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Day of the Week Effect in European Stock Market

REKHA GUPTA

This paper analyses the pattern of the days of week effect on European stock market. This study is based on thirteen countries indices which are chosen from European continent. Leven test, Robust test and independent student t- test have been 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.

Introduction

It is often assumed that the expected daily returns on stock are same for all days of the week. Thus, a number of studies have documented evidence in support of anomalous pattern of daily returns in the European 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 indicate 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 Europe. 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. Kiymaz and Berument (2003) report that volatility varies by the day of the week. Nath and Dalvi (2005) documented the impact of introduction of rolling settlement in India on the daily returns and noted the Mondays 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 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. Satish and Sonal (2009) have examined three types of anomalies

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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.

Objective

The object of this study is to test the day of the week effect in European stock market.

Hypotheses

In order to fulfil the objectives, following hypotheses are considered:

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

  $H_{o:}$ $\sigma_{MON}^2 = {}_{TUE}^2 = {}_{WED}^2 = {}_{THU}^2 = {}_{FRI}^2$

  $H_{A:}$ ${}_{MON}^2$ ${}_{TUE}^2$ ${}_{WED}^2$ ${}_{THU}^2$ ${}_{FRI}^2$

  ${}_i^2$ = variance of day of the week returns

- There are no differences in the average return on stock indices across the day of the week ;

  $H_{o:}$ ${}_{MON} = {}_{TUE} = {}_{WED} = {}_{THU} = {}_{FRI}$

  $H_{A:}$ ${}_{MON}$ ${}_{TUE}$ ${}_{WED}$ ${}_{THU}$ ${}_{FRI}$

  ${}_i$ = Average return of day of the week

- The null hypothesis posits that specific day return has no difference with other days of the week.

  $H_{o:}$ ${}_{\text{SPECIFIC DAY}} = {}_{\text{OTHER DAYS OF THE WEEK}}$

  $H_{A:}$ ${}_{\text{SPECIFIC DAY}}$ ${}_{\text{OTHER DAYS OF THE WEEK}}$

  ${}_i$ = Average return of day of the week

Methodology

To analyse whether day of the week effects exists or not in European capital market, the data for thirteen countries are collected from international websites. 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. 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.

Following steps and methods are applied for this study:

- Average share price of each company is obtained as:

Where:

P_H = *Highest market price during the day; and*

P_t = *Lowest market price during the day.*

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

$$R_t = \frac{(P_i - P_{i-1}) * 100}{P_{i-1}}$$

Where:

T_t = *is the rate of return for the period t; and*

P_t *and* P_{i-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–1)* degree of freedom.

$$WW = \frac{\left\{\sum_{j=1}^{J} n_j (D_j - D)^2\right\}}{\left\{\sum_{j=1}^{J} \sum_{i=1}^{nj} (D_j - D)^2\right\}} \left[\frac{(N - j)}{J - 1}\right];$$

$$D_{ij} = \left|R_{ij} M_i\right|$$

$$D_{ij} = \sum_{i=1}^{nj} \frac{D_{ij}}{n_j}, \quad \frac{D_{ij}}{N}$$

Where:

W is the result of the test;

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

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

which is the mean of the D_{ij}*; and*

is the grand mean of D_{ij}

The significance of w is tested against *F (ak – 1, N – K)* where *F* is a quintile of the F test distribution, with *K-1* and *N–K* its degrees of freedom, and a 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 to measure the mean difference between specific day returns and other day's returns. To carry out the test, it calculates the statistic as follows:

Table 1: Leven 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.
Belgium	.228	.923	.585	.674	2.692	.032	.375	.826	1.068	.373	.857	.490
Denmark	1.129	.343	1.608	.173	.455	.769	.142	.966	.662	.619	.277	.893
Finland	.654	.624	.685	.603	1.667	.158	1.071	.371	.656	.623	.201	.938
France	.986	.416	1.509	.200	1.952	.102	.429	.788	.399	.809	.356	.839
Germany	1.522	.196	.958	.431	.888	.472	.507	.731	1.108	.353	.681	.606
Greece	1.120	.347	.422	.793	1.549	.188	.646	.630	.307	.873	.081	.988
Italy	2.624	.035	2.883	.023	1.656	.161	.345	.848	.151	.963	.767	.547
Netherland	.434	.784	.968	.426	2.113	.080	.799	.527	.797	.528	.296	.880
Norway	1.138	.339	.319	.865	1.238	.295	.493	.741	1.140	.338	1.314	.265
Spain	2.282	.061	3.690	.006	1.564	.184	.531	.713	.256	.906	.259	.904
Sweden	1.796	.130	.785	.536	.909	.459	.633	.639	.303	.876	.429	.788
Switzerland	.952	.434	1.095	.359	2.306	.059	.188	.945	.667	.616	.697	.594
UK	.241	.915	.246	.912	2.490	.044	1.023	.396	.680	.607	.291	.884

