 1$. The three sets of graphs of MTSF have been plotted and presented through Figure 2. From, this figure we observed that, in all cases, MTSF of the system decreases with increasing failure rate of partial failure of a unit.

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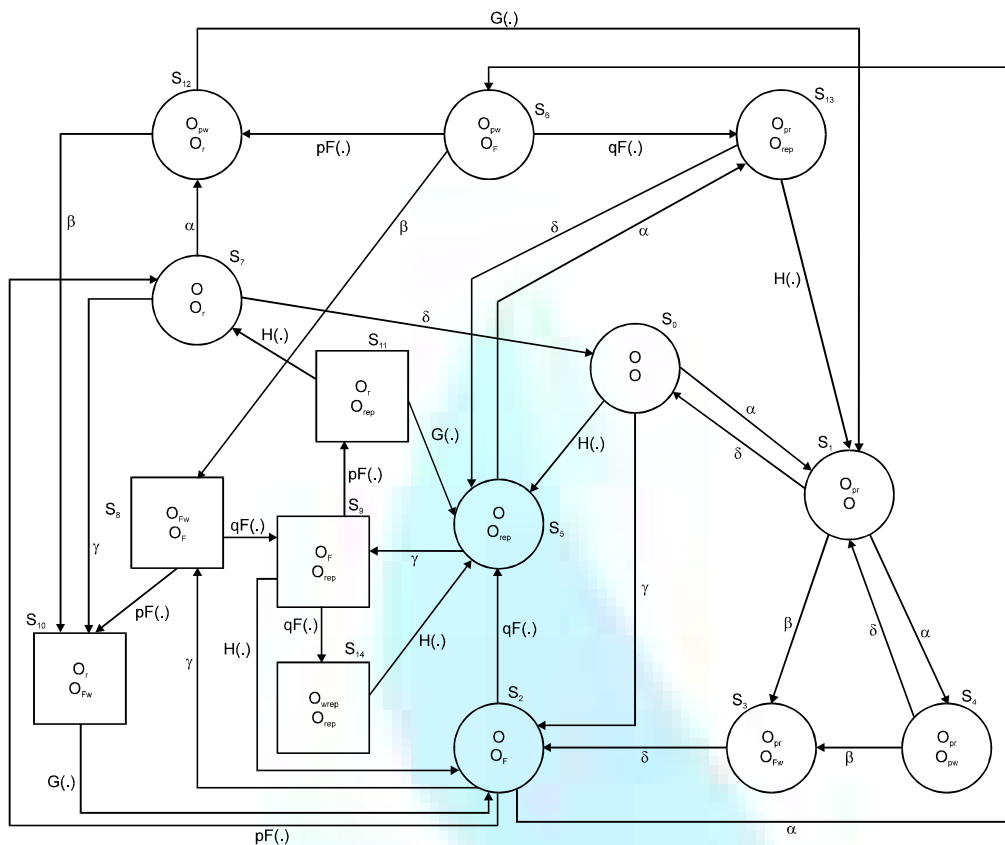
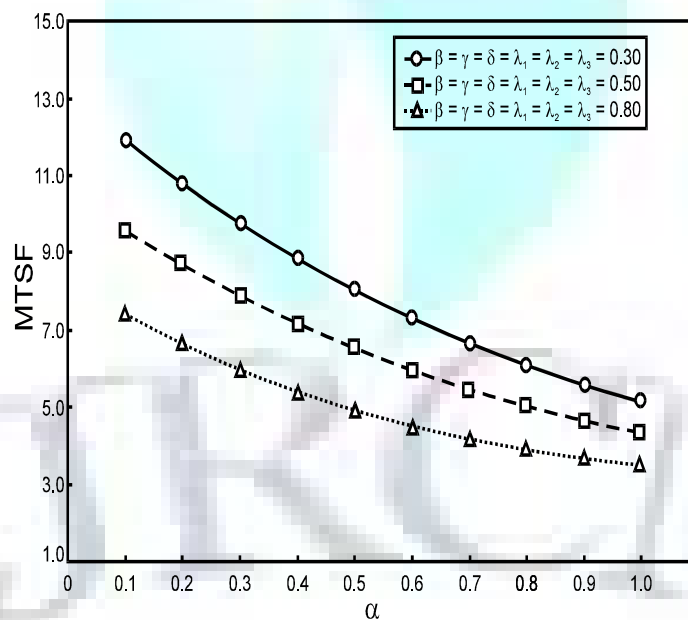
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FIGURES

FIGURE 1: STATE TRANSITION DIAGRAM

FIGURE 2
Behaviour of MTSF

SURVEY OF NEWRENO AND SACK TCP TECHNIQUES PERFORMANCE IN PRESENCE OF ERRORS FOR HIGH SPEED NETWORK

MARGAM K.SUTHAR

M.TECH STUDENT

DEPARTMENT OF ELECTRONIC AND COMMUNICATION ENGINEERING

U.V.PATEL COLLEGE OF ENGINEERING

GANPAT UNIVERSITY

KHERVA

ROHIT B. PATEL

PROFESSOR

DEPARTMENT OF ELECTRONIC AND COMMUNICATION ENGINEERING

U.V.PATEL COLLEGE OF ENGINEERING

GANPAT UNIVERSITY

KHERVA

ABSTRACT

Degradation of the performance of TCP because of errors in transmission media has always a Key area of research. In recent years, the demand for network bandwidth is growing due to increase in global population of internet and variety of application. Optical data communication has been acknowledged as the best solution to meet the present bandwidth requirement of users and supporting future network service. Optical fiber give higher throughput and bandwidth but when large network (like, internet's connection undersea over the world) and errors in transmission media at a time same congestion problem as copper wire. To solve such problem require improving TCP protocol. So, in this paper attempts to study, simulate and analyze the most improved version of TCP (SACK TCP and Newreno TCP) base on Go-Back-N and Selective Acknowledgment in Presence of Errors in High Speed Network.

KEYWORDS

TCP (Transmission Control Protocol), SACK (Selective Acknowledgement), ARQ (Automatic Repeat Request).

INTRODUCTION

TCP/IP protocol stack has been an inseparable part of Internet. Therefore, behavior and efficiency of the protocol stack significantly contribute in the performance of Internet. TCP has been modified by various add on techniques to achieve a desired performance level in heterogeneous environments. TCP is responsible for flow, error and congestion control which has a direct impact on network performance and service. Among TCP variants, SACK TCP is considered as the most stable and efficient scheme [2].

TCP provide fairness in sharing bandwidth TCP gradually traffic after connection establishment and it decreases it when any loss found for particular connection. Flow control is used for control congestion over transport layer to reduce loss of packet. If any loss found at receiver then it is responsible to inform to the sender about this loss so sender can take appropriate action for that packet regarding its retransmission and if rate of loss is high then it take some action to reduce those losses [1]. When TCP use for make a communication between sender and receiver at time, fast the sending process sends a SYN (Synchronization Sequence numbers during connection) packet to which the receiving process replica with its SYN-ACK and the sender replies with an ACK. Once this three way handshake is negotiated, the connection is established and data transmission can begin. When all data is sent, the client and the server exchange FIN (Terminate connection) and ACK in both direction and terminate connection between sender and receiver [1].

TCP use sliding window to handle flow control. The Sliding window protocol used by TCP, however, is something between the Go-Back-N and Selective Report Sliding Window [1]. In Go-back-N protocol accumulative ack scheme is used. In Go-Back-N Automatic Repeat Request, in this protocol we can send several frames before receiving acknowledgments; we keep a copy of these frames until the acknowledgments arrive. Ssize (send window, size) for Go-Back-N = 2^{m-1} [1]. In sack, is another mechanism that does not resend N frames when just one frame is damaged; it resent only the damaged frame. Ssize (send window, size) for Selective Repeat ARQ = 2^{m-1} [1].

In TCP each byte of data that is sent by client is assigned a sequence number, unique to that session. The server acknowledges receipt of each byte of the data using ACK segment. Acknowledgements of the TCP are cumulative; an ACK confirms the successful receipt of all the data bytes up to (but not including) the acknowledged sequence number. Normally, TCP does not acknowledge each byte received individually, nor does it send ACK packet every time it receives data. It waits for a certain amount of time. During this period, if more data segment arrives, these segments are acknowledged together at once ("delayed acknowledgment") or if a data segment has to be sent, the acknowledgement is "piggy backed" along with the data packet [3].

In Tahoe TCP, loss recovery depends only on time out and for retransmission it must wait for time out, during this waiting period it has to stop father TCP transmission and finally it can send less data in given time. Also, it doesn't send immediate ACK's, it sends cumulative acknowledgements, and therefore it follows a 'go back n' approach. Thus every time a packet is lost it waits for a timeout. This offers a major cost in high band-width delay product links. Some modification is done, that is known as fast retransmit. In that we recover from loss with the help of three duplicate acknowledgments [2].

On receiving three successive duplicate acknowledgements the sender can infer that receiver has not received at least the packet immediately after the number in duplicate ack. Retransmission can be triggered without waiting for time out. This improves throughput as well as channel utilization. It returns to slow start and sets ssthresh to one half of the congestion window [1].

Every time When only one packet loss in Tahoe TCP It returns to slow start with congestion window to 1 and sets ssthresh to one half of the congestion window. Now, some of the modification is done, and that is known as Fast Recovery and it avoids slow start with congestion window to 1 [4].

Reno is improved version of TCP. It include operation of fast recovery with Tahoe TCP. Fast Recovery is entered by a TCP sender after receiving an initial threshold of dup ACKs. This threshold, is generally set to three. Once the threshold of dup ACKs is received, the sender retransmits one packet and reduces its congestion window by one half. Instead of (reduce to 1) slow-starting, as is performed by a Tahoe TCP sender [1]. Reno performs very well over Tahoe TCP when the packet losses are small. But when we have multiple packet losses in one window then RENO doesn't perform too well and its performance is almost the same as Tahoe under conditions of high packet loss. Such limitations overcome by Newreno TCP. In such all three versions (Tahoe TCP, Reno, and Newreno) of TCP use Go-Back-N for the flow control. Due to that receiver cannot inform to the sender that packet is loss or it is out of order. These limitations overcome by SACK TCP.

In Section Overview of TCP Go-Back-N and Selective Acknowledgment Based Improved TCP Version we describe basic different between SACK and Newreno TCP Version. After that we describe simulation topology. In Section Result of simulation describe packet delivery v/s time and throughput v/s time base comparisons of newreno TCP and SACK TCP at different error rate.

OVERVIEW OF TCP GO-BACK-N AND SELECTIVE ACKNOWLEDGMENT BASED IMPROVED TCP VERSION

1. NEWRENO TCP

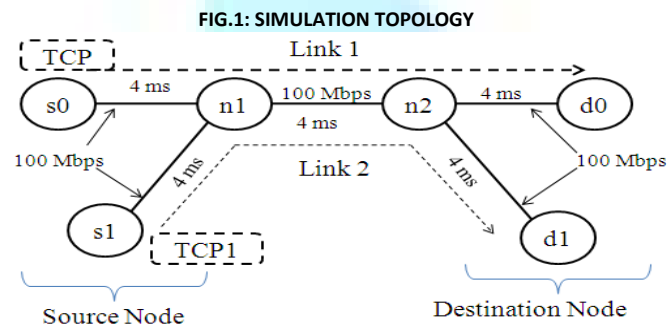
Newreno is a slight modification or improved version of TCP-Reno. A Reno sender exits fast recovery on arrival of partial acknowledgment ignoring the possibility of multiple packet losses. New Reno requires only sender side changes to allow TCP to recover from multiple losses in a window of data. It is able to detect multiple packet losses and thus is much more efficient than Reno in the event of multiple packet losses. Newreno differs from Reno in that it doesn't exit fast-recovery until all the data which was out standing at the time it entered fast-recovery is acknowledged. Thus it overcomes the problem faced by Reno of reducing the *cwnd* multiples times [2]. Newreno sends cumulative acknowledgements; therefore it follows a 'go back n' approach. So, when packet is loss sender not get complete information about packets which are reach successfully at the destination after loss, or it is out of order. Due to this, sender may be unnecessarily retransmitting that packet [2].

2. SACK TCP

SACK TCP, a modified version of TCP-Reno with SACK. Reno TCP use 'go back n' approach, in that receiver cannot inform to the sender that packet is loss or it is out of order. Due to this, sender may be unnecessarily retransmitting that packet. However, these revisions are not enough to prevent TCP from attempting unnecessary retransmissions while facing multiple losses. These limitations overcome by SACK TCP [2]. SACK retains the slow-start and fast-retransmit parts of RENO. SACK TCP requires that segment acknowledged cumulatively but should be acknowledged selectively. Addition of SACK option in TCP header enabled sender to determine lost segments accurately and minimize unnecessary retransmissions [5].

SIMULATION TOPOLOGY

We have used network simulator ns -2 for our experiments based on simulation. This section describes simulations for different TCP Version like Newreno, and SACK TCP in Presence of Errors in High Speed Network topology. For all simulations, traffic on two connections starts simultaneously and has same link delay. Simulation topology is shown in below figure 1.



Experiment is done for two parallel tcp connections, two different senders (s0 and s1) connected with three different receiver (d0 and d1) using link (n1-n2) with capacity 100mbps, data arrive from two sender by two different link(s0-d0, s1-d1) these two link have capacity 100 Mbps. All link have same link delay = 4ms.

Erroneous environment is created by corrupting packets which are required to travel on link from node s0 and s1 to node d0 and d1 (the receiver) with varying different error rate. Here in simulation we vary error in reverse link and check the performance of Newreno and SACK TCP at different error rate. For packet deliver we only consider link 1 and check packet delivery variation in the network.

The next section describes the results of simulation using number of packets delivered in case of Newreno and SACK TCP. Here in simulation we compare Newreno and SACK TCP base on packet deliver v/s time and throughput v/s time.

RESULTS OF SIMULATION

1. COMPARISONS OF NEWRENO TCP AND SACK TCP BASE ON PACKET DELIVERY V/S TIME AT DIFFERENT ERROR RATE

Packet delivers v/s time for Newreno TCP and SACK TCP for different error rate shown in below figure. Here we consider simple topology as given in figure 1 and at different error rate we compare the performance of Newreno TCP and SACK TCP. All the simulation result given in figure 2, 3, 4 and 5 are check only on link 1 because in Network two links are share same bandwidth.

In figure 2 we consider same 0.01 forward link error rates for three different reverse link error rate (0.10, 0.20, and 0.30). In figure 3 we consider 0.02 forward link error rates for three different reverse link error rate (0.10, 0.20 and 0.30). As shown in figure 3 and 4, same as Newreno we check the performance for SACK TCP.

TABLE 1: DELIVERED PACKETS

Forward link Error Rate	Reverse Link Error Rate	Newreno TCP	SACK TCP
0.1	0.10	2332761	3007702
0.1	0.20	1164742	1353031
0.1	0.30	215542	1137836
0.2	0.10	848764	1729548
0.2	0.20	158137	436265
0.2	0.30	134104	183511

From figure 2 and 4, deliver packet in SACK TCP is higher compare to Newreno TCP. For error rate 0.01 forward links and 0.10 in reverse link at that time packet deliver due to SACK TCP and Newreno TCP are 30007702, 2332761 respectively. So using SACK TCP we deliver 674941 number of higher packet compare to Newreno. Now for different error rate deliver packet in case of Newreno and SACK TCP shown in Table 1.

FIG. 2: DELIVER PACKET V/S TIME FOR NEWRENO TCP AT DIFFERENT ERROR RATE AT FORWARD LINK AND REVERSE LINK

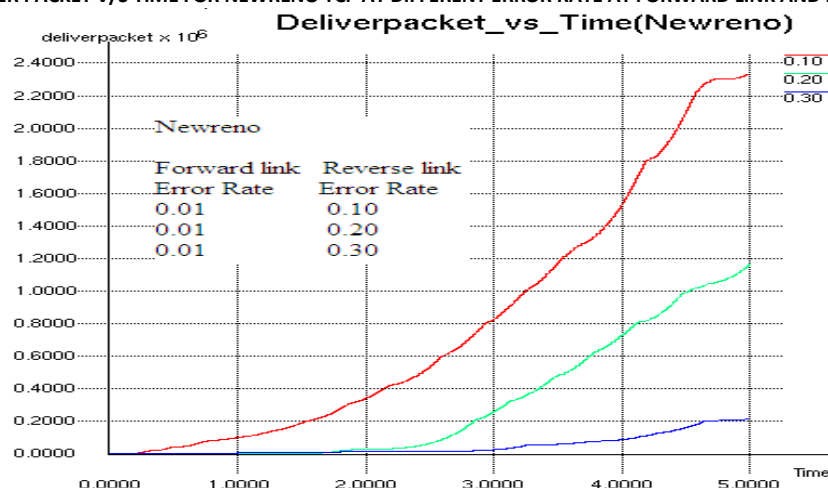


FIG. 3: DELIVER PACKET V/S TIME FOR NEWRENO TCP AT DIFFERENT ERROR RATE AT FORWARD LINK AND REVERSE LINK

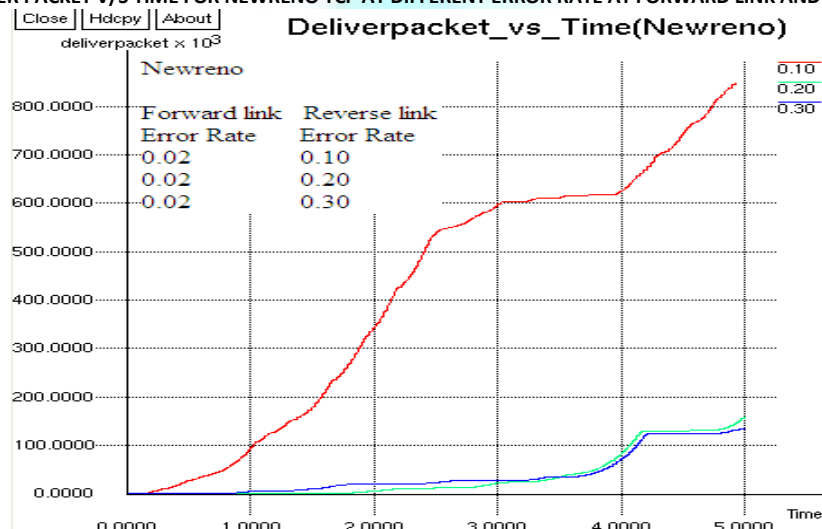


FIG. 4: DELIVER PACKET V/S TIME FOR SACK TCP AT DIFFERENT ERROR RATE AT FORWARD LINK AND REVERSE LINK

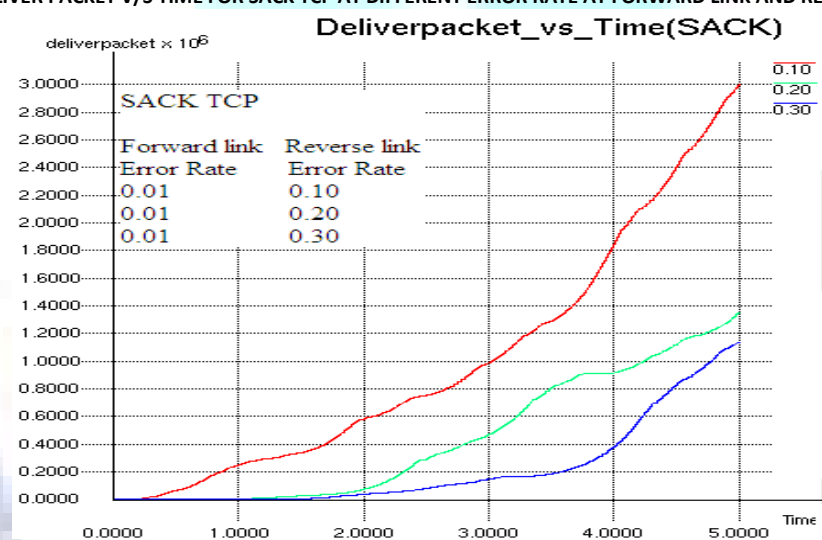


FIG. 5: DELIVER PACKET V/S TIME FOR SACK TCP AT DIFFERENT ERROR RATE AT FORWARD LINK AND REVERSE LINK

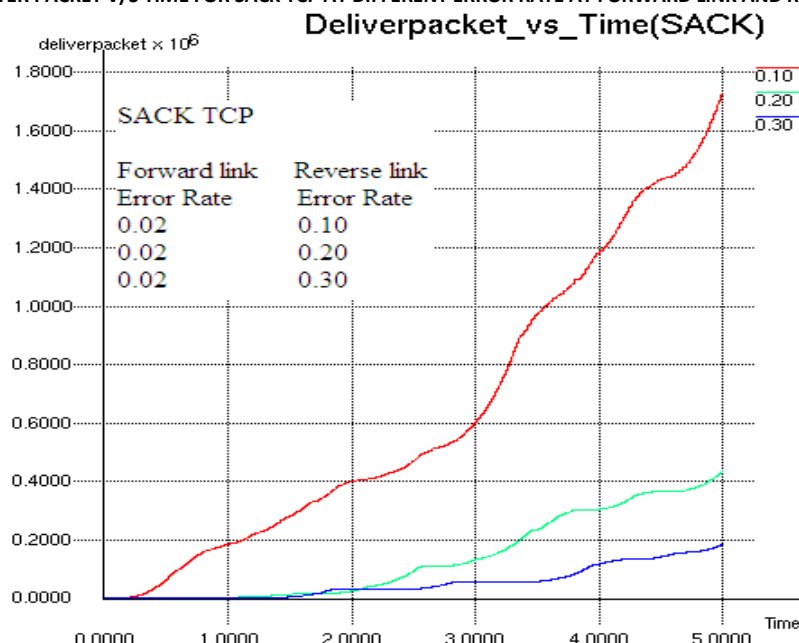
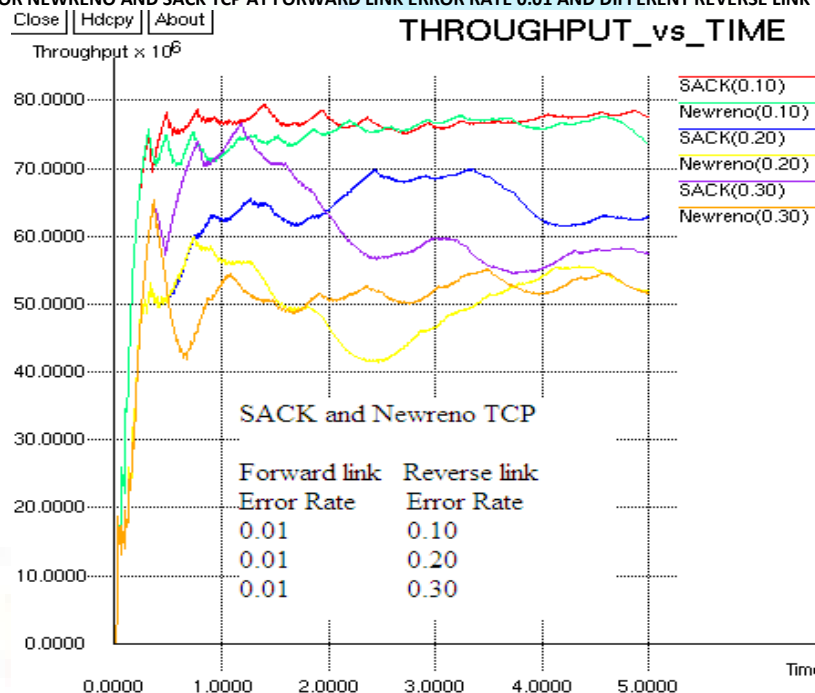


Table1. Shows number of packets delivered to receiver, d0 using Newreno and SACK TCP in presence of different error conditions in forward and reverse link between the source and destination. The table shows continuous degradation in performance of Newreno with increasing error rate in forward link. However, the performance degradation is relatively less with increase in reverse link error.

2. COMPARISONS OF NEWRENO TCP AND SACK TCP BASE ON THROUGHPUT V/S TIME AT DIFFERENT ERROR RATE

Hear above all result we check for only link 1. Now we check the performance venation in Network TCP and SACK TCP due to different error rate at forward and reverse link.

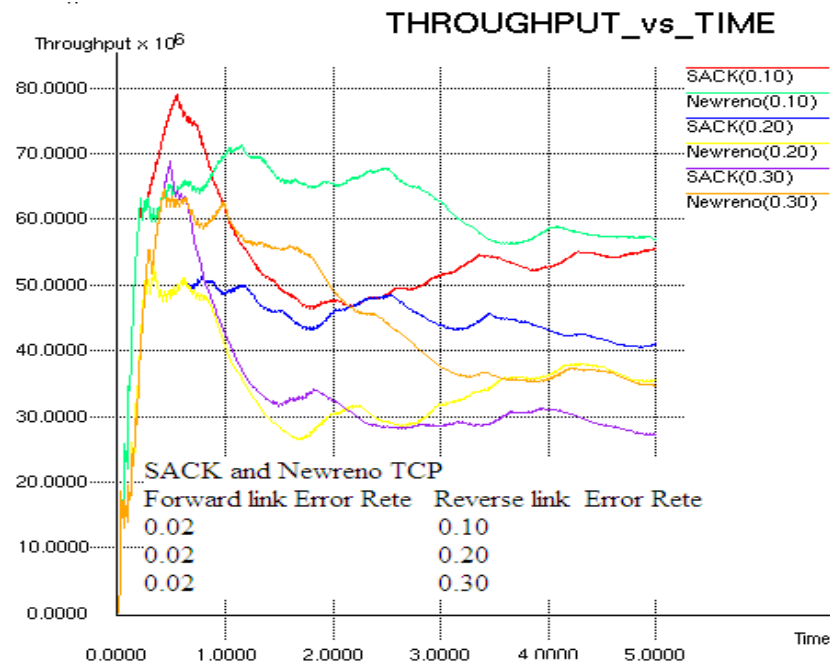
FIG.6: THROUGHPUT V/S TIME FOR NEWRENO AND SACK TCP AT FORWARD LINK ERROR RATE 0.01 AND DIFFERENT REVERSE LINK ERROR RATE (0.10, 0.20, AND 0.30)



In case of Newreno, when packet is loss sender not get complete information about packets which are reach successfully at the destination after loss, due to this, sender may be unnecessarily retransmit that packet.

This problem overcome by TCP with 'Selective Acknowledgments' is an extension of TCP Reno and it works around the problems face by TCP RENO and TCP New-Reno, namely detection of multiple lost packets, and re-transmission of more than one lost packet RTT (Round Trip Time).

FIG.7: THROUGHPUT V/S TIME FOR NEWRENO AND SACK TCP AT FORWARD LINK ERROR RATE 0.02 AND DIFFERENT REVERSE LINK ERROR RATE



As shown in above figure 5 and 6, overall network throughput v/s time of SACK TCP for High Speed network at different error rate is better compare to the Newreno. From figure 5, we set fixed forward link error rate is 0.01, and we vary reverse link error rate (0.10, 0.20 and 0.30). Now when 0.01 forward link rate and 0.10, 0.20 and 0.30 reverse link error rate at that time SACK TCP Highest throughput 79Mbps (79% of total capacity) against 76Mbps (76% of total capacity) in Newreno. Same way for ever error rate SACK TCP throughput compares to Newreno is higher as shown in figure.

Now in figure 6, we change forward link error rate to 0.02, and check for same different reverse link error rate (0.10, 0.20 and 0.30) at such time also we get SACK TCP Throughput is higher compare to Newreno Throughput. So as error rate vary in forward link or in reverse link in all condition SACK TCP give Better performance compare to Newreno TCP.

CONCLUSION

From the above simulation result, SACK TCP give higher Number of packet delivery v/s time at different error rate compare to Newreno TCP Because in SACK TCP use acknowledged selectively and Newreno use Go-Back-N for flow control due that at the reverse link SACK send only selectively acknowledged for the loss packet so it reduce unnecessarily retransmission packet from sender and it increase the throughput of overall network as shown in figure 6 and 7. Reno and SACK TCP in such two version making minimal changes to TCP's underlying congestion control algorithms. We assume that the addition of Selective acknowledgments to TCP will open the way to further developments of the TCP protocol.

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A STUDY OF INDIAN BANKS WITH REFERENCE TO SERVICE QUALITY ATTRIBUTES AND CUSTOMER SATISFACTION

DR. ASHWIN G. MODI

I/C HEAD

DEPARTMENT OF HOSPITAL MANAGEMENT

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY

PATAN

KUNDAN M PATEL

ASST. PROFESSOR

V. M. PATEL COLLEGE OF MANAGEMENT STUDIES

GANPAT UNIVERSITY

KHERVA

ABSTRACT

Indian Banking Industry is having cut-throat Competition after the LPG (Liberalization, Privatization and Globalization). To face the Dilemma, Bank should understand the importance of customer and focus on service quality as much research done to understand correlations in customer satisfaction, Loyalty and Profitability. Moreover in this era, No bank can afford to lose a customer especially due to dissatisfaction. So it is a need of the day that every bank has to recognize relationship between customer satisfaction and service quality to survive in the Banking Industry. This study attempts to identify and measure relationship of service quality attributes (of SERQUAL Model) and customer satisfaction in Retail Banking.

KEYWORDS

SERQUAL Model, Service quality attributes, Retail banking.

INTRODUCTION

Indian banking sector having a long lasting history with unique characteristics, still maintained a Special position at the whole monetary system of the world. Moreover, it had shown unique strength while facing the economic crisis after 2008. This unique strength was having a back of Banking Regulations by RBI, Fundamentals of Banking Industry and Conservative and trustworthy Customers. The demand side of Indian Banking Industry has many different astonishing aspects; due to its Socio- Economic and Demographic Characteristics. This made many segments of market with special service Demand in different mode, way and quantity. This differential need developed different categories of commercial banks over a period of time. The Commercial banks providing services to retail customers having mainly categories which consist of public sector banks (State bank of India, its Associate banks and Nationalised Banks) Private sector Banks(Old, New and Foreign banks) and Co operative banks(with RRBs). The Co operative banks (with RRBs) are mainly focusing in rural coverage in contrary Foreign banks are developing their major business in metro cities only. The Remained public and private sector banks are covering the vast banking services requirement. Besides they are having a long experience, wide branch coverage, large funds, higher customer numbers and major market share of Indian banking Industry.

SCENARIO OF PUBLIC AND PRIVATE SECTOR BANKS

Indian Public sector bank had special positive acceptance by public after the nationalization, the branches of the public sector bank rose to approximately 800% in deposits and advances took a huge jump by 11,000%. Second shifting incident was Liberalization; it changed the whole pattern on banking industry. Liberalization made the market very competitive. Every sector bank has to perform effectively in serving the customers to cope up the tuff rivalry. It can be revealed that public sector banks has higher figures in offices, employees, deposits and advances compare to private sector bank as older institution(see Table 1.1). In against that, Private sector is increasing their physical appearance through offices, employees in relatively faster mode. Moreover, Private sector shown significant increase compare to public sector in Capital and reserves.

TABLE 1.1 BANKING INDICATORS OF PUBLIC SECTOR AND PRIVATE SECTOR 2005 TO 2010

Items	Public Sector Banks			Private Sector Banks		
	2005-06	2009-10	CHANGE %	2005-06	2009-10	CHANGE %
No. of offices	50168	61301	22	6835	10387	52
No. of employees	744333	734594	-1	110505	182284	65
Business per employee (in Rs. lakh)	366.61	870.29	137	670.94	798.37	19
Profit per employee (in Rs. lakh)	2.22	5.34	141	4.50	7.19	60
Capital and Reserves & surplus	115044	241001	109	43823	119984	174
Deposits	1622481	3691802	128	428456	822801	92
Investments	633557	1205783	90	180568	354117	96
Advances	1106288	2701300	144	312962	632494	102
Interest income	137874	306488	122	35223	82874	135
Other income	21905	48388	121	8091	20180	149
Interest expended	80504	211940	163	21507	51206	138
Operating expenses	41308	65991	60	12038	22676	88
Cost of Funds (CoF)	4.46	5.34	20	4.35	4.83	11
Return on advances adjusted to CoF	3.55	3.76	6	4.41	5.06	15
Wages as % to total expenses	22.48	14.76	-34	12.15	12.76	5
Return on Assets	0.88	0.97	10	1.07	1.28	20
CRAR	12.17	13.32	9	12.42	17.45	40
Net NPA ratio	1.32	1.10	-17	1.01	1.03	2

Source: Computed from RBI database

Moreover Public sector banks has adopted positive attitude towards competitive environment, it can be seen especially in Profit per employee (based on decrease in no. of employee) but when it comes to return on assets, net NPA ratio, Investments and interest income- expenses public sector banks performance is relatively lower compared to Private sector banks. Being a Private sector player having a higher profit motive, they shown comparative high efficiency in wages as % of total expenses and proportionate growth between advances and interest income. This can be easily interpreted by their branches and ATM location. Private sector banks have 58% branches in Urban and Metro-Politan compare to only 42% branches of Public sector bank. Furthermore in Rural branches only 12% branches established by Private sector compare to 33% of public sector.

BRANCHES STATISTICS MARCH, 2010					
	Rural	Semi-urban	Urban	Metro-politan	Total
Public Sector Banks	19,567	14,595	12,920	11,743	58,825
Private Sector Banks	1,201	3,037	3,027	2,762	10,027
TOTAL	20,768	17,632	15,947	14,505	68,852

Source: compiled RBI database

Based on above statistics, one can recognize that public sector banks are having major geographical coverage without a major concern of profit motive whereas private sector banks are capturing that market chunk where they can have a relatively higher margin by either diverting valuable customer pull to their bank branches or capturing whole new market chunk.

Not only private bank but many of public sector banks are also focusing on the same to fulfill the increasing needs of customers and maintain growth in business. Customers of the new era demands innovative products and services which expects technology based sound performance from bank and its employees. This indicates that it is important for any bank to understand the phenomenon of service quality, customer satisfaction and their importance for bank's profitability and growth.

SERVICE QUALITY AND CUSTOMER SATISFACTION

Service quality is the key feature to create a unique identity in customer's mindset in service industry. Moreover in the competitive era, where customer demands something special, service quality may be a key to win. Moreover Customer satisfaction is considered as the soul of success. According to Hofstede (2001), most of the Asian cultures are collectivist [People in the collective cultures discriminate in-groups (relatives, institutions and organizations) and out-groups]. In this case, word of mouth (WOM) advertisements are important for the banks. File and Prince (1992) highlighted that the customers who are satisfied tell others about their good experiences and this enhances WOM advertising. In this way, banks can increase customers. High customer satisfaction is important in retain a loyal customer base (Prabhakaran 2003). To relate service quality and customer satisfaction has importance. It is confirmed that high quality of service will convert higher customer satisfaction and loyalty by Kumar et al (2009). Parasuraman et al (1988) and Naeem and Saif (2009) established that customer satisfaction is the outcome of service quality.

All Banks in the market try to sell mere products and services (Cross-selling), adopt new forceful marketing strategies, to develop new innovative products and to place greater weight on both the tangible and intangible aspects of their service (Petridon and Glaveli, 2003). As a result of this tuff competition, bank service quality has become an increasingly important factor in determining market shares and profitability in the banking sector (Spathis et al., 2002).

This study is an attempt of comparative study of public and private study with reference to service quality attributes based on SERVQUAL Model (Parasuraman et al., 1988) and customer satisfaction.

The rest of the paper is organized along the following lines. In section II, it has summarization of previous studies related to service quality, customer satisfaction and comparative study of public and private banks. Section III discusses the data and methodology for this study. Section IV discusses analysis and results of the study. In section V, includes conclusion and summarizes study with its limitations and applications.

OBJECTIVE

This study has following objectives

- To recognize the critical factors of service quality in retail banking industry
- To identify the interrelationship between service quality attributes and customer satisfaction in retail banking industry
- To compare public sector bank and private sector banks by customer satisfaction level.

LITERATURE REVIEW

CONCEPT OF SERVICE QUALITY

Philip Kotler (2006) "Service any act or performance that one party can offer to another that is essentially intangible and does not result in the ownership of anything." Fogli (2006, p.4) given definition of service quality as "a global judgement or attitude relating to a particular service; the customer's overall impression of the relative inferiority or superiority of the organization and its services. Service quality is a cognitive judgement". Study of Ganesh C. et al (2003) found, a good customer services in bank having three base courtesy, speed and accuracy.

SERVICE QUALITY MODEL (SERVQUAL MODEL)

Parasuraman et al (1985) undertook a Qualitative Research to investigate the concept of Service Quality. The findings of the study included five gap out of which four are from marketer side and one was from customer side. The later gape was showing gap between customer expectations and customer perceived services. Then in further study of Parasuraman et al (1985) identified ten service quality attributes as Reliability, Responsiveness, Competence, Access, Courtesy, Communication, Credibility, Security, Understanding, Tangibles. Then after (1988) Parasuraman et al collapsed ten attributes to five attributes viz,

1. Tangibles – physical facilities, appearance of personnel and equipment
2. Reliability – ability to perform the promised service dependably and accurately
3. Responsiveness – willingness to help customers and provide prompt service
4. Assurance - Assurance (combination of items designed originally to assess Competence, Courtesy, Credibility, and Security) – ability of the organization's employees to inspire trust and confidence in the organization through their knowledge and courtesy.
5. Empathy - Empathy (combination of items designed originally to assess Access, Communication, and Understanding the customer) – personalized attention given to customer.

After doing research on five different industries (banking was one of them) Parasuraman et al (1988) stated that SERVQUAL model can facilitate the Service and Retailing Organizations in assessing the expectations of customers and Service Quality perceptions. It can focus on the core areas where managers need to take attention and action to improve Service Quality.

Critique arguments by Carman (1990), Babakus and Boller (1992), Brown et al (1993) were made on the model for its number of dimensions, scale and items composited which was again argued by Parasuraman et al (1993). Finally there were supports to SERVQUAL model after successfully application in retail banking by Angur et al (1999). Based on above, it can be revealed that SERVQUAL Model is successful in measuring results related to service quality in banking. This study utilized attributes of SERVQUAL model with item performance.

CUSTOMER SATISFACTION IN RETAIL BANKING

Research study of Zaim et al (2010) argued tangibility reliability and empathy are key factor for customer satisfaction contrarily Mengi (2009) found responsiveness and assurance are having major impact on customer satisfaction. Especially for Retail banking study research of Ahmed et al (2010) found empathy having Negative influence to customer satisfaction whereas Arasli et al (2005) found reliability attribute has highest influence to customer satisfaction.

This study were utilized SERVQUAL Model at Greek Cypriot Banking Industry. Levesque and McDougall (1996), competitive interest rate and good "employee-customer" relationship are two important determinants for customer satisfaction in retail banking.

SERVICE QUALITY AND CUSTOMER SATISFACTION RELATIONSHIP

(Beerli et al., 2004) Service quality and Customer satisfaction are having positive relationship. Moreover many researcher proved that service quality is the antecedent of customer satisfaction (Bedi, 2010; Kassim and Abdullah, 2010; Kumar et al., 2010; Naeem and Saif 2009; Balaji, 2009). Parasuraman et al (1988) defined service quality and customer satisfaction as "service quality is a global judgement, or attitude, relating to the superiority of the service, whereas satisfaction is related to a specific transaction".

COMPARISON OF PUBLIC SECTOR AND PRIVATE SECTOR

Aruna Dhade et al(2008) indicated that public sector (As representative SBI) banks are having comparative lower satisfaction in relation to promptness in account handling and technical updates than private sector banks. In relation to past study on comparison of banks, studies by Vyas and Dhade (2006), Ganesan P. (2001), Rayapati Vijaya Sree (2003), Gupta V. and Jain P. K. (2003) compared the performance of public, private and foreign banks by using profitability, productivity. Their studies also found that public sector banks have lower charges compare to private sector banks and foreign banks which makes profit margin in unexpected thinner mode. Kantawala Amita S. (2004), Ketkar W Kusum et al.,(2004) studied comparative performance of banks and found decreasing trend in public sector and increasing prominence of new private sector banks

RESEARCH METHODOLOGY

This section covers research methodology of this study. First part includes research questions of the study which is followed by research hypothesis and related explanatory terms of the study. Third part contains sample selection followed by data collection. Last part of this methodology; surround validity and reliability of the concern study.

RESEARCH QUESTION

This study addresses following research questions based on study requirements,

1. Which are identical service quality attributes affecting customer satisfaction in retail Banking sector
2. How service quality attributes having relationship with customer satisfaction in retail Banking Sector
3. To understand the performance of public sector and private sector banks by comparing the customer satisfaction

RESEARCH MODEL AND HYPOTHESIS

This study utilizes SERVQUAL Model based attributes as they are appropriate and fit (as per the literature review) for the concern study. First part of the study focuses on relationship of service quality attributes and customer satisfaction which is followed by comparison of customer satisfaction in public and private sector banks in Retail banking.

SERVICE QUALITY ATTRIBUTES CUSTOMER SATISFACTION

Each service quality attribute (viz. Tangibles, Responsiveness, Reliability, Assurance, and Empathy) taken individually in null and first hypothecation.

H0: There is no positive relationship between service quality attribute(s) and customer satisfaction in retail banking sector

H1: There is positive relationship between service quality attribute(s) and customer satisfaction in retail banking sector

CUSTOMER SATISFACTION IN PUBLIC AND PRIVATE SECTOR BANKS

Comparison of public sector and private sector banks by Customer satisfaction would be done.

H0: There is no significant difference between customer satisfaction of Public sector and private sector banks in retail banking

H1: There is a significant difference in customer satisfaction of Public sector and Private sector banks in retail banking

SAMPLES SELECTION AND DATA COLLECTION

This study considered samples from Mehsana district based on convenient sampling method. Sample size was taken 90 which are equally divided in pull of public sector and private sector bank customers. 120 questionnaires were given to respondents visited in office hours of banks from which 90 questionnaires were found fully complete and in equal proportion of bank sector, those were considered for further analysis. SPSS 17 and MS Excel were utilized for testing and analysis purpose.

MEASURING VARIABLE

The study has two areas to measure which are Service quality attributes and customer satisfaction. The Service Quality attributes based on SERVQUAL Model: Tangible, Reliability, Responsiveness, Empathy and Assurance. The study has used multiple items scaled for attributes and single item scale for customer satisfaction. These scales were adopted from past study of Mengi (2009) Siddiqi (2011) and Naser (2002). the Likert scale 1 to 5 were taken into questionnaire specifically for attributes and customer satisfaction. Likert scale interprets as 1 very dissatisfied to 5 very satisfied.

VALIDITY AND RELIABILITY CONCERNS

Validity of Study is concerned with the right representation of concept by measure. This study has been concerned with content validity. This study utilizes previous research instrument and based on literature review to concern validity.

Reliability is concerned with the level of consistency in variables while measuring. Hair *et al.* (2007) mentioned that the rationale for internal consistency is that the indicators of the scale should all be measuring the same construct and thus be highly inter-correlated. As per the Fujan et al (2007), the Cronbach alpha acceptance cut off point is 0.60 for internal consistency. The reliability test result of each indicators in this study is shown in appendix 01.

In the study, each indicator has been found higher figure of Cronbach's Alpha than 0.7. Based on the above case, these indicators are proven its reliability for this study.

ANALYSIS AND INTERPRETATION

This part of analysis and interpretation can be divided in four parts. First part focuses on basic sample statistics which indicating coverage of different categories which is followed by bank group statistics. Third part focuses on results found for relationship between attributes and customer satisfaction. Last part includes bank sector wise customer satisfaction comparison.

DESCRIPTIVE STATISTICS

From the total respondent, 83 percentage respondents are male ageist of 17 percent female. 35 percent Respondent are Businessman followed by 31 percent employee where as only 18 percent are professional and remain other 16 percent are student, housewife etc. In Income group 43 percent respondent are from Rs.1 lack to Rs. 3 lack category which is followed by 37 percent respondent from less than Rs. 1 lack Income. As far Education concern, 51 percent respondents are from up to graduate category followed by 28 percent respondent from up to post graduate and higher studies category.

In Database of Respondents, Minimum and Maximum of Tangibles are 2 and 5 with its Mean 3.59 and standard deviation of 0.75. In Reliability, Minimum and Maximum are 1.8 and 4.8 with its Mean 3.52 and standard deviation of 0.67. Range of Responsiveness is 1.6 to 5 with its Mean 3.68 and standard deviation of 0.70 whereas Range of Assurance is 1.2 to 5 with its Mean 3.84 and standard deviation of 0.65. In Reliability, Minimum and Maximum are 2.4 and 4.8 with its Mean 3.762 and standard deviation of 0.59. It has been observed that Mean and standard Deviation are similar in all attributes. It represent that opinion are more of similar. Lower standard deviation is indicating higher similarity in opinion of respondent.

BANK GROUP STATISTICS

Respondent for public and private sector bank were taken same. It has been observed that in Category wise comparison, professional are found more in private sector. Similarly in age group of 26 to 40 more respondents are in private sector. Respondent descriptive statistics bank sector wise is in appendix 02.

PERSON CORRELATION BASED COMPARISON

As per The research questions “Which are identical service quality attributes affecting customer satisfaction in retail Banking sector” and “How service quality attributes having relationship with customer satisfaction in retail Banking Sector” the given hypothesis will examine the relationship between attributes and customer satisfaction in retail banking sector.

Hypothesis 01 (for attributes Tangible, Reliability, Responsiveness, Assurance, Empathy)

H0: There is no positive relationship between service quality attribute(s) and customer satisfaction in retail banking sector

H1: There is positive relationship between service quality attribute(s) and customer satisfaction in retail banking sector

The result for relationship, it has been found that the correlation (r) of tangibles is 0.501 and the significant level is 0.01. The table shows that the p -value is 0.000, which is less than 0.01. We therefore reject the null hypothesis, and concluded that there is a medium positive ($r = .501$) relationship between tangibles and customer satisfaction in the retail banking sector. The study found the correlation (r) of Reliability is 0.636 and the significant level is 0.01 therefore reject the null hypothesis, and concluded that there is a large positive ($r = .636$) relationship between Reliability and customer satisfaction. Responsiveness has found 0.620 correlation with p value 0.00 which intends large relation between Responsiveness and customer satisfaction in the retail banking sector. Assurance has found 0.704 correlations with p value 0.01 which indicate Large positive relationship between Assurance and customer satisfaction where as empathy has been found 0.632 correlation with p value 0.00 which again not accepting null hypothesis and indicates Large positive relationship between Empathy and customer satisfaction in the retail banking sector.

Based on above results, the study indicates that Assurance is having highest positive relation with customer satisfaction where as other four attributes also having positive relationship with customer satisfaction.

T STATISTICS BASED INTER BANK COMPARISON

According to research question “To understand the performance of public sector and private sector banks by comparing the customer satisfaction” the hypothesis will compare the customer satisfaction bank groups.

HYPOTHESIS 02

H0: There is no significant difference between customer satisfaction of Public sector and private sector banks in retail banking

H1: There is a significant difference in customer satisfaction of Public sector and private sector banks in retail banking

The result table shows that the Mean of customer satisfaction in public sector is 3.73 compare to private sector bank 3.84. It has been also seen that standard deviation is 0.963 in public sector compare to private sector standard deviation 0.796 for customer satisfaction. To get equality of variance for this part of study, The Independent sample test has been conducted.

From the table result of p value (0.552) is more than 0.05 so Null Hypothesis is not rejected. It intends that there is no significant difference in the customer satisfaction of public and private sector banks.

CONCLUSION

The objectives of this study are to study and find interrelationship between service quality and customer satisfaction and to compare the customer satisfaction in Public and Private sector Bank. This study anticipated to identify the important attributes to bank to get success in this competitive environment.