Table 2: 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.
Belgium	.705	.590	1.607	.173	.146	.965	1.099	.358	.257	.905	.744	.563
Denmark	.508	.730	.246	.912	1.442	.221	.686	.602	.885	.474	.207	.934
Finland	.112	.978	.187	.945	.454	.770	.413	.800	.897	.466	1.801	.129
France	.465	.761	.215	.930	.236	.918	1.474	.211	.351	.843	1.396	.236
Germany	.135	.969	.111	.979	.408	.803	1.127	.344	.443	.778	1.100	.357
Greece	.989	.414	.572	.683	.402	.807	2.825	.026	.762	.551	.958	.431
Italy	.190	.943	.842	.500	.290	.884	2.002	.095	.543	.704	.973	.422
Netherland	.407	.803	.132	.971	.307	.873	.953	.434	.417	.797	1.302	.270
Norway	1.008	.404	.550	.699	2.839	.025	1.030	.392	.462	.764	.209	.934
Spain	.308	.873	.421	.793	.095	.984	1.140	.338	.468	.759	.780	.539
Sweden	.908	.460	1.626	.168	1.240	.295	.643	.632	.423	.792	.405	.805
Switzerland	.501	.735	.447	.774	.297	.879	.881	.476	.771	.545	.413	.799
UK	.768	.547	.113	.978	1.268	.283	1.068	.373	.448	.774	.718	.580

Table 3: Independent t-test for testing homogeneity of difference between monday and different days of the week

Name of	2003-04		2004-05		2005-06		2006-07		2007-08		2008-09	
Countries	t-value	p-Value	t-value	p-Value	t-value	p-Value	t-value	p-Value	t-value	p-Value	t value	p-Value
Belgium	-0.53546	0.592808	0.58931	0.556173	0.463589	0.643339	1.453427	0.147369	1.004575	0.316085	-1.15743	0.248207
Denmark	0.371332	0.710717	0.305853	0.759976	-1.18852	0.23577	-0.77892	0.43678	-1.7663	0.078628	0.081153	0.935388
Finland	0.183849	0.854286	0.28395	0.776689	-1.05658	0.292175	-0.08685	0.930862	0.457903	0.647438	-0.436	0.663223
France	1.012375	0.312338	0.296423	0.767148	0.709209	0.478845	0.812406	0.417338	0.173186	0.862647	-1.23982	0.21621
Germany	0.616539	0.538104	0.492312	0.622928	0.502295	0.615895	0.281237	0.778763	0.346157	0.729524	-1.46555	0.144054
Greece	-0.22928	0.818904	0.592481	0.554073	0.688848	0.491582	2.218296	0.027483	-0.08531	0.932089	-0.96648	0.334814
Italy	0.758448	0.448909	0.684054	0.494569	-0.05191	0.958642	0.543132	0.587537	-0.44597	0.656013	-1.31616	0.18936
Netherland	1.0751	0.283366	0.154471	0.87736	0.480847	0.631039	0.174532	0.86159	-0.27879	0.780637	-0.75551	0.450655
Norway	-0.02805	0.977646	1.345245	0.17979	1.536918	0.125863	-0.16902	0.865929	-0.08254	0.934291	0.103848	0.917376
Spain	0.763655	0.445817	0.200356	0.841372	0.313683	0.754019	0.256773	0.797567	0.585781	0.558562	-0.68975	0.491001
Sweden	1.19723	0.232398	-1.51957	0.129913	0.547832	0.584304	-0.3391	0.734832	-0.91224	0.362561	-0.67256	0.501883
Switzerland	1.244572	0.214488	-0.70211	0.483272	0.108837	0.91342	0.089629	0.928657	-0.53201	0.595213	-0.54446	0.586626
UK	0.980387	0.327858	0.102695	0.918289	1.031606	0.303274	0.995444	0.320507	0.60311	0.546998	-0.71022	0.478245