The positive relationship of service quality attributes with customer satisfaction is proved by the hypothesis test. Among the five service quality attributes Assurance has been found highest positive correlation with customer satisfaction. Assurance is the degree of trust and confidence that the customer believes that the service provider is competent to provide the service. The probable explanation of this result is that the bank can inculcate feelings of confidence in its customers and the banks handle their customers in a professional way and competently. Reliability and empathy have been found second and third highest positive relation with customer satisfaction with very short gap. Tangible shows least positive correlation with customer satisfaction. The probable explanation of this finding is that the sometime customers look to any tangible indications which may be used as indicators of the service quality. The customers can judge the premises of the banks; or perhaps the appearance of the bank's staff.

The non rejection of null hypothesis proves there is no significant difference in customer satisfaction of Public and Private sector banks. The probable explanation of the result is that both types of banks are having their own strengths. Private Banks seem to have satisfied its customers with innovative new services and they have been successful in capturing and retaining customers by providing new facilities than Public sector Banks where as Public sector banks have satisfied its customer by wide pool of branches, healthy trust level than private sector banks and adopting newer technology based services with experienced employees.

MANAGERIAL IMPLICATIONS

This study has proved the positive relationship between service quality attributes and customer satisfaction. This study also indicated that SERVQUAL model attributes are suitable for banking industry of India. Thus bank managers can rely on it as an instrument for measuring bank service quality. As all attributes are found positively correlated with customer satisfaction, bank manager can emphasis on all service quality attributes to maintain and improvement in delivering services by them.

In this study Assurance has found the highest positive correlation with customer satisfaction. The basics of assurance is focusing on believes of customers regarding trust and confidence in bank. Therefore bank managers and staff should always give more weightage to assurance while dealing with customers. Any statement or activity which may disturb the trust or confidence in bank (technology, system of recording transaction, or anything else by which customer's worth can be affected negatively on comes under any risk) should not be happened. Managers can promote the activities which can be resulted in higher trust and confidence level in customer's mindset.

LIMITATIONS OF THE STUDY

Although this study was based on SERVQUAL attributes, other variables like Interest rate, charges etc may influence customer decision making process in banking industry. The sample size of this study is 90. This sample size meets the minimum requirement. One may use a bigger sample size to find out more about service quality, customer satisfaction in retail banking in India. Public and private sector banks are only considered by this study. Role of Foreign banks have been excluded.

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ANNEXURE

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.894	.899	5

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Tangibles	14.7956	5.323	.602	.400	.906
Reliability	14.8711	5.098	.794	.640	.859
Responsiveness	14.7022	5.091	.756	.643	.868
Assurance	14.5467	5.181	.803	.658	.858
Empathy	14.6311	5.480	.783	.629	.865

PREDICTING CONSUMER BUYING BEHAVIOR USING A DATA MINING TECHNIQUE**ARATHI CHITLA****ASSOCIATE PROFESSOR****DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING****TELANGANA UNIVERSITY****DICHPALLY****ABSTRACT**

Consumer is the most essential source of revenue for business organizations; therefore his behavior is of significant importance for achieving market survival and financial prosperity. Consumer buying behavior is a complex phenomenon, which is comprised of a bundle of decision making processes, economic determinants and market stimuli. Data mining involves extracting interesting patterns from data and can be found at the search of the Operational Research (OR), as its aim is to create and enhance decision support systems. Traditional OR methods linear programming, quadratic optimization, genetic algorithms and concept based on artificial ant colonies. Data mining application domains ranges from credit risk, marketing and fraud detection to counter-terrorism. In all of these, data mining is increasingly playing a major role in decision making as well as in consumer buying behavior. This paper outlines the upcoming trends and challenges in data mining and identifies a technique to predict consumer purchase patterns.

KEYWORDS

consumer, data mining, decision making, purchase patterns.

INTRODUCTION

In the globalization era, consumer plays a key role in determines what a business is. Consumer behavior focuses on the study of both physical activities and decision making processes that occur in the process of search, evaluation, acquiring, use and disposal of products. Data mining involves extracting interesting patterns from data and can be found at the search of the Operational Research (OR), as its aim is to create and enhance decision support systems. Traditional OR methods linear programming, quadratic optimization, genetic algorithms and concept based on artificial ant colonies. Data mining application domains ranges from credit risk, marketing and fraud detection to counter-terrorism. In all of these, data mining is increasingly playing a major role in decision making as well as in consumer buying behavior.

SURVEY OF LITERATURE

Data mining techniques are more effective tool for analyzing consumer behavior. However the data mining methods have disadvantages as well as advantages. Therefore it is important to select appropriate tool to mine database.

The Junzo watada et al. in their paper "A Data mining approach to consumer behavior" tried to improve data mining analysis by applying several methods including fuzzy clustering, principal component analysis and discriminate analysis. Many defects included in the conventional methods are improved in this paper. [4]

Parvinder S. Sandhu et al. in their paper "Mining utility-oriented association rules" explains, An efficient approach based on profit and quantity" Association rule mining has been an area of active research in the field of knowledge discovery and numerous algorithms have been developed to this end. In this paper, they propose an efficient approach based on weight factor and utility for effectual mining of significant association rules. Initially, the proposed approach makes use of the traditional Apriori algorithm to generate a set of association rules from a database. The proposed approach exploits the anti-monotone property of the Apriori algorithm, which states that for a k-item set to be frequent all (k-1) subsets of this itemset also have to be frequent. Subsequently, the set of association rules mined are subjected to weight age (W-gain) and utility (U-gain) constraints, and for every association rule mined, a combined utility weighted score (UW-Score) is computed. Ultimately, they determine a subset of valuable association rules based on the UW-Score computed. The experimental results demonstrate the effectiveness of the proposed approach in generating high utility association rules that can be lucratively applied for business development. [6]

Jyothi Pillai in "User centric approach to itemset utility mining in Market Basket Analysis" describes Business intelligence is information about a company's past performance that is used to help predict the company's future performance. It can reveal emerging trends from which the company might profit. Data mining allows users to sift through the enormous amount of information available in data warehouses; it is from this sifting process that business intelligence gems may be found. Within the area of data mining, the problem of deriving associations from data has received a great deal of attention. This problem is referred as "market-basket problem". Association Rule Mining (ARM), a well-studied technique in the data mining field, identifies frequent itemsets from databases and generates association rules by assuming that all items have the same significance and frequency of occurrence in a record. However, items are actually different in many aspects in a number of real applications such as retail marketing, nutritional pattern mining, etc. Rare items are less frequent items. For many real world applications, however, utility of rare itemsets based on cost, profit or revenue is of importance. For extracting rare itemsets, the equal frequency based approaches like Apriori approach suffer from "rare item problem dilemma". Utility mining aims at identifying rare itemsets with high utility. The main objective of Utility Mining is to identify the itemsets with highest utilities, by considering profit, quantity, cost or other user preferences. Also valuable patterns cannot be discovered by traditional non-temporal data mining approaches that treat all the data as one large segment, with no attention paid to utilizing the time information of transactions. Now, as increasingly complex real-world problems are addressed, temporal rare itemset utility problem, are taking center stage. In many real-life applications, high-utility itemsets consist of rare items. Rare itemsets provide useful information in different decision-making domains such as business transactions, medical, security, fraudulent transactions, and retail communities. For example, in a supermarket, customers purchase microwave ovens or frying pans rarely as compared to bread, washing powder, soap. But the former transactions yield more profit for the supermarket. A retail business may be interested in identifying its most valuable customers i.e. who contribute a major fraction of overall company profit. In this paper, these problems of analyzing marketbasket data are considered and important contributions are presented. It is assumed that the utilities of itemsets may differ and determine the high utility itemsets based on both internal (transaction) and external utilities. [9]

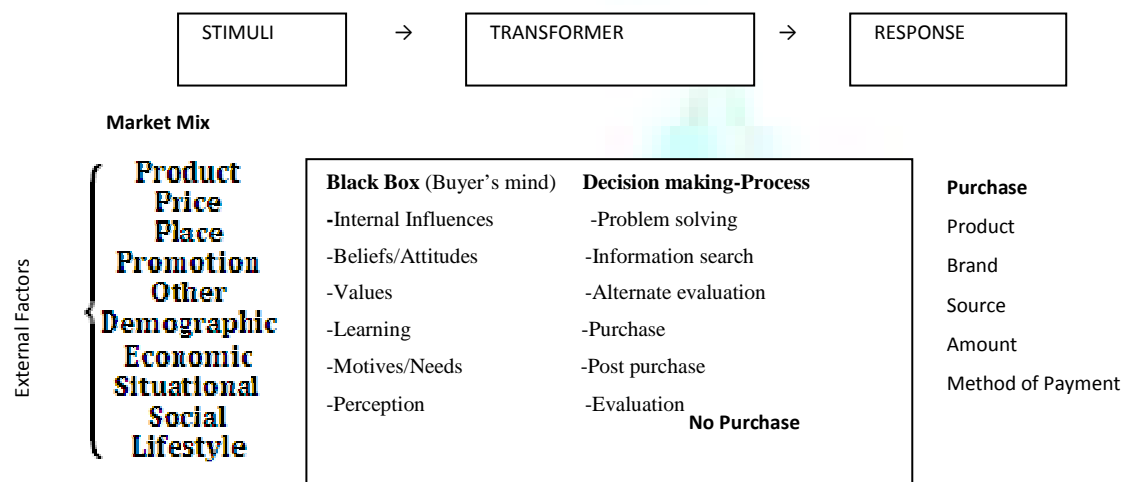
"Efficient Association Rule Mining for Market Basket Analysis" Shrivastava A., Sahu R. writes in that Data mining is an attitude that business actions should be based on learning, that informed decisions are better than uninformed decisions, and that measuring results is beneficial to the business. Data mining is also a process and a methodology for applying the tools and techniques. Association rule mining is also one among the most commonly used techniques in Data mining. A typical and the most running example of association rule mining is market basket analysis. This process analyzes customer buying habits by finding associations between the different items that customers place in their "shopping baskets". The discovery of such associations can help retailers develop marketing strategies by gaining insight into which items are frequently purchased together by customer and which items bring them better profits when placed with in close proximity. The algorithms for single dimensional association rule mining, such as apriori and the FP-tree developed are in a greater use today. However, candidate set generation in apriority is still costly, especially when there exists a large number of patterns and/or long patterns. And both these algorithms prune the item sets based on their frequencies (i.e., if their frequencies exceed minimum support threshold then they term them as frequent and the rest of them as infrequent). But this pruning technique is insufficient to help market analyst to make decisions such as planning the supermarket's shelf space, changing the layout new store layouts, new product assortments, which products to put on promotion so as to improve their marketing profits. So the focus of

this paper is to enhance these algorithms in a way that it provides frequent profitable patterns which help market analyst to make the best informed decisions for improving their business. [10]

CONSUMER BUYING BEHAVIOR

The study of how and why people purchase goods and service is termed consumer buying behavior. The term covers the decision-making processes from those that precede the purchase of goods or services to the final experience of using the product or service. Models of consumer buying behavior draw together the various influences on, and the process of, the buying decision. They attempt to understand the proverbial 'black box' of what happens within the consumer between his or her exposure to making stimuli and the actual decision to purchase.

TABLE 1: BLACK BOX MODEL OF CONSUMER BUYING BEHAVIOR



Source: Keegan et al. (1992, p. 193)

BUYING DECISION

The buying situation can vary from routinized responses behavior to limited problem solving to extensive problem solving. The process of buying takes place in the mind of buyer. In this process two activities take place.

- The thought process-analyses and decides what to buy, when to buy, etc...
- The resultant activity-accepting or rejecting a product.

Buying is not a single act but a multi component decision on the need class, generic class, product form, brand, vendor, quantity timing and method of payment. Consumer decision behavior is the behavior with most consumers has the general objective of creating and maintaining a collection of goods and services that provides current and future satisfaction.

TYPES OF CONSUMER DECISION MAKING

Routine response behavior is usually found in the cases of frequently purchase and low cost items. The products through its type are purchased quickly with less effort.

Limited decision making is pertinent in the case of purchases made by the consumers less frequently, the investment needed also will be comparably high. This requires a moderate amount of time for information gathering and deliberation.

Extensive decision making is require when a consumer wants to produce unfamiliar products which is totally new, having high unit value and bought once in his life time. This is the most complex type.

FACTORS INFLUENCING CONSUMER BUYING BEHAVIOR

Consumer buying behavior is determined by:

- Level of involvement in purchase decision. Importance and intensity of interest in a product in a particular situation.
- Buyer's level of involvement determines why he/she is motivated to seek information about a certain precuts and brands but virtually ignores others.

Consumer buying Process What influences consumers to purchase products or services? The consumer buying process is a complete matter as many internal and external factors have an impact on the buying decisions of the consumer. The six stages to the consumer buying process include:

- Problem Recognition** (awareness of need)-difference between the desired state and the actual condition. Deficit in assortment of products.
- Information search**
 - Internal search, memory.
 - External search if you need more information. Friends and relatives (word of mouth). Marketers determined sources; comparison shopping; public sources etc.

A successful information search leaves a buyer with possible alternatives, the evoked set.

- Evaluation of alternatives** need to establish criteria for evaluation, features the buyer wants or does not want. Rank/weight alternatives or resume search. Information from different sources may be treated differently. Marketers try to influence by "framing" alternatives.

- Purchase decision** Choose buying alternative, includes product, package, store, method of purchase etc.

- Purchase** may differ from decision, time lapse between 4 & 5, product availability.

- Post-Purchase Evaluation** outcome. Satisfaction or Dissatisfaction. **Cognitive Dissonance**, have made the right decision. This can be reduced by warranties, after sales communication.

What can data mining do? Data mining is primarily used today by companies with a strong consumer focus-retail, financial, communication, and marketing organizations. It enables these or staff skills, and "external" factors such as economic indicators, competition, and customer demographics. And, it enables them to determine the impact on sales, customer satisfaction, and corporate profits. Finally, it enables them to "drill down" into summery information to view detail transactional data. With data mining, a retailer could use point-of-sale records of customer purchase to send targeted promotions based on an individual's purchase history. By mining demographic data from comment or warranty cards, the retailer could develop products and promotions to appeal to specific customer segments.

For example, Blockbuster entertainment mines its video rental history database to recommend rental to individual customers. American Express can suggest products to its card holders based on analysis of their monthly expenditures.

BENEFITS OF DATA MINING TO CONSUMERS

Data mining, or knowledge discovery, an estimated \$ 1.85 billion industry, requires the computer-assisted process of digging through and analyzing enormous amounts of data and then extracting the meaning of the data. But for business owners, data mining can be a powerful tool to take their company from zero to profitability in relatively short order. Data mining includes:

- **Market segmentation** identifies the common characteristics of customers. Market segmentation allows a company's marketing or sales arm to focus on prospects that are "most likely" to buy products.
- **Customer churn** predict the factors that cause customers to leave a business and go to a competitor. Understanding these factors helps companies take action to reduce their churn rate.
- **Fraud detection** identifies which transactions are most likely to be fraudulent.
- **Direct marketing** predicts what online buyers are most likely to respond to in order to obtain the highest response rate.
- **Interactive marketing** predicts what online buyers are most likely to respond to in order to optimize website advertisements and increase conversion rates.
- **Trend analysis** analyzes changes over a period of time to forecast future performance.

STAGES OF DATA MINING IN CONSUMER BEHAVIOR

One "official" definition of consumer behavior is "The study of individuals, groups, or organizations and the process they use to select, secure, use and dispose of products, services, experiences, or ideas to satisfy needs and the impacts that these processes have on the consumer and society."

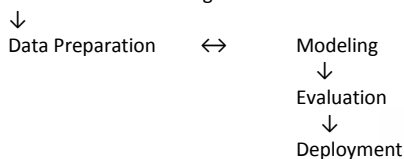
The ultimate goal of data mining is prediction of consumer buying behavior and predictive data mining is the most common type of data mining and one that has the most direct business applications. The process of data mining consists three stages: (1) the initial exploration, (2) model building or pattern identification with validation/verification, and (3) deployment (i.e., the application of the model to new data in order to generate predictions).

Stage 1: Exploration: This stage usually starts with data preparation which may involve cleaning data, data transformations, selecting subsets of records and – in case of data sets with large numbers of variables ("fields") performing some preliminary feature selection operations to bring the number of variables to manageable range (depending on the statistical methods which are being considered). Then, depending on the nature of the analytic problem, this first stage of the process of data mining may involve anywhere between a simple choice of straightforward predictors for a recognition model, to elaborate exploratory analyses using a wide variety of graphical and statistical methods in order to identify the most relevant variables and determine the complexity and/or the general nature of models that can be taken into account in the next stage.

Stage 2: Model Building and validation: This stage involves considering various models and choosing the best one based on their predictive performance (i.e., explaining the variability in question and producing stable results across samples). This may sound like a simple operation, but in fact it sometimes involves a very elaborate process. There are a variety of techniques developed to achieve that goal-many of which are based on so called "competitive evaluation of models," that is applying different models to the same data set and then comparing their performance to choose the best. These techniques-which are often considered the core of predictive data mining include: Bagging (Voting, Averaging), Boosting, Stacking (Stacked Generalizations), and Meta-Learning.

Stage 3: Deployment: That final stage involves using the model selected as best in the previous stage and applying it to new data in order to generate predictions or estimates of the expected outcome.

Business understanding ↔ Data Understanding



TYPES DATA MINING ALGORITHMS IN CONSUMER BUYING BEHAVIOR

- Classification algorithms predict one or more discrete variable, based on the other attributes in the dataset. An example of a classification algorithm is the Microsoft Decision Trees Algorithm.
- Regression algorithms predict on or more continuous variable, such as profit or loss, based on other attributes in the dataset. An example of a regression algorithm is the Microsoft Time Series Algorithm.
- Segmentation algorithms divide data into groups or cluster, of items that have similar properties. An example of a segmentation algorithm is the Microsoft Clustering Algorithm.
- Association algorithms find correlations between different attributes in a dataset. The most common application of this kind of algorithm is for creating association rules, which can be used in a market basket analysis. An example of an association algorithm is the Microsoft Association Algorithm.
- Sequence analysis algorithms summarize frequent sequences or episodes in data, such as a Web path flow. An example of a sequence analysis algorithm is the Microsoft Sequence Clustering Algorithm.

MICROSOFT DECISION TREE ALGORITHM

The Microsoft Decision Tree algorithm is a classification algorithm provided by Microsoft SQL to predict the consumer buying behavior. The marketing department of the company identifies the characteristics of previous customer that might indicate whether those customers are likely to buy a product in the future. The database stores demographic information that describes previous customers. By using the Microsoft Decision Tree algorithm to analyze this information, the marketing department can build a model that predicts whether a particular customer will purchase products, based on the states of known columns about that customer, such as demographics of past buying patterns.

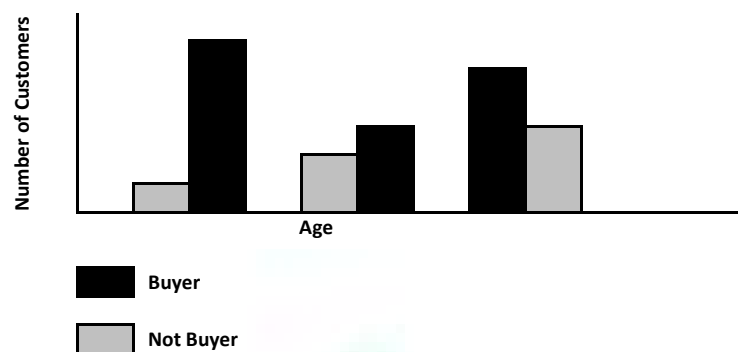
HOW THE ALGORITHM WORKS?

The Microsoft Decision Tree algorithm builds a data mining mode by creating a series of splits in the tree. These splits are represented as nodes. The algorithm adds a node to the model every time that an input column is found to be significantly correlated with the predictable column. The way that the algorithm determines a split is different depending on whether it is predicting a continuous column or a discrete column.

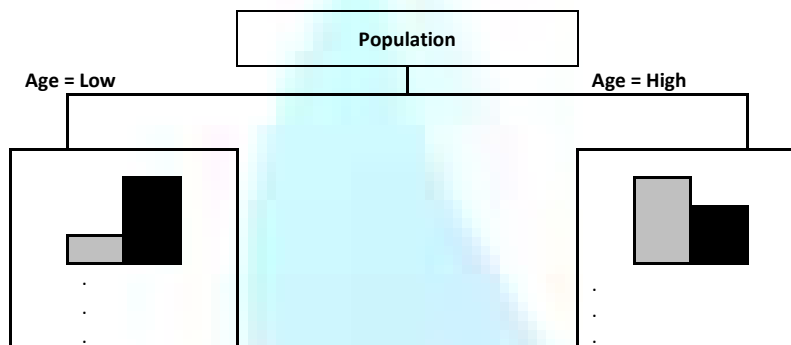
The Microsoft Decision Trees algorithm uses feature selection to guide the selection of the most useful attributes. Feature selection is used by all Analysis Services data mining algorithms to improve performance and the quality of analysis. Feature selection is important to prevent unimportant attributes from using processor time. If you use too many input or predictable attributes when you design a data mining modes, the model can take a very long time to process, or even run out of memory. Methods used to determine whether to split the tree include industry standard metrics for entropy and Bayesian networks.

A common problem in data mining modes is that the model becomes too sensitive to small differences in the training data, in which case it said to be over-fitted or over-trained. An over fitted model cannot be generalized to other data sets. To avoid over fitting on any particular set or data, the Microsoft Decision Trees algorithm uses techniques for controlling the growth of the tree.

The Microsoft Decision Trees algorithm builds a tree for a discrete predictable column can be demonstrated by using a histogram. The following diagram shows a histogram that plots a predictable column, Bike Buyers, against an input column, Age. The histogram show that the age of a person helps distinguish whether that person will purchase a bicycle.



The correlation that is shown in the diagram would cause the Microsoft Decision Trees algorithm to create a new node in the model.



As the algorithm adds new nodes to a model, a tree structure is formed. The top node of the tree describes the breakdown of the predictable column for the overall population of customers. As the model continues to grow, the algorithm considers all columns.

Querying a Decision Trees Modes (Analysis Services – Data Mining)

Queries help you better understand and work with the information in the model in the following ways:

- Making single and batch predictions.
- Learning more about the patterns found by the model.
- Viewing detail or the training cases for a particular pattern or subset of the mode.
- Drilling through to details of the cases in the mining model.
- Extracting formulas, rules, or statistics about all or a subset of the model and data.
- To create meaningful queries on the content of a decision trees model, you should understand the structure of the model content, and which node type store what kind of information.

SAMPLE QUERY

By querying the data mining schema the necessary nodes can be retrieved and is possible to predict the bike buyers of the company form the total customers.

```

Select MINING_PARAMETERS
From $ system. DMSHEMA_MINING_MODELS
WHERE MODEL_NAME='TM-Decision Tree'
SELECT NODE_CAPTION
FROM [<decision tree model name>]
WHERE NODE_UNIQUE_NAME= '<node id>'
SELECT Predict ([Bike Buyer]), Predict Node ID ([Bike Buyer])
FROM [<decision tree model name>]
PREDICTION JOIN
<input row set>
  
```

CONCLUSION

Consumers provide the economic rationale for business activity. The data mining ensures the consumer purchase pattern in the market. It predicts the purchasing behavior of the consumers like “what do they buy?”, “When do they buy?”, “why do they buy?”

Marketers have to meet the preferences of consumers, because the beliefs are passed down the generations. The market leader will try to encourage habitual buying behavior by running frequent reminder advertising, avoiding out of stock condition. Challenger firms will encourage variety seeking by offering lower prices, deals, free samples and advertising that presents reasons for trying something new. In the evaluation stage, consumer ranks and forms purchase intension.

Generally the consumer purchase decision will be to buy the most preferred brand. Many purchases involve some risk taking. The marketer must understand the factors that provoke feelings of risk in consumer and must provide information and support that will reduce the perceived risk.

Buyer motivation, a key component of consumption, is the stimulus inducement or purpose in a certain desire.

The advent of data mining enhances the customer behavior prediction accuracy. The decision tree model classifies the consumers into buyers/not buyers. Mining change for consumer behavior is useful for satisfying customer needs in dynamic business environments. The system is developed would enable the marketing managers to rapidly establish marketing strategies and increase the profit of the company.

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PERFORMANCE ANALYSIS OF VALUE STOCKS & EVIDENCE OF VALUE PREMIUM: A STUDY ON INDIAN EQUITY MARKET

RUBEENA BAJWA
ASST. PROFESSOR
RAYAT BAHRA INSTITUTE OF MANAGEMENT
BOHAN, HOSHIARPUR

DR. RAMESH CHANDER DALAL
ASSOCIATE PROFESSOR
UNIVERSITY SCHOOL OF MANAGEMENT
KURUKSHETRA UNIVERSITY
KURUKSHETRA

ABSTRACT

The superiority of value stocks over growth stocks and presence of value premium has been analyzed by many academicians in equity management, but most of the research on value and growth phenomena is based on the data from US stock markets. Superiority of value stocks over growth stocks has also been indicated in Non-US markets (Louis K.C. Chan and Josef Lakonishok (2004) & by Peter Oertmann (1999) who investigated 18 stock markets and indicated that value investment strategies have outperformed all equity markets. Satneet K. Sabharwal & Timothy Falcon Crack (2005) have found inconsistent results from other markets. The present study examines the performance of value stocks in Indian equity market and the evidence provides that investing in value stocks has not been much fruitful here however low price-earnings ratio stocks give better and consistent returns.

JEL CLASSIFICATION

G11

KEYWORDS

Value stocks, value premium, performance consistency.

INTRODUCTION

Classification of investment avenues is pervasive in financial markets and these are classified into broad categories such as; large stocks, small stocks, venture capital, government bonds, value stocks and high growth stocks (Bernstein, 1995; Swensen, 2000). The asset classes are known as 'styles' and the process is known as 'style investment'. Although style investing has been introduced as a new concept in the 1980s, the categorization of assets into different groups has taken place already for a long time. One style which emerged 75 years back was given in 'Security Analysis' book written by Benjamin Graham and David L. Dodd. They witnessed the five year span of the market – the run-up to the best and worst time of the markets from 1929 peak and crash of October 1929. They laid out a plan for how the investors in any environment might sort hundreds and thousands of common stocks, preference shares and debentures to identify the worthy investments. They applied their approach to the U.S. stock and bond markets and to the global capital markets. The theory they invented was known as "value investing" in their book Security Analysis in 1934 which is based on the assumption that two values are attached to a stock: Market Price and Business Value. Value investing is the practice of investing in securities or assets less than they are worth. The most exceptional concept invented in 1934 is still applicable today as these lessons are timeless. In late 1970s Banz documented the superior performance of securities on the basis of 'common characteristics' and discovered the "small firm" effect. At the end of 1970s market efficiency as explained by Fama (1970) was questioned and academic research started questioning the consistency of stock returns with EMH and it appeared that the EMH could not account for certain classes of stocks with similar characteristics. Several academic studies found that there were categories of stocks that had similar characteristics and performance patterns. Moreover, the returns of these stock categories performed differently than other categories of stocks. That is, the returns of stocks within category were highly correlated and the returns between categories of stocks were relatively uncorrelated. The first such study was by James L. Farrell Jr. (1975) who called these categories of stocks "clusters". He found that for stocks there were at least four such categories or clusters – growth, cyclical, stable, and energy. In the latter half of the 1970s, there were studies that suggested even a simpler categorization by size (as measured by total capitalization) which produced different performance patterns.

Value stocks investors seek to invest in undervalued stocks i.e. below their "intrinsic value" and wait for that value to be recognized by other investors. They put more weight on judgements about the extent that they think that stock is mispriced in the market; buy if underpriced and sell if overpriced. They look for 'margin of safety' i.e. the gap between the price of investment and its underlying value stocks and ideally require the market price well below the company's intrinsic value by nearly 33%. So, value investing is buying, with a sufficient margin of safety, a part of capital of a company whose market price is below the company's "real" value, or "intrinsic value" - selling the stock when the market price reaches the intrinsic value. Value investing originated in 1920s at a time when investors were guided mostly by speculation and insider information (Graham & Dodd). Investing in the companies trading below their true value is the underlying principle of value investing. Several strategies exist for value investing including investing in companies with high valuation ratios such as book-to-market ratio, earnings-to-price ratio and in companies with high dividend yields. Prior evidence on value investing suggests that value stocks generate higher returns than growth stocks. Chan & Chen (1991) have called these stocks as "fallen angels" whose earnings-to-assets are low. Lakonishok (1994) has defined value strategies as buying shares having low prices as compared to the indicators of fundamental value such as earnings, dividends or cash flow. The academic studies on value & growth investing have had a strong impact on investment management and 'value' and 'growth' investing are two widely recognized distinctive disciplines adopted by investors and professional managers. The current study investigates performance of value stocks in Indian stock market and found that the stocks are not able to generate superior returns even in down markets and the returns generated by these stocks are not consistent.

LITERATURE REVIEW

After the crash of October 1929, the great depression started and growth stock investing disappeared. In the 1930s and 1940s, the value stock approach started to gain attention. Though Warren Buffet is the best known proponent of value investing actually, it was his 'guru' Benjamin Graham (1894-1976) who pioneered the concept of value investing and positioned it as an investment style best suited for risk-averse investors in his 1934 classic - Security Analysis. Graham's investment philosophy was to buy good assets cheaply, when they are out of favour. Or, as Warren Buffet puts it, 'finding an outstanding company at a sensible price.' Graham and Dodd (1934) advocated to stay away from growth stocks. The capital asset pricing model (CAPM) of Sharpe (1964) and Lintner (1965) was the most widely recognized explanation of stock prices and expected returns.

The Sharpe – Lintner CAPM equation describes the individual asset return based on market portfolio and estimation of beta. The notions of value and growth were introduced in the academic finance by Rosenberg (1985). In the early 1980s the evidences of stocks with high EP or BM ratios outperforming the stocks with low EP or BM ratios was regarded as pricing anomaly but in the mean time explanations were developed explaining the exceptional returns of value stocks and figured 'value premium'. The perspectives of different authors for the value puzzle were different. De Bondt & Thaler (1985) and Lakonishok, Shleifer & Vishny (1994) regarded value premium due to market overreaction and mispricing of stocks. Davis (1995) brings survivorship bias into discussion and finally the higher returns of value stocks are attributed to the systematic risk of such investments. The performance of these strategies is based upon the performance of the variables forming these strategies. Fama & French (1992) in their study combined the two variables size and book-to-market equity to capture the cross sectional variation in the average stock returns. They have found the evidence from the portfolios formed, that size has strong correlation with the average returns and size and book-to-market effects dominate all other firm-specific variables in explaining the cross-section of average returns, with average returns on small stocks higher than those on big stocks (the size effect) and average returns on high book-to-market stocks higher than those of low book-to-market stocks (the book-to-market effect). They find that the small caps outperformed the large caps by 0.74% on average per month over the period 1963 to 1990. Those studies demonstrate that small caps earn higher average returns than is predicted by the capital asset pricing model. Lakonishok et al. (1994) defined value strategies as buying shares having low prices compared to the indicators of fundamental value such as earnings, book value, dividends or cash flow. They classified stocks into "value" or "glamour" on the basis of past growth in sales and expected future growth as implied by the current Earnings-to-Price ratio. Fama and French (1996) define 'anomalies' as the patterns in average returns that are not explained by the CAPM. These are related to firm characteristics like size, earnings/price, cash flow/price, book-to-market equity, past sales growth, long-term past return, and short-term past return. They argue that many of the CAPM average-return anomalies are related and, except for continuation of short-term returns, they are largely captured by the three-factor model (Fama and French (1993)). Fama and French (1998) find international evidence stating that for the period 1975-1995, the value premium which is the difference between the high BE/ME and low BE/ME stocks is 7.68% per year and the value stocks outperform growth (glamour) stocks in twelve of the thirteen major (developed) markets. They also allow for another out-of-sample test of value premium on sixteen emerging markets and find the same result. With respect to size effect, they find that like US stocks returns, small stocks in emerging markets have higher average return than big stocks. Arshanapalli, Coggin, and Doukas (1998) show that the value-growth spreads on international stock markets substantially vary from year to year with respect to both signs and magnitudes. Reasons for such a cyclical behavior of value premiums are still unexplored. Nai-fu Chen and Feng Zhang (1998) in their study have found that the value effect is strong and persistent in US, somewhat less in Japan, Hong Kong and Malaysia and undetectable in Taiwan and Thailand and the reason for these differences is different market growth rates. Using three variables DIV, LEV & SEP; they have concluded that the higher returns of value stocks are compensated for higher risk. Further they concluded that value stocks give higher returns because these are the firms which are in distress, have high financial leverage and face earnings uncertainty in future. Peter Oertmann (1999) in his study has investigated 18 stock markets over three global regions from January 1980 to June 1999. The results indicate that value premiums reveal a time variation similar to the movements of global economic risk premiums. Over these 20 years; value stocks have outperformed all equity markets. Value-growth return spreads are driven by expected business conditions and the market climate and there is low correlation between value premiums across international stock markets that call for country specific style management. Though lots of attention has been concentrated for many years on the phenomenon of the value premium at the portfolio level, only recently the focus has been shifted at the stock level. The first author to recommend an analysis of the distribution of returns of value stocks over different holding periods was Piotroski (2000), who documented that, although value stocks over perform the market as a whole, most of them actually underperform the market over all reasonable holding periods, with the percentage of over performance reaching less than 43% on the US sample. The same result was obtained for both value and growth stocks by Bird and Casavecchia (2005), where they highlighted that a typical value stock underperform the market, and they evidenced that the value premium is determined by just a small number of stellar stocks that "drag" the overall performance of the style considered. Asness (1997) was one of the first to put forward an explanation for this underperformance. In his paper, he suggested that the normal valuation metrics such as sales-to-price, cash-flow-to-price, earnings-yield, and book-to-market used to identify value and growth stocks are "raw" measures in establishing when a reversion in these stocks could take place. Indeed, the value of the market-based ratio provides an indication of the level of the market expectations in relation to the company's future performance but it does not signal if and when the value (growth) stock will benefit (suffer) from a reversion in these expectations in the future. Benjamin Graham (1965) was correct in suggesting that while the stock market in the short run may be a voting mechanism, in the long run it is a weighing mechanism. True value will win out in the end. And before the fact, there is no way in which investors can reliably exploit any anomalies or patterns that might exist. Satneet K. Sabharwal, Timothy Falcon Crack (2005) also inconsistent with the previous research of other markets have found that growth beats value in Indian stock market. They have analyzed 792 BSE stocks from January 1990 to August 2004. Their first major finding is strong negative relation between D/P deciles and size-beta-adjusted abnormal returns and strong positive relation between P/E deciles and size-beta-adjusted abnormal returns. Second major finding is that stock returns increase with market capitalization. Most of the empirical research in the value-growth phenomena is based on the stock market data from the United States, but many new researches are coming up which will benefit the investors around the world to benefit from the superior returns of value-investing strategies.

RESEARCH METHODOLOGY

The Definition of value stocks has undergone a significant evolution. Value stocks have one or more of the following characteristics: Low market price to book ratio (B/M effect), Low price to earnings ratio (Cash flow effect), High dividend yield, Low market price relative to historical price (Contrarian), Low price to sales multiple, Discount valuation relative to industry peers, Lower PEG ratio than comparable industry peers, High return on equity. Based on the most of academic research, the current study has chosen the following three attributes to explain the value puzzle.

- Low price-to-earnings ratio stocks;
- Low price-to-book ratio stocks;
- High dividend yield stocks

OBJECTIVES

1. Measuring the performance of value stocks in Indian stock market
2. Identifying the presence of value premium in context to Indian stock market
3. Measuring performance consistency of value stocks

TESTABLE HYPOTHESIS

To measure if the returns generated by value investment strategies are statistically indifferent

$$H_0 : \mu_1 = \mu_2 = \mu_3$$

$$H_1 : \mu_1 \neq \mu_2 \neq \mu_3$$

DATA INPUTS

Value Investment style has been identified as purchasing the stocks with Low P/B, Low P/E and High Dividend Yield stocks. Present study has considered the stocks listed in S&P CNX 500 NSE INDEX. On the basis of data availability and trading frequency, number of companies in sample consisted of 240 companies. The study period was from July 1999 to July 2009, but it has been extended up to Sep 2010. 45 quartiles for the entire period with 180 observations have been analyzed. 30 Days Average Returns are used from Prowess Database of CMIE, Mumbai. Quarterly values are considered for the value weighted returns for Low P/B, Low P/E & DY based stocks. 240 stocks chosen from 500 stocks of the Index are divided into four equal sized quartiles arranged from lowest to highest values for the first two parameters and from highest to lowest for DY. First quartile of P/B & P/E and last quartile of DY represents Value stocks and the average returns of the quartiles are considered for the analysis of value stocks. The quartiles are revised every quarter on the basis of value metrics.

METHODOLOGY

Performance Analysis of Value Stocks has been analyzed on two frameworks;

- Risk & Return Analysis: To calculate risk & return analysis of value stocks; Average Returns & Standard Deviation are calculated. Average Returns are calculated for quartiles (sorted on the basis of value metrics) constructed for each quarter, standard deviation is also calculated for each quartile and in each quarter.
- Performance Outcomes have been measured by Standard Error & Sharpe Ratio. Standard Error estimate is measured as smaller the estimate; the more dependable estimate is.

$$\text{Standard Error} = \frac{S.D.}{\sqrt{n}}$$

Standard Error of the mean is the standard deviation of sample mean over population mean. As long as the estimator is unbiased, the standard deviation of the error is same as that of the estimate itself. Smaller standard error estimates less sampling error.

DEFINING STYLE PERFORMANCE CONSISTENCY

Performance consistency of value stocks has been measured with the help of Ex-post Tracking Error. It is the difference between the stock's returns corresponding to the benchmark index i.e. the volatility of excess returns.

$$\text{Tracking Error} = \sigma E.R. (R_m - R_t) \quad (\text{volatility of excess returns})$$

Information ratio has been used to measure the efficiency and consistency of stocks. It is measured as follows;

$$\text{Information ratio} = \frac{\text{Excess Returns (versus benchmark)}}{\text{Tracking error (volatility of excess returns)}}$$

ANOVA has been applied to measure the comparative performance of three value stock strategies and F value & P value are calculated.

STUDY RESULTS

MEAN RETURNS OF VALUE STOCKS

The results are not consistent with the studies done on other International markets where value stocks have shown better performance and there is large evidence of presence of value premium. Fama & French (1998) find that value beats growth in 12 out of 13 developed countries. They also took emerging markets like India but the results for India were weak with t-statistics almost zero and they also state that they do not have enough data to conclude the presence of value premium. Claessens (1995) look at 19 emerging markets including India using identical data but different estimation techniques and report statistically significant relationship between returns and P/E and size respectively. The results have shown that high value attributes stocks have shown lowest performance where and as we move towards low value stocks, the performance is improving.

TABLE I: MEAN RETURNS OF VALUE STOCKS FOR ALL YEARS

QUARTILE	STOCKS	FEATURES	MEAN RETURNS OF STOCKS	AVERAGE RETURN
I	VALUE	LOW P/B	0.01	0.03
		LOW P/E	0.06	
		HIGH DY	0.03	
II	UPPER MIDDLE VALUE	ML P/B	0.05	0.04
		ML P/E	0.02	
		MH DY	0.06	
III	LOWER MIDDLE VALUE	MH P/B	0.10	0.1
		MH P/E	0.10	
		ML DY	0.10	
IV	LOWEST VALUE	HIGH P/B	0.15	0.14
		HIGH P/E	0.14	
		LOW DY	0.14	

Table I presents the Mean Returns of the Value stocks for the entire study period. The average returns for high value stocks is 0.03 whereas the average returns is rising to the low value quartiles with highest return of 0.14 for lowest values stocks. It can be analyzed from the above table that the performance of value stocks in the Indian stock market is not consistent with the prior research conducted on other stock markets and the stocks with higher value attributes have performed poorly in the entire study period.

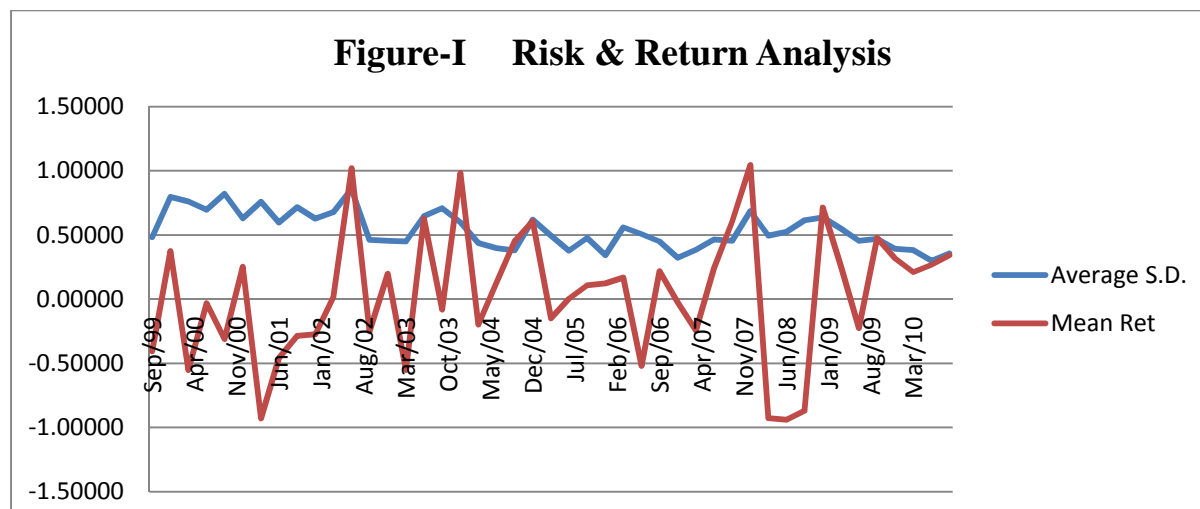
RISK & RETURN ANALYSIS OF VALUE STOCKS

Return analysis of value stocks is done by calculating mean returns for all quarters and risk analysis was done by calculating standard deviation.

TABLE II: RISK & RETURN ANALYSIS OF VALUE STOCKS: STANDARD DEVIATION & MEAN RETURNS

Date	Average S.D.	Mean Ret	Date	Average S.D.	Mean Ret
Sep-99	0.483	-0.407	Mar-05	0.493	-0.149
Dec-99	0.796	0.374	Jun-05	0.377	0.002
Mar-00	0.760	-0.552	Sep-05	0.476	0.109
Jun-00	0.697	-0.033	Dec-05	0.342	0.122
Sep-00	0.822	-0.310	Mar-06	0.560	0.168
Dec-00	0.629	0.253	Jun-06	0.507	-0.520
Mar-01	0.758	-0.930	Sep-06	0.448	0.218
Jun-01	0.598	-0.459	Dec-06	0.321	-0.027
Sep-01	0.716	-0.287	Mar-07	0.385	-0.243
Dec-01	0.627	-0.273	Jun-07	0.465	0.239
Mar-02	0.677	0.015	Sep-07	0.455	0.605
Jun-02	0.858	1.020	Dec-07	0.686	1.045
Sep-02	0.462	-0.252	Mar-08	0.493	-0.927
Dec-02	0.453	0.198	Jun-08	0.525	-0.939
Mar-03	0.450	-0.553	Sep-08	0.613	-0.870
Jun-03	0.647	0.630	Dec-08	0.637	0.713
Sep-03	0.710	-0.082	Mar-09	0.550	0.255
Dec-03	0.599	0.983	Jun-09	0.453	-0.226
Mar-04	0.437	-0.200	Sep-09	0.470	0.477
Jun-04	0.397	0.129	Dec-09	0.393	0.318
Sep-04	0.380	0.450	Mar-10	0.382	0.209
Dec-04	0.620	0.607	Jun-10	0.299	0.268
			Sep-10	0.356	0.341

Table II shows the risk & return results for value stocks. From the observations it can be analyzed that value stocks have shown negative average returns in 20 out of total 45 observation of the study period. These stocks have performed poorly for the years; 2000, 2001, 2006 & 2008. In the entire period the returns have been proved to be highly volatile. The volatility of value stocks is high in as it can be depicted from Table III that standard deviation was highest at 0.858 in 2002 June although with higher returns of 1.020. In year 1999, 2000, 2001 & 2003 risk has been higher in value stock investments. The risk on these stocks declined in 2004 to 0.397 & 0.380 in second & third quarter but these stocks are volatile in the entire study period. Risk on these stocks was lowest in June 2010 with standard deviation of 0.299. The stocks have shown negative returns in 20 out of 45 observations.



But it can be depicted from Figure I that on an average high returns on value stocks are backed by high volatility. Standard deviations have been higher for the quarters when the returns are more.

PERFORMANCE OUTCOMES

Performance outcomes of value stocks have been measured by Sharpe Ratio and Standard Error. Table III exhibits the performance outcomes of value stocks during the entire study period. Standard Error is a good proxy for the Sharpe Ratio.

TABLE: III PERFORMANCE OUTCOMES OF VALUE STOCKS: STANDARD ERROR & SHARPE RATIO

Time Period	Mean SE	Mean Sp	Time Period	Mean SE	Mean Sp
Sep-99	0.085	-8.007	Mar-05	0.063	-5.953
Dec-99	0.104	-6.043	Jun-05	0.049	-7.773
Mar-00	0.098	-8.303	Sep-05	0.062	-6.940
Jun-00	0.110	-7.386	Dec-05	0.043	-10.940
Sep-00	0.106	-8.353	Mar-06	0.313	-7.747
Dec-00	0.080	-8.737	Jun-06	0.065	-10.463
Mar-01	0.097	-7.183	Sep-06	0.058	-10.600
Jun-01	0.076	-6.603	Dec-06	0.041	-15.230
Sep-01	0.093	-4.500	Mar-07	0.050	-13.437
Dec-01	0.080	-3.427	Jun-07	0.059	-9.437
Mar-02	0.087	-3.027	Sep-07	0.059	-7.250
Jun-02	0.111	-0.880	Dec-07	0.088	-2.843
Sep-02	0.060	-4.183	Mar-08	0.064	-4.470
Dec-02	0.059	-2.227	Jun-08	0.068	-5.363
Mar-03	0.058	-3.737	Sep-08	0.079	-3.373
Jun-03	0.083	-0.480	Dec-08	0.082	1.063
Sep-03	0.092	-1.437	Mar-09	0.068	0.226
Dec-03	0.078	0.132	Jun-09	0.058	-0.917
Mar-04	0.057	-2.640	Sep-09	0.060	0.735
Jun-04	0.051	-2.883	Dec-09	0.050	0.684
Sep-04	0.050	-3.157	Mar-10	0.049	0.161
Dec-04	0.080	-2.637	Jun-10	0.037	0.491
			Sep-10	0.046	0.536

Sharpe ratio is positive in eight out of forty five observations. It has been higher in the month of December, 2008 at 1.06333 and the ratio is consistently positive in all quarters from September 2009 till September 2010. The strategies have performed poorly in the months from December 2005 to September 2007 when it reached to the lowest of -15.23000 in December 2006. The ratio is consistently negative for six years i.e. from September 2009 to September 2005, excluding the quarter of December 2003. Standard Error of value stocks is highest in the month of March 2006 at 0.31267 and slightly higher in the quarters of December 1999, June 2000, September 2000 and June 2002 in comparison to other quarters. However it is lowest at 0.03733 in the month of June 2010 and is comparatively lower during March 2010, September 2010 and December 2006.

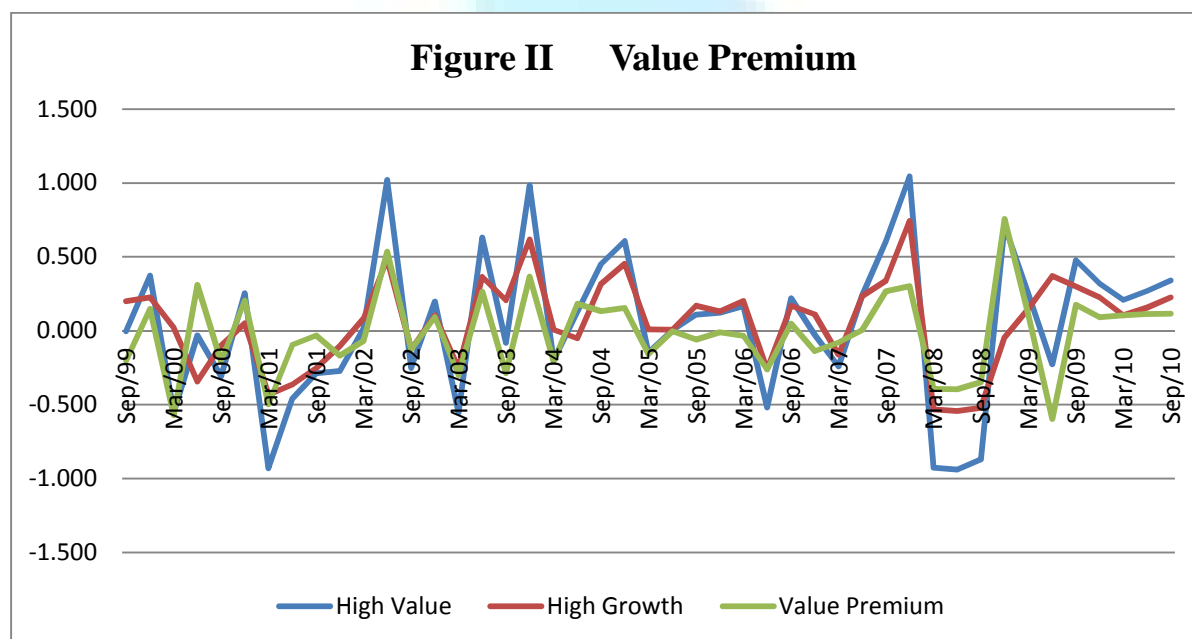
VALUE PREMIUM

Value Premium or the difference in returns of value and growth stocks has been identified and exploited by many financial market practitioners since Graham & Dodd (1934). U.S. evidence presented by Basu (1977), Fama & French (1992, 1993, 1995 & 1996) & Lakonishok (1994) report that the value stocks outperform growth stocks. This pattern seems to exist in other markets too as evidenced by Nai-fu Chen and Feng Zhang (1998) in Japan, Hong Kong & Malaysia & Peter Oertmann (1999) in 18 stock markets over three global regions. Although empirical research in value-growth phenomena is based upon markets based on US but new researches are coming up which have analyzed the performance of two strategies in other regions of the world. The results of current study conducted on Indian stock market over the span of 11 years from 1999 to 2010 have shown somewhat different results regarding value premium.

TABLE IV: VALUE PREMIUM

Date	High Value	High Growth	Value Premium	Date	High Value	High Growth	Value Premium
Sep-99	-0.004	0.199	-0.203	Mar-05	-0.149	0.009	-0.158
Dec-99	0.374	0.226	0.148	Jun-05	0.002	0.007	-0.004
Mar-00	-0.552	0.020	-0.572	Sep-05	0.109	0.170	-0.061
Jun-00	-0.033	-0.344	0.311	Dec-05	0.122	0.131	-0.009
Sep-00	-0.310	-0.102	-0.208	Mar-06	0.168	0.203	-0.035
Dec-00	0.253	0.050	0.204	Jun-06	-0.520	-0.258	-0.262
Mar-01	-0.930	-0.433	-0.497	Sep-06	0.218	0.169	0.049
Jun-01	-0.459	-0.364	-0.096	Dec-06	-0.027	0.112	-0.139
Sep-01	-0.287	-0.254	-0.033	Mar-07	-0.243	-0.162	-0.080
Dec-01	-0.273	-0.104	-0.169	Jun-07	0.239	0.235	0.004
Mar-02	0.015	0.083	-0.068	Sep-07	0.605	0.339	0.266
Jun-02	1.020	0.484	0.536	Dec-07	1.045	0.743	0.302
Sep-02	-0.252	-0.126	-0.126	Mar-08	-0.927	-0.532	-0.394
Dec-02	0.198	0.105	0.093	Jun-08	-0.939	-0.542	-0.397
Mar-03	-0.553	-0.253	-0.300	Sep-08	-0.870	-0.521	-0.349
Jun-03	0.630	0.365	0.265	Dec-08	0.713	-0.044	0.757
Sep-03	-0.082	0.205	-0.287	Mar-09	0.255	0.147	0.108
Dec-03	0.983	0.617	0.366	Jun-09	-0.226	0.371	-0.597
Mar-04	-0.200	0.007	-0.207	Sep-09	0.477	0.300	0.176
Jun-04	0.129	-0.052	0.182	Dec-09	0.318	0.226	0.092
Sep-04	0.450	0.317	0.133	Mar-10	0.209	0.104	0.105
Dec-04	0.607	0.452	0.154	Jun-10	0.268	0.156	0.113
				Sep-10	0.341	0.226	0.116

From table IV it can be depicted that value premium is positive in only 21 observations from total 45 observations. Value premium is also not consistent except for last five quarters of the study period. However it was highest at 0.757 in the month of December 2008.



From Figure II it can be observed that value premium has been highly volatile and the superior performance of value stocks is mainly for the period of June 2002, December 2003, September 2004, September 2007 & December 2008. It is thus analyzed that existence of value premium in Indian equity market is not as consistent as in other markets of the world and in the entire study period premium has been positive in less than half of the quarters.

PERFORMANCE CONSISTENCY OF VALUE STOCKS

Performance consistency of Value Stocks has been analyzed with the help of two measures; Information Ratio and Tracking Error. Information ratio has been calculated from the Tracking error (volatility of excess returns) of the excess returns of value stocks.

TABLE V: TRACKING ERROR & INFORMATION RATIO (IR)

Value Strategies	T.E. (Sp-i)	IR
P/B ↓	0.5450	0.0257
P/E ↓	0.5246	0.1104
Div Y ↑	0.4438	0.0595
Overall Value Stocks	0.5011	0.0655

Table V depicts that the volatility of excess returns (Tracking Error) is lowest in High Dividend Yield Stocks, but the Information ratio of Low P/E stocks have been proved to be better and so it is better investment strategy in value stocks. It depicts both the efficiency and consistency of returns measured at the span of 10 years time period. However, the ratio has not been able to reach atleast to 0.5, considered to be good in any of the value stock strategies. The results could be better analyzed from the following figure.

FIGURE III: TRACKING ERROR AND INFORMATION RATIO OF VALUE STRATEGIES

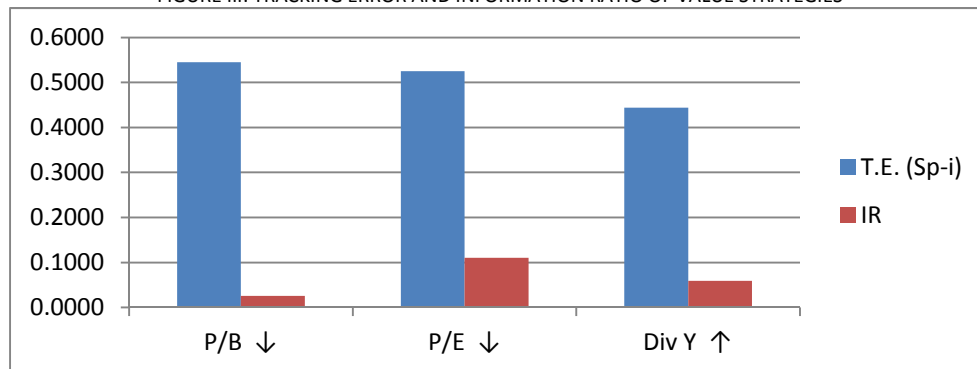


Figure III shows the performance consistency of value stocks and depicts that it is better to invest in stocks with Low P/E ratio in context to the Indian stock market. Although tracking error is higher than high dividend yield stocks, but Information ratio of low P/E stocks is higher than both high dividend yield and low P/B ratio stocks.

TESTING HYPOTHESIS

TABLE 4
ANOVA

Groups	Count	Sum	Average	Variance
P/B ↓	45	0.666	0.0148	0.297049
P/E ↓	45	2.642	0.058711	0.275393
Div Y ↑	45	1.223	0.027178	0.197122

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.046136	2	0.023068	0.089927	0.9140543	3.064760677
Within Groups	33.86085	132	0.256522			
Total	33.90699	134				

The above results show that the average returns earned by Low P/E stocks is higher than Low P/B and High dividend yield value strategies. F- value is calculated as 0.089927 which is lower than critical value of 0.5, the critical F= 3.06476 and P-value calculated as 0.91405 is greater than the significance level (0.5). So we can say that we cannot reject the null hypothesis and conclude that the returns generated by the three strategies of value stocks are statistically indifferent.

CONCLUSION

The mean returns of value stocks have been lower for high value attributes stocks and returns are rising as we move from higher to low value stocks. Higher returns of value stocks are backed by higher volatility in Indian equity market during the entire study period. Performance outcomes of these stocks depicted through Sharpe ratio and Standard error are also not good and these stocks have shown positive ratio in only eight out of forty five observations. Existence of value premium is inconsistent from other markets in the world and it is positive in less than half of the quarters of entire study period. The results for performance consistency of value are weak, but from the results we can analyze investing in low P/E stocks gives consistent returns in Indian equity market. Further the study concludes that returns generated by the three strategies of value stocks are statistically indifferent.

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STAR RATING FOR INDIAN BANKS WITH RESPECT TO CUSTOMER SERVICE

DR. M. S. JOHN XAVIER
ASSOCIATE PROFESSOR
DEPARTMENT OF CORPORATE SECRETARY SHIP
PRESIDENCY COLLEGE
UNIVERSITY OF MADRAS
CHENNAI

ABSTRACT

Reserve Bank of India has so far appointed five committees on customer service in order to ensure quality service to Indian banking customers. 'Committee on customer service in banks' under the chairmanship of Shri Damodaran recommended star rating for customer service in Indian Banking industry. This article focuses on the levels and lacunas in customer service provided by Indian banking industry today. Star rating is being applied to colleges, restaurants, hotels, movies, refrigerators and air conditioners. Star rating for banking industry with respect to their customer service is very much necessary to distinguish the quality service providers from the profit-mongers. BCSBI - Banking Codes and Standards of India, formed as an independent and autonomous body by RBI in 1993 is already entrusted with the responsibility of enforcing quality service in banks. BCSBI can be rightly assigned with the responsibility of fixing standards and processing of applications for star rating of banks. In many branches it was found by the Damodaran Committee that there was no helper in "May I help you" counters. All such service approach absent banks can be grouped under zero star rating and where they will be looked down by the banking community and forced to improve service quality. Star rating of banks on the basis of level of customer service can definitely create customer centric culture among Indian banking industry. Customers who want premium services and are willing to pay accordingly can easily identify and approach such banks.

KEYWORDS

Bank Customers' charter, Base rate, Four eyes principle, High net worth individuals, Star rating of banks.

INTRODUCTION

Reserve Bank of India has so far appointed five committees on customer service in order to ensure quality service to Indian banking customers. 'Committee on customer service in banks' under the chairmanship of Shri Damodaran recommended star rating for customer service in Indian Banking industry. Star rating is being applied to colleges, restaurants, hotels, movies, refrigerators and air conditioners. Three star hotels provide distinctive better facilities to customers than ordinary hotels. Star rating in these industries has indeed increased awareness among consumers and prompted the businessmen to elevate their service/product quality. University Grants Commission also assigns stars to colleges in India while accrediting the quality or standard of the institution. Thus it is becoming inevitable that such rating should be extended to banking industry also. On the other side, series of financial sector reforms, privatization, and entry of more and more foreign banks and introduction of newer technologies have thrown up a lot of challenges as well as opportunities to the Indian banking sector. Against this backdrop this article focuses on the levels and lacunas in customer service provided by Indian banking industry today.

REVIEW OF LITERATURE

Since star rating of banks is a new emerging topic of study much printed literatures are not available for review. Shri Damodaran Committee report available in the website of RBI was mostly useful in the writing of this article. Besides The books on customer service especially in banks were reviewed to compile this article. Books reviewed are given in the reference.

IMPORTANCE OF THE STUDY

Customer service is an age old business practice. 'Service with a smile' is a fundamental business rule throughout the world. Goodwill, consistent growth, high ROI – all these factors have their roots in strong customer base in any business. Loyalty from customers underscores the importance of customer service and customer satisfaction. Sustained growth of Indian banks in the backdrop of closure of age old banks in USA and UK has attracted more FDI in banking sector. The importance of customer service can be understood with the followings.

- a. 'Patronage by loyal customers yields 65 percent of a typical business' volume', -American Management Association.
- b. 'Dissatisfied customers would tell between 7-10 people while a satisfied customer would recommend a company to 3-4 friends' -PIMS (Profit Impact of Market Strategy), London.
- c. 'The cost of attracting a new customer is estimated to be five times the cost of keeping current customer happy', (Kotler, 1997)
- d. Competition among banks has reduced the margin level of profits. This is because technological growth has enabled them to provide new services at less cost and time.

Star rated hotels are chosen by affluent customers who seek facilities and are willing to pay the price. Similarly star rated banks can fix premium charges and provide standard services in less time. Customers who want such services will certainly approach such banks. Classification of banks on the basis of customer service facilities provided by them is necessary to attract more FDI and for the enhancement of multi-national trade. It can enable a customer to easily identify a bank for the urgent service required by him. Star rating mainly classifies the institutions on the basis of standards of customer service. Banks willing to elevate their star rating can understand clearly the areas of improvement expected of them. Customer centric culture can be created in all banks through star rating.

STATEMENT OF THE PROBLEM

In the absence of updated enactments customers will be taken for a ride by the businessmen. Majority of Indian population consists of uneducated or less educated citizens. It becomes essential on the part of the State to bring stricter laws and regulations to protect the unorganised customers against institutionalized banks. Banking ombudsman scheme is one such measure to protect the banking customers from deficiency in services. The number of complaints against a particular bank calls for action from the top management as well as the regulatory body-RBI. Since the complaint figures put a scar on the image of the bank. Every bank toils to reduce such complaints. In the same manner star rating for banking industry with respect to their customer service is very much necessary to distinguish the quality service providers from the profit-mongers. This can certainly improve the number of facilities provided to customers by every bank. It can also act as deterrence on the part of banks and restrain them from ill-treating or ignoring the customers.

OBJECTIVES

The objectives of this article are as follows:

1. To describe what constitutes fair customer service.
2. To bring out the importance of rating of banks with respect to customer service.

3. To highlight the contemporary issues and challenges in servicing banking customers.

4. To focus on specific areas where improvements are required in customer service.

This article is limited to Commercial banks in India and does not include Regional Rural Banks or Co-operative Banks.

RESEARCH METHODOLOGY

This paper is an inductive and descriptive study to portray the necessity of star rating in banking industry in India. Since the topic of star rating for banking industry has not gained momentum and is in an evolutionary stage, this topic of study is inductive. Though star rating is practiced in some other industries if it is inducted into the banking industry in India an addition to the existing precepts and practices in banking can be made. This study is descriptive in the sense that the existing lacunas in customer service in Indian banking industry are listed in the light of fair customer service in banking as enumerated by Consumer International and the report of Damodaran Committee.

MEANING OF FAIR CUSTOMER SERVICE

"Customer service is a series of activities designed to enhance the level of customer satisfaction – that is, the feeling that a product or service has met the customer expectation", Turban et al. (2002). 'Treating the Customers Fairly' has become the accepted norm all over the world. Financial Services Authority of the UK Government asked all institutions under its jurisdiction to fulfill TCF – treating customers fairly in December 2008. Knowledge on fair customer service as enumerated by international institutions can equip us in setting standards for classification banks under star rating. According to Consumers International the following six components are essential to demarcate that customers are treated fairly by a bank.

i. Confidence:

It is the responsibility of banks to foster customer's confidence in the banking system, where fair treatment of customers is central to the bank's culture.

ii. Demand-Supply Match:

Banking services and products are designed to meet the identified needs of bank customers.

iii. Transparency:

Bank customers need be provided with clear information on rules and policies of operating bank account and are updated with proper notice in advance regarding any change in any rule and/or policy.

iv. Advisory Role:

Bank staff is expected to render advice to the bank customer as per the needs, age and financial status of the customer. The advice should also match the standard of performance of the service or product in reality.

v. Satisfactory Redressal of Grievances:

Customer may have just a query or concern which must be answered or attended promptly. Ignoring queries/concerns/suggestions escalate into a complaint and then into a dispute. In the operation of a bank, there should not be any unreasonable barriers to make a complaint or submit a claim in a dispute.

vi. Switch-Over:

It should be easy to switch-over branch in a bank, without imposition of any service charges and without change of account number. In the long run, the objective should be to have account portability as a reality.

GROWTH OF CUSTOMER SERVICE IN INDIAN BANKING INDUSTRY

The importance of extending speedy, efficient, fair and courteous customer service in banking sector has been emphasized through various committee reports, guidelines and circulars by RBI and Government of India (Table 1). The chronology of events is as follows:

TABLE 1: CHRONOLOGY OF EVENTS IN BANKING CUSTOMER SERVICE

SL.	YEAR	EVENT PARTICULARS
1	1975	Talwar Committee on Customer Service in Banks by Govt. of India
2	1986	Consumer Protection Act
3	1990	Goiporia Committee on Customer Service in Banks
4	1997	All Government Departments including banks were asked to formulate Citizen's Charter in order to set benchmarks for speedy and standard delivery of service and expeditious resolution of customers' grievances.
5	2004	Tarapore Committee – led to formation of Banking Codes and Standards of India (BCSBI) and Board level committees for Monitoring customer service in banks
6	2006	Sadasivan Working Group to formulate a scheme to ensure reasonableness of bank service charges
7	2010	Damodaran Committee on customer service in banks

Source: Compiled by the author

In spite of all these efforts the degree of penetration of services achieved by mobile telephone services in 15 years could not be achieved by banks in the last 75 years.

ISSUES AND CHALLENGES IN CUSTOMER SERVICING

After liberalization in 1991, there is acute competition between the three categories of banks (Table 2) in India. This article is concerned with the 87 banks given the table 2. Government of India and RBI has issued guidelines periodically to all banks and specific guidelines to public sector banks in order to improve quality of service. The Committee headed by Shri. Damodaran, submitted to RBI a 79 page report on 'Customer Service in the Indian Banking Sector' on 30.8.2011.

TABLE 2: COMMERCIAL BANKS IN INDIA - 31.3.2011

Sl.No.	Particulars	Numbers	Total
1	Public Sector Banks		26
2	Private Sector Banks, old, existed before 1991-92	18	25
	New, after 1991-92	7	
3	Foreign banks		36
	Total		87
	Foreign banks having representative offices		34

Source: Compiled by the author from data in <http://freepress.in/business/bank and rbi.org.in>

The recommendations of the committee relating to basic customer service are included here:

- Bank Customers' Charter** : Every bank (Public, Private, Foreign, Scheduled Urban Co-operative Banks, RRBs) should prepare a fresh "Bank Customers' Charter" incorporating all the aspects of RBI Guidelines, Principles of Citizens' Charter and Codes of BCSBI. This Bank Customers Charter should be displayed on the bank's web site/notice board of every branch.

Customers' charter is a declaration that the bank undertakes to satisfy as customers' rights. These are in effect standards of performance, which the bank pledge to adhere to. Charter assumes the nature of guarantee if it includes an assurance to compensate the customer in the event of failure to comply with.

2. **Customer Education:** Customer protection is best given through customer education. Hence they should be adequately educated on all products sold by a bank. A Financial Literacy and Counseling Centre should be available in every block in the country to assist informed decision making of the bank customers.
3. **Basic banking services:** RBI had identified 27 basic banking services and advised banks to ensure that these are made available to the users at reasonable prices/charges. Since what was reasonable was not defined, there was unjustifiable disparity and no uniformity in pricing of banking services. These discrepancies need be removed.
4. **Basic savings bank account to all:** Every bank should offer a basic savings bank account which permits a minimum number of transactions without prescription of a minimum balance. The present guidelines for opening of No Frills accounts need to be further simplified to enable rapid financial inclusion of poorer sections of people and migrants. The penal charges for not maintaining the minimum balance should be in proportion to the shortfall observed and the customer should be informed by SMS/email. The penalty for returned cheques may be levied on the drawee and the presenting party should be exempt from penalties.
5. **Student Customers:** Customers like students make frequent small payments through Demand Drafts and necessary approvals may be obtained to accept online payments and till such time it would be in order to have tear away draft of predetermined values of say Rs.10, 50, 100 or 500 at nominal prices.
6. **Rural and Tribal areas:** Functioning of rural branches should be revised to a time convenient to the customers i.e., morning hours and late evening hours. Banking facilities available in the tribal and North Eastern areas were very scanty and these areas come under 'neglected banking areas'.
7. **Inaccurate credit information reports** to the Credit Information Bureau are vitiating loan sanctions. Any adverse remark should be informed to the customer for necessary clarification.
8. Bank home loan customers who have floating interest rate loans have expressed unhappiness over the discrimination in interest rates offered to the new customers. Foreclosure charges are seen as a restrictive practice and it may be dispensed with. **Switch over to base rate** on their floating interest rate home loan should be allowed.
9. Whenever frauds are reported by customers the RBI Guidelines require that the banks should not wait for the investigation to be completed and pay the customers without demur. Banks are advised to redress the complaints in respect of failed /dispensation of short cash ATM transactions within 12 days of receipt of complaint, or to pay compensation of Rs. 100/- per day for delay in redressing of such complaints on its own.
10. Relationship Managers are appointed in banks to look after **high net worth individual** (HNI) customers and companies. While focused attention benefits a customer, sometimes rude Relationship Managers expose the bank and the customers to undesirable risks. '**Four eyes principle**' should be followed in case of relationship managers and one man branches. (Four eyes principle or two-man control is designed to achieve a high level of security for all operations. The presence of two authorized people is required at all times for all operations).
11. Under existing system banking is done under various Acts like Indian Contract Act 1857, Negotiable Instruments Act 1881, Limitation Act 1963, Stamp Act 1899, Telegraph Act 1985, Wireless Telegraphy Act 1933, Banking Regulation Act 1949, RBI Act 1935, TRAI Act 1997, and IT Act 2000. A comprehensive legislation suitable to technology driven multi product modern banking has become necessary. This will considerably help in banking operations and redressal of customer grievances.

There is substance in the argument that Indian banking customers can not expect premium services at cheaper charges. But the RBI reasonably insists that the charges may be levied commensurate with the services. Any bank, whether foreign or private or public sector - all banks utilize Indian land, employees and communicational facilities at Indian costs. Therefore invariably all banks cannot levy dollar charges as long as they utilize rupee resources.

CUSTOMER SERVICE DEPARTMENT (CSD) EMPLOYEES

The CSD incumbents need be given specialized training so that customer complaints are professionally handled. Aggrieved customers approach the CSD of the concerned bank and as the CSD mostly reiterates the bank staff viewpoints there is escalation of complaints to Banking Ombudsman. The financial muscle available with the bank permits it to escalate matters to very high levels with appeals. It is a fact that mostly the cost of settling a case is less than the cost of appealing against the decisions of Lower Consumer Courts. Solving the complaint should be objective of the CSD department rather than fighting to finish objective. The following measures can improve grievance handling:

- a. Every bank should have online Grievance Redressal System,
- b. Internal Auditing of customer service,
- c. Time frame for Grievance Redressal in banks,
- d. Minor complaints that could be resolved at the branch level should not be forwarded to next level,
- e. Customers can be invited to attend specific CSD meetings, and
- f. Where policy issues are not involved, banks should weigh the cost aspects before appealing against the decision of lower court.

With a view to enhancing the effectiveness of the Banking Ombudsman Scheme banks were advised in April 2005 that Customer Service Committee of the Board should play a more active role with regard to complaints/grievances received by the Banking Ombudsmen of the various States.

STAR RATING AND BCSBI

Bureau of Energy efficiency - a statutory body of Govt. of India, is assigned with the responsibility of receiving and processing the applications for issue of star rating for refrigerators and air conditioners. In the banking industry BCSBI - Banking Codes and Standards of India, formed as an independent and autonomous body by RBI in November 2003, is already entrusted with the responsibility of enforcing quality service in banks. There are a total of 90 banks as members of this society, who have voluntarily agreed to abide by the standards of service prescribed by BCSBI. BCSBI in association with Indian Banks Association scripted '**Code of Bank's Commitment to Customers**' in 2006, and revised in 2009. The Code calls for commitment from banks to train and familiarize all the staff in following and implementing the Codes. This was not been achieved. Therefore, BCSBI has initiated Indian Institute of Banking and Finance to conduct a certificate course on 'Customer Service and Banking Standards' for all banking staff. Moreover, the BCSBI has been asked to rate the banks on customer service and to prescribe minimum benchmarks in banking services. Therefore, star rating of banks on the basis of customer service similar to star rating for energy efficiency can be prescribed with the help of BCSBI.

Star rating for a bank may be assigned taking into consideration the following criteria.

- a. Number of complaints received by ombudsman against that bank and disposed in favour of customers.
- b. Number of complaints received and remains unsettled with the CSD of the bank.
- c. The time duration taken by the bank to provide each service while compared to other banks.
- d. Whether the customers are left to wait for long duration in the bank.
- e. The charge levied by the bank while compared to other banks.
- f. The amount of penal charges levied by the bank.
- g. The finance provided by the bank to the priority sector.
- h. Provision of customer friendly ambience inside the bank.

CONCLUSION

Sustained growth of Indian banks in the backdrop of closure of age old banks in USA and UK has attracted more FDI into Indian banking sector. This shows that Indian banking industry is doing well while compared to other counterparts in the globe. Indian banks can do better by removing the deficiencies in customer servicing. It was found by the Damodaran Committee that the basic mandatory RBI Guidelines related to customer service were not followed in letter and spirit by banks in India. In short, it opined that the minimum degree of customer focus was absent to label banks as customer centric organizations. In many branches

it was found that the "May I help you" counters were unmanned. All such service approach absent banks can be grouped under zero star rating and where they will be looked down by the banking community. Customer servicing has not been taken up as a managerial function and given scientific and utmost care. Star rating of banks on the basis of level of customer service can definitely create customer centric culture among Indian banking industry.

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ROUTING OF VLSI CIRCUITS USING ANT COLONY OPTIMISATION

A.R.RAMAKRISHNAN

ASSOCIATE PROFESSOR

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

PSG COLLEGE OF TECHNOLOGY

COIMBATORE

V. RAJKUMAR

P.G. STUDENT

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

PSG COLLEGE OF TECHNOLOGY

COIMBATORE

ABSTRACT

This paper discusses about VLSI routing that involves locating a set of paths to route wires, which connects all the terminals of the cells. Routing problem consists of connecting the terminals of the cells already placed on the chip, according to the given set of design specifications. The specifications involve the net-list, which indicates terminals to be interconnected. Efficient routing leads to reduction of total wire-length and hence active power consumption by minimizing the load capacitance of the chip. In this paper, Ant Colony Optimization [ACO] technique has been applied for routing process. Three benchmarks namely IBM, MCNC, ISCAS89 have been considered for testing the proposed algorithm. In this proposed methodology, a good reduction of wire-length is obtained for minimum number of pins with increased time over-head.

KEYWORDS

Routing problem, netlist, power consumption, Ant colony, wire-length, Benchmark.

INTRODUCTION

The number of transistors on a VLSI chip, or IC chips to be interconnected is generally very large. The task of routing is to define path on the layout surface, on which conductors that carry electrical signals are run. These conductors (also called wiring segments) interconnect all the pins that are electrically equivalent. With rapid advancement in VLSI technology the number of transistors that can be placed on the single chip increased to about two billion. Such complex chips require power efficient design and advanced manufacturing techniques. One of the ways to minimize power consumption of the chip is to minimize the total wire length used for routing.

Routing in VLSI chips has been studied extensively and various routing methods have been proposed. Joobani [1], suggested an intelligence approach of routing wires based on the knowledge gained from the routers. These knowledge based routers avoid flaw with the help of guideline provided by the expert system, but consumes more time. Lienig [2], used genetic algorithm to minimize net-length, number of vias and crosstalk occurring due to the length of the parallel wires. Parallel approach of genetic algorithm showed better performance for channel and switch-box routing.

Yu Hu [3], suggested ACO-Steiner algorithm, where routing is performed by construction of Steiner points along with terminals and better minimization of wire-length is achieved compared to that of Lyet's [4] non-rectilinear Steiner tree algorithm. Kastner [5] uses predictable routing, commonly called Labyrinth Router, to perform global routing using pre-defined patterns in-order to estimate congested areas for routing nets. Here for the given number of nets, pattern routing is done for particular percentage of nets, followed by Maze routing for the remaining nets to provide accurate routing of all nets and wire length estimation, at the expense of longer running time. FastRoute [6], provides global routing solutions by reducing the congested areas for routing nets faster than Labyrinth router and less accurate wire-length estimations. FastRoute2.0 [7], is an improvement made for FastRoute resulting in faster run time compared to that of Labyrinth and good wire-length reduction compared to that of FastRoute at the expense of runtime. NTHU Router [8], outperforms FastRoute2.0 with improved wire-length reduction but consumes more runtime for routing nets.

The authors in this paper propose ACO based algorithm to find solutions that minimize wire length, and therefore power consumption.

ROUTING PROBLEM AND ACO

ROUTING PROBLEM

The routing problem is defined as locating a set of paths to route wires that connect all the nets in the netlist. A net is a set of cells (also called terminal nodes) that need to be connected to each other in predefined manner. One of the important constraints that affects the efficiency and the usability of the chip is the power consumed by the chip. The power consumed by the chip is a function of capacitance determined by the equation $P = aCV^2f$, where a is an activity factor, V is voltage, f is frequency and C is capacitance due to wire-length. The main capacitance component is routed wires and hence the goal of this paper is to minimize the number of wires which in turn effectively reduces power consumption of the chip.

ANT COLONY OPTIMIZATION

Ant colony algorithms are developed from natural behaviour of real ants, particularly suited for the solution of optimization and control problems. ACO algorithms are inspired by foraging behaviour of ants and the indirect communication between them. Ants secrete a chemical substance called pheromone, that coordinates the ants while walking from food source to nest and vice-versa [9]. The trail marked by strong pheromone concentration tends the ants to choose the shortest path probabilistically between the nest and food source. Based on this context, ACO algorithms are derived with artificial ants and their indirect communications made by artificial pheromone. These pheromone trails make the ants to find all the possible shortest path between two points probabilistically with optimized solutions. For each execution of algorithm, the pheromones are modified [10, 11, 12] and the goodness of the path is based on the deposition of strong pheromone. The following gives an overview of the basic ACO algorithm [9].

ALGORITHM 1: ACO (Ant Colony Optimization)

1. Import the coordinates from benchmark circuit
2. Calculate the distance between each points
3. Initialize pheromone
4. {while (condition is not met)
5. Place ants at random position
6. {Initialize ant's memory
7. Start the route
8. {Using the pheromone and heuristics values calculate the probability to visit the nodes

9. } update the visited node in ant's memory
10. } Find the best route
11. Update pheromone
12. }}

IMPLEMENTATION OF ACO ALGORITHM FOR VLSI ROUTING

In this section, ACO algorithm underlying assumptions and methods followed for the implementation are discussed. This work uses the following Benchmark sets to perform routing.

BENCHMARK SETS

There exists several different formats to specify input format to the router[13]. These benchmark provides the placement of the node that should be routed with shortest path. This work uses following set of benchmark suites namely,

- a) R1,R2 benchmarks of IBM from R.S.Tsay [14] [15].
- b) Prim 1, Prim 2 benchmarks of MCNC from Jackson et al [16][17].
- c) S1423 ,S5378 ,S15850 benchmarks of ISCAS89 benchmarks from J.G. Xi et al[18][19][20].

These benchmark circuits consists of net-list that provide information of nets to be interconnected. The process of routing nets are as follows.

ROUTING NETS

From the given net-list, the ants are distributed randomly on the available nodes to be routed. The distance between the nodes are calculated initially. The number of ants on the node and other ACO parameters like α (pheromone parameter), β (desirability parameter), and ρ (Pheromone update-evaporation constant) are varied according to the best solution. The ant's memory are initialized and current node on which the ant is placed is updated in ant's memory. The probability of ant to choose shortest path depends upon the pheromone amount and desirability of the path. The shortest path made by the ant results in reduced wire-length.

DESIRABILITY

The desirability of the ant to visit the node depends upon the distance between the two nodes and hence defined as the minimum distance between current node i , where ant is located to the node yet to be visited j and all other remaining ants belonging to the same net

$$\alpha' \eta_{i,dir} = \frac{1}{\text{Min} [\alpha' D_{i,j}, \alpha' D_{i,k}, \alpha' D_{i,m}]} \quad (1)$$

where α' is the terminal node from where the current ant started, i is the current node of the ant that started at α' , dir is the next node decided by this function, which is not yet already visited, $\alpha' D_{i,j}$ is the total distance between ant's next node j and all other ants when the previous given node is i and can be defined as:

$$\alpha' D_{i,j} = [\sum_{a=1}^n M_{i,\alpha} + M_{x,j}] \text{ For } a \neq \alpha' \quad (2)$$

here $M_{i,\alpha}$ is the Manhattan distance between point ' i ' and ' α ' and α is the current position for other ants of the net.

PROBABILITY

Thus the probability of choosing an arc (i, j) could be defined as following

$$P_{i,j} = \frac{(\tau_{i,j}^\alpha) (\eta_{i,j}^\beta)}{\sum (\tau_{i,j}^\alpha) (\eta_{i,j}^\beta)} \quad (3)$$

Where $P_{i,j}$ is the probability that an ant at node i will move to node j , $\tau_{i,j}$ is the amount of pheromone on path i, j , $\eta_{i,j}$ is the desirability of any path i, j , α parameter to control the influence of $\tau_{i,j}$, β is the parameter to control the influence of $\eta_{i,j}$. After calculating desirability and probability, ants starts traversing the path and connects the nets as described by the net-list, followed by the pheromone update.

PHEROMONE UPDATE

Pheromone update is done in order to choose the best shortest path across different iteration. Here the deposited pheromones are first evaporated by a constant factor ρ and given by the equation,

$$\tau_{i,j} = (1 - \rho) \tau_{i,j} \quad (4)$$

Next pheromone update is done only for the best ant after each iteration and hence it can be denoted as the function of tour length traversed by best ant given by the equation

$$\Delta \tau_{i,j}^{bs} = 1/c^{bs} \quad (5)$$

Where $\Delta \tau_{i,j}^{bs}$ is the amount of pheromone deposited on the path taken by the best ant of the iteration and c^{bs} is the tour length traversed by the best ant.

Therefore, the pheromone update could be represented as:

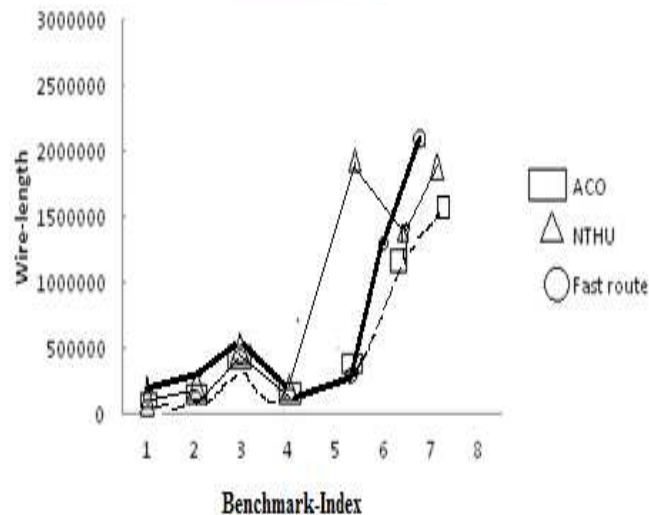
$$\tau_{i,j} = (1 - \rho) \tau_{i,j} + \rho \Delta \tau_{i,j}^{bs} \quad (6)$$

EXPERIMENTS AND ANALYSIS

The ACO algorithm for routing has been coded in MATLAB and the experiments are executed on a 2.40 GHz Intel core i3 processor. The three main parameters that affect any ACO algorithm is the choice of alpha (α), beta (β) and rho (ρ). A good parameter setting maintains a balance between the focus of the search and exploration of new paths during the search. Whereas a bad parameter setting will make the search either too narrow and focused leading to stagnation behaviour or could cause excessive exploration of search paths leading to a never converging search process. Thus to find a suitable value of parameters that maintains the balance between the focus and explorative nature of the search the difference between tour lengths was measured for various nets with many different sets of parameter values as indicated in table 1. The set of parameter values that provided a good improvement in performance with the iterations of the algorithm was chosen.

The number of ants used in an ACO algorithm depends on the number of nodes of the search graph and has a direct influence on the computation time of the algorithm. More ants per node are able to perform a more exhaustive search compared to fewer ants, but also require more time for computation. Thus, there exists a trade-off between the computation time and performance of the ACO-route algorithm. This trade-off exists only until the number of ants used in the algorithm is below saturation value beyond which performance does not improve. If the average number of ants per node is increased beyond this saturation value, the increased number of ants tends to reinforce the locally optimum solution. Beyond this value, the only affect of the increase in number of ants is to increase the computational time of the algorithm. Same effect is experienced in performing the iterations as shown in table 2. Three types of benchmark suites were tested and summarised results are shown in table 3. From the table we can infer that From the result we can infer that if number of pins are increased, correspondingly wire-length also increases with inherent time period. The reason is due to routing done on single layer. In contrary, if multi-routing layer are introduced, there can be a rapid decrease in wire-length accompanied by the reduction of power consumption. Figure1 illustrates the wire-length of ACO route, NTHU route and Fast route. The wire-length of NTHU route is of maximum unit compared to that of other two routers. ACO has a low wire-length at the expense of time period, compared to that of Fast route and still can be minimized by using multi-routing layers.

FIGURE 1: COMPARISON OF WIRE-LENGTHS WITH BENCHMARKS



Benchmark Index[1-S1423; 2-S5378; 3-S15850; 4-Prim1; 5-prim2; 6-R1; 7-R2]

TABLE 1: DIFFERENT SETS OF PARAMETER VALUES

Benchmark S1423 status	Alpha	Beta	Rho	Wire-length(unit)
Normal	1	5	0.5	72792
Above	2	10	1	74285
Below	0.5	2.25	0.25	85998

TABLE 2: NUMBER OF ANTS PER NODE AND NUMBER OF ITERATIONS PERFORMED

Benchmark S1423 Status	No of Iteration	No of ants	Wire-length(units)
Normal	100	74	72792
Above	200	128	72479
Below	50	37	74601

TABLE 3: COMPARISON OF ACO –ROUTE WIRE-LENGTH WITH TIME PERIOD

Provider	Benchmark Name	Fast Route		NTHU Route		ACO Route	
		WireLength (Unit)	Time(Secs)	Wire-Length (Unit)	Time(Secs)	Wire-Length (Unit)	Time(Secs)
ISCAS'89	S1423 (74 pins)	107277	0.72	91605	4.17	72792	119
	S5378 (179 pins)	176517	0.93	146874	7.44	138379	207
	S15850 (579ns)	359990	1.6	315474	5.98	363841	321
MCNC	Prim 1 (269ns)	131463	1.52	115500	13.17	109793	412
	Prim 2 (603ns)	268681	1.92	2446976	15.59	303613	626
IBM	R1 (267ns)	1320665	1.46	1230884	12.22	1084887	408
	R2 (598 pins)	2169791	1.88	1918561	13.61	2149532	551

CONCLUSION AND FUTURE SCOPE

The goal of this work is to minimise the length of wires used in routing. Routing of VLSI chips is an NP complete optimization problem. An algorithm using an Ant Colony Optimization technique was developed for solving the constraint of optimizing wire-length and thereby the load capacitance. Adjusting and fixing the controlling parameters like alpha, beta, and rho yields good reduction of wire-length. Moreover saturate level of number of iterations and number of ants per node provides comparable reduction of wire-length. For minimum number of pins better reduction of wire-length was achieved. However there is significant room to enhance the algorithm and widen the domain to which it applies. Implementation of Algorithm in multi-layered path which has advantage of reduction of wire-length, naturally decreases capacitance and in-turn reduce active power component. Hence more number of pins can be accommodated and algorithm can be implemented with different architecture.

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A STUDY ON INVESTORS' CONSCIOUSNESS AND INVESTMENT HABITS TOWARD MUTUAL FUNDS: - AN EXPLORATORY STUDY OF MEHSANA DISTRICT

ATUL PATEL

ASST. PROFESSOR

**SMT. S. B. PATEL INSTITUTE OF BUSINESS MANAGEMENT
VISNAGAR**

H. D. PAWAR

ASST. PROFESSOR

**SMT. S. B. PATEL INSTITUTE OF BUSINESS MANAGEMENT
VISNAGAR**

JAYSHRI DATTA

ASST. PROFESSOR

**SMT. S. B. PATEL INSTITUTE OF BUSINESS MANAGEMENT
VISNAGAR**

ABSTRACT

Mutual fund industry has spectators' considerable growth during the past couple of the years which is due to significantly acceleratory growth of income of the household and the recent growing situation of the market. Day by day, many mutual fund operators are coming up into the market with the different features and extra bundle of benefits to attract the investors towards them., thus by looking this thought cut competition among the mutual fund operators, it is necessary to make right inference about the investors' consciousness and their investment habits towards mutual fund. To commence the research study about the investor's consciousness and their investment habit towards different mutual funds existed in the Indian Mutual fund industry; researchers have collected views of 299 respondents with the help of simple random sampling method. Collected primary data were analyzed by SPSS 16 by employing various statistical tools like Graphs, t- test, χ^2 - test and Factor analysis. It is found that less percent of the respondents choose Mutual fund as their most preferable investment option and accumulate the information through their reference group, invest for short span of time, expect high return, prefer open ended scheme for their investment. Moreover, it is also revealed that most preferable investment options for the investors is only associated with the Age and Income group of the investors. By factoring method, set of 25 variables were classified into 8 factors like, Sponsor, Product, Services, Scheme Related Qualities, Disclosure of Fact of Scheme, Disclosure of Method, Expenses & Performance, and Reputation & Brand of Fund.

KEYWORDS

AUM, Habit, Investors, Mutual fund

INTRODUCTION

Mutual fund industry has spectators' considerable growth during the past couple of the years which is due to significantly acceleratory growth of the rising income of the household and the recent growing situation of the market. Nowadays, almost maximum number of institutions and individuals make their investment in the mutual fund with the objective of getting maximum gain. Investors pay more attention on mutual fund as an instrument for investment securities than compared to the other financial instrument like the shares, debentures and other securities. Mutual fund industry offer varied types of mutual fund product which suit the investors' objectives and through it they are strengthen investor faith and confidence in the health of the industry. Mutual Funds offer a relatively less expensive way to invest than compared to other avenues such as capital market operations. It has also offer different mutual fund schemes so that investors can invest in it according to their availability of fund and time. Moreover, there are plenty of mutual fund firms in India catering to the need of the investors and the numbers of such firms are growing steadily year by year. Even the investors, who could not enter stock markets with low investible funds, can benefit from a portfolio comprising of high-priced stocks because they are purchased from pooled funds. The investments in mutual funds are not without risks because the same forces such as regulatory frameworks, government policies, interest rate structures, performance of companies etc. that clutter the equity and debt markets.

MUTUAL FUND INDUSTRY UPDATES

Indian Mutual Fund industry saw a fall in assets under management (AUM) of 3.54% in Rupees it is Rs. 5, 92,250 crore in 2011 on year 2010, This was due to redemptions by large corporate houses and banks from especially short term funds post the SEBI regulation that securities with a residual maturity of over 91 days should be marked-to-market on a daily basis effective 1 August 2010. In addition, the Indian Mutual Fund industry also saw huge redemption pressure on equity schemes on account of profit booking and mutual funds were net sellers of equity to the tune of Rs. 28,132 crore.

Day by day many mutual fund operators are coming up into the market with different features and extra bundle of benefits to attract the investors towards them., thus by looking this through cut competition among the mutual fund operators, it is necessary to make inference about the investors' consciousness and their investment habits because as we know that the human behavior is not consistent but it's varied from time to time.

LITERATURE REVIEW

Agapova (2011) has examined the cross-sectional differences among money market mutual funds (MMMFs) in the context of sponsoring fund families. He has found that flows to family NON-MMMFs are negatively related to family MMMF flows, and family NON-MMMF cash flow volatility is positively related to family MMMF cash flow volatility. The study has further recommended that fund family investors also use family MMMFs as cash centers by utilizing free asset transfers within the family.

Badrinath, S.G & Gubellini, S (2011) have evaluated the return performance of long-short, market-neutral and bear mutual funds using multi-factor models and a conditional CAPM and revealed that Market-neutral funds provide a down market hedge, but bear funds do not generate the returns that investors hope for.

Cao, Ghysels & Hatheway (2011) have investigated two types of funds that make more extensive use of derivatives, global funds and specialized domestic equity fund and found that risk and return characteristics of these two groups of funds are significantly different from funds employing derivatives sparingly or not at all and that Fund managers time their use of derivatives in response to past returns.

Chen, Kraft & Weiss (2011) have tested mutual funds that engage in tax planning and how do they respond to changes in the capital gains tax rates was investigated. It was found that there was consistency with tax planning by managers of both open-end and closed-end mutual fund and mutual fund managers may not tax plan like individuals because fund managers have incentives to consider the tax liability of both current and potential investors.

Agarwal, Boyson, Naik & Narayan Y (2009) have examined the performance of these funds relative to hedge funds and traditional mutual funds and found that despite using similar trading strategies, hedged mutual funds underperform hedge funds.

Bazo, Javier & Pablo (2009) have examined the market for equity mutual funds and found that Funds with worse before-fee performance charge higher fees and that better fund governance may bring fees more in line with performance.

OBJECTIVE OF THE STUDY

Objective of this study is to understand and analyze the consciousness and investment habits of investors toward different mutual funds existed in the Indian Mutual fund industry.

RESEARCH METHODOLOGY

To commence the research study about the investor's consciousness and their investment habits towards different mutual funds existed in the Indian Mutual fund industry, researchers have opted exploratory research design. In this study, to collect the reliable opinion regarding their consciousness and investment habits about the mutual fund, researchers have drawn the opinion of 299 investors with the help of simple random sampling method from the different region of Mehsana District. The collections of opinions were recorded in the well structured and tested questionnaire with the help of trained personnel. In the questionnaire different types of closed-ended questions were used to capture the relevant information from the investors. The secondary data were collected from the record, review, reference books and internet.

Analysis of the collected primary data was done with the help of a statistical software SPSS.16 where different statistical tools like, Graphs, t- test, Chi- square and Factor Analysis were used.

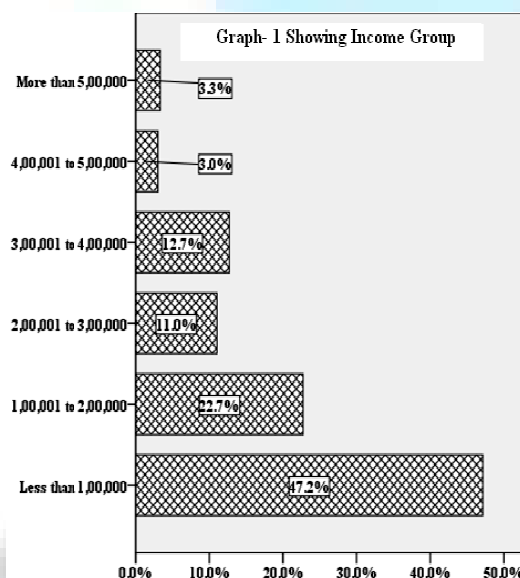
HYPOTHESIS

Ho1: All fund selection factors are important for the Mutual fund investors to take the decision regarding the selection of Mutual fund and the relevant mutual fund schemes.