Table 4: Independent t test 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
Belgium	1.161293	0.24663	-0.30049	0.764047	-0.48099	0.630936	0.615508	0.538783	-0.30808	0.758278	-0.53109	0.595833
Denmark	-0.71821	0.473326	-0.31074	0.756266	0.740723	0.459565	1.445633	0.149558	0.966644	0.334703	0.777941	0.437367
Finland	0.148101	0.882386	0.50005	0.61749	-0.17105	0.864385	-0.78229	0.434806	-0.48826	0.625811	1.309933	0.191456
France	0.494728	0.621226	-0.21323	0.831319	-0.09514	0.924282	-0.53529	0.592931	-0.78579	0.432744	1.101419	0.271778
Germany	-0.00078	0.999376	0.078291	0.937659	0.17613	0.860332	-0.87329	0.38335	-0.14728	0.883033	1.060948	0.289758
Greece	-1.52968	0.127777	-1.2211	0.223216	-0.46202	0.644482	-0.70306	0.48271	0.256219	0.797999	0.622156	0.534453
Italy	-0.18127	0.856305	-1.40901	0.160064	0.492424	0.622848	-0.70162	0.483587	-1.04201	0.298441	1.084412	0.279257
Netherland	0.312384	0.755009	-0.43628	0.663003	0.40557	0.6854	-0.67913	0.497691	-0.23662	0.813151	1.23901	0.216508
Norway	-1.28057	0.201565	0.391237	0.695962	2.080962	0.038686	0.687033	0.492766	0.344945	0.73044	0.793666	0.428167
Spain	0.491473	0.623537	-0.9013	0.368332	-0.22507	0.822107	-0.33606	0.737112	-0.61575	0.538629	0.57475	0.565983
Sweden	1.173928	0.241587	-0.45408	0.650175	1.67202	0.095792	-0.14929	0.881454	0.320873	0.748587	0.954766	0.340669
Switzerland	0.06605	0.947393	-0.62038	0.53558	-0.12495	0.900661	0.249324	0.803322	-1.04082	0.299016	0.850597	0.395831
UK	0.876817	0.381441	-0.06812	0.945746	1.423804	0.155776	-0.18782	0.851178	-0.6245	0.532883	0.42655	0.670081

Table 5: Independent t test 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
Belgium	0.874996	0.382416	-1.62184	0.106069	-0.12843	0.897914	-0.63137	0.528378	-0.3359	0.737229	1.451927	0.147781
Denmark	-0.68553	0.49367	-0.15083	0.880235	1.820984	0.069819	-0.54702	0.584861	0.047691	0.962003	0.194269	0.846129
Finland	-0.5827	0.560635	-0.75135	0.453169	0.446599	0.655723	-0.26877	0.788339	-1.24126	0.215728	-0.46543	0.642044
France	-0.6788	0.497893	-0.05538	0.955877	0.36222	0.717489	-2.07966	0.038584	-0.2087	0.834857	0.300134	0.764326
Germany	-0.21812	0.827518	0.143185	0.886259	0.152876	0.878617	-1.4627	0.144815	-0.16377	0.870051	0.910449	0.363481
Greece	-0.31233	0.755138	-0.57097	0.568538	0.636996	0.524732	-2.35114	0.019536	-0.83433	0.404914	-0.72628	0.468405
Italy	-0.44667	0.655505	0.311428	0.755733	0.107039	0.914843	-2.38929	0.017645	0.296835	0.766846	0.027821	0.977828
Netherland	-0.62379	0.533334	0.169063	0.865881	0.444596	0.656991	-1.34407	0.180154	-0.37075	0.711144	-0.22378	0.823108
Norway	1.574754	0.116614	-0.53286	0.594611	-1.12379	0.262422	-1.74755	0.0819	-1.03163	0.30329	-0.11415	0.909213
Spain	-0.84997	0.396184	-0.45019	0.652981	0.092217	0.926599	-1.8441	0.066361	-0.7107	0.477946	-0.17721	0.859492
Sweden	-0.30046	0.764083	0.026293	0.979045	0.230139	0.818175	-1.10427	0.270587	-0.25868	0.796107	0.114258	0.90913
Switzerland	-0.65976	0.510032	0.765599	0.444643	1.079479	0.281423	-1.51017	0.13231	-0.35101	0.725892	0.362406	0.717364
UK	-0.00863	0.993118	-0.39433	0.693684	-0.29065	0.771563	-1.48325	0.1393	-0.94095	0.347662	1.026624	0.30561