Ho2: Most preferable investment option is depends upon the Demographics Factors (like, Gender, Age group, education qualification, Occupation, Income group and annual saving) of the investors.

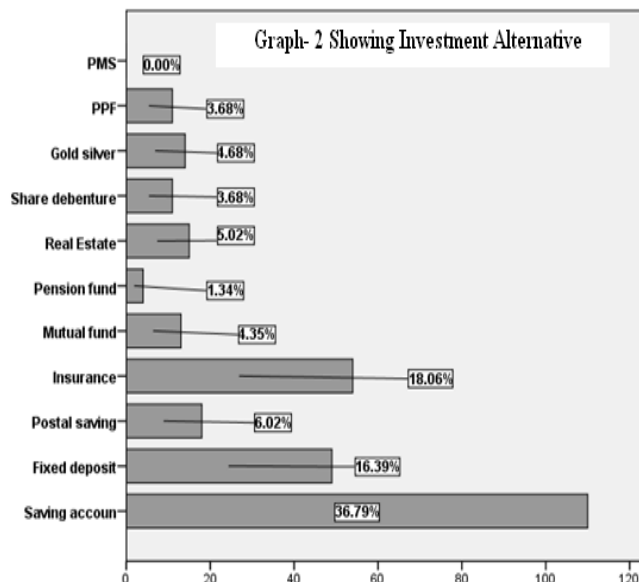
STATISTICAL ANALYSIS

Statistical analysis indicates that 52.17% of the investors' choose Mutual fund as their alternative for investment options. Thus, the proportion of investment in mutual fund is quite very low than compared to the other source of investment. Hence, there is great opportunity to grow the market share for the mutual fund operators and they can increase their profit as well.



Graph-1 indicates that 47.2% of the respondents' annual income of their family is less than Rs.1, 00,000. & 22.7% people income is Rs.1 lakhs to 2 lakhs. Moreover, it is also specified that only 6.35% (3.34 +3.01) of the respondent's annual income of their family is found to be more than Rs.5, 00,000. Thus, it's revealed still maximum number of the people from this district are still living under the poverty line.

Analysis also depicts that 65.9% of the respondents annual saving is less than Rs.50, 000 and 20.7% of the respondents save Rs.50, 000 to 1 lakhs annually. Thus, we can say that maximum number of the respondents annual saving is very low because of their lower income.



Graph-2 shows the classification of the investors according to their preference about the investment alternatives. Here, it is pointed out that 36.79%, 18.06% and 16.39% of the investors saving option is Saving Accounts, Insurance and Fixed Deposit respectively. Most of the respondents give the equal weightage as their saving option like PPF, Gold & Silver, Share Debenture, Real Estate, Mutual fund Postal saving etc. Thus, it shows that very less percentage of the respondents select Mutual fund as their most preferable saving option.

TABLE-1 REFERRING TIME LIMIT OF THE INVESTMENT			
Time	Up to 3 yrs	3 – 5 yrs	>5 yrs.
%	43.1%	33.8%	23

Table-1 depicts that 43.1% and 33.8% of the respondents' time limit for their investment is up to 3 years and 3 – 5 years respectively. Only few investors invest their money for long period of time. Moreover, the trend of time limit of investment is found to be downward as the number of years is going high. Thus, investors annual income may be very fluctuate and that is why they may prefer short time limit for their investment.

TABLE: 2 EXPECTED RETURN				
Return	8 to 12%	12 to 16%	16 to 20%	> 20%
%	42.5	37.1	12.7	7.7%

Table: 2 shows that the 42.5% of the investors expected 8 to 12% return on their investment, 37.1% of the investors expected 12 to 16 % return. This analysis explored that more than 75% of the investors expected return less than 16% on their investment.

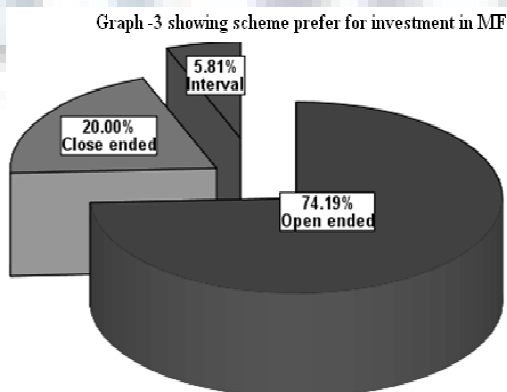
PREFERABLE SECURITIES FOR INVESTMENT

TABLE 3: SHOWING THE INVESTORS' OPINION ABOUT SECURITIES FOR INVESTMENT					
Preferable securities for investment	Highly Favorable (%)	Favorable (%)	Somewhat Favorable (%)	Not Favorable (%)	Highly Not Favorable (%)
Share	34.8	26.8	19.4	10.4	8.7
Debenture	5.4	26.8	39.1	19.7	9.0
Mutual Fund	12.4	31.4	31.8	16.7	7.7
Derivatives	4.7	12.0	32.1	38.1	13.0

Above table - 3 reflect the light on the attitude of investors towards the preferable securities for investment. It depicted that 61.6% of the investors have opined that the Share is high preferable security for them which one was followed by the Mutual Fund security investment option where only 43.8% of the investors have shown positive attitude. Maximum investors have shown negative attitude towards the derivatives options for investment. Hence, the analysis revealed that most preferable investment option or highly favorable investment security by the investors is Share.

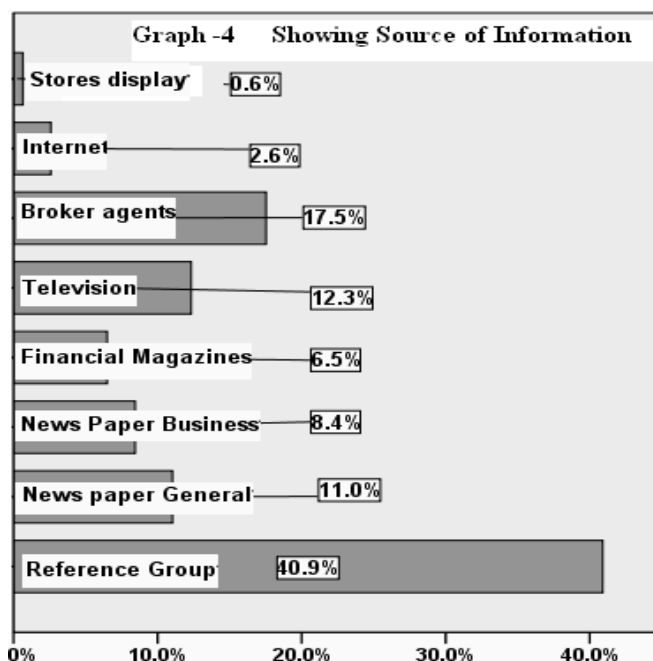
Moreover, analysis depicts that 43.2% of the male investors and 46% of the female investors have shown positive attitude towards the preferable investment security "mutual fund". Moreover, male investors have opined investment in the mutual fund is high favorable than other investment options.

SCHEME PREFERENCE FOR INVESTMENT IN MUTUAL FUND

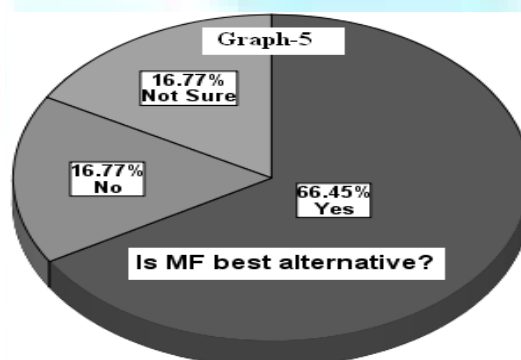


Graph-3 shows the scheme prefer for investment in the Mutual fund. It shows that 74.19% of the investors chosen open ended scheme of mutual fund, 20% chosen close ended scheme of mutual fund and only 5.81% of the investors chosen interval scheme of mutual fund in the selection of their scheme. This analysis indicates that maximum number of the mutual fund investors selects open ended scheme of mutual fund as scheme prefer for investment in the mutual fund.

MEDIA OF COLLECTING INFORMATION ABOUT MUTUAL FUND



Graph-4 indicates that how's the investors come to know about the mutual fund. Here, Chart indicates that 40.9% of the investors collect the information about the mutual fund by their reference group, this reference group may consist their colleagues, relatives etc. and second source of information is found to be Broker Agents by covering 17.5% of the respondents. Hence, we can say that to increase sell of mutual fund, a mutual fund operator should focus on the various group of people and they must create awareness regarding the mutual fund through their agents. Here, television and news paper is found to be medium mode to collect the information about the mutual fund.



Graph-5 shows the investors opinion regarding the mutual fund alternative. It shows that 66.45% of the investors responded that the mutual fund is the best option to invest their money. It is also found that equal percentage of the investors are not sure and they are not in favor that the Mutual fund is the best alternative for investment. As it shows that 16.77% of the investors are not sure about the best source for investment is a mutual fund. It might be lack of information about the mutual fund. Hence, mutual fund operator should create awareness programme about their fund that how it is work and where their fund is invested by them to collect the maximum output or gain.

REASONS FOR NOT INVESTING IN MUTUAL FUND:

Analysis also indicates that the 41.52% of the investors don't invest in the mutual fund because of its completely related with the market fluctuation and equal proportion of the investors that is 23% of the investors don't invest in mutual fund because of insufficient knowledge and the rate of return is not guaranteed and 12.50% of the investors don't invest in mutual fund because they have capabilities of handling their fund.

TESTING OF HYPOTHESIS

Ho: All fund selection factors are important for the Mutual fund investors to take the decision regarding the selection of Mutual fund and the relevant mutual fund schemes.

Here, two tailed test significant value for all the selected factors is found to be 0.000. It indicates that all the selected factors are not important for investors to take their decision regarding the selection of the fund and their most effective scheme. Means few factors might be more important and few factors might be less important for the investors.

Below table-4 indicates that the upper and lower limit in the confidence interval for all the tested factors is found to be negative which shows that the mean value for all factors is less than test value that (i.e.) 3. Means, all the tested factors are not important but they might be more important for the investors. They considered these all factors while making decisions regarding the selection of the mutual fund and the different schemes available. Among these all the factors, factors like, Fund performance record, Fund reputation and brand name, Scheme's expense ratio, Disclosure of the method and the periodicity of the scheme, Disclosure of NAV on every trading day, Disclosure of deviation of investment from original pattern are more important for the investors.

TABLE- 4						
One-Sample t - Test	Test Value = 3 (Neutral)					
	t	d.f	Sig.	M. D.	95% C.I.	
					Lower	Upper
Fund performance record	-32.5	150	.000	-1.616	-1.71	-1.52
Fund reputation and brand name	-17.2	150	.000	-1.020	-1.14	-.90
Scheme's expense ratio	-12.2	150	.000	-1.000	-1.16	-.84
Scheme's portfolio of investment	-9.0	150	.000	-.775	-.94	-.61
Reputation of fund manager/scheme	-6.5	150	.000	-.570	-.74	-.40
withdrawal facilities	-8.1	150	.000	-.649	-.81	-.49
Favorable rating by rating agency	-5.7	150	.000	-.503	-.68	-.33
Innovativeness of the scheme	-5.2	150	.000	-.430	-.59	-.27
Product with tax benefits	-6.6	150	.000	-.576	-.75	-.40
Entry and exit load	-5.9	150	.000	-.503	-.67	-.34
Minimum initial investment	-7.5	150	.000	-.642	-.81	-.47
Reputation of sponsoring firm	-7.7	150	.000	-.662	-.83	-.49
Recognize brand name of sponsor	-8.0	150	.000	-.609	-.76	-.46
Well developed agency network of sponsor	-8.0	150	.000	-.629	-.78	-.47
Sponsor expertise in managing fund	-8.3	150	.000	-.656	-.81	-.50
Well developed research and infrastructure	-7.3	150	.000	-.570	-.72	-.42
Past performance in terms of risk and return	-8.4	150	.000	-.656	-.81	-.50
Disclosure of investment objective in the advertisement	-6.8	150	.000	-.530	-.68	-.38
Disclosure of periodicity of valuation in the advertisement	-5.0	150	.000	-.450	-.63	-.27
Disclosure of the method and the periodicity of the scheme	-13.0	150	.000	-.967	-1.11	-.82
Disclosure of NAV on every trading day	-10.3	150	.000	-.735	-.87	-.60
Disclosure of deviation of investment from original pattern	-10.0	150	.000	-.781	-.93	-.63
MF's investor grievances structure	-5.0	150	.000	-.430	-.60	-.26
Fringe benefits	-7.8	150	.000	-.603	-.75	-.45
preferred mutual fund to avoid problem	-7.0	150	.000	-.570	-.73	-.41

H02: Most preferable investment option is depends upon the Gender, Age group education qualification, Occupation, Income group and annual saving of the investors.

TABLE 5: CHI-SQUARE TESTS			
	Chi-Square Value	d.f	Asymp. Sig. (2-sided)
Gender	10.696 ^a	9	.297
Age group	59.877 ^a	36	.007
Education Qualification	56.25	36	.017
Occupation	54.723	54	.447
Income Group	70.323	45	.009
Annual Saving	31.531	27	.250

Above table shows the asymptotic significant two tailed test value. The sig. values for Gender, Occupation, Annual saving and education qualification is quite high, which indicates that the most preferable investment options is not associated with Gender, Occupation, Annual saving and Education Qualification but it is only associated with the Age group and Income group of the investors.

FACTOR ANALYSIS

RELIABILITY ANALYSIS

TABLE- 6: RELIABILITY STATISTICS	
Cronbach's Alpha	N of Items
.874	25

Here, reliability analysis of the set of 25 questions was done to check the internal consistency about the investor's opinion towards the set of 25 variables. In table -6 Cronbach's Alpha reliability test value for the set of 25 items was found to be 0.874. It shows that there is consistency in the opinion of the investors about the set of these all the 25 questions. That is the set of these all the 25 items are reliable for their further analysis. Here, to reduce the number of variables in to small group, a factor analysis was employed.

TABLE -7 KMO AND BARTLETT'S TEST ^A		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.763
Bartlett's Test of Sphericity	Appr. Chi -Square	1363.02
	df	300
	Sig.	.000

Moreover, in table -7 Kaiser-Meyer-Olkin measure of sampling adequacy was 0.763 stating the applicability of factor analysis. Bartlett's test of Sphericity indicates that the correlation matrix of the selected variables is not identity matrix.

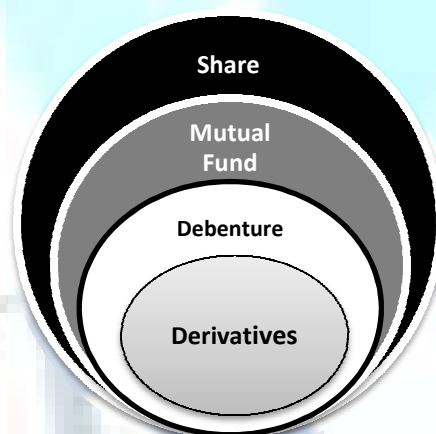
Before undertaking the factor analysis, variables having less (0.5) communalities were removed from the list. When analyzing a covariance matrix, the initial Eigen values were the same across the raw and rescaled solution and Principal Component Analysis method was employed for the Extraction of the variables. Interpretability of the factors was improved through rotating the factors and rotation maximizes the loading of each factor, so Varimax rotation method was employed in this analysis. Here these all 25 factors have been extracted in the 8 components which are mentioned below.

Table-8 Factor Analysis			
1. Sponsor Related Qualities		4. Scheme Related Qualities	
• Sponsor expertise in managing fund	.771	• Reputation of fund manager/scheme	.770
• Past performance in terms of risk and return	.740	• Scheme's portfolio of investment	.695
• Recognize brand name of sponsor	.713	• Withdrawal facilities	.685
• Reputation of sponsoring firm	.652	5. Disclosure of Fact of Scheme	
• Well developed research and infrastructure	.612	• Disclosure of investment objective in the advertisement	.690
• Well developed agency network of sponsor	.593	• Disclosures of periodicity of valuation in the advertisement	.642
2. Product Related Qualities		• Minimum initial investment	.600
• Innovativeness of the scheme	.735	6. Disclosure of Method	
• Product with tax benefits	.718	• Disclosures of the method and the periodicity of the scheme	.877
• Entry and exit load	.639	7. Expenses and Performance	
• Favorable rating by rating agency	.548	• Scheme's expense ratio	.772
3. Services		• Fund performance record	.623
• Preferred mutual fund to avoid problem	.786	8. Reputation and Brand of Fund	
• Fringe benefits	.750	• Fund reputation and brand name	.761
• MF's investor grievances structure	.544		

By using factory analysis, all 25 factors were classified in the 8 major factors like, Sponsor, Product, Services, Scheme Related Qualities, Disclosure of Fact of Scheme, Disclosure of Method, Expenses & Performance, and Reputation & Brand of Fund.

MODAL SHOWING LEAST PREFERABLE TO MOST PREFERABLE SECURITIES FOR INVESTMENT

Below model indicates that the most preferable security for investment for the investors is Share and Mutual Fund have taken second position as preferable alternatives for the investment and very least preferable investment security is found to be Derivative among the investors. Through this model a person can easily understand the preference pattern of the investors about their different security avenues. It shows that only few people are interested or they prefer Derivatives as their preferable investment options.



FINDINGS

- Maximum number of respondents annual saving is very low because of their lower income. Moreover, it shows that very less percentage of the respondents select Mutual fund as their most preferable saving option and collects the information about it through their reference groups.
- Investors' invest their money for less than five years and expect high return from their investment and prefer open ended scheme for their investment.
- The analysis revealed that most preferable investment option or highly favorable investment security by the investors is Share and Mutual fund has taken second position as an investment option.
- The proportion of investment in mutual fund is quite very low than the other source of investment the reason for that is associated with the market fluctuation.
- Most preferable investment options for the investors is only associated with the Age and Income group of the investors.
- It indicates that all the selected factors are important for investors to take decision regarding the selection of the fund and their most effective scheme, These all the factors are classified in to 8 major factors like, Sponsor, Product, Services, Scheme Related Qualities, Disclosure of Fact of Scheme, Disclosure of Method, Expenses & Performance, Reputation & Brand of Fund.

CONCLUSION

The emergence of an array of savings and investment options and the dramatic increase in the market for financial assets in the recent years in India has opened up an entirely new area of earning. An average Indian investor is a learner when it comes to financial markets, the causes may be many: the lack of opportunity, lack of conceptual understanding and the influence of a fixed-income orientation in the Indian culture. Salaried person's savings are most often deposited in mutual funds; the theory behind this is that by pooling together a huge aggregation of individual savings. Moreover, it is found that the investment of the investors significantly depends upon investor's age group and their income and most of them are attracted through the reference group and they prefer open ended scheme for the investment.

Thus, the market potential can be tapped by scrutinizing investor behavior to identify their expectations, risk preference, return and time limit of investment. Presently, more and more funds are entering the industry and their survival depends on strategic marketing choices of mutual fund companies, to survive and thrive in this highly promising industry, in the face of such cutthroat competition. In addition, the availability of more savings instruments with varied risk-return combination would make the investors more alert and choosy.

MF requires complete understanding of the peculiarities of the Indian Stock Market and also the psyche of the small investor. Under such a situation, the present exploratory study is an attempt to understand the behavior of MF investors in connection with scheme preference and selection.

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THE JIGSAW CAPTCHA

BALJIT SINGH SAINI
ASST. PROFESSOR
SCIT (CSE)
LOVELY PROFESSIONAL UNIVERSITY
PHAGWARA

ABSTRACT

In this paper a new CAPTCHA technique is proposed which focuses on dividing a picture into parts, jumble those parts and present them to the user (along with the original image). The user is required to assemble those parts in order to form the correct picture (the JIGSAW puzzle). This task requires judging the complex content of the broken parts of the image and making a decision as to which part is to be placed where. The biggest advantage of the system is that the user will choose an image for the task from his own computer system and hence no database is required to be maintained by the website owner. The complexity of the system can be easily extended by dividing the image into as many parts as required. The system is very user friendly as most of us had played such a puzzle during our childhood days. Preliminary results showed that the users preferred this technique over usual text based CAPTCHAs.

KEYWORDS

CAPTCHA, bot security, web security.

INTRODUCTION

According to J. Langford, L. Ahn and M. Blum (2004) CAPTCHA stands for "Completely Automated Public Turing Test to Tell Computers and Humans Apart". CAPTCHA systems have been widely adopted nowadays on the internet for protecting free online services for humans from abuse by automated scripts/bots. CAPTCHA must satisfy three basic properties. The tests must be

1. Easy for humans to pass
2. Easy for the tester machine to generate and grade.
3. Hard for a software to pass. The only automation that should be able to pass a CAPTCHA is the one generating the CAPTCHA.

CAPTCHAs are generally based on *Character* recognition or *Image* recognition. Although image based CAPTCHAs are more secure and hard to break but they are rarely used because they require a lot of database to be maintained.

But in my work I have proposed a technique which will overcome this drawback of image based CAPTCHAs

REVIEW OF LITERATURE

A lot of CAPTCHA techniques based on images have been proposed so far.

M. Chew and J. Tygar (2004; 2005) presented two works on CAPTCHA. In their first work they proposed two techniques:

1. Asking the test subject to determine if two subsets of images are associated with the same word or not (the distinguishing CAPTCHA).
2. Showing the test subject a set of images where all but one image is associated with a word and asking the test subject to identify the anomalous image (the anomaly CAPTCHA).

In their second work called Collaborative filtering the CAPTCHA asks questions to the user that has no absolute answer. Instead the CAPTCHAs are graded by comparison to other people's answers. By observing real-world trends made by human subjects, collaborative filtering CAPTCHAs attempt to extract complex patterns that reflect human choices.

This technique suffers from problems like *misspelling*, *synonymy*, *polysemy* and *mislabeling*.

Another technique based on image orientation was proposed by R. Gossweiler, M. Kamvar and S. Baluja (2009). This CAPTCHA requires users to adjust randomly rotated images to their upright orientation.

D. Morrison, S. Marchand-Maillet and E. Bruno (2009) introduced a system called TagCAPTCHA which presents the user with a number of images that must be correctly labeled in order to pass the test. The images are divided into two subsets: a control or verification set for which annotations are known, and an unknown set for which no verified annotations exist. The verification set is used to control against the tags provided for the unknown set. If the user provides correct verification tags, the tags for the unknown set are promoted.

J. Elson, J. Douceur, J. Howell and J. Saul (2007) formally introduced Asirra (Asirra stands for Animal Species Image Recognition for Restricting Access), a cat or dog labeling based CAPTCHA design. The beauty of Asirra lies in its cleverly using the database from Petfinder.com. It asks the user to pick images of "cat" among 12 random chosen pictures.

Y. Chanamolu (2009) in his thesis presents a method for implementing an image based CAPTCHA. The technique is based on image orientation in which some of the images presented to the user will be in correct position while some will be rotated. The user is required to select the rotated images. This method has two advantages as listed by the author. First since no exact labels are needed from the user, the class number of objects that can be used for orientation is theoretically infinite and can be huge in practice. The classes have no need to be static. Secondly as orientation is the focus, the image of objects can be repeatedly used as long as the object has not been identified. Image consumption can be much slower. But the images that are to be selected have to be such that their orientation should be unambiguous.

PROBLEM DEFINITION

The contribution of my method is that it is an image based CAPTCHA. The images that will be used would not be required to be stored at the server side. In fact the image will be chosen by the user from the images that he/she has in his/her computer. Even if a user does not have any images he/she can still choose image from the clips that are already there in any computer that come as a part of windows operating system. The user will be required to choose any picture and then that picture will be broken into four parts and will be provided to the user in a jumbled fashion as shown in Figure 1. Also there will be a 2x2 matrix. The user will have to place the correct part into the correct cell of the matrix. When the user does this for all the parts he/she is directed to the next page.

FIGURE 2: SAMPLE JIGSAW CAPTCHA



As mentioned above one of the requirement for a good CAPTCHA is that it should be easy for the humans to solve. As this is one of the common puzzles that almost everyone goes through during his childhood, the users will find it very easy and interesting to solve.

PROBLEM ANALYSIS

IMAGE SELECTION

The user can only select an image of extension .jpeg, .gif or .png only. This is done to avoid user selecting a file other than an image. A special check for the extension has been included to achieve this.

PROBLEMS AFFECTING HUMAN PERFORMANCE

Not providing image to the user from the server side saves a lot of space on the server but the user may encounter some problems while solving the puzzle that are related to making a good selection of the image for the puzzle. If the user selects an image like the one shown in Figure 2, it will take a lot of time for him to solve the puzzle because all the parts will be alike and the user will not be able to locate the correct location of the any sub part of the image.

FIGURE 3: AMBIGUOUS IMAGE



USER STUDY

CAPTCHA Metrics: In this two metrics were considered for evaluating CAPTCHAs: a metric that allows us to measure CAPTCHA efficacy with respect to the number of matrix size and a metric measuring the expected time for a human user to take a CAPTCHA.

Matrix Size: As a the user can be provided with a number of options for the matrix size but it is to be considered that with increase in size of the matrix the difficulty level to solve the puzzle will increase and the user will be overburdened. The increase in size decreases the size of the each part of the sub-divided image and hence it becomes difficult for the user to identify the exact position of each part to solve the puzzle.

Time: Time is an important metrics for any CAPTCHA as a CAPTCHA is an overhead for any user. Hence the time to solve a CAPTCHA should be as small as possible so that the user spends more time on his/her intended work rather than proving his/her identity as a human being.

ADVANTAGES

1. The complexity and hence the security of the system can be easily increased by increasing the size of the matrix from 2x2 to any higher value like 3x3 or 4x4 or even higher as desired.
2. There is no need to store images on the server side and hence no need of any database.
3. The system is free from the problems faced in character recognition.
4. It is an enjoyable method as compared to traditional CAPTCHA.
5. The users who suffer from Dyslexia and hence face difficulty in solving character based CAPTCHA can easily solve this CAPTCHA.

TESTS AND RESULTS

A test was performed in which about 84 users participated. Several goals were kept in mind for the test:

1. Average time taken by the users to solve the puzzle for various matrix sizes. Four matrix sizes were considered: 2x2, 2x3, 3x3 and 3x4.
2. Matrix size that the users would prefer to solve if this is provided as a CAPTCHA to them.
3. The enjoyment factor of this CAPTCHA as compared to the traditional character based CAPTCHAs.
4. The difficulty level of the CAPTCHA for various matrix sizes as compared to character based CAPTCHAs.
5. Any difficulty faced by the users.

The test was conducted on a web browser and the user response was taken in the form a feedback form. The results were as follows:

1. Average time taken (in seconds) to solve the CAPTCHA for various matrix sizes is summarized in the table below.

TABLE 1: AVERAGE TIME TAKEN TO SOLVE CAPTCHA OF VARIOUS MATRIX SIZE

Average Time (in sec)			
2x2	2x3	3x3	3x4
12.50	20.94	34.51	53.92

2. Preferred matrix size: 44% of the users preferred 3x3 matrix size for the test.
3. Enjoyment factor: Results showed that 82% of the users found this CAPTCHA enjoyable as compared to the traditional character based CAPTCHAs.
4. Difficulty level: The difficulty level was also compared to the character based CAPTCHAs. Difficulty was checked for each 2x2, 2x3, 3x3 and 3x4 matrix sized puzzle. Results showed that for 2x2 matrix 93% , for 2x3 65%, for 3x3 42% and for 3x4 36% users found it easy to solve as compared to traditional CAPTCHA.

PROBLEMS FACED BY USERS

The main problem that some of the users encountered was that when the matrix size increases the broken parts become a little small and hence the users find it difficult to place the right part in the right location.

Another problem reported by a few users was that if the image had a white portion and that white portion becomes one of the broken part of the image then it becomes difficult to find that white part and hence to solve the puzzle. Hence even after placing all the parts correctly the user will not be able to pass the test because he would not come to know that the white part is not still placed in its correct location.

CONCLUSION

A novel CAPTCHA system is presented that requires the users to correctly drag and drop the broken parts of an image into their correct location. This is a task that many users are already familiar with. Initial results showed that 82% of the users found this method to be more interesting and enjoyable to deciphering text as is required in traditional CAPTCHA. Results also showed that for simple lower matrix size like 2x2 and 2x3 the users found this method to be easy to solve than deciphering text as is required in traditional CAPTCHA. Also as the difficulty level is increased i.e. matrix size is increased, it requires more time to solve the CAPTCHA.

Also as no image database is required for this system, the party implementing this system is free from the overhead and cost of maintaining a huge database. Some users did encounter some difficulty in solving the puzzle for matrix of higher size but overall the response time was very satisfactory.

SCOPE OF FURTHER RESEARCH

There are a number of interesting extensions to this CAPTCHA system that we can investigate and deploy. This system does not work if it is accessed via mobile. The user is not able to drag the broken parts into their desired location. Hence the task can be implementing this system for mobile phone users also. Another aspect is to look into the security of the system. The system can be tested for possible ways of bypassing it. So far I did not come across a method or technique in artificial intelligence that could solve this puzzle by its own. Hence a study can be done to find out the possible weak points of the system and hence to overcome them and make the system more secure.

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STUDY OF THE AWARENESS ABOUT THE SERVICES OFFERED BY THE DEPOSITORY PARTICIPANTS IN RAJASTHAN

DR. DHIRAJ JAIN
ASST. PROFESSOR
PACIFIC INSTITUTE OF MANAGEMENT
UDAIPUR

PREKSHA MEHTA
MBA STUDENT
PACIFIC INSTITUTE OF MANAGEMENT
UDAIPUR

ABSTRACT

The research study was based on the micro economic approach of estimating the awareness level of services offered by the depository participants to the respondents i.e. demat account holders in the state of Rajasthan. The study done on a demat account holders all over the Rajasthan state. The data was collected by distributing a structured questionnaire to 100 demat account holders. The awareness level about services offered by depository participants to the investors was moderate. The opinion regarding the account opening and maintenance charges was reasonable. The level of awareness about closing and termination of demat account was also moderate. Most of the investors were equity holders & there was no significant relationship between demographic factors and level of awareness.

KEYWORDS

Awareness, Depository, Investment, Investors, Services.

INTRODUCTION

Before 1996, the account settlement period of stock exchanges was 14 days which has been shortened to 7 days. The National Securities Clearing Corporation Ltd. (NSCCL) is a wholly owned subsidiary of NSE providing a settlement guarantee and Bank Of India Shareholding Ltd. is the clearing house of the BSE which is owned jointly by the Bank Of India and BSE. In the case of corporate securities the issuer used to maintain the register and the issuer or the transfer agent used to physically receive the security from a transferee accompanied by a transfer deed signed by the transferor. Majority of the transactions settled in the security market were based on physical movement leading to a wide variety of bottlenecks like increase in transaction cost, bad delivery, tearing, mutilation of certificate, fraud and theft, time and postal delays etc and to remove all these bottlenecks, The Depositories Act 1996, was introduced for dematerialization of securities, electronic transfer of securities, and electronic book entry in depositories.

As the depository network expanded the NSDL and CDSL had been granted a certificate of commencement of business by SEBI. Depository is an institution which holds securities with it, in which trading is done among shares, debentures, mutual funds, derivatives, future & options and commodities. The intermediaries are depository participants and every depository participant needs to be registered under any depository in India before they begin their operation in the market. Thus, in India there are two depositories functioning for over a decade (NSDL & CDSL). Therefore there is a need to identify the level of awareness about the services offered by the depositories in India.

REVIEW OF LITERATURE

Dellarocas C, (2000) Contributed to the development of a rigorous discipline for designing trust management mechanisms in online communities. He identifies several properties of online interaction that are challenging the accumulated wisdom of our communities on how to produce trust and require the development of new mechanisms and systems. **Sultan Sing (2011)** studied the factors affecting the decision making of the investors in the depository system. Most of the investors are aware of the view that shorter settlement period, safety of securities with the depositories, attitude of the staff available with the DPs, timely services provided by the DPs to the investors, reduction in transaction cost, repatriation of sales proceeds of shares/debentures by NRIs were some of the factors that affect the decision making of the investors in the depository system. Earlier studies covered the depository system and environment, which mainly pertained to depository legislation, which was a viable alternative of depository, implications of depositories ordinance, internal audit of depository participants, an overview of the Depositories Act 1996, responsibilities of auditing profession, role of depository in stock and capital market, SEBI guidelines in the depository system, services provided by different depositories or accessibility of depositories to retail investors. But it was very important to study the financial performance of depositories themselves and hence the author conducted the study. **Aggarwal and Dixit (1996)** expressed their views about the legal framework for depository system in India. They also explained the benefits of the paperless trading, responsibilities of depository or participants and eligibility criteria, etc. **Ravi Shah (2002)** highlighted that NSDL and CDSL have changed the face of the Indian capital market. The move from an account period settlement in paper form only to a T+3 settlement in pure electronic form has been achieved in a record span of few years, whereas it took somewhere between 10-20 years in most of the developed countries. **Hurkat and Ved (1999)** discussed the role of depository system in many advanced countries in the stock and capital markets the world over. They also analyzed the services offered by NSDL, dematerialization, re-materialization, trading and fee or charges, comparison of a bank and a depository for the benefits of the depository.

STATEMENT OF PROBLEM

The number of investor accounts in the country's stock market is inching towards the 2 crore mark, with the opening of more than 10 lakh new accounts since the beginning of 2010. At the end of October, the total number of investor accounts, as maintained with the country's two depositories NSDL and CDSL, stood at little over 1.97 crore, up from about 1.86 crore as on December 31, 2010. However, the rate of increase in the number of accounts seems to have slowed down drastically from the recent years. While the number of total accounts has increased by about 11 lakh so far in 2011, the increase was of about 20 lakh accounts during 2010 with both NSDL and CDSL accounting for addition of 10 lakh accounts each. The number of investor accounts had swelled even faster in previous years, especially between 2006-2009, on the back of growing investor interest in the stock market as markets were rallying smartly with a number of high-profile IPOs. A sluggish trend prevailing in the market for many months now and absence of any major IPOs seems to have adversely affected the interest of new investors in the market. The total number of investors could be, however, somewhat lower as some of the people or entities could have more than one accounts. As per the latest data available, the total number of investor accounts in demat or electronic format, which have been made mandatory to trade in the capital markets, maintained with NSDL (National Securities Depository Ltd) currently stands at about 1.20 crore. On the other hand, Central Depository Services (India) Ltd (CDSL) currently maintains about 77.7 lakh demat investor accounts. These exclude the invalid accounts that have been closed or frozen due to unavailability of investor identification details like PAN (Permanent Account Number). Lakhs of investor accounts have been frozen or closed in the recent years.

after PAN was made mandatory for these accounts in 2006. At the end of 2010-2011, NSDL had a total of 1.13 crore investor accounts, while CDSL had 73.4 lakh accounts.

Hence, with the increase in the number of investors account and compulsion of SEBI to trade securities in demat mode, an attempt has been made to study about the "Awareness level of services offered by Depository Participants among Retail Investors" at a micro level. For this purpose, instead of carrying out nationwide research emphasis has been given on a particular state. For this purpose, 5 investors' intensive state has been identified and among those states, Rajasthan state has been selected randomly.

OBJECTIVE OF THE STUDY

- To study the awareness level of retail investors about the nomination services and other services offered by the depository participants in respect of their age, qualification, income etc.
- To study the awareness level of retail investors about the closing and termination of demat accounts.
- To examine the investors opinion regarding charges on various services offered by the depository participants.
- To examine which security the investor finds most appealing.

HYPOTHESIS FRAMED FOR THE STUDY

H₀₁: There is no significant association between educational qualification and the level of awareness about services offered by the depository participants.

H₀₂: There is no significant association between annual income and the level of awareness about the services offered by the depository participants.

METHODOLOGY

- The study is exploratory study with the objective of analyzing the investors awareness about the services offered by the depository participants to the demat account holders. The study has been conducted with the help of the opinion collected from the investors existing in the Rajasthan state. Here, collecting the opinion from all the investors is not possible. Hence, it has been decided to select a representing sample from the investors. For this purpose the sample of hundred investors was selected randomly by adopting the lottery method.
- A well structured questionnaire was prepared and the responses were invited on the investors' awareness and their opinion.
- A pilot study was conducted before administering the questionnaire to the respondents. The purpose was to find out if any modifications were required in the questionnaire or not. A sample of ten respondents was selected for pre-testing. After pre-testing it was found that there is no need for modification, so the questionnaire was used to collect data. Chi-square test and Analysis of Variance (ANOVA) were used to test the hypothesis formulated for the present study. Chi square test was used to find out whether there is any association between socio-economic attributes and awareness level of investors. ANOVA was used to compare the mean score of opinion on charges among investors of different educational qualifications, annual income, age and range of investment in securities.

LIMITATION OF THE STUDY

The study is confined to Rajasthan state only. This is because other states will definitely involve high cost and time.

ANALYSIS AND INTERPRETATION OF DATA

TABLE 1: DEMOGRAPHIC FACTORS

S. No.	Status	No. of respondents	percentage
1. Educational Qualification			
1	Non-Graduate	2	2.0
2	Graduate	53	53.0
3	Post-Graduate	40	40.0
4	Others	5	5.0
	Total	100	100.0
2. Annual Income			
1	Less Than Rs. 1,50,000	9	9.0
2	Rs. 1,50,000 - Rs. 2,50,000	14	14.0
3	Rs. 2,50,000 - Rs. 4,50,000	26	26.0
4	More Than Rs. 4,50,000	51	51.0
	Total	100	100.0
3. Age Group			
1	Less Than 30 Years	45	45.0
2	30-40 Years	30	30.0
3	40-50 Years	17	17.0
4	50-60 Years	7	7.0
5	More Than 60 Years	1	1.0
	Total	100	100.0
4. Gender			
1	Male	88	88.0
2	Female	12	12.0
	Total	100	100.0
5. Range of investment			
1	Less Than Rs. 10,000	4	4.0
2	Rs. 10,000 - Rs. 30,000	11	11.0
3	Rs. 30,000 - Rs. 50,000	19	19.0
4	Rs. 50,000 - Rs. 70,000	12	12.0
5	Rs. 70,000 - Rs. 1,00,000	8	8.0
6	More Than Rs. 1,00,000	46	46.0
	Total	100	100.0

Sources: Primary Data

The respondents were asked about their present educational qualification, annual income age, gender and range of investment with the objective of finding its relation with their awareness. The above table shows that of the 100 respondents most of the respondent were graduates and post graduates and having an

annual income of more than Rs.4, 50,000 and were of less than 30 years of age & invested more than Rs. 1, 00,000 per year. Most of the respondents were male (88%). These all were the crucial to determine the risk taken by the investors.

INVESTORS CHOICE OF INVESTMENT

The investors were given options to choose the type of investment or security in which they invest. The choice of investments was Equity, Debentures, Government Security, Initial Public Offerings, and Mutual Fund.

TABLE 2: INVESTORS' CHOICE OF INVESTMENT

Sr. No.	Choice of investment	Number Of Respondents	Percentage
1	Equity	64	32.65
2	Debentures	23	11.74
3	Government Security	24	12.24
4	Initial Public Offerings	36	18.37
5	Mutual Fund	49	25
	TOTAL	196	100

Sources: Primary Data

The investors were given multiple options to choose. The above table shows that of 100 respondents, 32.65% invest in equity, only 11.74% in debentures, 12.24% in government securities 18.37% in initial public offerings, and 25% of the respondents also invest in mutual funds.

EDUCATIONAL QUALIFICATION AND AWARENESS ABOUT SERVICES OFFERED BY DEPOSITORY PARTICIPANTS

In order to find out the association between the educational qualification of the respondents and their awareness about services provided by depository participants, and the chi-square test is applied.

Null Hypothesis: The association between the educational qualification of the respondents and their level of awareness about services offered by depository participants is not significant.

TABLE 3: EDUCATIONAL QUALIFICATION AND AWARENESS ABOUT SERVICES OFFERED BY DEPOSITORY PARTICIPANTS

Level of Awareness	Educational Qualifications				Total
	Non-Graduate	Graduate	Post-Graduate	Others	
Low	0(.2)	6(5.3)	4(4)	0(.5)	10(10)
Moderate	2(1.3)	36(33.4)	23(25.2)	2(3.2)	63(63.0)
High	0(.4)	9(11.7)	11(8.8)	2(1.1)	22(22.0)
Very High	0(.1)	2(2.7)	2(2)	1(.3)	5(5.0)
TOTAL	2	53	40	5	100

Sources: Primary Data (Figures in the brackets represent the expected frequency)

CHI-SQUARE TESTS			
	Value	Degree of freedom	Asymp. Sig. (2-sided)
Chi-Square	6.886	9	.649

As the calculated chi-square value (6.886) is less than the table value (16.919) at 5% level of significance for 9 degree of freedom, the null hypothesis is accepted and it could be concluded that the association between the educational qualification and the level of awareness about the services offered by the depository participants is not significant. Awareness level is moderate among all the group of investors, whether they are highly qualified or have low qualification.

ANNUAL INCOME AND AWARENESS ABOUT SERVICES OFFERED BY DEPOSITORY PARTICIPANTS

In order to find out the association between the annual income of the respondents and their awareness level about services provided by the depository participants, the Chi-square test is applied.

Null Hypothesis: The association between the annual income of the respondents and their level of awareness about services offered by depository participants is not significant.

TABLE 4: ANNUAL INCOME AND AWARENESS ABOUT SERVICES OFFERED BY DEPOSITORY PARTICIPANTS

Level Of Awareness	Annual Income				Total
	Less Than Rs. 1,50,000	Rs. 1,50,000 – Rs. 2,50,000	Rs. 2,50,000 – Rs. 4,50,000	More Than Rs. 4,50,000	
Low	2(.9)	2(1.4)	1(2.6)	5(5.1)	10
Moderate	7(5.7)	8(8.8)	22(16.4)	26(32.1)	63
High	0(2.0)	3(3.1)	3(5.7)	16(11.2)	22
Very High	0(.5)	1(.7)	0(1.3)	4(2.6)	5(5.0)
TOTAL	9	14	26	51	100

Sources: Primary Data (Figures in the brackets represent the expected frequency)

CHI-SQUARE TESTS			
	Value	Degree of freedom	Asymp. Sig. (2-sided)
Chi-Square	14.089	9	.119

As the calculated chi-square value (14.089) is less than the table value (16.919) at 5% level of significance for 9 degree of freedom, the null hypothesis is accepted and it could be concluded that the association between the annual income and their level of awareness about the services offered by the depository participants is not significant. Awareness level is moderate among all the group of investors, whether they have high income or have low income.

AGE GROUP AND LEVEL OF AWARENESS ABOUT SERVICES OFFERED BY DEPOSITORY PARTICIPANTS

In order to find out the association between the age group of the respondents and their awareness level about services provided by the depository participants, the Chi-square test is applied.

Null Hypothesis: The association between the age group of the respondents and their level of awareness about services offered by depository participants is not significant.

TABLE 5: AGE GROUP AND AWARENESS ABOUT SERVICES PROVIDED BY DEPOSITORY PARTICIPANTS

Level of Awareness	Age Group					Total
	Less Than 30 Years	30-40 Years	40-50 Years	50-60 Years	More Than 60 Years	
Low	2(4.5)	3(3.0)	4(1.7)	1(.7)	0(.1)	10
Moderate	32(28.4)	14(18.9)	10(10.7)	6(4.4)	1(.6)	63
High	9(9.9)	10(6.6)	3(3.7)	0(1.5)	0(.2)	22
Very High	2(2.3)	3(1.5)	0(.9)	0(.4)	0(.1)	5
TOTAL	45	30	17	7	1	100

Sources: Primary Data (Figures in the brackets represent the expected frequency)

CHI-SQUARE TESTS			
	Value	Degree of freedom	Asymp. Sig. (2-sided)
Chi-Square	13.825	12	.312

As the calculated chi-square value (13.825) is less than the table value (21.026) at 5% level of significance for 12 degree of freedom, the null hypothesis is accepted and it could be concluded that the association between the age group and their level of awareness about the services offered by the depository participants is not significant. Awareness level is moderate among all the age groups.

RANGE OF INVESTMENT IN SECURITY AND LEVEL OF AWARENES ABOUT SERVICES PROVIDED BY THE DEPOSITORY PARTICIPANTS

In order to find out the association between the age group of the respondents and their awareness level about services provided by the depository participants, the Chi-square test is applied.

Null Hypothesis: The association between the range of investment of the respondents and their level of awareness about services offered by depository participants is not significant.

TABLE 6: RANGE OF INVESTMENT AND AWARENESS ABOUT SERVICES PROVIDED BY DEPOSITORY PARTICIPANTS

Level of Awareness	Range Of Investment in Securities						Total
	Less Than Rs. 10,000	Rs. 10,000 - Rs. 30,000	Rs. 30,000 - Rs. 50,000	Rs. 50,000 - Rs. 70,000	Rs. 70,000 - Rs. 1,00,000	More Than Rs. 1,00,000	
Low	0(.4)	2(1.1)	4(1.9)	1(1.2)	1(.8)	2(4.6)	10
Moderate	4(2.5)	9(6.9)	12(12.0)	9(7.6)	7(5.0)	22(29.0)	63
High	0(.9)	0(2.4)	3(4.2)	2(2.6)	0(1.8)	17(10.1)	22
Very High	0(.2)	0(.6)	0(1.0)	0(.6)	0(.4)	5(2.3)	5
TOTAL	4	11	19	12	8	46	100

Sources: Primary Data (Figures in the brackets represent the expected frequency)

CHI-SQUARE TESTS			
	Value	Degree of freedom	Asymp. Sig. (2-sided)
Chi-Square	25.311	15	.046

As the calculated chi-square value (25.311) is more than the table value (24.996) at 5% level of significance for 15 degree of freedom, the null hypothesis is rejected and it could be concluded that the association between the range of investment and their level of awareness about the services offered by the depository participants is significant. The respondents having low awareness have lower range of investment and the respondents having high awareness have the higher range of investment.

Comparison of Mean Score of Opinion on Charges among Investors of Different Educational Qualification

Null Hypothesis: There is no significant difference between mean score of opinion on charges among investors of different educational qualification.

TABLE 7: EDUCATIONAL QUALIFICATION AND OPINION SCORE ON CHARGES

Educational Qualifications	Mean	Std. Deviation	Number of respondents
Non-Graduate	1.50	.707	2
Graduate	.53	.799	53
Post-Graduate	.63	.807	40
Others	.00	.000	5
Total	.56	.795	100

Sources: Primary Data

ANNOVA TABLE

	Sum of Squares	Degree of freedom	Mean Square	F	Sig.
Between Groups	3.557	3	1.186	1.927	.130
Within Groups	59.083	96	.615		
TOTAL	62.640	99			

Sources: Primary Data

ANOVA was applied to test whether respondents with different qualification vary in their mean scores on opinion regarding charges. The ANOVA results shows that the significant value (.130) is greater than the level of significant value i.e. 5% (.05), therefore the difference in the investors' educational qualification is insignificant to the score of opinion on charges. Hence null hypothesis is accepted.

Comparison of Mean Score of Opinion on Charges Among Investors of Different Annual Income

Null Hypothesis: There is no significant difference between mean score of opinion on charges among investors of different annual income.