Table 6: Independent t-test 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
Belgium	-1.29229	0.19745	-0.73889	0.460653	-0.24608	0.805819	-1.58072	0.115216	-0.11099	0.911714	-0.50172	0.616309
Denmark	1.061281	0.289625	-0.62816	0.530484	0.080699	0.935747	-0.55073	0.582319	0.546865	0.584984	-0.14946	0.881314
Finland	0.436905	0.66257	0.113687	0.90958	0.86071	0.390589	-0.0466	0.962873	-0.29659	0.767038	1.59613	0.11176
France	0.103602	0.917568	0.671071	0.50278	-0.73238	0.464614	0.322383	0.747434	-0.21324	0.831313	1.183662	0.237676
Germany	0.128826	0.8976	-0.16705	0.867464	-1.26277	0.20783	0.474272	0.635723	-1.0379	0.30035	0.425494	0.67085
Greece	1.129007	0.260333	0.610654	0.541992	-0.99739	0.319576	-0.80185	0.423444	-0.88381	0.37767	1.535887	0.125935
Italy	0.27764	0.781522	1.083566	0.279593	-1.01127	0.312858	0.741375	0.459182	0.011269	0.991018	0.946236	0.344968
Netherland	0.026487	0.97889	0.510119	0.610408	-0.94805	0.344006	0.260164	0.794953	-0.41415	0.679122	1.269222	0.205547
Norway	-0.09687	0.922909	-0.42631	0.67026	-2.32582	0.021011	-0.03979	0.968297	-0.2877	0.773824	0.044785	0.964315
Spain	0.155353	0.876673	0.985603	0.325321	-0.4784	0.632779	0.561045	0.575274	-0.32128	0.748275	1.119938	0.263828
Sweden	-1.37263	0.17115	2.263687	0.024472	-1.84902	0.065655	0.242993	0.808219	-0.19183	0.848038	0.427342	0.669518
Switzerland	0.157299	0.87514	0.821544	0.412126	-0.58365	0.559988	-0.2697	0.787625	0.444404	0.657154	0.264438	0.791666
UK	-0.20045	0.841294	0.54868	0.583725	-1.81145	0.071296	-0.66909	0.504072	0.062832	0.949952	0.445748	0.656173

Table 7: Independent t-test 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
Belgium	-0.19796	0.843237	2.066315	0.039805	0.380307	0.704035	0.081186	0.93536	-0.26472	0.791443	0.721835	0.471074
Denmark	-0.01699	0.986458	0.797894	0.425704	-1.4248	0.155477	0.453392	0.650668	0.232875	0.816059	-0.91608	0.360543
Finland	-0.17579	0.860603	-0.12901	0.897456	-0.11213	0.910848	1.164029	0.245558	1.544986	0.123673	-2.02209	0.044263
France	-0.91842	0.359283	-0.70351	0.482376	-0.23323	0.815768	1.399923	0.162786	1.019145	0.309131	-1.40608	0.160948
Germany	-0.51756	0.605224	-0.53199	0.595204	0.433324	0.665147	1.516667	0.130624	0.974009	0.331021	-0.96494	0.335527
Greece	0.875085	0.382644	0.581803	0.561232	0.151902	0.879391	1.45488	0.147026	1.515666	0.130904	-0.48277	0.629713
Italy	-0.38637	0.699555	-0.69431	0.488128	0.471647	0.637587	1.706384	0.089214	1.172906	0.241982	-0.77143	0.441199
Netherland	-0.77196	0.44087	-0.40183	0.688142	-0.36571	0.714885	1.533711	0.126375	1.287143	0.199249	-1.57943	0.115506
Norway	-0.18197	0.855762	-0.73884	0.460711	-0.23603	0.813643	1.279512	0.202029	1.036551	0.300997	-0.83429	0.404943
Spain	-0.54262	0.587893	0.123548	0.901777	0.295671	0.767723	1.296258	0.196092	1.018964	0.309225	-0.84629	0.398208
Sweden	-0.67194	0.502271	-0.40641	0.684799	-0.52111	0.602761	1.316628	0.189225	1.044206	0.297445	-0.82377	0.410896
Switzerland	-0.78375	0.43395	-0.29978	0.764593	-0.44804	0.654517	1.386375	0.166914	1.481904	0.139689	-0.94691	0.344624
UK	-1.62996	0.104389	-0.20885	0.834735	-0.30983	0.756956	1.271008	0.204936	0.832829	0.405759	-1.17998	0.239153

Where:

$\overline{X}_1$ *is the mean of first sample;*

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;*

S is the combined standard deviation.

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

Result and Discussion

Table 1 indicates The Levene statistics which shows that volatility between days of the week return are insignificant of all thirteen European country indices. It reveals that days of the week returns volatility have insignificant variation in European country.

Table 2 shows the Robust test statistics. It can be stated from table that for 100 per cent of the country indices, the average return difference between the days of the week are insignificant from 2003-04 to 2008-09. 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 European stock market.

For testing the specific day effect Independent t test is also used, 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 3, 4, 5, 6 and 7 for monday, tuesday, wednesday, thursday and friday. It can be cited from table that all country indices have insignificant difference between specific day and other days in a week. It reveals that null hypothesis is accepted in all the years.

The present study has been carried out 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 European stock markets.

Conclusion

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

- The result shows that all country indices days of the week volatility have insignificant variation; and

- It also depicts that majority of country indices have insignificant difference between mean return of days of the week.

This study suggests that the investors that all days in week are equally important. No specific day is important for purchasing and selling the securities for investor, portfolio manager and policy maker.

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Analysis of Risk and Return in South Asian Stock Market: Evidence from Descriptive Statistics

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Bhutanese economy is highly dependent on Indian economy as 85% of the total trade happens with India. When such high level of dependency is present, most of the macro economic variables in Bhutan are expected to follow the movements in India. Since stock market indices capture, to a large proportion, the economic performance of a country, we tried comparing Bhutanese stock index (specially constructed for the purpose of this study as Bhutan did not have stock index till few months ago) with Indian stock index – Bombay Stock Exchange (BSE). To see if market return and risk (measured in terms of standard deviation) show similar relationship between Bhutanese stock and Indian Stock and with the rest of the markets in the South Asian region. The average returns and associated risk across stock markets for the full sample period (2006-2011) and for different time period (annually). have been analysed. This risk-return relationship between different time periods for individual stock market to see if risk-return pattern changes due to difference in time has also been analysed.

Introduction

Stock return is basically referred to the percentage change of stock index. If the change is positive, the return is positive and vice-versa. Stock market returns are very volatile in nature. The measure of the degree of price movement in a stock, future contract or any other market is termed as market volatility. To understand whether the stock returns are normally distributed for across different time periods and across different markets becomes important for those who are investors in the stock market. Stock market volatility measures variability or dispersion about the central tendency of the price of stock. The measure of the degree of price movement in a stock is termed as stock market volatility. Hence volatility could mean changeability or random movement. Risk associated with stock return is the standard deviation or variance of stock returns.It is the variability or the dispersion of stock returns that is used in measuring the volatility.

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Kaur (2004) defines volatility as the most basic statistical risk measure and can be used in measuring the market risk of a single instrument or an entire portfolio of instruments. Kaur states that volatility can be expressed in different ways.

Stock return can be calculated as follows.

$$R_t = (P_t / P_{t-1}), \times 100$$

where R_t is the rate of return for the period t, P_{t-1} and P_t is the index of two successive periods.

As mentioned above, volatility or risk is the standard deviation of return for the data series for certain time period. If we want to estimate the pattern of risk and return we find mean return and standard deviation associated with returns for similar time period and compare.