TABLE 8: ANNUAL INCOME AND OPINION SCORE ON CHARGES

Annual Income	Mean	Std. Deviation	Number of respondents
Less Than Rs. 1,50,000	.33	.707	9
Rs. 1,50,000 - Rs. 2,50,000	1.07	.730	14
Rs. 2,50,000 - Rs. 4,50,000	.50	.707	26
More Than Rs. 4,50,000	.49	.834	51
TOTAL	.56	.795	100

Sources: Primary Data

ANNOVA TABLE

	Sum of Squares	Degree of freedom	Mean Square	F	Sig.
Between Groups	4.466	3	1.489	2.457	.068
Within Groups	58.174	96	.606		
TOTAL	62.640	99			

Sources: Primary Data

ANOVA was applied to test whether respondents with different annual income vary in their mean scores on opinion regarding charges. The ANOVA results shows that the significant value (.068) is greater than the level of significant value i.e. 5% (.05), therefore the difference in investors' annual income is insignificant to the mean score of opinion on charges. Hence null hypothesis is accepted.

Comparison of Mean Score of Opinion on Charges among Investors of Different Range Of Investment

Null Hypothesis: There is no significant difference between mean score of opinion on charges among investors of different range of investment.

TABLE 9: RANGE OF INVESTMENT AND OPINION SCORE ON CHARGES

Range Of Investment in Securities	Mean	Std. Deviation	Number of respondents
Less Than Rs. 10,000	.50	.577	4
Rs. 10,000 - Rs. 30,000	1.00	.894	11
Rs. 30,000 - Rs. 50,000	.79	.855	19
Rs. 50,000 - Rs. 70,000	.33	.651	12
Rs. 70,000 - Rs. 1,00,000	.63	.744	8
More Than Rs. 1,00,000	.41	.777	46
TOTAL	.56	.795	100

Sources: Primary Data

ANOVA TABLE

	Sum of Squares	Degree of freedom	Mean Square	F	Sig.
Between Groups	4.788	5	.958	1.556	.180
Within Groups	57.852	94	.615		
TOTAL	62.640	99			

Sources: Primary Data

ANOVA was applied to test whether respondents with different range of investment vary in their mean scores on opinion regarding charges. The ANOVA results shows that the significant value (.180) is greater than the level of significant value i.e. 5% (.05), therefore the difference in the investors' range of investment is insignificant to the score of opinion on charges. Hence null hypothesis is accepted.

CONCLUSION

The findings from the chi-square test shows that the investors' level of awareness about services offered by depository participants and about closing and termination of demat account is moderate though they vary in their educational qualification, age group & annual income.

However, the finding from ANOVA reveals that the account opening charges and maintenance charges are reasonable. This research made an attempt to find out the level of awareness about the services offered by the depository participants in the Rajasthan state. The conclusion drawn from the analyzed data show that the awareness level among investors is not up to the mark and they are not aware about the various services offered by the depository participants. The results of this study will be a sort of feedback for the investors, brokers and regulatory bodies as to what extent have the investors' education programme reached. It is therefore, a matter of paramount importance that the investors are empowered through education on the functioning of the market, obligation of the intermediaries like depository participants the operational intricacies and the risks and pitfalls involved in security trading.

SUGGESTIONS

1. Investors' awareness programmes should be organised to make the investors aware about the services offered by the depository participants.
2. As most of the investors are only aware about the NSDL, They must be made aware about both the depositories NSDL and CDSL.
3. Day to day trends in stock markets, industries and economy can be provided to the investors that would make them more cautious while trading in securities.
4. Investors must be made aware about the usage of internet based services to know about their transaction details.
5. Other than nomination, facilities provided by the depository participants like transposition-cum-demat facility, transmission facility, client-level-pay-in facility and dematerialization must be made known to the investors.
6. Investors must be made aware about the circumstances under which a depository participant can terminate their demat account.
7. Better infrastructure facilities with more computer terminals for easier and convenient transaction can be provided by the depository participants.

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ATTACHMENT BETWEEN STOCK INDICES FII, NSE AND BSE

P. KRISHNAVENI
ASST. PROFESSOR
DEPARTMENT OF MBA
SNS COLLEGE OF TECHNOLOGY
COIMBATORE

ABSTRACT

The aim of this study is to identify the relationship between the Foreign Institutional Investment inflows and stock indices of India. In this context, an empirical study was conducted. The period of 1999-2009 is taken to analyze the correlation between BSE index and FII inflows and the period 2003-2009 is taken to know the relation between NSE index and FII inflows. It is found that there is a significant positive correlation between the BSE index and the FII inflows and the NSE index and FII inflows.

KEYWORDS

stock indices, FII, NSE, BSE.

INTRODUCTION

Foreign Institutional investors have played a major role in the emergence of truly money flows, notably through their cross-border investments. India has become the most attractive destination and was placed at the second spot in the year 2008 by the Global Retail Development Index. Thus, the foreign institutional investors have gained a significant role in the Indian Capital markets. Many overseas institutional investors, especially those from Europe and the US, almost always purchase stocks on the basis of fundamentals. Further, stock price movements correspond to the activities of foreign institutional investors. However, another concern of investors regards conditions other than the actual purchase of stocks. This paper examines the relationship between movements of Foreign Institutional Investment (FII) inflows and stock indices of India. The period of 1999-2009 is taken to analyze the correlation between BSE index and FII and the period 2003-2009 is taken to know the relation between NSE index and FII. It is found that there is a significant positive correlation between the BSE index and the FII inflows and the NSE index and FII inflows.

STATEMENT OF THE PROBLEM**STOCK MARKET PERFORMANCE**

Stock Market performance is an indicator of the overall health of the economy. If the general perception of investor about the economic performance is negative, the stock market gets decline and showing a bearish trend. At the same time, if the investor's perception is positive then the stock market performance is also good and bull markets are inevitable. Hence, overall economic and stock specific performance influences performance of the market. Thus, Stock Market Performance acts as the barometer of the economy as a whole.

FOREIGN INSTITUTIONAL INVESTMENT

The World Bank is advised to the developing countries to develop their stock markets to get foreign private capital flows in form of foreign institutional investors. It was suggested that these investments would help the stock markets directly through widening investor foundation and indirectly gripping the local authorities to improve the trading system. While the volatility associated with the foreign institutional investor's investment strategies is well known, there was also concern that foreign institutional investors might introduce distortion in the host country markets due to pressure on them to secure capital gains. Thus, it becomes important to assess the impact of foreign institutional investors on the Indian stock exchange.

LITERATURE REVIEW

Considerable amount of research have been conducted about the impact of financial and macroeconomic variables on stock prices in different economies with widespread econometric methods. Suchismita Bose and Dipankor Coondoo (2004) investigated the impacts of reforms of the foreign institutional investors' investment policy, on FII portfolio flows to the Indian stock markets and found that the policies mostly render FII investments more sensitive to the domestic market returns. Fama (1981) said that the stock prices reflect these variables such as inflation, exchange rate, interest rate and industrial production. Later Maysami and Koh (2000) and Choi et al (1992) examined the impacts of the interest rate and exchange rate on the stock returns and showed that the exchange rate and interest rate are the determinants in the stock prices. Frank and Young (1972) investigated the relationship between stock prices and exchange rates by employing six different exchange rates and concluded no statistically significant underlying relationship between the two. Rajesh Chakrabati (2001) analyze these flows and their relationship with other economic variables and concluded that the equity flows are highly correlated with equity returns in India, they are more likely to be the effect than the cause of these returns. Kishor C. Samal (1997) investigated the main features of India's equity market and its consequent problems due to the hot money movement by Foreign Institutional investors (FIIs) and concluded that there has been increased liberalization of domestic financial and capital markets. Nidhi Dhamija (2008) examines the role of various factors relating to individual firm-level characteristics and macroeconomic-level conditions influencing FII investment and the study revealed regulatory environment of the host country has an important impact on FII inflows and the pace of foreign investment began to accelerate, regulatory policies have changed to keep up with changed domestic scenarios. P.Krishna Prasanna (2008) examined the contribution of foreign institutional investment particularly among companies included in sensitivity index (Sensex) of Bombay Stock Exchange and also examined the relationship between Foreign institutional investment and firm specific characteristics and . It is observed that foreign investors invested more in companies with a higher volume of shares owned by the general public. Douma, Pallathiatta and Kabir (2006) investigated the impact of foreign institutional investment on the performance of emerging market firms and found that there is positive effect of foreign ownership on firm performance. They also found impact of foreign investment on the business group affiliation of firms. Aggarwal, Klapper and Wysocki (2005) observed that foreign investors preferred the companies with better corporate governance. Investor protection is poor in case of firms with controlling shareholders who have ability to expropriate assets. The block shareholders affect the value of the firm and influence the private benefits they receive from the firm. Companies with such shareholders will find it expensive to raise external funds. Yin-Hua and Woidtke (2005) found that when company boards are dominated by members who are affiliated to the controlling family, investor protection will be relatively weak and it is difficult to determine the degree of separation of management from ownership. They also observed that firm value is negatively related to board affiliation in family controlled firms. Li (2005) observed that in case of poor corporate governance the foreign investors choose foreign direct investment (FDI) rather than indirect portfolio investment. It is generally believed that FDI could be better protected by private means. Aswani Kumar Bhalla (2008) analyzed the India's growth story in the terms of real welfare of the people, the role of foreign institutional investment in India and found the governments are following similar policy measures to attract foreign investment in India to correct both their fiscal failures, balance of payments and to increase foreign exchange reserves in the name of giving the boost to the economy.

OBJECTIVES AND HYPOTHESIS

- **PRIMARY OBJECTIVE**

1. To study the relationship between the performance of stock markets and Foreign Institutional Investment inflows in India.

• **SECONDARY OBJECTIVES**

1. To study the relationship between the performance of Bombay stock market and the foreign institutional investment inflows.
2. To study the relationship between the performance of National Stock Market and the foreign institutional investment inflows.
3. To study the relationship between the performance of National stock exchange, Bombay stock exchange and FII inflows.

HYPOTHESIS

1. H_0 : There is no significant relationship between BSE market performance and FII inflows in India.
2. H_0 : There is no significant relationship between NSE market performance and FII Inflows in India.
3. H_0 : There is no significant relationship between NSE, BSE markets performance and FII Inflows in India.

METHODOLOGY

Research Design is Analytical in nature. The study is undertaken for a period of 11 years from January 1999 to December 2009 to assess the relationship between BSE performance and FII inflows and a period of 7 years from January 2003 to December 2009 to know the relationship between NSE performance and FII inflows. Sample size is 360 for each sample element, the sample frequency being monthly.

The entire data set is secondary data collected from the following websites:

1. <http://www.moneycontrol.com>, a web-site of database is compiled on the basis of reports submitted to SEBI by custodians and constitutes trades conducted by FII.
2. <http://finance.yahoo.com>, providing historical data pertaining to stock market indices.

Correlation technique is used for analysis (a perfect correlation is represented by a correlation coefficient of 1; perfect negative correlation by -1 and zero represents no correlation), ANOVA is used to analyze the relationship among the BSE, NSE and FII inflows in India and bar charts are used for pictorial representations of the relationships.

ANALYSIS AND FINDINGS

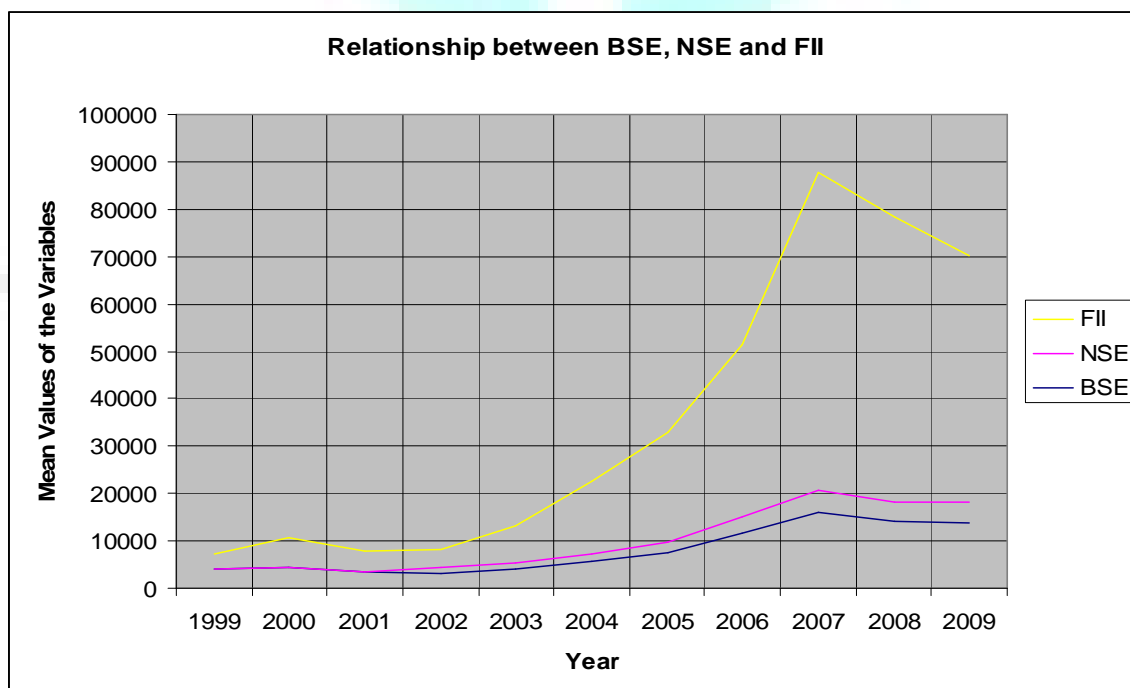
PERFORMANCE OF STOCK MARKETS AND FII

Table No.1 shows the descriptive statistics of the variables. From this table, the mean value of FII increases, the other variables (NSE and BSE) also increases. And also shows the interrelationship between BSE, NSE and FII Inflows in India. Almost all the variables move in the same direction.

TABLE NO. 1: DESCRIPTIVE STATISTICS FOR VARIABLES

Year	Mean			Std. Deviation		
	BSE	NSE	FII	BSE	NSE	FII
1999	4166.62		3032.958	642.9509		978.1156
2000	4501.888		6232.625	531.5		1844.524
2001	3475.922		4322.217	446.7641		1614.59
2002	3230.578	1013.67	3860.026	194.376	59.39326	809.8928
2003	3967.638	1264.071	7901.375	928.3005	299.8477	3854.661
2004	5551.601	1751.35	15323.64	531.4195	171.2462	3131.453
2005	7498.368	2297.104	23182.18	1038.343	284.7412	5434.226
2006	11647.7	3425.871	36317.03	1328.131	335.3277	8584.2
2007	15901.44	4680.646	67097.3	2640.503	829.6906	23533.04
2008	14028.76	4198.833	60063.15	3137.13	909.3233	20420.82
2009	13941.48	4183.446	52167.04	3195.1	901.83	18302.02
TOTAL	7992	2996.452	25409.05	4966.922	1429.076	25833.76

CHAT NO.1



Chat No.1 shows the relationship between BSE, NSE and FII inflows in India. This shows the significant relationships between the variables. The BSE and NSE index move along with the FII Inflows.

HYPOTHESIS TESTING

H₀: There is no significant relationship between BSE market performance and FII inflows in India.

Table 2 shows that the calculated value of significance (0.000) is less than the assumed significance value (0.01) and hence the null hypothesis is rejected and alternative hypothesis is accepted. There is a positive significant relationship between BSE market performance and FII Inflows in India.

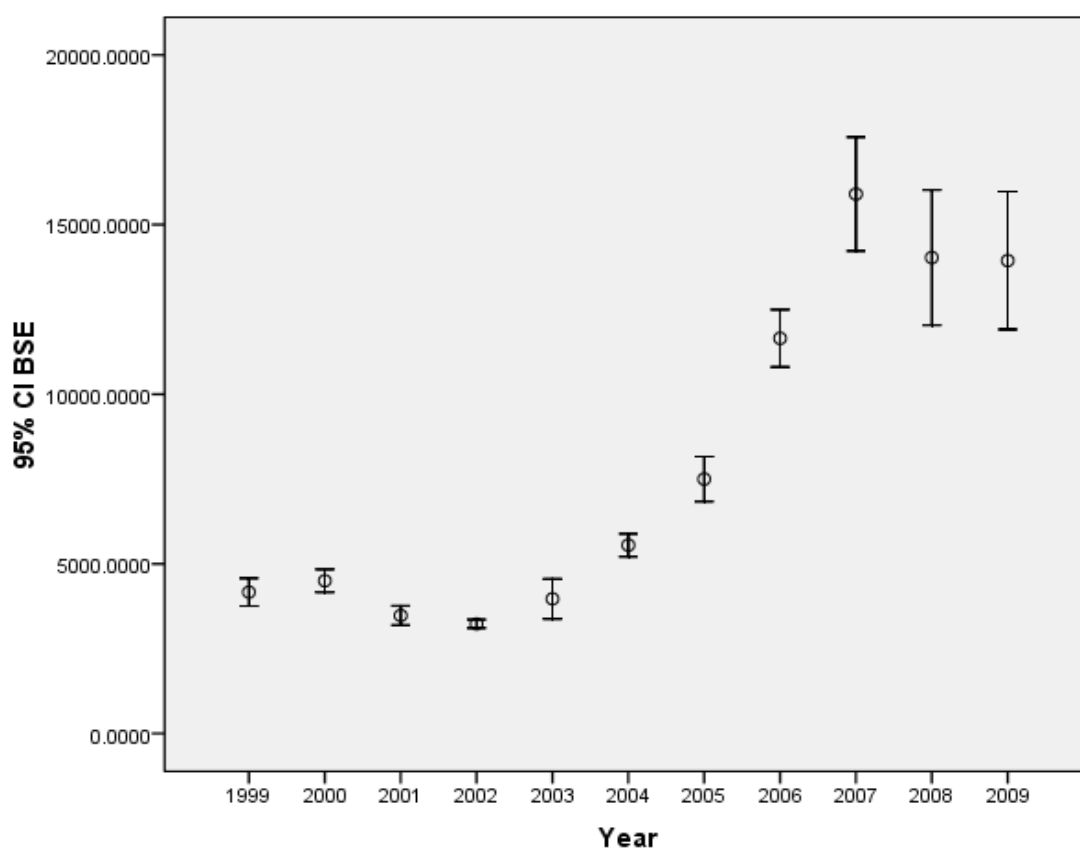
**TABLE 2: TESTING OF HYPOTHESIS
CORRELATIONS**

		FII	BSE
FII	Pearson Correlation	1	.947**
	Sig. (2-tailed)		.000
	N	132	132
BSE	Pearson Correlation	.947**	1
	Sig. (2-tailed)	.000	
	N	132	132

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

H₀: There is no significant relationship between NSE market performance and FII Inflows in India.

Table 3 shows that the calculated value of significance (0.000) is less than the assumed significance value (0.01) and hence the null hypothesis is rejected and alternative hypothesis is accepted. There is a significant relationship between NSE market performance and FII Inflows in India.



The error bar chart of figure 1 shows that the error bars for the years 2004 and 2005 do not overlap. This shows that there is no a significant relationship between the performance of BSE in the year 2003 and 2004. The BSE Indices are highly correlated in the rest of the years.

**TABLE 3: TESTING OF HYPOTHESIS
CORRELATIONS**

		NSE	FII
NSE	Pearson Correlation	1	.928**
	Sig. (2-tailed)		.000
	N	89	89
FII	Pearson Correlation	.928**	1
	Sig. (2-tailed)	.000	
	N	89	89

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

H₀: There is no significant relationship between BSE, NSE markets performance and FII inflows in India.

Table 4 shows that the calculated value of significance (0.000) is less than the assumed significance value (0.01) and hence the null hypothesis is rejected and alternative hypothesis is accepted. There is a noteworthy relationship between BSE, NSE markets performance and FII Inflows in India, which is the same as concluded from the previous analysis.

TABLE: 4 TESTING OF HYPOTHESIS

ANOVA Table

		Sum of Squares	df	Mean Square	F	Sig.
FII * date	Between Groups (Combined)	7.157E10	10	7.157E9	54.625	.000
	Within Groups	1.585E10	121	1.310E8		
	Total	8.743E10	131			
BSE * date	Between Groups (Combined)	2.880E9	10	2.880E8	99.195	.000
	Within Groups	3.514E8	121	2903818.350		
	Total	3.232E9	131			
NSE * date	Between Groups (Combined)	1.507E8	7	2.152E7	59.970	.000
	Within Groups	2.907E7	81	358870.453		
	Total	1.797E8	88			

CONCLUSION

Foreign Institutional Inflows effect varies from country to country. It can affect the productivity and balance of payment of the recipient country. But, in developing countries have been a great need for foreign capital to increase the productivity and to build up foreign exchange reserves to meet the current account deficit. Thus, foreign investment provides a way to get foreign capital.

A more investment by FIIs indicates that they are confident in Indian market. These Foreign institutional investors are highly influence the stock market performance. The sub-prime crisis and other economic conditions had caused a liquidity crunch for these institutions, so they are forced to withdraw money from Indian market so as to repay loans they had taken. These withdrawals had caused panic in Indian stock market. It is required to understand when they withdraw their funds? And when they invest more money?. Because there is a high positive correlation between stock market performance and FII inflows in India.

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UTILIZATION OF E-BANKING SERVICES BY THE CUSTOMERS OF ICICI BANK LIMITED**M. S. ANANTHI****ASST. PROFESSOR****DEPARTMENT OF COMMERCE & RESEARCH CENTRE****SOURASHTRA COLLEGE (AUTONOMOUS)****MADURAI****DR. L. P. RAMALINGAM****ASSOCIATE PROFESSOR****DEPARTMENT OF COMMERCE & RESEARCH CENTRE****SOURASHTRA COLLEGE (AUTONOMOUS)****MADURAI****ABSTRACT**

Banking is undergoing rapid changes world-wide and India is no exception. The financial sector reforms aimed at deregulation, liberalization and globalization of Indian banking have changed the entire scenario of Indian banking. The concept of e-banking includes all types of banking activities performed through electronic networks. In India, the ICICI Bank was the pioneer bank and it kicked off its online banking in 1996 followed by a host of other banks. As information technology services have come into the Indian banking for the last 15 years, not many research works are documented in Indian context. So, an attempt has been made. A sample of 280 customers was chosen for carrying out the survey. The study concludes that 'human contact is necessary' in addition to e-channels. This throws up a challenge to banks as well as policymakers. Technology alone cannot give a sustainable competitive advantage for the banks. But, beyond a point, IT along with 'personal touch' will be necessary for the banks to retain the existing customers and attract new customers. Banks have to incorporate this in their IT and operational strategy. According to Price Waterhouse Coopers report titled 'Banking in 2050', India is likely to emerge as the third largest banking market in the world by 2040 after China and US, leaving behind Japan, Germany and the UK.

KEYWORDS

E-Banking, ICICI Bank, Internet Banking, Online Banking, Utilization.

INTRODUCTION

The banks in the past did not find any attractions in the Indian economy because of the low level of economic activities and meager business prospects. The needs and requirements, hopes and aspirations of the masses remained neglected till the dawn of independence in 1947. After attaining independence, the development underwent radical changes. The beginning of the decade 1980s brought a significant change in the concept of bank marketing because of the use of sophisticated information technology in the banking sector. The advent of electronic fund transfer system made the ways for the induction of ATMs, Direct Deposit of Payroll, Pay by Phone, Point of Sale, Credit and Debit Cards, Automated Clearing House, Credit Deposit Machines, Auto banking and so on. The process of development thus started gaining the momentum. The use of sophisticated technologies particularly by the foreign banks has sizably increased the expectations of customers.

ELECTRONIC BANKING

The prefix "e-" (electronic) is quite being everywhere in today's global world: "e-business", "e-mail", "e-learning", "e-commerce", "e-banking", "e-", "e-" ... are the buzz words. Although e-commerce is a buzz word in today's global economy but it is still in its infancy stages in the financial sector especially in banks in developing countries like Malaysia, Turkey, Nigeria, Pakistan, and India. The beginning of the electronic business (e-business) or electronic commerce (e-commerce) age has been shivering the business environment and breaking out innovative and unconventional ways of doing business. One of the latest outcomes of this e-business is internet banking or online banking or electronic banking (i.e. e-banking). The advent of e-business accompanied with technological innovations and globalization is constantly propelling the businesses organization to redefine their business operations in terms of value chain reengineering and restructuring business models. Likely, the financial sector is metamorphosing under the impact of competitive, regulatory and technological forces.

CONCEPT OF E-BANKING

In information technology era, internet banking is most popular for their services. The concept of e-banking includes all types of banking activities performed through electronic networks. It is the most recent delivery channel of banking services which is used for both business-to-business (B2B) and business-to-customer (B2C) transactions. However, in true sense, e-banking includes activities like payment of bills and invoices, transfer of funds between accounts, applying for a loan, payment of loan installments, sending funds to third parties via emails or internet connections regardless of where the client is located. In India, Internet banking both as a medium of delivery of banking services and as a strategic tool for business development, has gained wide acceptance internationally and is fast catching up with more and more banks entering the fray. Initially, some of the banks permit customers to interact with them and transact electronically with them. Such services include request for opening of accounts, requisition for cheque books, stop payment of cheques, viewing and printing statements of accounts, movement of funds between accounts within the same bank, querying on status of requests, instructions for opening of Letters of Credit and Bank Guarantees etc.

The ICICI Bank was the pioneer bank to use Internet banking for some of its services, in India. ICICI Bank and a lot of other Indian banks use the Internet banking system to provide online banking solution. Some of the more aggressive players in this area such as ICICI Bank Ltd., HDFC Bank Ltd., Axis Bank Ltd., and Citibank offer the facility of receipt, review and payment of bills on-line. These banks have tied up with a number of utility companies.

The ICICI Bank provides a wide array of banking products and financial services to its retail and corporate customers. One of the eminent banking service providers the ICICI Bank kicked off online banking in 1996, followed by a host of other banks. But even for the internet as a whole, 1996 to 1998 marked the adoption phase, while usage increased only in 1999, owing to lower ISP online charges, increased PC penetration and a tech-friendly atmosphere. The 'Infinity' service of ICICI Bank Ltd. also allows online real time shopping mall payments to be made by customers. Banks like ICICI Bank Ltd., HDFC Bank Ltd. etc. are thus looking to position themselves as one stop financial shops. These banks have tied up with computer training companies, computer manufacturers, Internet Services Providers (ISP) and portals for expanding their net banking services, and widening their customer base. The ICICI Bank is considered as one of the 'Big Four Banks' in India along with State Bank of India, HDFC Bank and Axis Bank.

REVIEW OF PREVIOUS STUDIES

The various articles on e-banking do not show a comprehensive picture. A review of some of the relevant literature is given below:

Arne Floh and Horst Treiblmaier (2006) investigate the importance of antecedents of online loyalty such as trust, quality of the web site, quality of the service and overall satisfaction. Rather than investigating which factors drive customers to use online banking instead of offline banking, it addresses the problem of how to keep customers online and loyal to a specific supplier. **Infogile Technologies (2007)** in their case study paper describes the basic concepts, services offered, market survey and technology which enables mobile banking. Over the last few years, the mobile and wireless market has been one of the fastest growing markets in the world and it is still growing at a rapid pace. This opens up huge markets for financial institutions interested in offering value added services. **Malhotra and Singh (2007)** carried out a study to find the internet banking (i-banking) adoption by the banks in India. The study suggests that larger banks or banks with younger age, private ownership and lower branch intensity possess high probability of adoption of this new technology. **Rajesh Kumar Srivastava (2007)** conducted a study on usage of internet banking in Mumbai. The research is focused on what are the customer's perceptions about internet banking and what are the drivers that drive consumers. How consumers have accepted internet banking and how to improve the usage rate were the focus of research area in this study. The research corroborated the conceptual framework stating that if skills can be upgraded there will be greater will to use internet banking by consumers. **Kamakodi, N., (2008)** an Executive Director of India's oldest private sector bank 'City Union Bank Limited', Kumbakonam, Tamil Nadu, in an article highlighted that banks like ICICI in India used technology as a 'competitive advantage', and successfully became the largest private sector bank in India within five years of commencing operations. ATMs, cell phone banking, anywhere anytime banking and internet banking are the most popular services, which have come to the market, and all banks are competing with ICICI bank to offer these services. **Ahasanul Haque et al. (2009)** in their research paper dealt with the perception of Malaysian online customers on internet banking. This study shows that only protected transaction, have significant impact on consumers' perception about e-banking security, followed by service quality and regulatory frame work issues. **Shripad Vaidya (2009)**, a banking specialist from the Banking Domain Group of Tata Consultancy Services (TCS), in a paper discusses a case for comprehensive utilization in line with the global trends of adopting a completely evolved Internet Banking channel. This paper also gives a glimpse on how some of the leading banks and financial institutions across the globe make effective use of the Internet Banking channel to garner impressive results. Based on the observation, it is concluded that most of banks across the globe predominantly use Internet Banking channel for cost reduction or revenue growth; whereas very few banks seem to adopt this channel comprehensively, and that is true even for some of the banks with direct platform. **Rahmath Safeena, Hema Date and Abdullah Kammani (2011)** carried out a study on internet banking adoption in an emerging economy. This study determines the factors influencing the consumer's adoption of internet banking in India and hence investigates the influence of perceived usefulness, perceived ease of use and perceived risk on use of internet banking. It is an essential part of a bank's strategy formulation process in an emerging economy like India.

NEED OF THE STUDY

Banking is undergoing rapid changes world-wide and India is no exception. The financial sector reforms aimed at deregulation, liberalization and globalization of Indian banking have changed the entire scenario of Indian banking. Added to this is the IT revolution which has entirely affected the way of doing banking business and has considerably widened the range of products offered by banks. Electronic banking plays a vital role in the economic development of a country. Due to immense advances of information and communication technology (ICT), it certainly introduced new dimensions for the global E-banking community.

As India is taking giant leaps towards globalization, Internet banking is the sector to be studied with great interest. In India, the leading private sector bank and the eminent banking service providers, i.e. ICICI Bank Limited, kicked off its online banking service in 1996, followed by a host of other banks viz. HDFC, Axis, Citibank, Federal Bank, etc. Now, all the banks in India have either totally implemented 'Core Banking Systems' or halfway through.

In spite of various innovative e-banking services offered by many banks in India, the question of how the customers are utilizing the e-banking services has not been investigated so far. As customers get more and more educated, getting insight about modern banking, via Internet banking has evolved as primary area of concern for all leading and upcoming banks in India. As IT services have come into the Indian banking only in the last 15 years, not many research works are documented in Indian context.

At the backdrop, to study the utilization of e-banking services by the customers are quite important for formulating sound policies for the future. An analysis of utilization of e-banking services by customers might be considered sound interesting at this juncture. Hence, the study titled "Utilization of E-Banking Services by the Customers of ICICI Bank Limited in Madurai City" has been chosen for current research. This research work provides an insight analysis on the following questions:

- How the customers are utilizing the e-banking services?
- What are the factors motivated for the utilization of various e-banking services of ICICI Bank?

The research will assist bank administration to ascertain a better understanding of customers' utilization of automated services in bank's products offering and their attitude.

SCOPE OF THE STUDY

ICICI Bank Limited offers services to retail as well as corporate customers. But, the researcher has undertaken this study from the view point of utilization of e-banking services by the customers of ICICI Bank Limited in Madurai city. Hence, the scope of the study has also been limited to retail customers only.

OBJECTIVES OF THE STUDY

The main objectives of the study are –

- To analyze the extent of utilization of e-banking services by the customers of ICICI Bank Limited, and
- To understand the motivational factors for the utilization of various e-banking services.

RESEARCH METHODOLOGY

This is an exploratory research that evaluated different factors that how far the customers in Madurai city are utilizing the e-banking services. Data collection methods are an integral part of research design. Both primary and secondary data are used in this research. A structured interview schedule was used to collect the primary data to answer the research questions and objectives regarding utilization pattern of e-banking services by the customers of ICICI Bank in Madurai city. The time and cost constraints and difficulty to access to the potential respondents in Madurai city caused the researcher to use the non-probability method of convenience sampling. For distributing the interview schedules the ICICI Bank branches and ATMs location in Madurai city were chosen. The survey was conducted generally via face-to-face interviews. After consulting the experts and banking officials, 280 samples were taken for this research.

RESULTS AND DISCUSSION

UTILIZATION OF E-BANKING SERVICES

The main objective of the study is to analyze the extent of utilization e-banking services by the customers of ICICI Bank Limited. The e-banking services of ICICI Bank such as ATM, Cards, Tele (Phone) Banking, Internet Banking, Mobile Banking, Bill Payment Service, Electronic Clearing Service (ECS), Electronic Fund Transfer (EFT), and Investment in Securities are taken into account for study. In order to achieve the said objective, the most utilized e-banking services by the sample customers are gathered and the opinion is presented in Table 1.

TABLE – 1: UTILIZATION OF E-BANKING SERVICES OF ICICI BANK

E-Banking Services	Low Age Group		Middle Age Group		High Age Group		Overall	
	No.	%	No.	%	No.	%	No.	%
ATM	103	100.0	99	100.0	78	100.0	280	100.0
Cards	102	99.0	99	100.0	77	98.7	278	99.3
Tele Banking	55	53.4	31	31.3	56	71.8	142	50.7
Internet Banking	27	26.2	60	60.6	7	8.9	94	33.6
Mobile Banking	10	9.7	13	13.1	10	12.8	33	11.8
Bill Payment Service	17	16.5	8	8.1	17	21.8	42	15.0
ECS	65	63.1	23	23.2	35	44.9	123	43.9
EFT	22	21.3	12	12.1	21	26.9	55	19.6
Investment in Securities	27	26.2	34	34.3	30	38.5	91	32.5

(Percentages for a total of 103, 99, 78, and 280 for Low, Middle, High, and Overall Age Groups respectively)

It is found from Table 1 that the most utilized e-banking services in the low age group respondents are – ATM (100%), Cards (99%), Electronic Clearing Services (63.1%), and Tele Banking (53.4%). 'Internet Banking' and 'Investment in Securities' utilized in equal proportions (i.e. 26.2%). The electronic fund transfer service has been utilized to the extent of 21.3 per cent. Followed this, bill payment service (16.5%) and mobile banking (9.7%) comes in order.

In the case of middle age group respondents, ATM is mostly utilized by all the cent per cent respondents. In this category, all the respondents utilized the card services also. Next to this, the internet banking services utilized by 60.6 per cent of respondents, investment in securities by 34.3 per cent, and Tele Banking to the extent of 31.3 per cent. Remaining services are also utilized to some extent.

Regarding high age group respondents, ATM is utilized by all the sample respondents (i.e. 100%). Next to this, card accounts for 98.7 per cent, tele banking 71.8 per cent, electronic clearing services 44.9 per cent, and investment in securities 38.5 per cent. The remaining services, such as, electronic fund transfer, bill payment service, mobile banking and internet banking accounts for 26.9, 21.8, 12.8, and 8.9 per cent respectively.

Overall, all the respondents in the study unit utilized the ATM service, followed that card services, tele banking, electronic clearing service, accounted for a major portion, i.e. 99.3 per cent, 50.7 per cent, and 43.9 per cent respectively. It is understood from the above analysis that majority of respondents utilized the ATM and card services mostly from the ICICI Bank.

ASSOCIATION BETWEEN THE PERIOD OF UTILIZATION OF E-BANKING SERVICES AND THE AGE GROUP OF RESPONDENTS

The association between the age group of sample respondents and the period of utilization of e-banking services such as ATM, Cards, Tele Banking, Internet Banking, Mobile Banking, Bill Payment Service, ECS, EFT, and Investment in Securities has been analyzed with the help of chi-square test. For finding out the association, a three-way table has been uniformly framed. For this purpose, the respondents have been grouped into three group viz. low, middle, and high age groups. In addition, the period of utilization has also been grouped into three viz. less than 3 years, 3 to 7 years, and more than 7 years for e-banking services like ATM, Cards, Tele banking, and Investment in Securities. For other e-banking services like Internet banking, Mobile banking, Bill Payment Services, Electronic Clearing Service (ECS) and Electronic Fund Transfer (EFT), the period of utilization grouped as less than 6 months, 6 to 12 months, and more than 1 year. Based on this group, the chi-square test has been computed. The null hypothesis and the alternative hypothesis framed are given below:

Null Hypothesis (H_0): There is no association between the age group of respondents and the period of utilization of various e-banking services.

Alternative Hypothesis (H_1): There is association between the age group of respondents and the period of utilization of various e-banking services.

The 3 x 3 table (3 rows and 3 columns) of chi-square test has a degree of freedom of 4 and shows a table value of 9.488 at 5 per cent level of significance. The computed chi-square value for the various e-banking services is shown in the Table 2.

TABLE – 2: PERIOD OF UTILIZATION OF E-BANKING SERVICES AND AGE GROUP OF RESPONDENTS – CHI-SQUARE TEST

S. No.	E-Banking Services	Computed Chi-square Value	Hypothesis Result
1	ATM	43.00	Rejected
2	Cards	23.58	Rejected
3	Tele Banking	14.66	Rejected
4	Internet Banking	18.64	Rejected
5	Mobile Banking	9.00	Accepted
6	Bill Payment Service	41.12	Rejected
7	Electronic Clearing Service (ECS)	29.72	Rejected
8	Electronic Fund Transfer (EFT)	7.73	Accepted
9	Investment in Securities	45.67	Rejected

It is observed from the Table 2 that the computed chi-square value is greater than 5 per cent critical value for the e-banking services viz. ATM, Cards, Tele Banking, Internet Banking, Bill Payment Service, ECS, and Investment in Securities. Hence, the null hypotheses for these e-banking services are rejected. So, it is concluded that there is association between the age group of respondents and the e-banking services like ATM, Cards, Tele Banking, Internet Banking, Bill Payment Service, ECS, and Investment in Securities.

From the Table 2 it is also clear that the calculated chi-square value is less than the table value for 'mobile banking' and 'Electronic Fund Transfer'. So, the null hypothesis is accepted and it is said that there no association between the age group of respondents and the e-banking services viz. mobile banking and electronic fund transfer.

RANKING OF E-BANKING SERVICES BASED ON USAGE

The e-banking services such ATM, cards, tele banking, internet banking, mobile banking, bill payment services, electronic clearing service, electronic fund transfer, and investment in securities are utilized by most of the customers of ICICI Bank. Based on the usage of frequency, the customers are asked to rank the selected nine e-banking services. Weighted score method has been adopted for ranking the services by different age group respondents.

Under the weighted score method, the first rank assigned by the sample respondent to the e-banking service will be given the highest weightage score of 'nine' and the lowest score of 'one' has been awarded to the ninth rank. For each e-banking service, the total respondents for each rank have been found out. Then the score has multiplied with the number of respondents in each rank. All the multiplied scores are added from first to last rank. The resultant figure will be the weighted score. Then the weighted score has been divided by the total sample respondents for getting the mean score for each service. Then ranks are assigned to each e-banking service in descending order. Thus, ranks for each e-banking service are analyzed

RANKING BY LOW AGE GROUP RESPONDENTS

The ranks assigned by the low age group respondents towards the various e-banking services based on their utilization have been attempted. The result it displayed in Table 3.

TABLE – 3: RANKING OF E-BANKING SERVICES BASED ON THE FREQUENCY OF UTILIZATION BY LOW AGE GROUP RESPONDENTS

E-Banking Services	Weighted Score	Mean Score	Rank
ATM	923	8.96	I
Cards	821	8.05	II
Tele Banking	402	7.31	III
Internet Banking	187	6.93	IV
Mobile Banking	61	6.10	VII
Bill Payment Service	107	6.29	V
Electronic Clearing Service	390	6.00	VIII
Electronic Fund Transfer	132	6.00	VIII
Investment in Securities	168	6.22	VI

It could be found from Table 3 that most of the sample respondents utilized the 'ATM' service frequently. The calculated weighted score for this service is 923 and the mean score is 8.96 which are highest score among the various e-banking services. Hence, the first rank has been assigned to this service by the low age group respondents. The next rank, i.e. second goes to 'Cards', third to 'Tele Banking' and fourth to 'Internet Banking'. The 'Bill Payment Service' ranked in fifth position by scoring a mean score of 6.29, 'investment in securities' secured the sixth rank and 'mobile banking' placed in seventh position. The eighth rank was assigned to two services by the sample respondents, i.e. 'Electronic Clearing Service' and 'Electronic Fund Transfer'. These two services scored a weighted score of 390 and 132 respectively but the mean score for these two services is six.

RANKING BY MIDDLE AGE GROUP RESPONDENTS

The ranks allotted by the middle age group respondents towards the various e-banking services based on their utilization have been attempted. Table 4 exhibits this fact.

TABLE– 4: RANKING OF E-BANKING SERVICES BASED ON THE FREQUENCY OF UTILIZATION BY MIDDLE AGE GROUP RESPONDENTS

E-Banking Services	Weighted Score	Mean Score	Rank
ATM	878	8.87	I
Cards	803	8.11	II
Tele Banking	215	6.94	IV
Internet Banking	459	7.65	III
Mobile Banking	87	6.69	V
Bill Payment Service	47	5.88	VII
Electronic Clearing Service	133	5.78	VIII
Electronic Fund Transfer	54	4.50	IX
Investment in Securities	227	6.68	VI

It is inferred from Table 4 that the middle age group respondents ranked the e-banking services based on their usage. The first and second rank goes to 'ATM' and 'Cards' respectively based on the mean score of 8.87 and 8.11. The 'Internet Banking' ranked in third position (mean score 7.65) and the 'Tele Banking' in fourth position (mean score 6.94). Fifth rank is assigned to 'Mobile Banking'. Here also the 'Investment in Securities' placed in sixth position. The 'Bill Payment Service' moved to the seventh position by the middle age group respondents. The 'Electronic Clearing Service' and 'Electronic Fund Transfer' positioned in eighth and ninth rank respectively.

RANKING BY HIGH AGE GROUP RESPONDENTS

The ranks assigned by the high age group respondents towards the various e-banking services based on their utilization have been attempted. The result of the study is presented in Table 5.

TABLE – 5: RANKING OF E-BANKING SERVICES BASED ON THE FREQUENCY OF UTILIZATION BY HIGH AGE GROUP RESPONDENTS

E-Banking Services	Weighted Score	Mean Score	Rank
ATM	696	8.92	I
Cards	618	8.03	II
Tele Banking	378	6.75	III
Internet Banking	42	6.00	IV
Mobile Banking	56	5.60	VIII
Bill Payment Service	98	5.76	VI
Electronic Clearing Service	203	5.80	V
Electronic Fund Transfer	118	5.62	VII
Investment in Securities	168	5.60	VIII

It is observed from Table 5 that the four e-banking services viz. ATM, Cards, Tele Banking, and Internet Banking were placed in first to fourth rank respectively by the high age group respondents also. The computed mean score for these services are 8.92, 8.03, 6.75, and 6 respectively. The 'Electronic Clearing Service' forwarded to fifth rank by the high age group respondents. The sixth and seventh rank goes to 'Bill Payment Service' and 'Electronic Fund Transfer' respectively. Here the 'Mobile Banking' and the 'Investment in Securities' placed in eighth position by the high age group respondents and the mean score is 5.60 for these services.

The general observation is irrespective of age group; all the sample respondents mostly utilized the e-banking services of ICICI Bank such as ATM, Cards, Tele Banking, and Internet Banking frequently. Hence, the first four ranks scored by these services in all age group category. The usage in remaining e-banking services may differ from one age group to another age group which is clear from Tables 3 to Tables 5.

UTILIZATION OF BRANCH COUNTER OF ICICI BANK

As the e-banking services do not require the utilization of branch counter, an attempt is made to know the number of customers using the branch counter. For this purpose a question has been posed to the sample respondents. The responses received from the respondents are shown in the following Table 6.

TABLE – 6: UTILIZATION OF BRANCH COUNTER OF ICICI BANK

Response	Number of Respondents			
	Low Age Group	Middle Age Group	High Age Group	Overall
Yes	101 (98.1%)	98 (98.9%)	78 (100.0%)	277 (98.9%)
No	2 (1.9%)	1 (1.1%)	-	3 (1.1%)
Total	103 (100.0)	99 (100.0)	78 (100.0)	280 (100.0)

Table 6 clearly reveals that out of 280 sample respondents a vast majority of 98.9 per cent utilized the branch counter of ICICI Bank. Only a minimum of 3 respondents constituting 1.1 per cent do not utilize the branch counter. In the case of low age group 98.1 per cent utilized the branch counter and it 98.9 per cent in middle age group. But all the respondents (i.e. cent per cent) of high age group have utilized the branch counter. The general observation is irrespective of age all the sample respondents in different age groups utilized the branch counter of ICICI Bank.

REASON FOR UTILIZING THE BRANCH COUNTER OF ICICI BANK

Out of 280 sample respondents, 277 respondents utilized the branch counter of ICICI Bank. So, the reason for utilizing the branch counter has been attempted. The findings are depicted in Table 7.

TABLE – 7: REASONS FOR UTILIZING THE BRANCH COUNTER OF ICICI BANK

Reasons	Low Age Group		Middle Age Group		High Age Group		Overall	
	No.	Rank	No.	Rank	No.	Rank	No.	Rank
To make enquiry	98	I	93	I	77	I	268	I
To withdraw huge amount	65	III	44	III	56	III	165	III
To make a bulk cash deposit	22	IV	5	IV	8	VIII	35	V
To open fixed deposit	14	V	9	VI	26	IV	41	IV
To mature/renew fixed deposit	11	VI	1	VII	13	V	25	VI
To create new relationship	1	VIII	-	-	9	VII	10	VIII
To buy gold coins	7	VII	4	V	10	VI	21	VII
To deposit cheques	86	II	81	II	62	II	229	II

It is evident from Table 7 that the first and the foremost reason stated by the majority of sample respondents for using the branch counter is 'to make enquiry'. Hence, first rank is assigned to this reason. Next to this 'to deposit cheques', and 'to withdraw huge amount' comes in order as second and third. These three reasons have been mainly stated by all the age group respondents and overall the same result has been displayed.

The reason 'to make a bulk cash deposit' has been given fourth rank by the low and middle age group respondents whereas eighth rank has been assigned by the high age group respondents. Overall it is placed in fifth position. The reason 'to open fixed deposit' is positioned in fifth by the low age group respondents, sixth by the middle age group respondents, fourth by the high age group as well as by overall respondents.

There is no middle age group respondents for the reason 'to create new relationship' among the bankers. But this reason has been ranked as seventh by the high age group respondents and eighth by the low age group and overall respondents.

The reason 'to buy gold coins' has been placed in seventh by the overall respondents as well as low age group respondents whereas it is placed in fifth and sixth by the middle and high age groups respectively.

From the above analysis, the researcher comes to a conclusion that the branch counter of ICICI Bank is mostly utilized for the reasons such as 'to make enquiry', 'to deposit cheques' and 'to withdraw huge amount'.

DEMANDING OF E-BANKING SERVICES

A question regarding the demanding of e-banking services from the ICICI Bank during the last six months (i.e. April to September 2011) by the sample respondents has been attempted. The opinion received from the respondents is highlighted in Table 8.

TABLE – 8: DEMANDING OF E-BANKING SERVICES DURING THE LAST SIX MONTHS

Response	Number of Respondents			
	Low Age Group	Middle Age Group	High Age Group	Overall
Yes	69 (66.9%)	54 (54.5%)	41 (52.6%)	164 (58.6%)
No	34 (33.1%)	45 (45.5%)	37 (47.4%)	116 (41.4%)
Total	103 (100.0)	99 (100.0)	78 (100.0)	280 (100.0)

Table 8 exhibits that out of 280 respondents, a majority of 164 respondents constituting 58.6 per cent demanded e-banking services from the ICICI Bank during April to September 2011. The low age group respondents demanded more i.e. 66.9 per cent when compared to other age groups. However, around 41.4 per cent not demanded so.

In order to see whether there is any relationship between the e-banking services demanded and age group of respondents, chi-square test has been applied. The null hypothesis framed is given below:

Null Hypothesis: "There is no significant relationship between the e-banking services demanded and the age group of respondents".

The calculated chi-square value is 4.830 which is less than the table value of 5.991 at the 5 per cent level of significance. Hence, the null hypothesis is accepted. So, it is concluded that there is no significant relationship between the e-banking services demanded and the age group of respondents.

REASON FOR DEMANDING E-BANKING SERVICES

There are so many reasons for demanding e-banking services by the customers of ICICI Bank. The reasons may be low cost, easy to use, faster transaction, convenient, saves time, anywhere anytime, to use latest service, and no need to go branch of the ICICI Bank. As the respondents were stated more than one reason, the results have been interpreted by using ranking method. The top most liked reason is given the first rank and the others come in order. The result of analysis is exhibited in Table 9.

TABLE – 9: REASONS FOR DEMANDING E-BANKING SERVICES

Reasons	Low Age Group		Middle Age Group		High Age Group		Overall	
	No.	Rank	No.	Rank	No.	Rank	No.	Rank
Low cost	55	I	40	I	26	I	121	I
Easy to use	34	IV	26	IV	26	I	86	III
Faster transaction	25	VII	27	III	21	III	73	VI
Convenient	37	II	30	II	20	IV	87	II
Saves times	36	III	24	V	24	II	84	IV
Anywhere Anytime	30	VI	26	IV	19	V	75	V
To use latest service	31	V	18	VI	24	II	73	VI
No need to go branch	8	VIII	3	VII	5	VI	16	VII

Table 9 explains the reasons for demanding e-banking services from the ICICI Bank. In the total sample, 164 respondents demanded e-banking services. According to the low age group respondents, due to 'low cost' majority of them have demanded the e-banking services. Hence, this reason has been ranked as 'first'. The next rank goes to the 'convenient' reason, and third to 'saves times'. The fourth to eighth ranks are assigned to the reasons viz. easy to use, to use latest service, anywhere anytime, faster transaction, and no need to go branch respectively.

From the opinion of middle age group respondents, it is understood that the reason 'low cost' as the first and foremost reason for demanding e-banking services following this the reasons 'convenient', and 'faster transaction' comes in order. Two reasons such as 'easy to use' and 'anywhere anytime' placed in fourth position. 'Saves times', 'to use latest service', and 'no need to go branch' occupied the fifth, sixth and seventh ranks respectively.

An equal number of 26 respondents in high age group have demanded the e-banking services due to 'low cost' and 'easy to use'. Hence, these reasons have been ranked as 'first'. The second rank goes to the 'saves times' and 'to use latest service' reasons, and third to 'faster transaction'. The reasons 'convenient', 'anywhere anytime', and 'no need to go branch' are placed in fourth, fifth and sixth ranks respectively.

The overall result indicated in Table 9 shows that the first, second, and third ranks are assigned to the reasons viz. 'low cost', 'convenient', and 'easy to use'. The reason 'saves times' placed in fourth position, and fifth rank goes to 'anywhere anytime'. The reasons 'faster transaction' and 'to use latest service' occupies the sixth position. The final and the seventh rank positioned to the 'no need to go branch' reason.

It is concluded that the reason 'low cost' has been attracted to most of the respondents irrespective of age group which is clear from Table 9. So, the age-wise groups as well as overall respondents have placed it in first position. Next to this, the reason 'convenient' has been positioned in second except the high age group respondents.

TYPE OF E-BANKING SERVICES DEMANDED RECENTLY

The respondents have demanded a few e-banking services according to their choice during the last six months. In the sample study out of 280 respondents, 164 respondents have demanded e-banking services due to various reasons. What are the services demanded by them are attempted here and the result is depicted in the following Table 10.

TABLE – 10: TYPES OF E-BANKING SERVICES DEMANDED RECENTLY

E-Banking Services	Low Age Group		Middle Age Group		High Age Group		Overall	
	No.	Rank	No.	Rank	No.	Rank	No.	Rank
Cards	14	IV	13	III	15	IV	42	III
Tele Banking	17	II	6	VI	13	V	36	V
Internet Banking	17	II	18	II	17	III	52	II
Mobile Banking	1	VII	4	VIII	22	I	27	VIII
Bill Payment Service	11	V	5	VII	18	II	34	VI
Electronic Clearing Service	44	I	11	IV	12	VI	67	I
Electronic Fund Transfer	7	VI	7	V	17	III	31	VII
Investment in Securities	15	III	22	I	1	VII	38	IV

It is observed from Table 10 that the e-banking service 'Electronic Clearing Service' has been demanded by 67 sample respondents in overall. It is the highest number demanded among various services. Hence, this service has been placed in first rank. This service has been placed in first, fourth, and sixth position by the low, middle, high age group respondents respectively.

The 'internet banking' service has been demanded as 'second' by the overall respondents as well as by the low and middle age group respondents whereas the high age group respondents demanded it as their third choice. Third demand goes to 'cards' services of ICICI Bank by the overall respondents. The same choice has also been given by the middle age group respondents, and the low and high age group respondents demanded as fourth. The overall results also shows that the 'investment in securities' service has been demanded in fourth, 'tele banking' as fifth, 'bill payment service' as sixth, 'electronic fund transfer' as seventh, and 'mobile banking' as their eighth demand.

The 'investment in securities' has been demanded as first by the middle and high age group respondents whereas it is demanded thirdly by the low age group respondents. The type of e-banking services demanded recently differs from one age group to another. But from the overall analysis it is clear that most of the respondents in the sample unit have demanded the e-banking services like electronic clearing service, internet banking, and cards recently.

MOTIVATIONAL FACTORS FOR E-BANKING SERVICES

In general, a customer can not utilize any services without motivational factors. E-banking service is not an exception to this. Here also customers can be motivated by some factors for the utilization of e-banking services of ICICI Bank. Garrett's ranking technique was adopted for analyzing the motivational factors. For the application of Garrett's ranking technique, the sample customers were asked to rank the factors which mainly motivated them in utilizing the e-banking services of ICICI Bank. The customer who responded to the motivational factors is taken into consideration for analysis. The rank assigned to each factor by the sample respondents has been converted into per cent position by using the following formula:

$$\text{Per cent Position} = \frac{100 (R_{ij} - 0.5)}{N_j}$$

Where,

R_{ij} = Rank given by the j^{th} sample respondent for the i^{th} factor, and

N_j = Number of factors ranked by the j^{th} sample respondent.

The per cent position of each rank thus obtained has been converted into score by referring the table given by Garrett. Then the score has been multiplied with the number of respondents in each rank for each factor and the scores of all respondents for each factor have been then added together and the total score has been placed against that particular factor. The total scores of all respondents for each factor were divided by the number of respondents experiencing that motivation. Thus the mean scores for each factor were arrived and ranks were allotted. The factor which received the highest mean score is taken as the first one and the lowest as the last one. The above procedure was adopted for all the e-banking services separately and the overall analysis presented in Table 11.

TABLE – 11: OVERALL MOTIVATIONAL FACTORS FOR E-BANKING SERVICES OF ICICI BANK

E-Banking Services	Main Factors Motivated for Utilization	
	First Choice	Second Choice
ATM	Withdrawal of cash	Mini Statement of a/c
Cards	No Need to carry cash	Fear of theft of money
Tele (Phone) Banking	Balance enquiry/complaints	No charges
Internet Banking	Downloading applications and accounts statement	Individual access
Mobile Banking	Recent transactions	Mini statement and account history
Bill Payment Service	Saves time	Low charges
Electronic Fund Transfer	Immediate effective	Saves time
Electronic Clearing Service	Auto credit of dividend and interest	No charges
Investment in Securities	Low brokerage	Easy trade in stock market

The above Table 11 reveals the main motivational factors for utilization of e-banking services by the customers of ICICI Bank. The utilization of service 'ATM' for withdrawal of cash and mini statement of account; 'Cards' for no need to carry cash and fear of theft of money; 'Tele Banking' for balance enquiry / complaints and no charges; 'Internet Banking' for the purpose of downloading applications and accounts statement and individual access; 'Mobile Banking' for getting recent transactions and mini statements and account history information; 'Bill Payment Service' offers time saving and low charges; 'Electronic Fund Transfer' for transfer of money with immediate effect and saving of time; 'Electronic Clearing Service' for the auto credit of dividend and interest and no charge for transactions; and 'Investment in Securities' has been utilized for low brokerage and easy operation of trade in stock market.

FINDINGS

The following are the important findings of the study:

1. Most of the respondents utilized the card service and tele banking services as their top most priority followed that they utilized the electronic clearing services of the bank.
2. According to the frequency of usage, the e-banking services such as ATM, Cards, Tele Banking placed in first, second and third position respectively. Next 'internet banking' comes in order.
3. Even though in IT era, customers feels that 'Human contact is necessary'. This was proved by 98.9 per cent of respondents by visiting branch counter.
4. The demanding of e-banking services also going up. Around 59 per cent of respondents demanded e-channels further.

SUGGESTIONS

The average Indian's growing demand for personalized, quick and cost-effective services is pushing banks to innovate further. The following are some smart new offerings of other banks which are not offered by the ICICI Bank. As ICICI Bank is one of the leading private sector banks in India, the researcher suggest the management of the bank to implement these offerings within a quick span of time to its customers in all districts.

- The IDBI Bank has launched its Magic Card for salary account holders. This debit card masquerades as a credit card with much lower interest rate than regular credit cards for cash withdrawals up to three times of salary.
- With ATMs mushrooming and net banking gaining steam, one can excuse the 8 a.m. to 8 p.m. branch times, but those with lockers have long felt the pinch. To fix this problem, IDBI Bank and Standard Chartered have recently introduced locker facility at two of their branches in Mumbai.
- The Axis Bank has introduced the anytime ATM PIN generation at its ATMs without waiting for days for the bank to courier across a secured PIN when there is a need of a duplicate one or in case of forgotten of old one.
- When 'instant culture' has taken over everything, from coffee to the way we communicate, why should banking remain impervious? Say hello to instant loans which was unveiled by the Axis Bank recently for instant car loan facility.
- IndusInd Bank has introduced a facility, at all its ATMs, that lets you choose currency denomination between Rs.100, Rs.500 and Rs.1,000. This facility is not restricted to the bank's cardholders. Any VISA/Master Card/NFS Card owner can utilize it. For example if you need to withdraw Rs.2,000, you can choose to take 10 Rs.100 and one pink one (i.e. Rs.1,000) of your choice.
- The State Bank of India has introduced the 'green channel counters' at its branches. This is an attempt to do away with queues and introduce paperless banking. This device can be handled by customers themselves for depositing / withdrawing cash and fund transfers.

CONCLUSION

The results indicate that the majority of the customers are very comfortable and willing to use e-banking channels. At the same time, 98.9 per cent utilized the branch counter. It implies that 'human contact is necessary' in addition to e-channels. This throws up a challenge to banks as well as policymakers. Technology alone cannot give a sustainable competitive advantage for the banks. When all banks introduce IT in their technology, IT will lose its position as a differentiator. Beyond a point, IT along with 'personal touch' will be necessary for the banks to retain the existing customers and attract new customers. Banks have to incorporate this in their IT and operational strategy.

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A SYSTEM FOR EMBEDDING FIVE TYPES OF EMOTIONS IN SPEECH: USING TIME DOMAIN PITCH SYNCHRONIZATION OVERLAP AND ADD (TDPSOLA)

MAMTA SHARMA

LECTURER

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
LOVELY PROFESSIONAL UNIVERSITY
PHAGWARA**

MADHU BALA

LECTURER

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
LOVELY PROFESSIONAL UNIVERSITY
PHAGWARA**

ABSTRACT

Speech is the primary means of communication between people. To interact with computer, more naturally embedding emotions in speech is a step in this direction. The aim of the paper is to make an attempt to shed light on the way the system for embedding different emotions in the speech using the Time domain pitch synchronization overlap and Add (TD-PSOLA), that is used to enhance the neutral vocal expressions impact through the use of this system, with some required target emotions by selecting the modified parameters that will make humans perceive a targeted emotion in the way the system wants them to understand. An experiment was performed using the Punjabi voices both male and female which led to clear and synthesized emotional speech by using the Time domain pitch synchronization overlap and Add (TD-PSOLA). The experiment concludes with the findings that the system developed with the use of TD-PSOLA can be successfully used to embed emotions in the input neutral speech leading to better human understanding and evaluation of emotional speech.

KEYWORDS

Embedding Emotion, Speech, Speech Modeling, Time Domain Pitch Synchronization.

1. INTRODUCTION

This Paper concerns the process of embedding an emotion in the speech using Time Domain Pitch Synchronization Overlap and Add (TDPSOLA). The goal was to modify the pitch of the speech that can portray emotion with different levels of intensity. To achieve this, the system was based on theoretic frameworks developed by Psychologists to describe emotions.

The basic goal is to perform synthesize the speech so that it sounds natural. To increase the naturalness of the synthesized speech, the synthesized speech should deliver certain content in right emotion therefore making the speech and content more believable. Emotions can make the interaction with the computer more natural because the system reacts in ways that the user expects. Embedding emotion to the speech is a step in this direction. In this paper it is described that recognition for synthesis system is to automatically select a set of possible parameter values that can be used to resynthesize emotional speech. The system deals with the synthesis using TD-PSOLA. The modification of the input speech is only prosody modifications.

2. LITERATURE REVIEW

2.1 SPEECH PRODUCTION

Speech sounds are produced by causing modulation of the airflow through constrictions in the airways between the larynx and the lips. This modulation of the flow gives rise to the generation of sound. The acoustic process involved in production of speech sounds can be modeled as in Fig-1 shown under the figures section.

When the vocal folds are appropriately positioned and the pressure is raised in the airways below the glottis, the folds are set into vibration and the airflow through the glottis is modulated periodically. The spectrum of this modulated flow is rich in harmonics. The frequency of vibration of the vocal folds during normal speech production is usually in the range 80-160 Hz for adult males, 170-340 Hz for adult females, and 250-500 Hz for younger children [14].

The transfer function of the vocal tract for vowels has a relatively simple form for the special case in which the area function is uniform, the acoustic losses are neglected, and the radiation impedance at the mouth opening is assumed to be small. For a cylinder tube of length x , this transfer function is expressed as equation (Eq-1). The velocity of the sound, v , at body temperature is 354 m/s, and the length of a typical adult male vocal tract is 0.17 m [14]. For male speech the normal range of variation is $F_1 = 180\text{-}800$ Hz, $F_2 = 600\text{-}2500$ Hz, $F_3 = 1200\text{-}3500$ Hz, and $F_4 = 2300\text{-}4000$ Hz. The average distance between formants is 1000 Hz. Females have on the average 20% higher formant frequencies than males, but the relation between male and female formant frequencies is nonuniform and deviates from a simple scale factor [3].

2.2 SPEECH MODELING

2.2.1 SOURCE FILTER SPEECH MODELING

A rather useful model of speech production consists of a filter that is excited by either a quasiperiodic train of impulses (for voiced sounds) or a random noise source (for unvoiced sounds). The source-filter model realized by electrical circuits was first proposed by H. Dudley at Bell Laboratories in the 1930s [4]. At present, two types of the source-filter models are useful for speech processing: the all-pole model known as the autoregressive (AR) model, and the pole-zero model known as the autoregressive moving average (ARMA) model [5]. The AR model of a vocal tract is well known in speech processing as a linear predictive coding (LPC) model [6]. Another type of the source-filter speech model is the cepstral model using homomorphic signal processing based on the idea of the log magnitude approximation filter.

2.2.2 SINUSOIDAL SPEECH MODELING

2.2.2 (a) SINUSOIDAL MODEL IN SPEECH CODING AND SYNTHESIS

When compared with the source-filter model, a rather different approach represents that a sinusoidal speech model is simple because it models the speech signal as a sum of sine waves with defined frequencies, amplitudes, and phases. Perhaps, the first most detailed description of speech analysis/synthesis based on a sinusoidal model was presented in 1986 by R. J. McAulay, and T. F. Quatieri [7], [10], although some information about sinusoidal and harmonic coding and synthesis had been published a few years before also by other authors. In this model, first in every frame the amplitudes are computed from the local maxima of the magnitude spectrum and the phases are determined from the phase spectrum at the corresponding frequencies. However, this model cannot be used for speech synthesis or speech coding at low rates because of a very high number of sinusoidal parameters.

In [8] the authors propose the overlap-and-add (OLA) method with triangular, Hanning, or trapezoidal window instead of a computationally expensive matching algorithm with linear interpolation of amplitudes and cubic interpolation of phases. The sinusoidal model is suitable for prosodic modifications that are

necessary in the text-to-speech (TTS) systems. A time-scale and pitch modification system that preserves shape-invariance property during voicing is done using a version of the sinusoidal analysis/synthesis system modeling and independently modifying the phase contributions of the vocal tract and the vocal chord excitation [11]. In the sinusoidal model was compared with a code-excited linear prediction (CELP) concluding with complementarity of the two methods. The authors state that an ideal coder should be able to combine the noise-free quality of sinusoidal models with the robust analysis-by-synthesis procedures of CELP coders [9]. The harmonic sinusoidal analysis is used to encode the periodic part of speech and to split the speech spectrum into two frequency regions of harmonic and random components.

Harmonic speech model is a multiband excitation (MBE) model. It uses an analysis-by-synthesis method, in which Voiced speech is synthesized from the voiced envelope samples by summing the outputs of a band of sinusoidal oscillators running at the harmonics of the fundamental frequency. Unvoiced speech is synthesized from the unvoiced envelope samples by first synthesizing a white noise sequence. Its normalized Fourier transform is multiplied by the spectral envelope and then synthesized using the weighted OLA method.

Synthesis is also performed in a pitch-synchronous way using an OLA process. If the frame is voiced, the noise part is filtered by a high-pass filter with cutoff frequency equal to the maximum voiced frequency. At AT&T Labs-Research, HNM was compared with a time-domain pitch-synchronous OLA (TD-PSOLA) method [13]. TD-PSOLA relies on the speech production model described by the sinusoidal framework, although the parameters of this model are not estimated explicitly.

2.3 INTRODUCTION TO SPEECH SYNTHESIS

Speech is the primary means of communication between people. Speech synthesis, automatic generation of speech waveforms, has been under development for several decades. The text-to-speech (TTS) synthesis procedure consists of two main phases. The first one is text analysis, where the input text is transcribed into a phonetic or some other linguistic representation, and the second one is the generation of speech waveforms, where the acoustic output is produced from this phonetic and prosodic information as in Fig-2.

2.4 EMOTIONS IN SPEECH

There are four basic traditions in emotion research in Psychology [1]. Each theory focusing on different components and making different assumptions on what is important for describing an emotion.

2.4.1 THE DARWINIAN PERSPECTIVE

Charles Darwin in his book *The Expression of Emotion in Man and Animals* laid the groundwork for much of modern psychology and also for emotion research. He describes emotions as reaction patterns that were shaped by evolution. This implies that emotions are common in all human beings and also that some emotions might be shared with other animals.

2.4.2 THE COGNITIVE PERSPECTIVE

Cognitive emotion theories relate emotions to appraisal, which is the automatic evaluation of stimuli by low level cognitive processes. Scherer's component process model [15] makes physiological predictions relevant to speech from such appraisal processes.

2.4.3 THE SOCIAL CONSTRUCTIVIST PERSPECTIVE

In the social constructivist perspective, emotions are seen as socially constructed patterns that are learned and culturally shared [1]. Emotions have a social purpose that regulates the interaction between people.

2.5 DESCRIPTIVE SYSTEMS OF EMOTIONS

This section is only supposed to give a quick overview over the two main description systems used by most researchers.

2.5.1 EMOTION CATEGORIES

Different emotion theories have different methods for selecting such basic emotion words. In a Darwinian sense the basic emotions have been evolutionarily shaped and therefore can be universally found in all humans. There is a Jamesian extension that expects to find specific patterns for the basic emotions in the central nervous system.

2.5.2 CIRCUMPLEX MODEL OF AFFECT

Instead of independent emotion categories, several researchers have described an affective space [12]. Russell has developed a circular ordering of emotion categories that makes it straightforward to classify an emotion as close or distant from another one. By having subject's rate similarity of different emotion words and converting the ratings into angles, a circular ordering emerged as in Fig-3.

2.6 EMOTION IN SPEECH

Vocal expression has been recognised as one of the primary carriers of affective signals for centuries. Darwin in his pioneering monograph on the expression of emotions in man and animals underlined also this importance of the voice as an affective channel. Notably, Scherer has done important work in his studies on acoustic profiles. But many other studies have been undertaken that examine the relationship of vocal expression and emotion. To examine the vocal correlates of emotions, one has to analyse a speech database. The source of the content of such a database has been widely debated.

2.6.1 SOURCES OF EMOTIONAL SPEECH

To obtain authentic emotional speech data is one the biggest challenges in speech and emotion research. The most frequently used and oldest method is to have an actor portray certain emotions. This method has the advantage of control over verbal, phonetic, and prosodic speech content. Because only the emotion is varied in the actors' portrayal, direct comparisons of voice quality and prosody between different affective states are feasible. Another advantage is that it is easier to obtain expressions of full blown and extreme emotions.

The elicitation of authentic emotions in participants in a laboratory has been tried by number of researchers. There are a few techniques that are termed mood induction procedures which can be used in different settings.

2.6.2 ACOUSTIC CORRELATES OF EMOTIONS

During evolution speech was added to a "primitive analog vocal signaling system". This means that the study of speech parameters expressing emotions is very complex. Acoustic parameters vary in their function of linguistic information carriers and non-verbal information carriers. Therefore it is not clear which parameters should be measured. Parameters like voice quality are important carriers of emotion in speech but are very difficult to measure.

3. IMPORTANCE OF STUDY

This has many applications especially in the field of assisting blind and deaf people, speaker verification and security.

4. PROBLEM DEFINITION

Considering the wide range of possible modifications that can be applied on a speech signal to synthesize emotional speech, there is a need for a system that can select the parameters that are expected to perform well, thus narrowing down the sample set that needs to be evaluated by human raters. Considering the significantly different performances for different emotions, and the differences observed between human and machine perception of emotions, however, at this stage we prefer to view the proposed automated evaluation more as a preprocessing step than a replacement to human evaluations.

One of the biggest challenges in embedding emotion in speech is the selection of modification parameters that will make humans perceive a targeted emotion. The best selection method is by using human raters. However, for large evaluation sets this process can be very costly.

5. OBJECTIVE

The objective is to embed emotion in speech by using the time domain pitch synchronization Overlap and Add (TD-PSOLA). To do so we also require reading the recorded speech wave and its different parameters and then create an environment in MATLAB to implement the complete process of embedding emotion in speech using TD-PSOLA.

6. HYPOTHESES

6.1 EMBEDDING EMOTION IN SPEECH

Different synthesis techniques allow control over voice parameters in varying degrees. In most previous systems, only three to nine full blown emotions were modeled. These systems are:

6.1.1 RULE BASED SYNTHESIS

Rule based synthesis, also known as formant synthesis, creates speech through rules of acoustic correlates of speech sounds. Although the resulting speech sounds quite unnatural and metallic, it has the advantage that many voice parameters can be varied freely.

6.1.2 DIPHONE SYNTHESIS

Diphone synthesis uses recorded speech that is concatenated. The Diphone recording is usually made in a monotonous pitch and an F0 contour is generated through signal processing at synthesis time. This technique allows only limited control over voice parameters.

6.2 SPEECH SYNTHESIS TECHNIQUES AND ALGORITHMS

Synthesized speech can be produced by several different methods. The methods are usually classified into three groups. Articulatory synthesis, which attempts to model the human speech production system directly. Formant synthesis, which models the pole frequencies of speech signal or transfer function of vocal tract based on source-filter-model. Concatenative synthesis, which uses different length prerecorded samples derived from natural speech.

6.3 PSOLA METHODS

It is actually not a synthesis method itself but allows prerecorded speech samples smoothly concatenated and provides good controlling for pitch and duration. There are several versions of the PSOLA algorithm.

Time-domain version, TD-PSOLA, The basic algorithm consist of three steps (Charpentier et al. 1989, Valbret et. al 1991). The analysis step where the original speech signal is first divided into separate but often overlapping short-term analysis signals (ST), the modification of each analysis signal to synthesis signal, and the synthesis step where these segments are recombined by means of overlap-adding. Short term signals $xm(n)$ are obtained from digital speech waveform $x(n)$ by multiplying the signal by a sequence of pitch-synchronous analysis window $hm(n)$ as expressed in equation (Eq-8). The windows, which are usually Hanning type, are centered around the successive instants tm , called pitch-marks. These marks are set at a pitch-synchronous rate on the voiced parts of the signal and at a constant rate on the unvoiced parts. The used window length is proportional to local pitch period and the window factor is usually from 2 to 4 (Charpentier 1989, Kleijn et al. 1998). The pitch markers are determined either by manually inspection of speech signal or automatically by some pitch estimation methods (Kortekaas et al. 1997). The segment recombination in synthesis step is performed after defining a new pitch-mark sequence. Manipulation of fundamental frequency is achieved by changing the time intervals between pitch markers as in Fig-4. The modification of duration is achieved by either repeating or omitting speech segments. In principle, modification of fundamental frequency also implies a modification of duration (Kortekaas et al. 1997).

Another variations of PSOLA, Frequency Domain PSOLA (FD-PSOLA) and the Linear-Predictive PSOLA (LP-PSOLA), are theoretically more appropriate approaches for pitch-scale modifications because they provide independent control over the spectral envelope of the synthesis signal (Moulines et al. 1995). FD-PSOLA is used only for pitch-scale modifications and LP-PSOLA is used with residual excited vocoders. Some drawbacks with PSOLA method exists. The pitch can be determined only for voiced sounds and applied to unvoiced signal parts it might generate a tonal noise (Moulines et al. 1990).

6.4 Linear Prediction based Methods

Linear predictive methods are originally designed for speech coding systems, but may be also used in speech synthesis. In fact, the first speech synthesizers were developed from speech coders. Like formant synthesis, the basic LPC is based on the source-filter-model of speech. The digital filter coefficients are estimated automatically from a frame of natural speech.

The main deficiency of the ordinary LP method is that it represents an all-pole model, which means that phonemes that contain antiformants such as nasals and nasalized vowels are poorly modeled. The quality is also poor with short plosives because the time-scale events may be shorter than the frame size used for analysis. With these deficiencies the speech synthesis quality with standard LPC method is generally considered poor, but with some modifications and extensions for the basic model the quality may be increased.

7. RESEARCH METHODOLOGY

7.0 OVERVIEW OF TIME-SCALING TECHNIQUES

7.1 TIME DOMAIN TECHNIQUES: TIME-SEGMENT PROCESSING

In time-segment processing, the basic idea behind the time-stretching technique is to divide the input sound into segments, then if the sound is to be shortened, some segments are discarded, or if the sound is to be lengthened, some segments are repeated. In general, all time-segment processing techniques are based on overlapping and adding adjacent segments extracted from the input signal.

7.1.1 OVERLAP-ADD (OLA)

Overlap-add (OLA) techniques are generally the most computationally inexpensive of all the time-scaling techniques since the basic algorithm requires only simple read/write pointer manipulation and accumulate instructions. For basic time-scale compression, small windowed segments are extracted at time t_i and added to the output at time $t'_i = \alpha t_i$ where α is the time scale factor. The main artifact from the OLA technique comes from the amplitude and phase discontinuity at the boundary of the segments which causes pitch period discontinuities and consequent distortions that are detrimental to signal quality.

7.1.2 SYNCHRONOUS OVERLAP-ADD (SOLA)

One strategy for reducing the artifacts associated with the OLA technique is to modify the offset for placing each time-segment within a small range around the time-scale factor offset so that the cross-correlation between the overlapping samples is maximized for each pair of overlapping segments. This technique is referred to as Synchronous Overlap-Add (SOLA). The SOLA technique does a much better job at preserving the pitch, magnitude and phase relationships of the time-scaled signal.

7.2 SIGNAL MODEL ANALYSIS/SYNTHESIS

Signal modeling techniques model sounds as a sum of elementary sinusoidal components called partials. These techniques start by extracting partials, in the form of time dependent magnitude and instantaneous phase data, from a signal via time-frequency analysis, usually a Fourier transform based analysis, such as the short-time Fourier transform (STFT). The decomposition into individual partials is expressed in the additive synthesis equation (Eq-2). The instantaneous phase and instantaneous frequency are related by equation (Eq-3).

As its name implies, the additive synthesis expression is used to synthesize a signal from the time dependent magnitude and instantaneous phase data. Time-scaling is then achieved by modifying the phase and magnitude data before synthesizing. The modification is a time mapping function. To time-stretch a signal, we set >1 , or to compress in time we set <1 . The time-scaled signal is thus expressed as equation (Eq-4).

7.3 TIME-DOMAIN PITCH-SYNCHRONOUS OVERLAP ADD (TD-PSOLA)

Time-Domain Pitch-Synchronous Overlap and Add (TD-PSOLA) is a variation of the SOLA technique in which the signal is first analyzed to identify local pitch across the signal, and local pitch information is used to adjust a variable segment size parameter, and a variable segment offset parameter to preserve the local pitch (fundamental frequency) while achieving a desired time-scale change.

Considering a periodic signal $s(n)$, it is possible to get pitch modified version of $s(n)$ by summing OLA frames $si(n)$, extracted from the weighted window $w(n)$, and changing the time-shift between frames from the original pitch period T_0 to the desired one T expressed as equation (Eq-5).

If $T \neq T_0$, the operation results, again according to the Poisson Formula, in a re-harmonization of the spectrum of $si(n)$ with the fundamental frequency $1/T$ can be described as equation (Eq-6).

Consequently, $w(n)$ can be chosen so that the spectrum of $si(n)$ closely matches the envelope spectrum of $s(n)$. So the stated process provides a simple and efficient way to change the pitch of a periodic signal. Synthesizing speech is still not perfect, but the simplicity and efficiency has been increased with PSOLA. For

$T=T_0$ the equation simply results in reconstructed signal which is proportional to the original signal as equation (Eq-7). The TD-PSOLA algorithm block diagram is under the section figures (Fig-5).

8. RESULTS & DISCUSSIONS

The experiment is performed on Punjabi voices both for male and female. We achieved very clear synthesized emotional speech through TD-PSOLA for many cases. The TD-PSOLA method is not effective for stochastic speech signal as the frequency domain peak-picking cannot estimate a modulation rate in the aspiration noise source. The threshold value is still not perfect as we do more testing on different voices and utterances using TD-PSOLA. The pitch marking of the wave is very limited to the testing voices as figures are shown under the section figures.

9. FINDINGS

The results show that the proposed system is promising for selecting parameters for embedding emotional in speech. Considering the significantly different performances for different emotions, and the differences observed between human and machine perception of emotions, however, at this stage we prefer to view the proposed automated evaluation more as a preprocessing step than a replacement to human evaluations.

10. RECOMMENDATIONS AND SUGGESTIONS

With the application of neural network we can improve the artificial sound of the synthesized speech by adding emotion to it. The emotional synthesis speech will sound more natural with the neural network trained speech signals. The parametric behavior of the speech will get more accurately tuned for embedding emotion in the speech resynthesis.

11. CONCLUSIONS

The system, developed with supervised training, consists of synthesis (TD-PSOLA). The experimental results show evidence that the parameter sets selected by the system can be successfully used to embed emotion in the input neutral speech, demonstrating that the system can assist in the human evaluation of emotional speech.

12. SCOPE FOR FURTHER RESEARCH

Our future research will be directed towards the design of more robust systems, more sophisticated parameter modifications, and experimenting with different parameter selection techniques and additional emotions and embedding emotion in a stochastic speech.

13. ACKNOWLEDGEMENT

It is our pleasure to acknowledge to our debt to many people involved directly or indirectly in our project. No work will be done by a single person. Every work should be completed with co-operation and co-ordination of many people. We do not find words to express our sentiments about all those people who involve with us in our project. First of all, I must thank to Ms. Simrat Kaur Sandhu who have encouraged me to do research on the topic of "Embedding Emotion in Speech". She helped me in almost every field of this project.

14. APPENDIX

MATLAB IMPLEMENTATION

MATLAB FILES:

1. detect_vuv.m : it performs the detection of voiced and unvoiced samples in speech wave.
2. energy.m : it calculates the energy of the input frames of speech wave.
3. find_pmarks.m : it calculates and marks the pitches at the peaks in the short time energy function.
4. plot_pmarks.m : it plots the pitch marked by the „find_pmarks.m“.
5. tdpsola.m : it performs the time domain pitch synchronous overlap add function for embedding emotion in speech.
6. test.m : integrated file to perform the whole process with an ease.
7. window.m : it calculates the windowed coefficients of the speech frames passed through window.
8. zerocr_frm.m : it calculates the average zero crossing rate of the input speech frames.

15. FIGURES & TABLES

FIG-1: REPRESENTATION OF SPEECH SOUND PRODUCTION

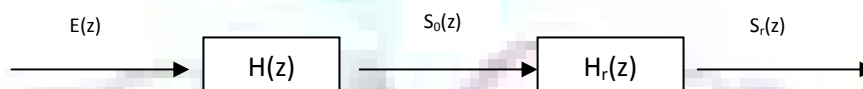


FIG-2: SIMPLE TEXT-TO-SPEECH SYNTHESIS PROCEDURE

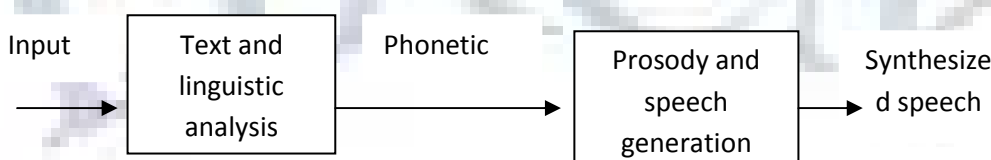


FIG-3: CIRCUMPLEX MODEL OF AFFECT AS DESCRIBED BY RUSSELL (1980)

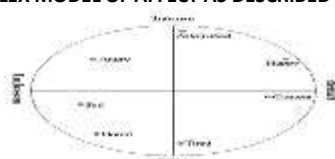


FIG-4: PITCH MODIFICATION OF A VOICED SPEECH SEGMENT

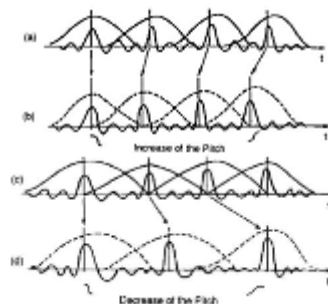


FIG-5: BLOCK DIAGRAM OF TD-PSOLA

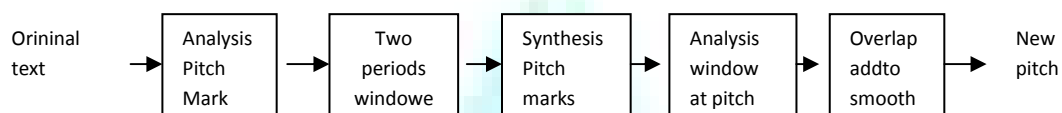


FIG-6: SPEECH WAVEFORMS USED FOR TESTING



FIG-7: PITCH MARKS ON THE ORIGINAL SPEECH WITH THE THRESHOLD VALUE AS

a. Tscale: 1.5

b. Pscale: 0.7

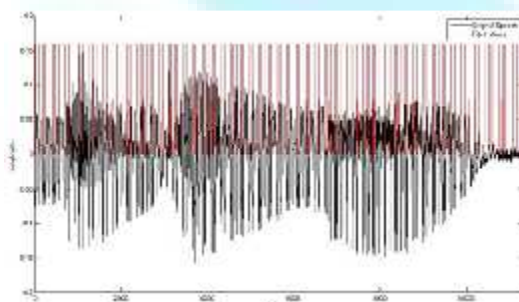


FIG-8: VOICED AND UNVOICED DETECTED MARKING IN SPEECH FRAMES

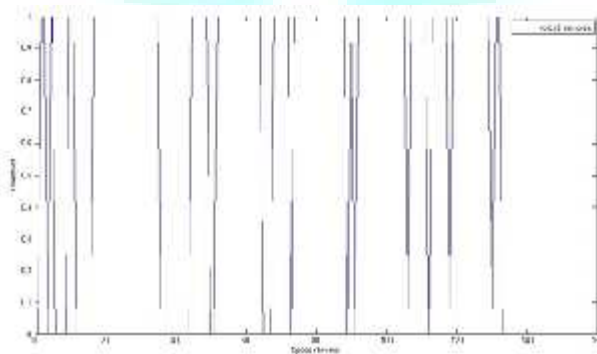
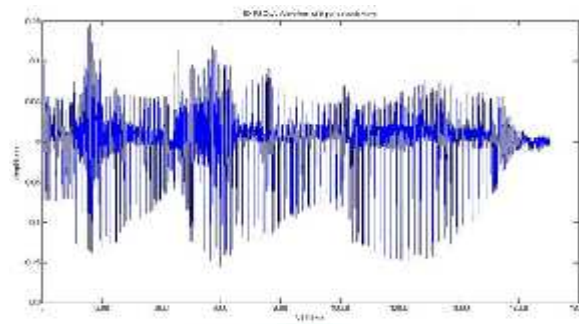


FIG-9: TD-PSOLA WAVEFORM OF THE INPUT WAVE



16. EQUATIONS

$$H(\omega) = \frac{1}{\cos(\omega \cdot x / v)} \quad (\text{Eq-1})$$

$$s(t) = \sum_{k=1}^K \omega_k(t) \cos \phi_k(t) \quad (\text{Eq-2})$$

$$\phi_k(t) = \int_0^t \omega_k(\tau) d\tau \quad (\text{Eq-3})$$

$$s'(t) = \sum_{k=1}^K \phi_k(t) \cos(\omega_k(t)) \quad (\text{Eq-4})$$

$$s_i(n) = s(n) W(n-iT_c) \quad \bar{s}(n) = \sum_{m=-\infty}^{\infty} s_r(n-i(T-T_0)) \quad (\text{Eq-5})$$

$$\text{if } s_r(n) \xleftrightarrow{f} S_f(\theta) \quad \text{then } \bar{s}(n) \xleftrightarrow{f} \frac{2\pi}{T} \sum_{k=-\infty}^{\infty} S_f\left(k \frac{2\pi}{T}\right) \quad (\text{Eq-6})$$

$$\begin{aligned} \bar{s}(n) &= \sum_{k=-\infty}^{\infty} s(n) w(n-iT) \\ &= s(n) W(n-iT) \\ &= K s(n) \end{aligned} \quad (\text{Eq-7})$$

$$xm(n) = hm(tm-n)x(n) \quad (\text{Eq-8})$$

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PERFORMANCE OF INDIAN SCHEDULED COMMERCIAL BANKS IN PRE AND POST GLOBAL CRISIS

PRABINA KUMAR PADHI
LETURER
GANDHI INSTITUTE OF INDUSTRIAL TECHNOLOGY
GOLANTHRA

MADHUSMITA MISHRA
LECTURER
GANDHI INSTITUTE OF INDUSTRIAL TECHNOLOGY
GOLANTHRA


ABSTRACT

A nation's infrastructure development plays a significant role in its economic growth. A fast growing economy results an even faster development of infrastructure. Infrastructure is defined as the physical framework of facilities to provide goods and services to the public. The growth of infrastructure helps to increase the per capita GDP of the nation. As a huge infrastructure banking sector plays an important role in the development of an economy. The development of banking sector and its stability is essential for the overall development of the economy. The stability of banking sector is determined on the basis of its performance and quality of assets. In this study, the performance of Indian Scheduled Commercial Banks before and after global financial crisis (2007-09) is highlighted. Various indicators that reflect efficiency of banks were affected during the financial crisis. The various aspects of performance of Indian Scheduled Commercial Bank – group wise are examined here. The Indian banking sector underwent structural changes during post liberalization era with the implementation of prudential norms for income recognition, provisioning and asset classification. The study is conducted using data available for the period 1999-00 to 2010-11. The results of the study indicate the vulnerability of scheduled commercial banks to the financial crisis. The impact of financial crisis on different economies varies and depends on the stability of the banking sector.

KEYWORDS

Banking, Commercial Bank, Financial Crisis, GDP (Gross Domestic Product), Infrastructure.

INTRODUCTION

 Global Economic Crisis affects the economies across the globe. Generally, crises have been generated by various factors like credit booms, miscalculations of risk, rapid outflows of capital from a country, unsustainable macroeconomic policies, off-balance sheet operations by banks, overheating of markets, and inexperience with new financial instruments, and deregulation without sufficient market monitoring and oversight. Financial meltdowns have occurred in various countries among the world. It has also a greater impact on the Indian economy. Each financial crisis is unique, yet each bears some resemblance to others. A well functioning financial system in a country regulates funds to the most productive uses and allocates risks to parties who are able to bear them. This leads to rapid economic growth and opportunity. This is only reason why a crisis creates so many difficulties in the smooth functioning of a nation. Generally, countries which are suffering from financial crisis experience vital interruptions in their infrastructure which hampers their growth rates. Infrastructure is basic physical and organizational structures of a nation. It helps in the operation of a society or enterprise, or the services and facilities, necessary for an economy to function. It can be generally defined as the set of interconnected structural elements which provide framework to support the entire structure of development. Especially it refers to the technical structures that support a society, such as electrical grids, telecommunications, roads, water supply, sewers, and so forth, and can be defined as the physical components of interrelated systems to enable, sustain, or enhance societal living conditions. Infrastructure facilitates the production of goods and services, and also the distribution of finished products to markets, as well as basic social services such as schools and hospitals. Economic infrastructure relates to the financial system, including the banking system, financial institutions, the payment system, exchanges, the money supply, financial regulations, as well as accounting standards and regulations. The provision of quality and efficient infrastructure services is essential to realize the full potential of the growth impulses surging through the economy. In this paper banking sector, an important infrastructure, is taken into consideration.

As it is known that the crisis affects the infrastructure of a nation, this paper highlights the performance of banking sector affected due to global financial crisis. It examines about the performance of banking sector in the global crisis scenario. For the purpose, the scheduled commercial banks in India were grouped into SBI and Associates, Nationalized Banks, Foreign Banks and Other Scheduled Commercial Banks. Data is collected and analyzed for the period 1999-00 to 2010-11.

LITERATURE REVIEW

Banking sector plays a pivotal role in the development of an economy. The stability of banking sectors is very much necessary for the development of an economy. The recent global financial crisis has triggered fall of many economies, contributed by financial losses and large non performance assets in banking sector. There are various literature which highlights about the financial crisis and its impact on the infrastructure.

The Asian financial crisis that began in July 1997 impacted the major Asian economies, but proved little impact on countries which had a strong banking sector. A notable feature in the banking sector regulations after Asian financial crisis was the thrust given to balancing financial liberalization with adequate regulatory and supervisory framework (Shirai, S 2001). The financial crises elevate the riskiness and highlight the risk absorption capacity of capital provides valid insight into the quality of assets the bank carries. The stability of financial institution is determined mainly based on its quality of assets and performance indicators. Quality of assets determines the survival and existence of business. Performance is judged on the basis of profitability. The financial institutions were considered stable during crisis period if the profitability and quality of assets is not affected (Wim Naudé, 2011). The stability of banking sector is vital for economic growth. In a report of Financial Stability, 2010, the Reserve Bank of India (RBI) focuses about the importance of banking sector in Indian economy. It is found that banks have traditionally been the most important financial intermediaries in India, accounting for approximately 70% of the total assets in 2009. The commercial banks by comprising more than three-fifths of the financial system assets, dominate the sector. Banks in India has played a central role in supporting the growth process, by mobilizing savings. So, banking sector directly put impact on the nation's economy. The various committees' including Dr.Narasimham Committee and Verma Committee emphasized the need to maintain quality of assets as a prerequisite for a vibrant and strong banking sector. The increased presence of Non Performing Assets (NPA) posed a strategic threat to the existence of banking sector. For banking sector, this can be studied only by addressing the trends of movement of certain financial indicators that affect the asset quality and performance of banks. (Wim Naudé, 2011).

OBJECTIVE OF THE STUDY

The present paper focuses on the global financial crisis as well as its impact on the banking sector. By taking both these themes this study has the following objectives:

- To examine the performance of scheduled banks before global financial crisis.

- To analysis the performance of scheduled banks global after financial crisis.

EVOLUTION OF THE CRISIS

Although it is a myth that the crisis was completely unforeseen, it did come as a surprise to many because it happened after almost a decade of very good global growth (Naudé, 2009; 2010). During 2007 it was realized that growing mortgage loan defaults in US and the failure of Northern Rock in the UK were harbingers of a crisis. In the USA a combination of cheap money, aggressive lending practices, rising house prices, and weak prudential regulation facilitates the extension of mortgage finance to the tune of more than a trillion US dollars, largely to households who had little prospects of ever repaying. Banks 'covered up' the risk by securitizing the expected income streams from these bad loans, packaging them in with other securities such as Collateralized Debt Obligations (CDOs). Problems started when mortgage defaults started rising, foreclosures on houses increased, and short-term interest rates started rising. In March 2007, the US's New Century Financial Corporation stopped issuing subprime mortgages. In July 2007 the Federal Deposit Insurance Corporation (FDIC) took over the Indy Mac Bank. On 7 September 2008 the US Treasury had to rescue (nationalize) the largest mortgage lenders, Fannie Mae and Freddie Mac. By mid 2008 around 40 per cent of all sub-prime mortgages issued in 2006 in the USA were non-performing. The deflation of the house price bubble shook confidence in the US dollar and became an important factor in rising energy and food prices. The price of oil jumped from US\$ 90 per barrel in January 2008 to US\$147 per barrel in July 2008. Oil and maize prices peaked in July 2008 at record levels, putting enormous economic strain on energy and food importing developing countries. Around 40 poor countries were thrown into an acute food crisis. On 15 September 2008 investment banking firm Lehman Brothers declared bankruptcy at that time the largest in the history of the USA (Naudé, 2009;2010). This caused widespread panic in financial markets. Declining stock markets tumbled further. Uncertainties about bank solvencies lead to a global credit contraction. Losses in wealth, consumer confidence and dwindling trade finance were followed by the news that the US, and most other advanced economies, were in recession. All regions of the world were affected – some regions such as Europe and the transition economies more directly by contagion in financial markets – and other regions, such as Asia, Africa and Latin America, more by the decline in global demand. The initial expectation of the impact of the crisis on global development also did not materialize. Although all countries were affected, what was surprising was the resilience shown by developing and emerging economies, who recovered sooner than many anticipated. Many avoided their own recessions. Even by mid 2009 the USA, the epicenter of the crisis, was not technically in a recession anymore. (Wim Naudé, 2011)

IMPACT ON INDIA

Financial crisis has an indirect impact on the Indian economy. This impact is felt both through trade and capital flows. The fall in international commodity prices and more particularly crude oil is reducing sharply the import bill from previous estimates. The recession arises in abroad have an adverse effect on our exports of goods and services. There is a sharp deceleration in the rate of growth of exports in 2008-09. The decreasing growth rate in exports will affect heavily to some sectors like textiles, automobile components and gem and jewelers as the exports contribute a huge portion to the total production of our economy. In contrast, to the strong inflow of over \$100 billion in 2007-08, 2008-09 saw a net increase of only \$10 billion in capital flows. The flow of portfolio capital turned negative. Indian firms have also experienced difficulties in raising money abroad. All this have a negative impact on the exchange rate.

IMPACT OF GLOBAL FINANCIAL CRISIS ON PROFITABILITY OF COMMERCIAL BANKS

In this article it is highlighted whether the financial crisis has impact on the profitability and quality of assets of scheduled commercial banks or not. The bank-group wise statistics on major performance indicators were divided into two periods, from 1999-00 to 2006-07 and 2007-09 to 2010-11. The first period i.e., 1999-07 indicates financial performance before global financial crisis. The second period i.e., 2007-00 indicates period after the financial crisis. The average annual growth (AAG) rate is calculated on various performance indicators for the two periods. Table 1 highlight about the performance of banking sector before and after global crisis.