Broadly, the literature shows that estimation and forecasting of stock market volatility has four approaches (Pandey 2005). Firstly, the volatility is calculated based on traditional approach. This approach uses standard deviation of stock returns based on the closing stock prices. Second method is termed as the extreme value method and the calculation of volatility by this method is similar to that of the first one except that it uses two extreme prices – high and low. The third approach of estimating volatility is called conditional volatility measurement. In this method the time-varying nature of the stock returns are considered and hence ARCH and GARCH models are applied. The ARCH model describes forecasted variances in terms of current observations. Rather than using short and long term sample standard deviation, it takes weighted averages of past squared forecast errors providing lessor weightage on distant past data and higher weightage on most recent data. This is considered an improvement on the classical volatility measurement system. The GARCH model revisited the ARCH model and assign weightage on past squared residuals on a geometrically declining trend. This is an improved version and widely used tool is forecasting volatility. The fourth approach is implied volatility and underlined difference with the rest is that it takes into account the market price of an option that implicitly represents asset prices. In other words, this approach deals with forward expectation of investors about likely future price path and calculates information of options that are trading in the market.

Leterature Review

Rajan and James (2005). found that average return and average risk do not necessarily show strong correlation. Karmakar and Roy (1995) found that irrespective of period taken for computation of average volatility, the risk pattern remains same. For the study period covered they report that the volatility in the Indian stock market represented by BSE remain almost uniform. Pandey (2005) showed that the conditional volatility models perform well in estimating volatility for the past in terms of statistical bias whereas extreme value estimators perform well on statistical efficiency criteria. In terms of forecasting volatility, the author reports that the extreme value estimators are better. Khan and Hug (2012) showed that there was mismatch

between the risks and returns across indices and across time intervals. Their results indicated the time effect on returns and due to extremely high returns on certain time period, the distributions are skewed.

In this analysis exercise we have used similar approach that was employed by Rajan and James,Karmakar and Royand Khan and Hug in calculating risk and returns.Returns and risks pattern of Bhutanese stock market is calculated on an annual basis and for the full sample (2006 -2011) using weekly data and compared with the risk-returns of Indian and other markets in the region calculated using similar approach. Since Bhutan did not have stock index till very recently (till few months back), we constructed one using weighted average price method using the prices of selected six listed companies. Although Bhutan has about 21 listed companies, only six companies had shown some level of trading and hence those that had very poor or almost no trading were dropped from the study. Bombay Stock Exchange (BSE) was used for Indian stock. For other countries (Nepal, Bangladesh, Sri Lanka and Pakistan) we used their national stock exchange data for 2006–2011.

Risk-Return Relationship Across the SAARC Countries

Table 1 presents the result for risk (standard deviation) and returns (mean) along with skewness and kurtosis (that analyses normalcy of return distribution across the countries under study). Results show that the weekly returns of all the countries under study are much lower than half a percent between 2006 – 2010 period. Weekly returns for Sri Lanka and Bangladesh are similar at .0042 percentage point followed by Nepal at .003%. The weekly average returns for stock market in Pakistan is the lowest among SAARC nations. Bhutanese stock and Indian Stock have weekly returns of .003 and .0023 percentage points. When we annualized the weekly averages, the annual average returns for Sri Lanka and Bangladesh (highest in the region) stand at 22%, Nepalese stock returns at 16%, Indian and Bhutanese stock returns were at 12% and 10% respectively and the Pakistani stock market provided only 6% (lowest in the region). In terms of average return Bhutanese stock seems to have closer relationship with Indian stock than with other markets.

In terms of risk, Nepal has the highest standard deviation (8.5%) although in average return it stands at third position among the SAARC nations. Risk associated with other nations is all below 5%. Risk associated with Indian stock market is 0.03843 whereas for Bhutan it is slightly lower (0.02604). Compared to Bhutan, India has higher risk and also the higher return. However, similar relationship of high risk – high return concept does not prevail when results are compared across the regional markets. This finding is very similar to that of Khan and Hug for Bangladesh.