TABLE 1: GROWTH RATE BEFORE AND AFTER THE GLOBAL FINANCIAL CRISIS (in %)

Major Performance Indicators	SBI & Associates		Nationalised Banks		Foreign Banks		Other Scheduled Bank	
	2000-07	2008-10	2000-07	2008-10	2000-07	2008-10	2000-07	2008-10
Total Interest Income	10.76	20.49	12.49	23.31	12.31	18.44	30.79	5.77
Total other income	9.55	34.00	14.47	33.31	19.08	27.16	42.50	6.01
Total operating expenses	10.13	16.65	10.24	14.45	14.70	10.51	33.55	3.86
Provision & Contingencies	13.43	57.60	18.27	51.04	39.98	46.33	50.53	34.86
Total Expenses	7.90	22.67	9.71	24.80	8.64	14.45	29.20	2.78
Profit during the year	24.09	24.55	35.40	25.55	34.51	8.99	42.34	11.59

Source: Statistical Tables relating to banks in India. 2000-11

It may be observed from the above table that the growth rate indicates a better performance before the financial crisis. The provision and contingencies that includes provisions towards NPA has grown considerably for all bank groups during 2007-08 to 2010-11. For SBI and associates, the average annual growth rate for the period 199-00 to 2006-07 was 13.43% which increases to 57.60% during 2007-08 to 2010-11. This highlights the vulnerability of the banking sector and the problems in asset quality. It is same for other banks. Only for other scheduled banks, the average annual growth rate showed a declining trend, where it came down from 50.53% to 34.86% during the mentioned period. The foreign banks were very much affected in the financial crisis where the profitability declined from 34.51% during period before financial crisis to 8.99% during periods after financial crisis. It also shows a sharp decline in profitability. The average annual growth rate in profitability during 2007-08 to 2010- 11 was 8.99%, which was far below than its annual average growth rate during 1999-00 to 2006- 07, i.e., 34.51%. SBI and associates reported better performance among the other bank groups, with an increased interest income during the period 2007-08 to 2010-11. So as a general conclusion it is found that the global financial crisis affected the profitability of banks.

RATE OF GROWTH OF NET NPA

Generally bank's stability and profitability is affected by the NPA. NPA affects stability of the banks since the assets do not generate any income for the bank, and affects profitability since banks have to maintain more provisions towards NPA. The movement of NPA hence is an important indicator that determines whether the Indian banking sector was affected by global financial crisis. (Table 2)

TABLE 2: RATE OF GROWTH OF NET NPA

Year	SBI and associates	Nationalized Banks	Public Sector Banks	Foreign Banks	All Scheduled Commercial Banks
2001	8.03	5.70	13.73	0.16	7.32
2002	-5.15	1.79	-3.36	17.71	1.62
2003	-13.08	-6.88	-19.95	2.01	-0.25
2004	-23.46	-27.63	-51.09	-6.60	-27.26
2005	6.64	-14.73	-8.09	-23.71	-6.73
2006	-4.57	-19.43	24.00	24.00	-15.59
2007	4.73	5.57	10.30	13.56	10.63
2008	32.06	4.04	36.09	36.45	20.51
2009	29.43	10.28	39.70	140.39	29.61
2010	18.05	63.46	81.51	-0.70	23.96

Source: *Trend and Progress of Banking in India- various issues.*

From the table 2 it is analyzed that the net NPA showed an increased trend after financial crisis i.e., 2007. The NPA grew by 20.51% in 2008, 29.61% in 2009 and 23.96% in 2010 for all scheduled commercial banks in India. The foreign banks show a considerable growth rate. Similarly for SBI & associates it is 32.06% in 2008, 29.43% in 2009 and 18.05% in 2010. Public sector banks have maximum growth rate in 2010 as compared to other banks.

The impact of global financial crisis on profitability and quality of assets is highlighted in the table 3.

TABLE 3: IMPACT OF GLOBAL FINANCIAL CRISIS ON PROFITABILITY AND QUALITY OF ASSETS (NPA as a percentage of total advances)

Year	Public Sector Banks	Private Sector Banks	Foreign Banks	All Scheduled Commercial Banks
2000	14.02	8.47	6.99	12.79
2001	12.39	8.54	6.85	11.45
2002	11.09	5.65	5.49	10.42
2003	9.36	9.20	5.38	9.06
2004	7.79	5.83	4.89	7.19
2005	5.73	3.84	3.06	5.16
2006	3.86	2.56	2.11	3.48
2007	2.81	2.36	1.92	2.66
2008	2.34	2.75	1.91	2.39
2009	2.09	3.25	4.30	2.44
2010	2.27	2.97	4.26	2.50

Source: *Trend and Progress of Banking in India- various issues.*

It may be observed from the above table that there is a gradual reduction in NPA as a percentage of total advances till 2007. The trend is reversed after 2007 especially for private sector and foreign banks which reported a higher NPA as a percentage of total advances. The presence is not seen in public sector banks, due to the higher level of advances. The financial crisis is reportedly affected the foreign banks severely compared to other bank groups. The increased rate is due to the higher levels of NPA generated from 2007 onwards. The result is an increase in total NPA ratio to 2.5% for all scheduled commercial banks for 2010.

CONCLUSION

The results of the study highlights that the banking sector in India is still vulnerable to crises. Even though there were remarkable changes in banking sector intended to improve the efficiency of the sector, the banks are still vulnerable to the financial crisis. The growths of NPA, growth rate before and after financial crisis are the indicators of its vulnerability. Reforms should be further strengthened to improve the financial stability of banking sector. The vulnerability of banking sector is not desirable for the growth of economy, hence require precautionary measures. The lessons from banking sector which are not affected by the financial crisis should be incorporated into the banking sector. More researches are desirable which investigates the methods to reduce the vulnerability in the banking sector. Collectively, this paper provides some indicators which can show the effect of financial crisis in banking sector. NPA is an important factor that still prevails as an alarming signal for banking growth and survival. There are other various other indicators like credit-deposit ratio and other by which the performance of the banking sector can be analyzed in the era of global crisis.

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FOOD PROCESSING INDUSTRY: INDIA NEED FOR DOMINATING GLOBAL MARKETS

ALI LAGZI
RESEARCH SCHOLAR
DEPARTMENT OF COMMERCE
UNIVERSITY OF MYSORE
MANASAGANGOTTHRI

R.THIMMARAYAPPA
LECTURER
MAHARAJA'S COLLEGE
UNIVERSITY OF MYSORE
MANASAGANGOTTHRI

ABSTRACT

Exporting processing food products from India is an idea that was unbelievable few years ago. Importing food grains under PRE-WTO era was a hard reality for this country which is now getting ready for processing food products export in a modest way. In Indian, the food processing industry is one of the largest in terms of production, consumption, export and growth prospects. India is an agrarian country and no policy maker can afford to ignore the vital importance of agriculture sector in the overall national economy. However, on account of poor warehousing and storage infrastructure, a sizeable proportion of food materials which is estimated at around 10 percent go waste. There is a lack of suitable infrastructure in the shape of cold chain, packaging centres, value added centre, modernized abattoirs, etc. With the advent of the WTO regime and the possibility of lowering of subsidies in the developed countries, India's competitive advantages in food production and processing industry shall come to the fore. Due to a variety of factors though world trade has moved more and more towards processed commodities, export of agricultural commodities performed unevenly with regard to such value added products. In order to address the problem, this paper focuses on schemes of government in food processing sector for implementation of infrastructure development.

KEYWORDS

Food Processing Industry, Global trade, infrastructure development.

INTRODUCTION

Food processing is the process of adding value to the agricultural or horticultural produce by using various techniques like grading, sorting, packaging, etc, which enhances the shelf life of food products. A strong and dynamic food processing sector plays a significant role in the overall economic set up of a country. It provides vital linkages and synergies between industry and agriculture. It has been identified as a sector having immediate potential for growth and employment. It leads to diversification of agricultural activities, improves value addition opportunities and creates surplus for export of agro-food products. The industry has very low processing level i.e. 2.2% for fruits and vegetables, around 35% in milk, 21% in meat and 6% in poultry products, which is significantly lower by international standards. For e.g. processing of agriculture produce is around 40% in China, 30% in Thailand, 70% in Brazil, 78% in the Philippines and 80% in Malaysia. Value addition to agriculture produce in India is just 20% with wastage estimated to be valued at around US \$13 billion. (Ministry of Food Processing Annual report 2005-06).

At present, just 6% of the food-items produced in the India are processed in contrast to the developed nations where 60% to 80% of the food items are processed. While the sector grew at an impressive 14.7% in 2008-09 despite the global slowdown, the country's highest authority, the Prime Minister, expects the National Food Processing Policy to the necessary boost to the sector.

FOOD PROCESSING INDUSTRY IN INDIA

The Food Processing Industry in India is one of the largest in terms of production, consumption, export and growth prospects. Important sub-sectors in food processing industries are: Fruit and Vegetable Processing, Fish Processing, Milk Processing, Meat and Poultry Processing, Packaged/Convenience Foods, Alcoholic Beverages and Soft drinks and Grain Processing, etc. agro-processing industries have a potentially important role in the economic development of developing countries-directly as a source of income and employment and indirectly for their backward linkages with agriculture. The latter is especially critical for the commercialization of agriculture in developing countries, which is widely recognized as important for adoption of modern farming technologies, improving agricultural productivity and incomes, and eventually for rural poverty reduction. Banupratap Singh (1992) opines on the agriculture needs, that "India has three distinct advantages over other farm exporters". Firstly, the availability of a variety of agricultural and allied products. Secondly, proximity of importing countries providing freight advantages. Thirdly low domestic farm prices. Author further suggest that, there is a need for recognizing agriculture as major economic and commercial activity at par with industry and providing it with all the essential facilities, support and incentives, to ensure faster agricultural growth, and stimulate overall growth of national economy and to overcome balance of payment and foreign exchange crisis by augmenting and promoting of export potential of agriculture products.

Food processing involves any type of value addition to the agricultural produce starting, the post harvest level. The processed food industry provides safe convenience foods to consumers, and promotes diversification and commercialization of agriculture by providing effective linkages between the farmer and consumers in both domestic as well as international markets.

The extent of processing can be categorized as follows:

- Primary Processing: cleaning, grading, powdering and refining of agricultural produce, e.g., grinding wheat into flour.
- Secondary Processing: basic value addition, e.g., tomato-puree, ground coffee, cleaning and processing of meat products.
- Tertiary Processing: high value addition products like jams, sauces, biscuits and other bakery products that is ready for consumption at the point of sale.

The industry has a wide scope covering activities such as agriculture, horticulture, plantation, animal husbandry and fisheries. It also includes other industries that use agriculture inputs for manufacturing of edible products.

The Ministry of Food Processing, Government of India (GOI), classifies the following under processed food industry:

- Dairy, fruits and vegetables
- Grains
- Meat and poultry
- Fisheries
- Consumer foods including packaged foods, beverages and packaged drinking water

Sada Shankar Sexana et.al. (1987) highlight the strengths and weaknesses of fresh fruits and vegetables. According to them the strengths are particularly India's geographical location with good logistic and suitable climate placed India in a favorable position for growing a variety of fruits and vegetables round the year, which are otherwise not possible during certain particular season in temperature zones.

The author highlighted some vegetables and fruits like tomato, orange and pineapple that are available in plenty in India during winter season, when the same are in short supply in USA, Russia and many European countries. In the mean time the authors identified some areas of weaknesses, absence of production base for exports at farm level, quick and safe transportation of fresh fruits and vegetables meant for exports, poor storage facilities comparatively higher freight rates and nonexistence of strong data base and production has affected international demand pattern at prevailing price.

To overcome these weaknesses, the author suggested that it is very essential to pursue a policy of exports on regular basis in view of highly competitive nature of international markets, which calls for nurturing and measures to be taken up for export oriented products development.

GLOBAL PROCESSED FOOD INDUSTRY

Global market for the processed foods follows the economic power of the countries. Developed economies show more inclination towards processed foods due to higher income levels. Rapid urbanization and rising income levels in the developing economies create the demand for processing foods. Low income levels and poor economic growth of the least developed countries create the demand for basic staples and carbohydrates. As per the research study in IIFT (2002) "competition in global market is a multi-dimensional concept, it involves not only price competition but also ability to deliver the contractual quality consistently at the appropriate time and place". The study further pointed out Indian infrastructural inadequacies which include pre and post harvest practices often limit the ability of Indian exporters to satisfy the needs of foreign buyers. The study stresses the need for radical transformation of agro-industry and export of agricultural products in order to convert customers satisfaction into consumers delight.

Shinoj and Mathur (2008) studied the changes in comparative advantage status of India's major agricultural exports vis-a-vis other Asian players during the post-reforms period (1991-2004). The finding showed that, the exports of certain commodities like cashew, oil, meat products, has been able to maintain its comparative advantage, but several others products like tea, coffee, spices, marine products, etc have been negatively affected. The authors concluded that India has been found losing out its comparative advantage in export of some of the agricultural commodities to other Asian competitors during the period after economic reforms.

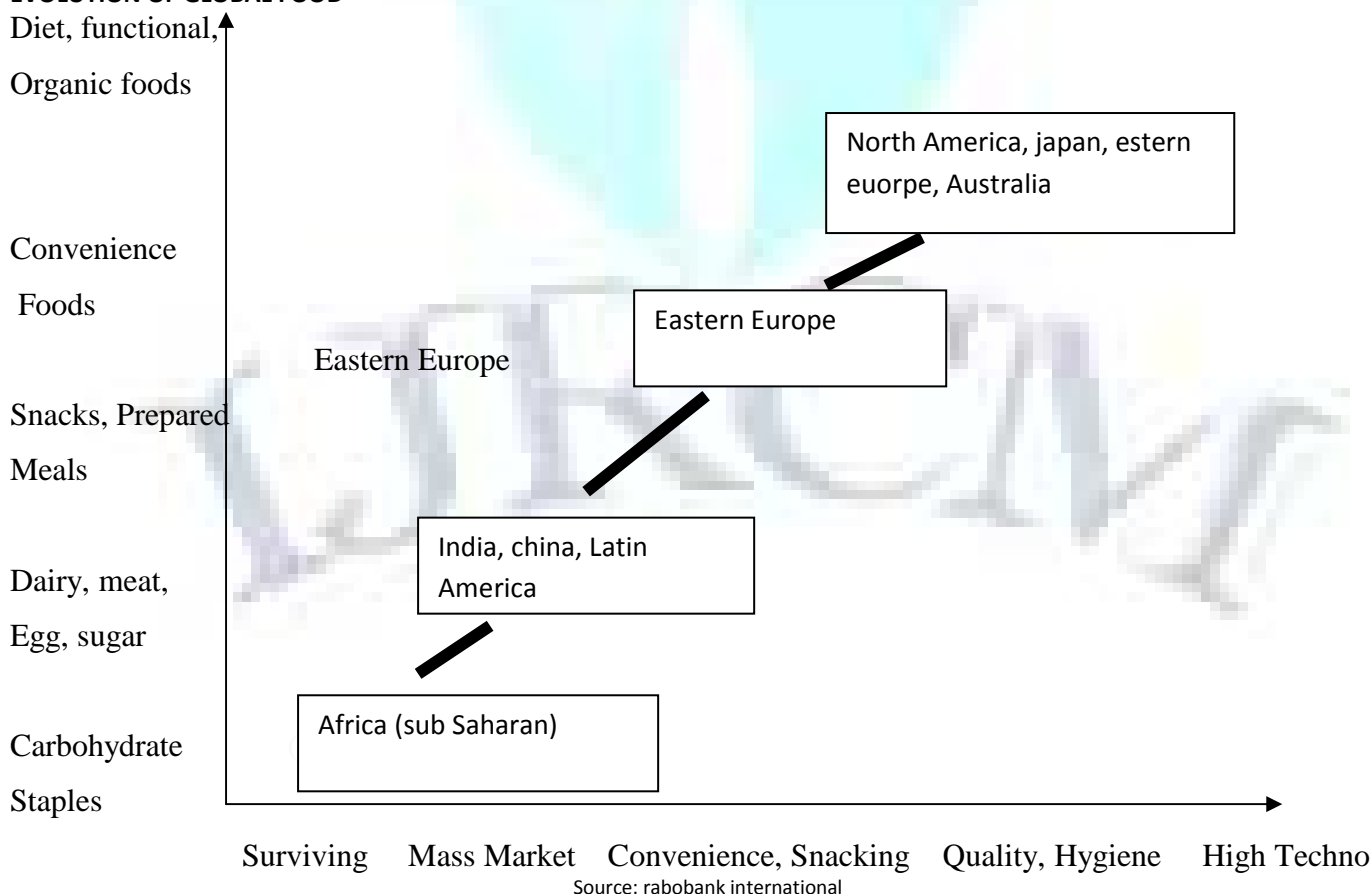
The market can be classified in to four major segments depending on the level of processing and the maturity of the market:

- Countries like USA, Japan and Australia demand highly organic and functional foods whose preparation involves high technology
- Quality and hygiene factors are the drivers in the Eastern European countries
- Developing countries like India, China and Latin America focus primarily on snacks, prepared meals and processed meat.
- Carbohydrates still constitute the major food in the least developed markets. Most of the least developed countries are net importers of food

The size of global processed food industry is estimated to be valued around US \$3.6 trillion and accounts for three-fourth of the global food sales. Despite its large size, only 6% of processed foods are traded across borders compared to 16% of major bulk agricultural commodities. Over 60% of total retail processed food sales in the world are accounted by the U.S, EU and Japan taken together. India's share in global production of processed fruits and vegetables product is far higher than it share in global exports. Although part of the reason is India's large domestic market, more importantly, the processed fruits and vegetables sector has not leveraged on the export market as a proactive source of revenue, the main reason is a lack of suitable infrastructure in the shape of cold chain, packaging centers, value added centre, etc...and government should attach highest priority to development and expansion of physical infrastructure for facilitating prompt growth of industries.

Japan is the largest food processing market in the Asian region, though India and China are catching up fast and are likely to grow more rapidly. Leading meat-importing countries namely Japan and South Korea have a developed processed food industry. One of the most technically advanced food-processing industries globally is Australia as the products produced are of international standards and at comparatively lower prices. Countries in the Sub-Sahara African region, Latin America and parts of Asia continue to be on the lower-end of technology competence in food items. However, Europe, North America, and Japan are on the higher-end of technology, with a sharper shift towards convenience and diet foods.

EVOLUTION OF GLOBAL FOOD



ABUNDANT AVAILABILITY OF RAW MATERIAL

India has varied agro climatic conditions; it has a wide-ranging and large raw material base suitable for food-processing industries. Subba Reddy (2000) and others opined that marketable surplus is initiation certain factors such as size of land holding (larger the size of holding greater is the quantum of marketable surplus). Level of production (higher levels of production help to generate larger marketable surplus). Higher productivity results in higher production. Productivity is influenced by the efficient use of various resources employed on the farm. It has a vast coastline of 8000 km, vast marine land with 10 major ports. India produces annually 90 million tones of milk (highest in the world), 150 million tones of fruits and vegetables (second largest), 485 million livestock (largest), 204 million tones food grain (third largest), 6.3 million tones fish (third largest), 489 million poultry and 45,200 million eggs. India's agricultural production base is huge.

TABLE (1) INDIA –COMPETITIVE EDGE

	India	share in global production (%)	global rank
Arable Land (million hectare)	161		2
Irrigated Land (million hectare)	55		1
Coast line (km)	8,000		19
Major Food Crops (MT)	35	4	3
Fruits (MT)	50	10	2
Vegetables (MT)	100	10	2
Rice/Paddy (MT)	92	22	2
Wheat (MT)	72	15	1
Milk (MT)	90	17	1
Sugarcane (MT)	296	21	2
Pulses (MT)	31	4	3
Tea (MT)	-	28	2
Edible Oil seed (MT)	25	7	3
Cattle (million)	485	16	1

Source: FICCI, Ministry of Agriculture. 2005

Low cost production base for domestic and export market can be set up considering India's comparatively cheap labour force and lower cost of production. India has access to significant investments to facilitate food-processing industry.

MAJOR CHALLENGES FOR THE INDIAN FOOD INDUSTRY

Food-processing industry is facing constraints like non-availability of adequate infrastructural facilities, lack of adequate quality control & testing infrastructure, inefficient supply chain, seasonality of raw material, high inventory carrying cost, high taxation, high packaging cost, affordability and cultural preference of fresh food. Unprocessed foods are prone to spoilage by biochemical processes, microbial attack and infestation. Good processing techniques, packaging, transportation and storage can play an important role in reducing spoilage and extending shelf life. The challenge is to retain the nutritional value, aroma, flavour and texture of foods, and presenting them in near natural form with added conveniences. Processed foods need to be offered to the consumer in hygienic and attractive packaging, and at low incremental costs.

Major Challenges for the Indian Food Processing Industry are:

- Consumer education on nutritional facts of processed foods
- Low price-elasticity for processed food products
- Need for distribution network and cold chain
- Backward-forward integration from farm to consumers
- Development of marketing channels
- Development of linkages between industry, government and institutions
- Taxation in line with other nations
- Streamlining of food laws

India as a signatory to the WTO has to open up its economy to imports of agricultural products from all over the world within a few years time. However, whether India will be able to exploit this advantage will depend upon a large number of factors. In case of processed fruits and vegetables, the quantity of exports has increased from 37820 million tonne in 1995-96 to 340071 million tonne in 2010-11. To know the impact of WTO on fruits and vegetables processing, annual compound growth rates were calculated and presented in Table(2).

From the table, it can be concluded that the growth rate of quantity of fruits and vegetables processing industries in India was high during the pre-WTO period (16.65 per cent) compared to post-WTO period (4.39 per cent). Similarly, the growth rate of value of processed fruits and vegetables was also high during pre-WTO period (28.76 per cent) than the post-WTO period (14.10 per cent). Thus, it may be inferred that WTO has shown negative impact on quantity and value of fruits and vegetables processing industries in India.

TABLE 2: ANNUAL COMPOUND GROWTH RATES (CGR) OF THE FRUITS AND VEGETABLE PROCESSING INDUSTRIES

Year	Quantity (Million tonne)	Value (lakh)	Growth in value over Previous year
1990-91	12349	2008	-
1991-92	15279	2960	47.41
1992-93	16625	3847	29.96
1993-94	27685	6728	74.88
1994-95	26680	7122	5.85
Annual CGR during Pre-WTO period	16.65	28.76	
Year	Quantity (Million tonne)	Value (lakh)	Growth in value over Previous year
2005-06	272524	74088	-
2006-07	318068	95554	28.97
2007-08	311755	96285	0.76
2008-09	387122	137180	42.47
2009-10	397976	143350	4.49
Annual CGR during	4.39	14.10	

Source: APEDA – 2011

POST-WTO PERIOD

The exports of processed agro-products from India during 2008-09 to 2010-11 are presented in Table (3).

It was found that the value of exports of dried and preserved vegetables declined from Rs.53207.48 lakh in 2009-10 to Rs.51697.09 lakh in 2010-11 and also the value of exports in other processed fruit and vegetables from Rs.143550.63 lakh in 2009-10 reduced to Rs.131635.53 lakh in 2010-11. Similarly, the export value of sheep/goat meat also declined from Rs.74720.07 lakh in 2009-10 to Rs.25318.88 lakh in 2010-11. In case of poultry products, it was observed that the value of exports drastically reduced from Rs.37211.85 lakh in 2009-10 to 30132.74 lakh in 2010-11.

TABLE 3: EXPORTS OF PROCESSED AGRO-PRODUCTS FROM INDIA DURING 2008-09 TO 2010-11**PROCESSED FRUITS AND VEGETABLES**

DRIED AND PRESERVED VEGETABLES	147861.22	49641.51	124613.50	53207.48	110173.91	51697.09
MANGO PULP	173013.60	75298.90	186197.85	74460.77	171929.43	81400.66
OTHER PROCESSED FRUITS AND VEGETABLES	387126.42	137179.00	397978.17	143550.63	340067.97	131635.53
PULSES	136880.08	54232.50	100130.94	40832.47	205820.98	85310.73
Total	844881.32	316351.91	808920.46	312051.35	827992.29	350044.01

ANIMAL PRODUCTS

BUFFALO MEAT	462749.62	483970.99	495019.71	548060.08	709437.49	841268.59
SHEEP / GOAT MEAT	37790.65	49336.94	52868.01	74720.07	11908.38	25318.88
POULTRY PRODUCTS	1057016.46	42205.80	1016783.10	37211.85	619150.80	30132.74
DAIRY PRODUCTS	70146.77	98086.06	34379.97	40268.39	36867.37	53389.35
ANIMAL CASINGS	1823.72	884.32	2020.56	3152.74	1809.42	3514.91
PROCESSED MEAT	857.63	1014.40	716.19	958.51	1366.16	2104.88
NATURAL HONEY	15587.53	14896.37	13310.77	14665.42	31675.57	24958.04
SWINE MEAT	817.82	917.23	1117.96	1034.90	1115.35	1050.94
Total	1646790.2	691312.11	1616216.27	720071.96	1413330.54	981738.33

OTHER PROCESSED FOODS

GROUND NUTS	297890.37	123900.93	340246.31	142593.30	417150.04	209406.40
GUARGUM	258567.56	133898.53	218479.74	113330.55	403675.01	281194.65
JAGGERY AND CONFECTIONERY	1467904.90	200482.09	53639.76	23320.18	1068376.45	349570.07
COCOA PRODUCTS	6831.90	8403.91	5863.88	9699.45	6962.54	13151.92
CEREAL PREPARATIONS	206928.49	110092.50	168795.50	101353.72	215727.31	122681.79
ALCOHOLIC BEVERAGES	56152.90	54254.20	70504.99	58952.65	132113.31	79019.63
MISCELLANEOUS PREPARATIONS	139637.31	59172.63	158803.46	69427.79	182184.21	87426.47
Total	2433913.43	690204.79	1016333.64	518677.64	2426188.87	1142450.93

[Source: APEDA – 2011]

CONCLUSION

India is the world's largest producer of milk, the second largest producer of fruits and vegetables, a major producer of spices, tea and coffee and large livestock population and vast marine wealth. There is not only a potential vast domestic market for it but also huge foreign market. The industry can become a top foreign exchange earner provided appropriate policies capture foreign market.

There is a lack of suitable infrastructure in the shape of cold chain, packaging centres, value added centre, modernized abattoirs, etc. Jaydeep and Tanya Singh (2010) suggested that, to achieve India's percentage share of global merchandise trade within the next five years, the new trade policy (2009-14) should propose measures for improvement in infrastructure related to export, bringing down transaction costs, and providing full refund of all indirect taxes and levies.

Government should attach highest priority to development and expansion of physical infrastructure for facilitating prompt growth of industries. In order to address the problem of infrastructure in food processing sector, the government should implement the scheme for infrastructure development.

There will better forward as well as backward linkages between farmers, processors and retailers and will link agricultural production to the market so as to ensure compressed supply chain, maximization of value addition, minimize wastages and improved farmers' income.

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ROLE OF BALANCED SCORECARD AS A COMMUNICATION TOOL

ANSHU
RESEARCH SCHOLAR
MANAV BHARTI UNIVERSITY
SOLAN

ABSTRACT

During the past decade more and more companies have experienced the importance of communicating strategy to their employees in an understandable way. Scorecards record performance related to a set of key performance indicators. The scorecards report cards on the organization's performance e. The Balanced Scorecard is a strategic planning and management system that is used extensively in business and industry, government and non- profit organizations worldwide to align business activities to the vision and strategy of the organization, improve internal and external communications and monitor organization performance against strategic goals. The Balanced Scorecard, created by Kaplan and Norton, is one of the management models providing tools to do this. The need for knowledge about how to create good internal communication in order to fully utilize the Balanced Scorecard Model makes this an interesting subject to study.

KEYWORDS

communication tools, performance indicators.

INTRODUCTION

The success of any organization is reflected upon by its performance which is in turn highly dependent upon its strategies. In this era of cut throat competition what an organization requires is not just framing the right strategies, but also managing the same. The organization has to understand that it needs to give impetus not only towards the financial results but also towards satisfaction of customers, development of state of the art technologies and creation of an environment of learning and growth. The Balanced Scorecard can be thought of as the strategic chart of account for an organization. The long term success of any organization is determined by the capabilities and the competencies it has developed. The Strategic Management Model Balanced Scorecard was introduced in 1992 and still generates a growing interest among companies today. In spite of all that has been written about the model there is still much confusion and misunderstanding among organizations and students about what the Balanced Scorecard actually is and how it is used. The fact that so much has been published about this term and most people have well acquainted with the term but very few actually know what it actually is, makes a study of Balanced Scorecard very interesting and relevant today. During the last decade more and more companies have started to see how important their employees are in creating a competitive advantage to secure future profit and growth in a dynamic business environment. Increased Decentralization has put a focus on the need for knowledge and understanding among the employees of the information that reaches them. During the past 60 years many studies on communication have been published. The studies about how people handle and interpret information have also been adapted to improve internal communication within organizations. Therefore a number of different ways to communicate everything from ideas to visions to the employees of a company and Balanced Scorecard is one way to do this. Kaplan and Norton, the creators of the Balanced Scorecard state that it is a system for information, communication and learning. This link between strategy and communication adds to the relevance of a study of the Balanced Scorecard as tool for communicating strategy. The statement above by Kaplan and Norton that Balanced Scorecard is a tool, not a measurement system, hence created an interest in studying the subject and its link to communication theory further.

PROBLEM

With the increase in the number of decentralized companies and organization information and the way it is communicated has become more important. For a company to create the needed flow of information it does not only need to know the importance of it, but also how the communication should be carried out in a way that makes it clear for receivers of the information. Good Internal Communication creates unity in the company and a common understanding of the company and contributes to the success of the company by creating a common direction. Therefore as many recommendations on how to best create a good internal communication as there are published books or articles on the subject, But what is really communication and communications within companies? By raising this Question and explore how it should best be done, it is possible to create a deeper understanding of how the theories can be best applied in accompany and how they can be used to communicate different messages. Here are many theories available today, all claiming to have the perfect solution to this problem. The Balanced Scorecard designed by Kaplan and Norton, is one of the theories claiming to have the perfect solution to the problem of communicating strategy to employees of an organization. The Strategy Model is used in both Private and Public Sectors as well as in Profit and Non- Profit Organizations.

PROBLEM FORMULATION

Based on the discussion above the following questions can be proposed:

- (I) How can the Balanced Scorecard be used as a tool for communicating strategy having communication theories in mind?
- (II) How does the Balanced Scorecard function as a communication tool in real life?

OBJECTIVES OF THE STUDY

As mentioned above there is still a lot of confusion around the Balanced Scorecard Concept. This paper creates a small contribution to the understanding of the Balanced Scorecard as a communication tool and not only a measurement tool by creating an overview of the theories about communication and the Balanced Scorecard and by describing how they link together into one possible model for communicating strategy, keeping intrapersonal communication in mind. This paper focuses on how the Balanced Scorecard is used as a communication tool towards employees and not towards other stakeholders.

RESEARCH APPROACH

There are several approaches a research paper can have. In this paper, we have found the Qualitative Method more suitable since we are looking to describe a function of a theory and how it is used in practice and through it increase the reader's knowledge and understanding of the subject. There are two main types of data which can be collected during a Research Project: Primary Data and Secondary Data. Primary Data is information collected by the researchers themselves for a specific purpose whereas Secondary Data is information collected by someone else and then reported in their own publication. Throughout the gathering of information for the study, Researcher has always tried to go back to the original source. Since the approach of this study is descriptive not only of a company, but also of the theories of the Balanced Scorecard and communication and how they interlink much of the data the study is based on have to be secondary. The researcher wants to create a clear picture with the reader of what the Balanced Scorecard is before moving on into how it can be used as a communication tool. It means that the theories which were used to describe the concept and combined into a model were collected from books either written by Kaplan and Norton, the creators of Balanced Scorecard or by the people who have studied the model and drawn their own conclusions of the use of it.

RELEVANT WORK

The Balanced Scorecard can be compared with the instrumental panel in an aircraft. To be able to fly an aircraft from one destination to another, different kinds of information are needed e.g. fuel level and cabin pressure. The advocates of the Balanced Scorecard claim that it is the same thing with companies. It provides information about what is needed to be able to navigate the company from one destination to another. The concept can be used for entire organization or for a part of the organization. What is most suitable depends on the company's situation and organization as well as other employed management control measures. According to **Olve**, It is beneficial to break down the top level measures to the most detailed level possible if as many employees as possible are to see how their work helps the company to attain a good score on its top level measures.

The Different companies have different vision and strategies and will have different Balanced Scorecards with varying numbers and types of perspectives depending on the content of company's vision and strategy. The basic model consists of four perspectives: Financial Perspective, Customer Perspective, Internal/ Business Process Perspective and Learning & Growth Perspective. The organization should try to obtain balance among the different perspectives. In all perspectives, there is an underlying clear vision and strategy constituting the framework for Scorecard as well as measuring the performance of a company during the past, present and future.

THE FINANCIAL PERSPECTIVE should show the actual results of strategic choice made in other perspectives. It describes what the owners expect of the company in terms of growth and profitability. The financial measures give an indication if the company's strategy and its implementation contribute to the improvement of profit.

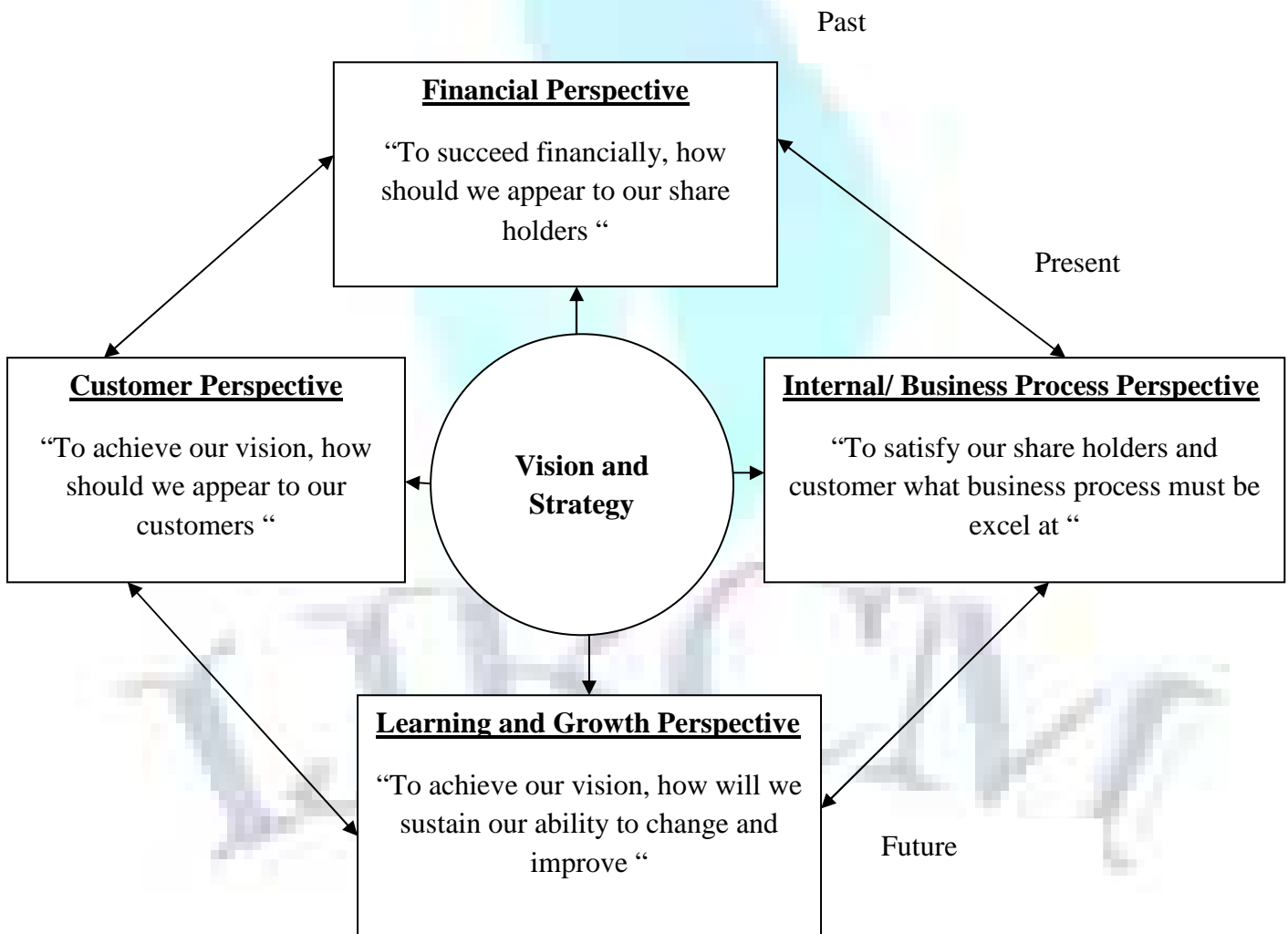
THE CUSTOMER PERSPECTIVE describes how value should be created for customers, how customer demand for this value should be satisfied and why customers are willing to pay for it. For that reason, the internal process developmental efforts of company should be guided by this perspective measures such as Market Share, Customer Satisfaction, Customer Acquisition and Profitability are used in this perspective.

THE INTERNAL/BUSINESS PROCESS PERSPECTIVE is mainly an analysis of the company's internal processes. The analysis includes identification of the resources and capabilities which the company needs to improve. This perspective focuses on the processes which are critical for the company's value creation towards shareholders and customers.

THE LEARNING & GROWTH PERSPECTIVE allows the organization to ensure its capacity for long term renewal, a pre-requisite for continued existence in the long run. In this perspective, the company should consider not only what it has to do for maintaining and developing the knowhow required for understanding and satisfying customers needs, but also how it can sustain the essential efficiency and productivity of the processes which currently create value for customers.

The following diagram represents all the above mentioned perspectives:

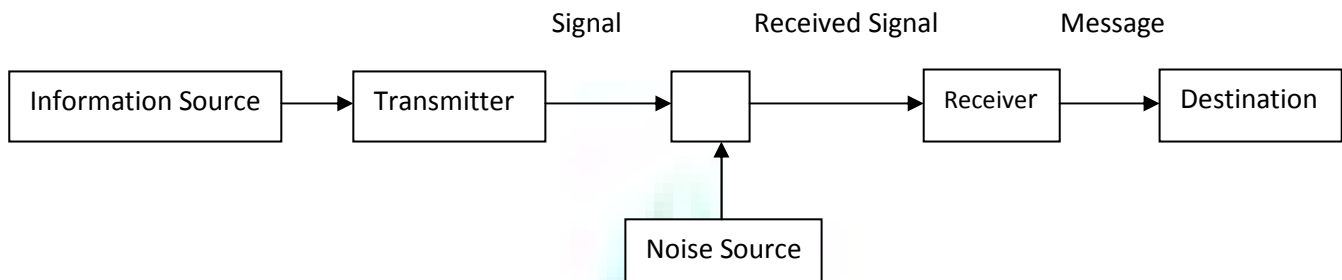
FIGURE-1: BALANCE SCORE CARD



TRANSMISSION MODELS

With increasing complexity in the business world today we become more and more dependent on the information around us. The communication process is never only one way, the information needs to be received as well as sent. This process of sending and receiving bits of information happens every second all over the world. In 1948, **Claud Shannon** created a mathematical model to describe a general communication system. The following diagram represents it:

FIGURE-2: SHENNON'S COMMUNICATION



The model focuses on how the message is encoded and sent through a medium where noise can disturb the transmission of message and how it then is decoded with the help of a receiver. His paper looks at the process with the eyes of an engineer and has mathematical and technical approach to finding a solution to the problem of noise. Mathew Hinton simplified Shanon's model and made it more applicable to an organization of today. He was on the opinion that mostly problems arise in an organization due to miscommunication. He described the communication process in four steps shown in the following diagram:

THE COMMUNICATIVE PROCESS MODEL



Formulating the information is made by deciding what to say, to whom to say it and how to say it. The more focussed information is more likely the outcome is to be what was desired. It is important to make a selection. Transmitting the information includes the channel of information is transmitted by and the timing.

COMMUNICATION WITHIN COMPANIES

With the increased interest in communication as a subject of study there have been an increasing number of papers and books published about how effective communication can be used as a tool for improving business. More companies pay more attention to communication and how it can be used. The amount of information that needs to be transmitted increases all the time, and it is important to get the information across in the right way. When organisational structures are built, companies pay attention to how information can flow as smoothly and quickly as possible and how to avoid misinterpretations and creation of rumours as well as in an effort to create an increased feeling of belonging and participation among the employees.

THE BALANCED SCORECARD AND COMMUNICATION

According to **Olve**, Scorecards are tools for communication and can be used in many different situations. The Scorecard as a communication tool carries significant educational weight since it contains information about an organisation's activities, what it measures, and how it performs against those yardsticks. Making the Scorecard a standard component of an organisation's ongoing communication program the Scorecard serves as a motivator.

The communication of the Scorecard goals and measures are the first step when it comes to drawing attention to the organisation's strategy. The organisational strategic objectives and measures somehow have to be transformed into tangible actions that the individual employees can execute in order to contribute to accomplishment of goals. The Scorecard's structure of cause and effect relationships can be used as guidelines when setting goals and measures for lower levels in organisation. Understanding can be enhanced if the same measures are employed at different levels in the company. If the cause and effect relationships of the measures can be identified, it will of course be even very easier to motivate employees to feel committed to the measures. Employees must have a great understanding of how their activities and attitudes contribute to the success of the overall organisation. Consequently the company's strive to make the employees understand their strategies. There are three processes that the organisation can implement to make the employees aligned with the corporate strategy.

- (I) **Communication and education programme:** A pre-requisite for implementing strategy is that everyone in organisation understands the strategy and which behaviour is required for attain strategic objectives. The base for achieving an organisational consensus is a continuous education programme for educating the organisation about the element of strategy and providing feedback.
- (II) **Program for goal formulation:** When a fundamental understanding for company's strategy is achieved all individuals and team all over the organisation have to translate the strategic objectives into more tangible goals.
- (III) **Incentive and Reward Systems:** These systems allow the employees a share in the company's success and conversely feel some of the pain when it is unsuccessful.

Channels of Communication Process in using Balanced Scorecard: The process of communicating with the employees about organization's vision; Business Concept and strategy should be considered as an internal market campaign. The objectives are same to the ones in Traditional Marketing Campaign- to create consciousness and to influence behaviour. In order to be effective the communication an education program should be continuous and comprehensive. The problem with communication is that a message could be sent many times, but it does not always mean that it has been received. So the use of different channels could be helpful either used singly or in combination in a communication program in order to reinforce the message. A wide range of communication tools can be used in line with the launch of Balanced Score Card. There are different channels when communicating strategy to the employees by using the Balanced Score Card. The following are the components that are commonly used and are considered as useful.

- (I) **Executive Announcements:** These are useful when introducing new strategies to the employees.
- (II) **Trainings:** These could be used to make the employee understand the strategy. The Scorecard could constitute a component in education and training Programmes within company.
- (III) **Meetings:** These constitute an essential part when it comes to communicating strategy using the Balanced Scorecard. Town meeting could initially be used by executives to introduce the Balanced Scorecard Concept. Small group meeting and face to face communications enables the communicators to focus the message in a personal manner and respond to question and feedback from audience.
- (IV) **The Brochure:** It is a one page document that can be used for reporting trends, current performance and describing the initiatives to accomplish the goals.
- (V) **Newsletters:** These are often used in communication with the employees. It could be used to educate the employees about the Balanced Scorecard, Explaining the perspective's importance, articulating the reasoning behind the specific objectives that have been selected and describing measures that would be used to motivate and monitor performance for that perspective.
- (VI) **Company Intranet/ Electronic Bulletin Board/ Home Page:** These provide further opportunities for organizations to communicate and gain commitment to the Balanced Scorecard Objectives. Bulletin Boards could be used to encourage the dialogue and debate by allowing managers and other employees to comment about exceeding or falling short on any specific measure. The textual presentation could be increased by adding video clips of customers, internal processes and employees and audio recording of chief executives, explaining why particular objective has been chosen, and the rationale for the measure selected for each objective.

Balanced Scorecard and Benefits

- Make strategy operational by translating strategy into performance measures and targets.
- Helps focus entire organization on what must be done to create a breakthrough performance.
- Integrates and acts as an umbrella for a variety of often disconnected corporate programmes, such as quality, process redesign and customer service.
- Breaks down corporate level measures so that local managers, operators and employees can see what they must do well in order to improve organizational effectiveness.

CONCLUSION AND FUTURE SCOPE

By comparing the model created by combining theories about the Balanced Scorecard and communication with the empirical findings, a number of conclusions can be made about how the Balanced Scorecard can be used as a communication tool and how reality sometimes creates a challenge, not always remembered in theory. When it is used properly as a communication tool we have seen that it helps the company ensured that all employees work towards the same goal. Strategies can be made clearer and connected to each employee's reality. It is also helpful for employees to focus on what is essential and keep themselves updated with the relevant information.

The Balanced Scorecard will probably be around but there will have to be developments. The strategy map is intuitively very appealing and will be used more often in concurrence with the Balanced Scorecard. Supervisory Boards will focus more and more on monitoring and guiding the strategy of the company, using the Balanced Scorecard. Better ways of measuring the data needed for the Balanced Scorecard can be derived "we are experts in what to measure, not in how to measure". Techniques for better innovation, employee capabilities, information system alignment, and climate, culture and customer success will certainly improve in coming years. Also there will be better information technology in communication process by using Balanced Scorecard.

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PERFORMANCE APPRAISAL OF INDIAN BANKING SECTOR: A COMPARATIVE STUDY OF SELECTED PRIVATE AND FOREIGN BANKS

SAHILA CHAUDHRY
STUDENT
SCHOOL OF MANAGEMENT
ITM UNIVERSITY
GURGAON

ABSTRACT

In the present study, an attempt is made to analyze the performance of selected private and foreign banks in India on the basis of parameters recommended in CAMEL Model, i.e. C-capital adequacy, A-asset quality, M-management efficiency, E-earnings quality and L-liquidity, which is divided into seven sections. First section includes a brief review of some of the earlier studies. Second section covers the scope, objectives, hypotheses and research methodology of the study. In third, fourth, fifth, sixth and seventh section, an attempt is made to analyze the capital adequacy, asset quality, management efficiency, earnings quality and liquidity of selected six banks in all selecting 3 banks from each category i.e. ICICI, HDFC and AXIS from private sector; and Citibank, Standard Chartered and HSBC from foreign banks in India for a period of 12 years, i.e. 2000 to 2011. To achieve the objectives of the study, the use is made of secondary data collected mainly from Report on Trends and Progress of Banking in India, Performance Highlights of Private and Foreign Banks in India, various journals such RBI Bulletin, IBA Bulletin, etc. To test the statistical significance of the results, one-way ANOVA technique has been used. It is found that the ability of the management to meet the need for additional capital is better in ICICI and Citibank in their groups as the capital adequacy ratio in these banks is better than other banks. The quality of assets indicates what types of advances the bank has made to generate interest income, which is better in HDFC and HSBC in their groups as the ratio of net NPAs to total assets/advances is better in these banks than other banks. Management efficiency is better in ICICI and Standard Chartered bank in their groups as the credit-deposits ratio is better in these banks than other banks. From the investors' point of view, HDFC and Standard Chartered are in a better position as their earnings quality is better in their respective groups which is evident from the ratio of operating profits to average working funds. On the other hand, from the depositors' point of view, ICICI and Citibank followed by HDFC and HSBC are in a better position in their respective groups as is evident from the ratio of liquid assets to total deposits/total assets.