On data normality, stock returns of all SAARC nations except Bhutanese and Pakistani stock returns are positively skewed or stock returns forming tails towards the right. In such a scenario, the mode of the return will be lower than the mean of the return. Therefore, the average annual or full

sample period return will not be representing weekly returns. However, the so long the skewness is within acceptable range (+-5%) data is considered to be normally distributed at 95% confidence level. Using this norm, the stock return data of Nepal seems to pose problem of normal distribution as its skewness is above +7.7 (positively skewed), having a long right tail. India and Pakistan have negative skewness of (-0.118) and (-0.837) respectively. All others have positive skewness.

In terms of flatness and peakedness of data distribution, we use kurtosis to measure the normality. All countries show positive kurtosis and much above zero level (a symptom of data non-normality). Again, data of Nepal has the highest kurtosis (110.757) followed by Bhutan (35.257). Sri Lankan data also is quite peaked (29.8). Kurtosis for rest of the countries is within +-5% mark. From the analysis of skewness and kurtosis, we may conclude that the data of Nepal, Pakistan, Bhutan and Sri Lanka are somewhat problematic in terms of normal distribution.

Table 1: Risk return relationship and data normality descriptive statistics (2006-11)

	N	Mean	Std. deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
RSLK	312	.0042	.03682	1.222	.138	29.844	.275
RBGD	312	.0042	.03030	.118	.138	4.227	.275
RNPL	312	.0030	.08583	7.727	.138	110.757	.275
RBSE	312	.0023	.03843	-.185	.138	1.717	.275
RBHU	312	.0019	.02604	2.506	.138	35.257	.275
RPAK	312	.0011	.03483	-.837	.138	2.100	.275
Valid N (listwise) 312							

Analysis of stock market returns and risk pattern show it is not necessarily true that the countries with higher risk have the higher returns. For example, the returns in Nepal is lower than in Sri Lanka and Bangladesh but the risk is highest in Nepal is the highest among the SAARC nations. When risk and return relationship is assessed for SAARC nations for (2006 – 2011) period, it is quite confusing to conclude that there exist positive relationship between risks and return as advocated by theory. If this were true than Nepal should have the highest return as it shows the highest risk. However, in majority of cases the relationship seems to confirm the countries with higher risk are also characterized by higher returns.

The analysis of mean stock return shows that Sri Lanka and Bangladesh stock markets had leading average return during the period. On the other end Pakistanistock market provided the least return. The stock market returns of Nepal and India have remained somewhat mediocre closely followed by Bhutanese market. It is important to look at risk when we compare returns

across different stock markets since markets with higher return are also supposed to have higher risk exposure and the investors are not free from risk when they try to maximize their returns.

It is seen that the countries with higher returns (Sri Lanka and Bangladesh) have higher risk too. Similarly stock markets with least average returns (Bhutan and Pakistan) have lowest risk. The return of Indian stock market was found somewhere in between and the risk level also confirms similar pattern. However, as we observe the risk and return for Nepal, we get slightly confusing result. Stock market return for Nepal is found at third place but it has the highest level of risk among the SAARC countries. There seems to be a big difference in terms of stock market risk in Nepal compared to other countries where risk levels are very close to one another.

Considering the big difference in risk level of Nepalese stock market in relation to its moderately low level of returns, the theoretical dictates of positive relationship between risk and return seems little inconclusive for the SAARC countries. However, this could be attributed to the continuous political unrest and consequently unstable and comparatively more volatile economic situation in Nepal that existed for the study period which unfortunately continuous even now.

Year-Wise Risk-Return Comparison

In this section we provide the risk-return analysis for different stock markets with split data (year-wise) to find out in which year and for which countries the risk-returns gaps are beyond average scenarios among SAARC countries. This analysis should provide us insight on the time effect of stock market returns. If differences in returns exist between different time risk levels remaining same, the investors can take advantage. Similarly, the investors can also benefit if risk levels are different across time and the returns are similar.

Table 2: Risk-return for comparison
descriptive statistics 2006 and 2007

	N	Mean	Std.	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
2006							
RNPL	51	.0237	.18989	4.168	.333	27.176	.656
RBSE	51	.0075	.03051	-1.275	.333	3.732	.656
RSLK	51	.0070	.02328	1.265	.333	4.365	.656
RBHU	51	.0029	.03215	.081	.333	5.693	.656
RPAK	51	.0009	.03518	-.700	.333	.118	.656
RBGD	51	.0000	.02190	.159	.333	-.167	.656
Valid N (listwiss	51						

Contd...