KEYWORDS

Capital adequacy, Asset Quality, Efficiency, Earnings quality, Liquidity.

INTRODUCTION

After the set back of early nineties when the Government of India had to pledge the gold to acquire foreign currency to meet the severe problem of balance of payment temporarily, the Government planned to liberalize the Indian economy and open its door to the foreigners to speed up the development process as a long-term solution for the ailing economy. The economic liberalization move, which was initiated in 1991 when the new government assumed office, has touched all the spheres of national activity. Perhaps one area where the deregulatory policies had the maximum impact was the banking sector. Until 1991, the banking in India was largely traditional. The bankers were prudent and cautious people who seldom took risks and were content with the normal banking activities i.e. accepting of deposits and lending against them. Labeled as "Agents of Social Change", their outlook was rigidly controlled by the policies of the Government, which were centered more on the alleviation of poverty and the upliftment of the downtrodden. The 1969 and 1980's nationalization of banks, bringing private banks under the state control, had the objective of realizing this government dream. Even as late as 1991-92, the profitability was a forbidden word in banking business. The banks were established to fulfill social objectives and their performance was evaluated on their 'task fulfillment' initiatives. Lending to the priority sectors, opening of rural branches, achievements in the implementation of Government sponsored schemes and adherence to the policies and programmes of the Government were the parameters considered for judging the performance of a bank. Indian banking system has made commendable progress in extending its geographical spread and functional reach. The nationalization of banks helped in increasing the number of branches, volume of deposits and ensured wider dispersal of the advances. Despite impressive quantitative achievements in resource mobilization and in extending the credit reach, some deficiencies have, over the years, crept into the financial system such as decline in the productivity and efficiency of the system, erosion of the profitability of the system, directed lending played a critical role in depressing the profits, the directed investments in the form of SLR and CRR hindered income earning capability and potentials, portfolio quality suffered due to political and administrative interference in credit decision-making, increase in cost structure due to technological backwardness, average ratio of capital funds to RWAs remained low which created problems in international operations and the system remained de-linked from sound international banking practices. Realizing all these ill effects, the efforts were made to bring reforms in the financial system of the country. The seed of the reforms in India were sown by the Narasimham Committee appointed by the RBI under the chairmanship of M. Narasimham, the former Governor of RBI, to examine the aspects relating to the structure, organization, functions and procedures of the financial system and suggest remedial measures. The Committee submitted its reports in November 1991 and thus, began a new chapter in Indian banking. The financial system reforms were based on the principles of operational flexibility and functional autonomy so that the efficiency, productivity and profitability of the financial institutions can be enhanced continuously. It also aimed at providing a diversified, efficient and competitive financial system with the ultimate objective of improving the efficiency of available resources, increasing the return on investments so that an accelerated growth of all the sectors of the economy can be promoted. The specific goals of the reforms were the development of transparent and efficient capital and money markets, promotion of competition through free entry/exit in financial sector, improvement in access of financial savings, improvement of financial health of banks by recapitalizing, restructuring etc. of weaker banks, improvement in the managerial competence and quality of human resources, and building the financial institutions and infrastructure to improve the supervision, audit, technology and legal framework.

LITERATURE REVIEW

The articles published on different facets of Indian banking reforms are restrictive in nature and have been found wanting in terms of the assessment of the impact of the reforms on the banking sector. A brief review of some of them is as follows:

Reddy and Yuvaraja (2001) were of the view that the adoption of international capital adequacy standards, deregulation of interest rates and entry of private and foreign banks underlined that the speed and sequencing of the financial sector reforms should be as per the requirements of the Indian economy. **Rao (2002)** concluded that the international regulations are forcing the Indian banks to adopt better operational strategies and upgrade the skills. The system requires new technologies, well-guarded risk and credit appraisal system, treasury management, product diversification, internal control, external regulation as well as skilled human resources to achieve the international excellence and to face the global challenges. **Muniappan (2003)** focused on two areas - firstly, challenges faced by the Indian banks and secondly, the management of these challenges. Every aspect of the banking industry, be it profitability, NPA management, customer service, risk management, HRD etc., has to undergo the process of transformation of aligning with the international best practices. He concluded that the future of Indian banking system needs a long-term strategy, which should cover areas like structural aspects, business strategies, prudential control systems, integration of markets, technology issues, credit delivery mechanism and information sharing, etc. **Ghosh and Das (2005)** highlighted the ways

how market forces may motivate banks to select high capital adequacy ratios as a means of lowering their borrowing costs. If the effect of competition among banks is strong, then it may overcome the tendency for bank capitalization. If systemic effects are strong, regulation is required. Empirical tests for the Indian public sector banks during the 1990s demonstrated that better capitalised banks experienced lower borrowing costs. **Mohan (2006)** focused on the changes in efficiency and productivity in Indian banking and stated that the patterns of efficiency and technological change witnessed in Indian banking can be viewed as consistent with expectations in an industry undergoing rapid change in response to the forces of deregulation. In reaction to evolving market prospects, a few pioneering banks might adjust quickly to seize the emerging opportunities, while others respond slowly and cautiously. **Sharma and Nikadio (2007)** presented an analytical review of the capital adequacy regime of the banking sector in India and concluded that in the regime of Basel I, Indian banking system performed reasonably well, with an average CRAR of about 12 per cent, which was higher than the internationally accepted level of 8 per cent as well as India's own minimum regulatory requirement of 9 per cent. **Fred, Stephen and Arthur (2009)** used a multivariate discriminant model to differentiate between low efficiency and high efficiency community banks (less than \$1 billion in total assets) based upon the efficiency ratio, a commonly used financial performance measure that relates non-interest expenses to total operating income. The discriminant model was applied using data for 2006-2008 and also included the periods of high performance as well as the deteriorating industry conditions associated with the current financial crisis. The model's classification accuracy ranges approximately from 88-96 per cent for both original and cross-validation data sets. **Dwivedi and Charyulu (2011)** analyzed the impact of various market and regulatory initiatives on efficiency improvements of Indian banks with the help of Data Envelopment Analysis (DEA) and found that national banks, new private banks and foreign banks have showed high efficiency over a period of time than the remaining banks. **Uppal (2011)** analyzed the performance of major banks in terms of productivity and profitability in the pre and post e-banking period and concluded that performance of all the banks under study is much better in post-e-banking period and further foreign banks are at the top position, whereas the performance of the public sector banks is comparatively very poor. **Ghosh and Ghosh (2011)** emphasized on management of non-performing assets in the perspective of the public sector banks in India under strict asset classification norms, use of latest technological platform, recovery procedures and other bank specific indicators in the context of stringent regulatory framework of the Reserve Bank of India and concluded that the reduction of non-performing asset is necessary for improving the profitability of banks and to comply with the capital adequacy norms as per the Basel Accord(s). **Thiagarajan, Ayyappan and Ramachandran (2011)** analysed the role of market discipline on the behaviour of commercial banks with respect to their capital adequacy and concluded that the commercial banks are well capitalized and the ratio is well over the regulatory minimum requirement. The private sector banks show a higher percentage of tier-I capital over the public sector banks. However the public sector banks show a higher level of tier-II capital. The study also indicated that market forces influenced the banks' behaviour to keep their capital adequacy well above the regulatory norms. The Non-Performing Assets influenced the cost of deposits for both public and private sector banks in a significant manner. The return on equity had a significant positive influence on the cost of deposits for private sector banks. The public sector banks can reduce the cost of deposits by increasing their Tier-I capital.

Induced by the forgoing revelations, an attempt is made to analyze the performance of selected private and foreign banks in India on the basis of parameters recommended in CAMEL Model, i.e. C-capital adequacy, A-asset quality, M-management efficiency, E-earnings quality and L-liquidity, which is divided into four sections. First section includes a brief review of some of the earlier studies. Second section covers the scope, objectives, hypotheses and research methodology of the study. In third, fourth, fifth, sixth and seventh section, an attempt is made to analyze the capital adequacy, asset quality, management efficiency, earnings quality and liquidity of selected six banks in all selecting 3 banks from each category i.e. ICICI, HDFC and AXIS from private sector; and Citibank, Standard Chartered and HSBC from foreign banks in India.

OBJECTIVES, HYPOTHESES AND METHODOLOGY

OBJECTIVES OF THE STUDY

The present study is conducted to achieve the following objectives:

1. To study the present position of capital adequacy of selected private and foreign banks in India.
2. To analyze the asset quality of selected private and foreign banks in India.
3. To appraise the management efficiency of selected private and foreign banks in India.
4. To examine the earnings quality of selected private and foreign banks in India.
5. To analyze the liquidity of selected private and foreign banks in India.

RESEARCH HYPOTHESES

To achieve the above objective of the study, the following hypotheses are formulated and tested:

1. There is no significant difference in the bank/group-wise capital adequacy of the selected private and foreign banks in India.
2. There is no significant difference in the bank/group-wise asset quality of selected private and foreign banks in India.
3. There is no significant difference in the bank/group-wise management efficiency of selected private and foreign banks in India.
4. There is no significant difference in the bank/group-wise earnings quality of selected private and foreign banks in India.
5. There is no significant difference in the bank/group-wise liquidity of selected private and foreign banks in India.

RESEARCH METHODOLOGY

The present study covers the performance analysis of selected private (ICICI, HDFC and AXIS Bank) and foreign banks (Citi Bank, Standard Chartered Bank and HSBC Bank) for a period of 12 years, i.e. 2000 to 2011. To achieve the objectives of the study, the use is made of secondary data which were collected from the various sources like Report on Trends and Progress of Banking in India, Performance Highlights of Private and Foreign Banks in India, various journals such RBI Bulletin, IBA Bulletin, Professional Banker, ICFAI Journal of Bank Management. To test the statistical significance of the results, one-way ANOVA technique has been used.

MANAGEMENT OF CAPITAL ADEQUACY

It is important for a bank to maintain depositors' confidence and preventing the bank from bankruptcy. Capital may be taken as a cushion to protect depositors and promote the stability and efficiency of financial system of any country. Capital adequacy reflects the overall financial condition of the banks and also the ability of the management to meet the need for additional capital whenever required. It also indicates whether the bank has enough capital to absorb the unexpected losses or not. Capital Adequacy Ratios act as indicators of bank leverage. The following ratio measures the Capital Adequacy:

CAPITAL ADEQUACY RATIO

The banks are required to maintain the Capital Adequacy Ratio (CAR) as specified by RBI from time to time. As per the latest RBI norms, the banks in India should have a CAR of 9 per cent. It is arrived at by dividing the sum of Tier-I and Tier-II capital by aggregate of Risk Weighted Assets (RWAs). The higher the CAR, the stronger is a bank as it ensures high safety against bankruptcy. Tier-I Capital includes equity capital and free reserves. Tier-II Capital comprises of subordinate debt of 5-7 years tenure revaluation reserves, general provisions and loss reserves, hybrid debt capital instruments and undisclosed reserves and cumulative perpetual preference shares. As is evident from the Table-3.1, average capital adequacy ratio is highest in ICICI and Citibank in private and foreign banks respectively. There is no significant difference in the average capital adequacy ratio of selected private and foreign banks individually and when all the banks taken together as the calculated value is less than the critical value in all the cases during the period under study.

ADVANCES TO TOTAL ASSETS

The ratio of the advances to total assets indicates a bank's aggressiveness in lending, which ultimately results in better profitability. Higher ratio of advances to total assets is preferred to a lower one. Total advances also include receivables. The value of total assets is excluding the revaluation of all the assets. As is evident from Table-3.2, average ratio of advances to total assets is highest in ICICI and Citibank in private and foreign banks respectively. There is no significant difference in the average ratio of advances to total assets in selected private sector banks. However, the difference between the average ratios of advances to

total assets in selected foreign banks is found significant at 5 percent level of significance. As a whole, there is a significant difference in the average ratio of advances to total assets in selected private and foreign banks at 5 per cent level when all the banks taken together during the period under study.

GOVERNMENT SECURITIES TO TOTAL INVESTMENTS

The percentage of investment in government securities to total investments is a very important indicator, which shows the risk-taking ability of the bank. It indicates a bank's strategy as being high profit-high risk or low profits-low risk. It also gives a view as to the availability of alternative investment opportunities. Government securities are generally considered as the most safe debt instrument, which as a result, carries the lowest return. Since government securities are risk-free, the higher the G-Securities to investment ratio, the lower the risk involved in a bank's investments. As is evident from Table-3.3, average ratio of government securities to total investments is highest in ICICI and Citibank in private and foreign banks respectively. There is no significant difference in the average ratio of government securities to total investments in selected private sector banks. However, the difference between the average ratios of government securities to total investments in selected foreign banks is found significant at 5 percent level of significance. As a whole, there is a significant difference in the average ratio of government securities to total investments in selected private and foreign banks at 5 per cent level when all the banks are taken together during the period under study.

From the above analysis, it is concluded that there is no significant difference in the capital adequacy ratio of selected private and foreign banks. However, a significant difference is found in average ratio of advances to total assets and government securities to total investments of foreign banks and when all the individual banks are considered together. But this difference is found insignificant in case of selected private sector banks during the period under study. Therefore, the null hypothesis i.e. there is no significant difference in the bank/group-wise capital adequacy of the selected private and foreign banks in India can be partially accepted.

MANAGEMENT OF ASSET QUALITY

The quality of assets is an important parameter to gauge the strength of bank. The prime motto behind measuring the assets quality is to ascertain the component of net NPAs as percentage to total assets/net advances. This indicates what types of advances the bank has made to generate interest income. Thus, assets quality indicates the type of the debtors the bank is having.

GROSS NPAs TO TOTAL ADVANCES

This ratio is arrived at by dividing the gross NPAs by total advances. Lower the ratio better is the performance of the bank. As is evident from the Table-4.2, average ratio of gross NPAs to total advances is lowest in PNB, HDFC and Citibank in public, private and foreign banks respectively. There is no significant difference in the average ratio of gross NPAs to total advances in selected public sector and private sector banks. However, the difference between the average ratios of gross NPAs to total advances in selected foreign banks is found significant at 5 percent level of significance. As a whole, there is a significant difference in the average ratio of gross NPAs to total advances in selected private and foreign banks at 5 per cent level when all the individual banks are considered together during the period under study.

NET NPAs TO TOTAL ASSETS

This ratio indicates the efficiency of the bank in assessing credit risk and, to an extent, recovering the debts. This ratio is arrived at by dividing the net NPAs by total assets. Total assets are considered net of revaluation reserves. Lower the ratio better is the performance of the bank. As is evident from the Table-4.2, average ratio of net NPAs to total assets is lowest in HDFC and HSBC in private and foreign banks respectively. There is no significant difference in the average ratio of net NPAs to total assets in selected foreign banks. However, the difference between the average ratios of net NPAs to total assets in selected private sector banks is found significant at 5 percent level of significance. As a whole, there is a significant difference in the average ratio of net NPAs to total assets in selected private and foreign banks at 5 per cent level when all the individual banks are considered together during the period under study.

NET NPAs TO NET ADVANCES

It is the most standard measure of assets quality. In this ratio, Net NPAs are measured as a percentage of net advances. Net NPAs are gross NPAs net of provisions on NPAs and interest in suspense account. As is evident from the Table-4.3, average ratio of net NPAs to net advances is lowest in HDFC and HSBC in private and foreign banks respectively. There is no significant difference in the average ratio of net NPAs to net advances in selected public and foreign banks. However, the difference between the average ratios of net NPAs to net advances in selected private sector banks is found significant at 5 percent level of significance. As a whole, there is a significant difference in the average ratio of net NPAs to net advances in selected private and foreign banks at 5 per cent level when all the individual banks are considered together during the period under study.

From the above analysis, it is concluded that there is no significant difference in the asset quality of selected foreign banks. However it is found significant in private sector banks and when all the individual banks are considered together during the period under study. Therefore, the null hypothesis i.e. there is no significant difference in the bank/group-wise asset quality of the selected private and foreign banks in India can be partially accepted.

MANAGEMENT OF EFFICIENCY

Management efficiency is another important element of the CAMEL Model. The ratio in this segment involves subjective analysis to measure the efficiency and effectiveness of management. The management of the bank takes crucial decisions depending on its risk perception. It sets vision and goals for the organization and sees that it achieves them. This parameter is used to evaluate management efficiency as to assign premium to better quality banks and discount poorly managed ones. The ratio used to evaluate management efficiency is described as under:

TOTAL ADVANCES TO TOTAL DEPOSITS (CREDIT-DEPOSITS RATIO)

This ratio measures the efficiency and ability of the bank's management in converting the deposits available with the bank (excluding other funds like equity capital, etc.) into high earning advances. Total deposits include demand deposits, savings deposits, term deposits and deposits of other banks. Total advances also include the receivables. As is evident from Table-5.1, average ratio of total advances to total deposits is highest in ICICI and Standard Chartered in private and foreign banks respectively. The difference between the average credit-deposits ratio in selected private sector banks and foreign banks is found significant at 5 percent level of significance. As a whole, there is a significant difference in the average credit-deposits ratio of selected private and foreign banks at 5 per cent level when all the individual banks are considered together during the period under study.

BUSINESS PER EMPLOYEE

This ratio shows the productivity of human resource of the bank. It is used as a tool to measure the efficiency of all the employees of a bank in generating business for the bank. It is arrived at by dividing the total business by total number of employees. Higher the ratio, the better it is for the bank. By business, we mean the sum of Total Deposits and Total Advances in a particular year. As is evident from Table-5.2, average business per employee is highest in AXIS and Citibank in private and foreign banks respectively. The difference between the average business per employee in selected private sector banks and foreign banks is found significant at 5 percent level of significance. As a whole, there is a significant difference in the average business per employee of selected private and foreign banks at 5 per cent level when all the individual banks are considered together during the period under study.

PROFITS PER EMPLOYEE

This ratio shows the surplus earned per employee. It is arrived at by dividing the Profit after Tax earned by the bank by the total number of employees. Higher the ratio better is the efficiency of the management. As is evident from Table-5.3, average profits per employee are highest in ICICI and Citibank in private and foreign banks respectively. The difference between the average profits per employee in selected private sector banks and foreign banks is found significant at 5 percent level of significance. As a whole, there is a significant difference in the average profits per employee of selected private and foreign banks at 5 per cent level when all the individual banks are considered together during the period under study.

From the above analysis, it is concluded that there is a significant difference in the management efficiency of selected private sector banks, foreign banks and all the individual banks when considered together during the period under study. Therefore, the null hypothesis i.e. there is no significant difference in the bank/group-wise management efficiency of the selected private and foreign banks in India can be partially accepted.

MANAGEMENT OF EARNINGS QUALITY

The quality of earnings is a very important criterion that determines the ability of a bank to earn consistently, going into the future. It basically determines the profitability of the banks. It also explains the sustainability and growth in earnings in the future. This parameter gains importance in the light of the argument that much of a bank's income is earned through non-core activities like investments, treasury operations, and corporate advisory services and so on. The following ratios try to assess the quality of income in terms of income generated by core activity- income from lending operations:

OPERATING PROFITS TO AVERAGE WORKING FUNDS

This ratio indicates how much a bank can earn from its operations net of the operating expenses for every rupee spent on working funds. This is arrived at by dividing the operating profits by average working funds. Average Working Funds are the total resources (total assets or liabilities) employed by a bank. It is the daily average of the total assets/liabilities during a year. The higher the ratio, the better it is. This ratio determines the operating profits generated out of working funds employed. The better utilization of funds will result in higher operating profits. Thus, this ratio will indicate how a bank has employed its working funds in generating profits. Banks which use their assets efficiently will tend to have a better average than the industry average. As is evident from Table-6.1, average ratio of operating profits to average working funds is highest in AXIS and Standard Chartered in private and foreign banks respectively. There is a significant difference in the average ratio of profits to average working funds of selected private sector banks and foreign banks, which is found significant at 5 percent level of significance. As a whole, there is a significant difference in the average ratio of profits to average working funds of selected private and foreign banks at 5 per cent level when all the individual banks are considered together during the period under study.

SPREAD OR NET INTEREST MARGIN (NIM) TO TOTAL ASSETS

NIM, being the difference between the interest income and the interest expended, as a percentage of total assets shows the ability of the bank to keep the interest on deposits low and interest on advances high. It is an important measure of a bank's core income (income from lending operations). The interest income includes dividend income and interest expended includes interest paid on deposits, loan from the RBI, and other short term and long term loans. As is evident from Table-6.2, average ratio of spread to total assets is highest in HDFC and Citibank in private and foreign banks respectively. There is a significant difference in the average ratio of net interest margin to total assets of selected private and foreign banks. As a whole, there is also a significant difference in the average ratio of net interest margin to total assets of selected private and foreign banks at 5 per cent level when all the individual banks are considered together during the period under study.

NON-INTEREST INCOME TO TOTAL INCOME

Fee-based income accounts for a major portion of a bank's other income. The bank generates higher fee income through innovative products and adapting the technology for sustained service levels. This stream of revenue is not dependent on the bank's capital adequacy and consequent potential to generate income is immense. Thus, this ratio measures the income from operations, other than lending, as a percentage of the total income. Non-interest income is the income earned by the banks excluding income on advances and deposits with the RBI. The higher ratio of non-interest income to total income indicates the fee-based income. As is evident from Table-6.3, average ratio of non-interest income to total income is highest in ICICI and HSBC in private and foreign banks respectively. There is no significant difference in the average ratio of non-interest income to total income of selected foreign banks. However, the difference between the average ratios of non-interest income to total income in selected private sector banks is found significant at 5 percent level of significance. As a whole, there is a significant difference in the average ratio of non-interest income to total income of selected private and foreign banks at 5 per cent level when all the individual banks are considered together during the period under study.

NET PROFITS TO TOTAL INCOME

This ratio is calculated by dividing the net profits by total income, which includes interest income and other income. As is evident from table 6.4, average ratio of net profits to total income is highest in AXIS and Citibank in private and foreign banks respectively. There is a significant difference in the average ratio of net profits to total income of selected private sector banks and foreign banks, which is found significant at 5 percent level of significance. As a whole, there is a significant difference in the average ratio of net profits to total income of selected private and foreign banks at 5 per cent level when all the individual banks are considered together during the period under study.

From the above analysis, it is concluded that the difference is found significant only in case of operating profits to average working funds and spread to total assets in foreign banks. However, it is also found significant in private sector banks and when all the individual banks are considered together during the period under study. Therefore, the null hypothesis i.e. there is no significant difference in the bank/group-wise earnings quality of the selected private and foreign banks in India can be partially accepted.

MANAGEMENT OF LIQUIDITY

Liquidity is very important for any organization dealing with money. Banks have to take proper care in hedging liquidity risk while at the same time ensuring that a good percentage of funds are invested in higher return generating investments so that banks can generate profit while at the same time provide liquidity to the depositors. Among a bank's assets, cash investments are the most liquid. The ratios used to measure the liquidity are as follows:

LIQUID ASSETS TO TOTAL ASSETS

Liquid Assets include cash in hand, balance with the RBI, balance with other banks (both in India and abroad), and money at call and short notice. Total assets include the revaluations of all the assets. The proportion of liquid assets to total assets indicates the overall liquidity position of the bank. As is evident from table 7.1, average ratio of liquid assets to total assets is highest in HDFC and Citibank in private and foreign banks respectively. There is no significant difference in the average ratio of liquid assets to total assets of selected private banks. However, the difference between the average ratios of liquid assets to total assets in selected foreign banks is found significant at 5 percent level of significance. As a whole, there is a significant difference in the average ratio of liquid assets to total assets of selected private and foreign banks at 5 per cent level when all the individual banks are considered together during the period under study.

LIQUID ASSETS TO TOTAL DEPOSITS

This ratio measures the liquidity available to the depositors of the bank. Total deposits include demand deposits, savings deposits, term deposits, and deposits of other financial institutions. Liquid assets include cash in hand, balance with the RBI, balance with other banks (both in India and abroad), and money at call and short notice. As is evident from table 7.2, average ratio of liquid assets to total deposits is highest in ICICI and Citibank in private and foreign banks respectively. There is no significant difference in the average ratio of liquid assets to total deposits of selected private banks. However, the difference between the average ratios of liquid assets to total deposits in selected foreign banks is found significant at 5 percent level of significance. As a whole, there is a significant difference in the average ratio of liquid assets to total deposits of selected private and foreign banks at 5 per cent level when all the individual banks are considered together during the period under study.

From the above analysis, it is concluded that there is no significant difference in the management of liquidity of selected private sector banks. Therefore, the null hypothesis i.e. there is no significant difference in the bank/group-wise liquidity of the selected private banks can be accepted. On the other hand, the difference is found significant in case of in foreign banks and when all the individual banks are considered together during the period under study. Therefore, the null hypothesis i.e. there is no significant difference in the bank/group-wise liquidity of the selected private and foreign banks in India cannot be accepted.

CONCLUSION

As a whole, it is concluded that overall financial condition and also the ability of the management to meet the need for additional capital is better in ICICI and Citibank in their groups as the capital adequacy ratio in these banks is better than other banks. The quality of assets indicates what types of advances the bank has made to generate interest income, which is better in HDFC and HSBC in their groups as the ratio of net NPAs to total assets/advances is better in these banks than other banks. The management of the bank takes crucial decisions depending on its risk perception. It sets vision and goals for the organization and sees that it achieves them. This parameter is used to evaluate management efficiency as to assign premium to better quality banks and discount poorly managed ones. Management efficiency is better in ICICI and Standard Chartered bank in their groups as the credit-deposits ratio is better in these banks than other banks.

The quality of earnings is a very important criterion that determines the ability of a bank to earn consistently, going into the future. It basically determines the profitability of the banks. It also explains the sustainability and growth in earnings in the future. Therefore, from the investors' point of view, HDFC and Standard Chartered are in a better position as their earnings quality is better in their respective groups which is evident from the ratio of operating profits to average working funds. On the other hand, banks have to take proper care in hedging liquidity risk while at the same time ensuring that a good percentage of funds are invested in higher return generating investments so that banks can generate profit while at the same time provide sufficient liquidity to the depositors. Therefore, from the depositors' point of view, ICICI and Citibank followed by HDFC and HSBC are in a better position in their respective groups as is evident from the ratio of liquid assets to total deposits/total assets.

SIGNIFICANCE AND LIMITATIONS

The results obtained from the present study will be helpful to the policy makers, depositors, investors and other stakeholders to take decisions about the capital adequacy, asset quality, management efficiency, earnings quality and liquidity of the selected private and foreign banks in India. As the present study covers the performance analysis of selected private and foreign banks (only three banks from each category) for a period of 12 years only, therefore results drawn cannot be applied to the banking sector as whole for the entire period especially after the reforms. Availability of time and lack of experience on the part of the researcher may be considered a stumbling block in achieving the objectives of the study.

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TABLES

TABLE 3.1: CAPITAL ADEQUACY RATIO (Percent)

Years	Private Sector Banks			Foreign Banks		
	ICICI	HDFC	AXIS	Citibank	Standard Chartered	HSBC
2000	19.64	12.19	11.37	10.62	9.50	10.30
2001	11.57	11.09	9.00	11.25	9.63	12.37
2002	11.44	13.93	10.65	11.04	9.28	10.92
2003	11.10	11.12	10.90	11.30	10.56	18.10
2004	10.36	11.66	11.21	11.11	10.87	14.54
2005	11.78	12.16	12.66	10.78	10.46	14.03
2006	13.35	11.41	11.08	11.33	9.93	10.61
2007	11.69	13.08	11.57	11.06	10.44	11.06
2008	14.92	13.60	13.73	12.13	10.59	10.59
2009	15.92	15.09	13.69	14.81	11.56	15.31
2010	19.14	16.45	15.80	20.76	14.81	15.58
2011	17.63	15.32	12.65	18.32	14.48	N.A.
Average	14.04	13.09	12.02	12.88	11.01	11.95
ANOVA	2.10 (Critical Value-3.28)			1.41 (Critical Value-3.28)		
Overall ANOVA	1.549 (Critical Value-2.35)					

Note: Axis Bank was renamed in 2006 before that it was UTI Bank.

Source: Data Compiled from the Performance highlights of Various Banks.

TABLE 3.2: ADVANCES TO TOTAL ASSETS (Percent)

Years	Private Sector Banks			Foreign Banks		
	ICICI	HDFC	AXIS	Citibank	Standard Chartered	HSBC
2000	30.29	29.51	52.58	44.38	45.26	33.37
2001	35.63	29.69	44.62	45.21	40.39	37.72
2002	44.02	28.61	37.22	52.96	47.76	40.94
2003	39.23	38.56	41.51	50.03	44.49	39.22
2004	48.60	41.87	38.77	51.55	47.07	37.97
2005	52.83	49.64	41.28	53.57	53.56	45.23
2006	58.14	47.69	44.86	53.82	52.39	44.86
2007	56.82	51.45	50.34	49.52	51.15	42.08
2008	56.43	47.62	54.45	45.76	45.41	39.44
2009	57.56	53.95	55.21	37.92	38.48	29.15
2010	49.86	56.56	57.76	38.38	46.80	25.96
2011	57.26	57.68	58.67	36.38	46.11	30.06
Average	48.89	44.40	48.10	46.62	46.57	37.17
ANOVA	0.78 (Critical Value-3.28)			10.81* (Critical Value-3.28)		
Overall ANOVA	3.632* (Critical Value -2.35)					

*Significant at 5 percent level of significance.

Note: Axis Bank was renamed in 2006 before that it was UTI Bank.

Source: Data Compiled from the Performance highlights of Various Banks.

TABLE 3.3: GOVERNMENT SECURITIES TO TOTAL INVESTMENTS (Percent)

Years	Private Sector Banks			Foreign Banks		
	ICICI	HDFC	AXIS	Citibank	Standard Chartered	HSBC
2000	63.73	55.92	66.22	77.33	60.69	58.27
2001	49.72	47.76	57.89	81.82	57.46	61.38
2002	63.31	44.11	64.26	80.14	57.65	70.96
2003	80.58	47.48	48.14	80.48	64.05	80.58
2004	68.84	59.52	64.88	80.58	71.62	84.97
2005	68.31	58.02	50.1	81.79	76.69	83.45
2006	76.18	69.14	54.77	90.08	79.84	70.87
2007	77.65	73.76	62.39	92.42	84.14	72.42
2008	71.70	74.69	60.97	94.99	92.67	75.51
2009	67.79	88.67	60.88	96.79	90.32	57.37
2010	61.20	87.17	61.84	97.83	80.88	67.99
2011	51.18	75.73	61.82	97.09	85.66	55.41
Average	66.68	65.16	59.51	87.61	75.14	69.93
ANOVA	1.436 (Critical Value-3.28)			9.120* (Critical Value-3.28)		
Overall ANOVA	10.075* (Critical Value -2.35)					

*Significant at 5 percent level of significance.

Note: Axis Bank was renamed in 2006 before that it was UTI Bank.

Source: Data Compiled from the Performance highlights of Various Banks.

TABLE 4.1: GROSS NPAS TO TOTAL ADVANCES (Per cent)

Years	Private Sector Banks			Foreign Banks		
	ICICI	HDFC	AXIS	Citibank	Standard Chartered	HSBC
2000	2.58	3.52	5.52	1.82	8.47	9.95
2001	5.82	3.17	4.68	1.37	8.12	7.05
2002	10.85	3.27	5.27	0.94	3.57	5.70
2003	5.31	2.26	17.38	1.96	3.27	5.31
2004	4.97	1.89	2.93	2.57	2.99	4.35
2005	3.11	1.72	1.99	2.04	2.77	3.24
2006	1.52	1.45	1.69	1.60	2.84	1.89
2007	2.11	1.40	1.08	1.61	2.65	1.71
2008	3.36	1.43	0.82	2.06	2.17	2.33
2009	4.42	2.01	1.10	4.52	2.82	5.58
2010	5.23	1.44	1.26	3.48	2.64	7.17
2011	4.64	1.06	1.12	2.06	2.33	3.63
Average	4.49	2.05	3.73	2.17	3.72	4.82
ANOVA	2.004 (Critical Value-3.28)			5.458* (Critical Value-3.28)		
Overall ANOVA	2.43* (Critical Value -2.35)					

*Significant at 5 percent level of significance.

Note: Axis Bank was renamed in 2006 before that it was UTI Bank.

Source: Data Compiled from the Performance highlights of Various Banks.

TABLE 4.2: NET NPAS TO TOTAL ASSETS (Percent)

Years	Private Sector Banks			Foreign Banks		
	ICICI	HDFC	AXIS	Citibank	Standard Chartered	HSBC
2000	0.52	0.32	0.13	0.47	0.92	0.34
2001	0.29	0.13	0.14	0.31	0.62	0.36
2002	N.A	0.14	1.29	0.21	0.19	0.93
2003	0.4	0.14	0.83	0.58	0.13	0.40
2004	1.09	0.07	0.46	0.72	0.24	0.27
2005	0.89	0.12	0.57	0.53	0.60	0.23
2006	0.42	0.21	0.44	0.51	0.82	0.26
2007	0.58	0.22	0.36	0.50	0.73	0.18
2008	0.87	0.23	0.23	0.56	0.47	0.23
2009	1.20	0.34	0.22	1.00	0.53	0.41
2010	1.05	0.18	0.23	0.82	0.65	0.60
2011	0.59	0.10	0.16	0.44	0.12	0.27
Average	0.66	0.18	0.42	0.55	0.50	0.37
ANOVA	7.90* (Critical Value-3.28)			1.899 (Critical Value-3.28)		
Overall ANOVA	4.607*(Critical Value -2.35)					

*Significant at 5 percent level of significance.

Note: Axis Bank was renamed in 2006 before that it was UTI Bank.

Source: Data Compiled from the Performance highlights of Various Banks.

TABLE 4.3: NET NPAS TO NET ADVANCES (Percent)

Years	Private Sector Banks			Foreign Banks		
	ICICI	HDFC	AXIS	Citibank	Standard Chartered	HSBC
2000	1.53	1.09	4.54	1.05	2.04	1.04
2001	2.19	0.45	3.43	0.70	1.53	0.99
2002	5.48	0.50	2.74	0.40	0.40	2.27
2003	5.21	0.37	2.30	1.17	0.31	1.03
2004	5.21	0.37	2.39	1.40	0.52	0.70
2005	2.21	0.16	1.29	1.00	1.12	0.50
2006	0.72	0.44	0.98	0.95	1.57	0.58
2007	1.02	0.43	0.72	1.02	1.43	0.43
2008	1.55	0.47	0.42	1.23	1.04	0.58
2009	2.09	0.63	0.40	2.63	1.37	1.42
2010	2.12	0.31	0.40	2.14	1.40	2.31
2011	1.11	0.19	0.29	1.21	0.27	0.91
Average	2.54	0.45	1.65	1.24	1.08	1.06
ANOVA	7.83* (Critical Value-3.28)			0.31 (Critical Value-3.28)		
Overall ANOVA	5.801*(Critical Value -2.35)					

* Significant at 5 percent level of significance.

Note: Axis Bank was renamed in 2006 before that it was UTI Bank.

Source: Data Compiled from the Performance highlights of Various Banks.

TABLE 5.1: TOTAL ADVANCES TO TOTAL DEPOSITS (Percent)

Years	Private Sector Banks			Foreign Banks		
	ICICI	HDFC	AXIS	Citibank	Standard Chartered	HSBC
2000	37.07	41.08	61.30	64.85	86.18	50.66
2001	42.93	39.77	53.02	65.99	101.93	62.77
2002	146.59	38.60	43.56	74.69	95.84	63.49
2003	110.61	52.53	42.32	71.18	72.44	64.07
2004	91.17	58.35	44.68	74.56	80.97	59.18
2005	91.57	70.33	49.20	84.30	88.67	74.18
2006	88.54	62.84	55.63	87.62	84.60	67.37
2007	84.97	68.74	62.73	86.76	88.09	66.45
2008	62.94	92.30	68.09	83.20	90.13	70.26
2009	69.24	99.98	69.48	77.25	89.75	55.21
2010	89.70	75.17	73.84	67.32	86.22	42.11
2011	95.91	76.70	75.25	71.64	84.22	50.64
Average	84.27	64.70	58.26	75.78	87.42	60.53
ANOVA	4.72* (Critical Value-3.28)			31.92* (Critical Value-3.28)		
Overall ANOVA	6.964* (Critical Value -2.35)					

* Significant at 5 percent level of significance.

Note: Axis Bank was renamed in 2006 before that it was UTI Bank.

Source: Data Compiled from the Performance highlights of Various Banks.

TABLE 5.2: BUSINESS PER EMPLOYEE (Rs. in Lakhs)

Years	Private Sector Banks			Foreign Banks		
	ICICI	HDFC	AXIS	Citibank	Standard Chartered	HSBC
2000	829.52	922.00	1101.00	1,160.64	570.01	467.44
2001	815.22	643.00	959.00	1,336.24	617.78	528.67
2002	486.49	778.00	896.00	1566.82	794.41	595.80
2003	1120.00	856.00	926.00	1660.19	840.54	622.78
2004	1010.00	866.00	808.00	1666.92	780.11	820.91
2005	880.00	806.00	895.00	1359.91	786.36	779.45
2006	905.00	758.00	1020.00	1607.92	837.29	975.65
2007	1027.00	607.00	1024.00	1360.48	924.20	979.68
2008	1008.00	506.00	1117.00	1763.78	817.35	1012.34
2009	1154.00	446.00	1060.00	1880.10	971.77	961.81
2010	765.00	590.00	1111.00	1979.89	1083.45	1135.52
2011	735.00	653.00	1366.00	1745.94	1345.62	1221.70
Average	894.60	702.58	1023.58	1382.83	864.04	841.81
ANOVA	11.94*(Critical Value-3.28)			40.337* (Critical Value-3.28)		
Overall ANOVA	29.397*(Critical Value -2.35)					

* Significant at 5 percent level of significance.

Note: Axis Bank was renamed in 2006 before that it was UTI Bank.**Source:** Data Compiled from the Performance highlights of Various Banks.

TABLE 5.3: PROFITS PER EMPLOYEE (Rs. in Lakhs)

Years	Private Sector Banks			Foreign Banks		
	ICICI	HDFC	AXIS	Citibank	Standard Chartered	HSBC
2000	10.92	9.60	6.91	19.22	10.27	4.36
2001	10.45	8.61	7.27	19.34	11.21	6.62
2002	5.00	9.75	7.79	22.14	20.38	5.00
2003	11.00	10.09	8.22	24.26	25.15	4.50
2004	12.00	9.39	8.07	28.33	13.37	6.32
2005	11.00	8.80	7.03	21.75	11.50	8.90
2006	10.00	7.39	8.69	21.71	14.50	12.07
2007	9.00	6.13	7.59	17.33	19.62	14.32
2008	10.00	4.94	8.39	37.33	20.22	16.69
2009	11.00	4.18	10.02	45.12	23.82	16.06
2010	9.00	5.98	12.00	18.32	26.31	11.73
2011	10.00	7.37	14.00	28.61	26.36	23.20
Average	9.95	7.68	8.83	25.29	18.56	10.81
ANOVA	3.883* (Critical Value-3.28)			13.13* (Critical Value-3.28)		
Overall ANOVA	22.21*(Critical Value -2.35)					

* Significant at 5 percent level of significance.

Note: Axis Bank was renamed in 2006 before that it was UTI Bank.**Source:** Data Compiled from the Performance highlights of Various Banks.

TABLE 6.1: OPERATING PROFITS TO AVERAGE WORKING FUNDS (Percent)

Years	Private Sector Banks			Foreign Banks		
	ICICI	HDFC	AXIS	Citibank	Standard Chartered	HSBC
2000	2.81	4.18	2.60	3.87	4.15	2.85
2001	2.35	2.83	1.50	4.05	4.07	3.18
2002	2.14	2.61	3.46	4.24	5.44	2.77
2003	2.49	2.58	2.50	3.76	4.93	2.49
2004	2.09	2.58	3.49	4.42	4.95	3.54
2005	2.18	2.56	2.04	3.81	3.50	3.79
2006	1.98	2.75	2.43	4.02	4.74	3.77
2007	2.05	2.98	2.27	3.98	5.25	4.09
2008	2.14	3.13	2.57	4.04	5.54	4.23
2009	2.33	2.94	2.95	3.72	5.66	4.39
2010	2.72	3.33	3.48	3.66	6.14	3.73
2011	2.37	3.12	3.17	3.16	4.60	3.08
Average	2.30	2.96	2.70	3.89	4.91	3.49
ANOVA	5.975* (Critical Value-3.28)			18.464* (Critical Value-3.28)		
Overall ANOVA	37.041*(Critical Value -2.35)					

* Significant at 5 percent level of significance.

Note: Axis Bank was renamed in 2006 before that it was UTI Bank.**Source:** Data Compiled from the Performance highlights of Various Banks.

TABLE 6.2: SPREAD TO TOTAL ASSETS (Percent)

Years	Private Sector Banks			Foreign Banks		
	ICICI	HDFC	AXIS	Citibank	Standard Chartered	HSBC
2000	1.54	2.60	1.36	4.55	4.24	2.75
2001	2.05	3.24	0.91	3.97	3.73	3.03
2002	0.57	2.65	1.39	3.76	3.76	2.63
2003	1.33	2.73	1.64	3.76	3.87	2.88
2004	1.50	3.16	2.39	4.58	4.23	3.29
2005	1.69	3.46	1.94	4.29	3.72	3.52
2006	1.87	3.46	2.17	4.53	4.06	3.67
2007	1.93	4.07	2.14	4.05	4.06	4.17
2008	1.83	3.93	2.36	4.36	3.74	3.90
2009	2.21	4.05	2.50	4.19	3.24	3.87
2010	2.23	3.77	2.77	4.25	4.38	3.60
2011	2.22	3.80	2.70	3.65	3.75	3.66
Average	1.75	3.41	2.02	4.16	3.90	3.41
ANOVA	33.33*(Critical Value-3.28)			11.565* (Critical Value-3.28)		
Overall ANOVA	54.602*(Critical Value -2.35)					

* Significant at 5 percent level of significance.

Note: Axis Bank was renamed in 2006 before that it was UTI Bank.

Source: Data Compiled from the Performance highlights of Various Banks.

TABLE 6.3: NON-INTEREST INCOME TO TOTAL INCOME (Percent)

Years	Private Sector Banks			Foreign Banks		
	ICICI	HDFC	AXIS	Citibank	Standard Chartered	HSBC
2000	18.54	15.57	15.87	20.65	19.17	20.45
2001	15.05	12.84	15.49	22.97	21.07	23.07
2002	21.08	16.37	26.07	29.59	23.90	24.18
2003	25.22	18.95	21.89	27.63	19.69	24.56
2004	25.63	18.78	21.89	28.01	21.70	26.47
2005	26.63	15.85	25.40	30.00	17.41	28.89
2006	22.62	20.07	20.16	25.39	25.71	29.65
2007	23.24	17.98	17.78	23.49	25.00	25.68
2008	22.25	18.42	20.40	29.09	32.25	29.83
2009	19.65	16.77	21.10	34.37	35.41	29.91
2010	22.53	19.76	25.32	20.77	33.33	29.25
2011	20.38	17.87	23.41	23.35	28.01	25.61
Average	21.90	17.43	21.23	26.27	25.22	26.46
ANOVA	7.615* (Critical Value-3.28)			0.25 (Critical Value-3.28)		
Overall ANOVA	10.102*(Critical Value -2.35)					

* Significant at 5 percent level of significance.

Note: Axis Bank was renamed in 2006 before that it was UTI Bank.

Source: Data Compiled from the Performance highlights of Various Banks.

TABLE 6.4: NET PROFITS TO TOTAL INCOME (Percent)

Years	Private Sector Banks			Foreign Banks		
	ICICI	HDFC	AXIS	Citibank	Standard Chartered	HSBC
2000	10.06	14.90	8.87	10.82	13.93	9.74
2001	11.02	14.54	8.18	12.55	13.00	11.70
2002	9.47	14.59	8.41	12.00	18.97	8.42
2003	9.63	15.53	10.25	14.31	30.02	7.66
2004	13.57	16.82	13.01	18.05	18.51	9.33
2005	15.63	17.77	14.30	19.07	19.93	14.72
2006	13.74	15.55	13.40	17.17	21.99	16.45
2007	10.75	13.58	11.83	15.71	25.31	17.91
2008	10.50	12.83	12.17	21.45	23.70	16.80
2009	9.71	11.44	13.22	20.85	21.80	14.30
2010	12.13	14.63	16.13	11.23	24.98	11.09
2011	15.79	16.18	17.12	17.34	23.34	21.87
Average	11.83	14.86	12.24	15.88	21.29	13.33
ANOVA	5.822*(Critical Value-3.28)			10.611*(Critical Value-3.28)		
Overall ANOVA	12.021*(Critical Value -2.35)					

*Significant at 5 percent level of significance.

Note: Axis Bank was renamed in 2006 before that it was UTI Bank.

Source: Data Compiled from the Performance highlights of Various Banks.

TABLE 7.1: LIQUID ASSETS TO TOTAL ASSETS (Percent)

Years	Private Sector Banks			Foreign Banks		
	ICICI	HDFC	AXIS	Citibank	Standard Chartered	HSBC
2000	28.29	16.14	13.39	12.46	9.94	15.73
2001	18.21	19.59	11.57	15.69	5.29	13.69
2002	12.18	16.22	18.8	12.46	6.41	16.99
2003	6.07	10.41	23.45	15.15	4.67	5.65
2004	6.76	11.36	8.14	17.59	4.82	5.71
2005	7.68	8.70	11.91	14.12	4.15	7.39
2006	6.76	9.41	7.32	13.93	10.42	7.67
2007	10.77	10.03	9.44	13.56	6.84	14.63
2008	9.51	11.09	11.41	13.90	7.72	12.10
2009	7.90	9.55	10.16	15.25	4.33	11.87
2010	10.70	13.46	8.42	15.90	5.38	9.02
2011	8.39	10.70	8.82	19.06	6.38	9.01
Average	11.10	12.22	11.90	14.92	6.36	10.79
ANOVA	0.161 (Critical Value-3.28)			28.016* (Critical Value-3.28)		
Overall ANOVA	5.728*(Critical Value -2.35)					

*Significant at 5 percent level of significance.

Note: Axis Bank was renamed in 2006 before that it was UTI Bank.**Source:** Data Compiled from the Performance highlights of Various Banks.

TABLE 7.2: LIQUID ASSETS TO TOTAL DEPOSITS (Percent)

Years	Private Sector Banks			Foreign Banks		
	ICICI	HDFC	AXIS	Citibank	Standard Chartered	HSBC
2000	34.62	22.47	15.61	18.21	18.93	23.87
2001	21.94	26.24	13.75	22.91	13.35	22.79
2002	39.85	21.89	22.00	17.58	16.73	26.35
2003	9.23	15.48	9.41	21.55	7.61	9.23
2004	12.44	11.93	27.03	25.45	8.30	8.90
2005	12.95	12.33	14.20	22.22	6.88	12.12
2006	10.32	12.42	9.08	22.68	16.82	11.52
2007	16.10	13.40	11.77	23.76	11.78	23.10
2008	15.56	14.66	14.27	25.26	15.32	21.55
2009	13.72	12.26	12.79	31.07	10.09	20.48
2010	19.24	17.88	10.76	27.89	9.92	14.63
2011	15.11	14.23	11.31	37.54	11.64	15.18
Average	18.42	16.26	14.33	24.68	12.28	17.48
ANOVA	1.067 (Critical Value-3.28)			16.488* (Critical Value-3.28)		
Overall ANOVA	5.784* (Critical Value -2.35)					

*Significant at 5 percent level of significance.

Note: Axis Bank was renamed in 2006 before that it was UTI Bank.**Source:** Data Compiled from the Performance highlights of Various Banks.

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