Contd...

2007							
RNPL	52	.0152	.07236	.927	.330	7.304	.650
RBGD	52	.0124	.02392	-088	.330	-.713	.650
RBSE	52	.0079	.03397	.023	.330	-103	.650
RPAK	52	.0078	.02719	-.867	.330	.190	.650
RBHU	52	.0032	.04084	1.309	.330	21.873	.650
RSLK	52	-.0015	.02037	.006	.330	.072	.650
Valid N (Iistwise)	52						

In 2006, Nepal leads in return but also has the highest risk. It is also observed that the data distribution in Nepal is more skewed towards right and also the kurtosis is much higher than in other countries. All other stock markets other than Nepal have skewness between -1 and +1) roughly. When it comes to kurtosis, most markets except Pakistan and Bangladesh have significantly higher kurtosis (greater than zero).

In 2006 Sri Lanka has comparatively lower risk given the return – indicating a preference for investment. India and Bhutan have quite similar risks but the returns in India seem better than in Bhutan. This indicates that in 2006 the investors would benefit more with Indian stock compared to Bhutanese stock for investment for similar risk exposure.

In 2007, Nepal leads both in both the risk and return. Bangladesh stands in the second place in terms of returns but the risk comparatively lower than in other countries (excepting Sri Lanka). Risk in Sri Lanka is the lowest but the return isnegative. When Bhutan is compared with India, it has much lower return but higher risk. Data distribution for all markets seem quite normal from skewness point of view but when kurtosis are considered Bhutanese and Nepalese stock markets do have data distribution problem.

Table 3: Risk-return for comparison descriptive statistics 2008 and 2009

	N	Mean	Std.	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
2008							
RBHU	53	.0008	.00943	1.518	.327	10.828	.644
RBGD	53	-.0013	.02144	.689	.327	1.159	.644
RNPL	53	-.0060	.03977	.092	.327	-.054	.644
RSLK	53	-.0089	.02845	-.954	.327	2.557	.644
RBSE	53	-.0118	.05354	-.074	.327	.577	.644
RPAK	53	-.0164	.04686	-.657	.327	.599	.644
Valid N (Iistwise)	53						

Contd...

Contd...

2009							
RSLK	52	.0187	.06874	.590	.330	13.617	.650
RBSE	52	.0119	.04624	.117	.330	.912	.650
RPAK	52	.0102	.04201	-.463	.330	1.252	.650
RBGD	52	.0099	.03227	2.179	.330	9604	.650
RBHU	52	.0025	.03008	5.849	.330	40.508	.650
RNPL	52	-.0044	.02445	.656	.330	.238	.650
Valid N (listwise)	52						

In 2008, Except for Bhutan all other countries show negative returns. Risk seems to be lower in Bhutan (0.00943) although return is higher. India, Pakistan and Nepal show comparatively higher standard deviation (0.05354, 0.04686 and 0.03977 respectively in 2008. India leads on risk followed by Pakistan. Although skewness for all stock markets are not high but as we see from kurtosis, Bhutanese returns followed by Sri Lanka show symptom on data non-normality.

During 2009, Sri Lanka shows highest return and also the risk. India has second level of return and risk, similarly Pakistan showed third level of return and risk. Risk and return pattern in 2009 shows that markets with high returns are also associated with higher risk.Nepal has the negative return with lowest risk in the region. In terms of data normality, 2009 seems to show high levels of peakedness for Bhutan, Sri Lanka and Bangladesh (kurtosis for these markets are very high).

Table 4: Risk-return for comparison descriptive statistics 2010 and 2011

	N	Mean	Std.	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
2010							
RSLK	53	.0139	.02694	.463	.327	.303	.644
RBGD	53	.0112	.02163	-.292	.327	-.142	.644
RPAK	53	.0054	.01968	-.695	.327	.167	.644
RBSE	53	.0025	.02305	-.297	.327	-.487	.644
RBHU	53	-.0005	.00702	-5.649	.327	38.163	.644
RNPL	53	-.0057	.02088	.699	.327	.433	.644
Valid N (listwise)	53						
2011							
RBHU	51	.0026	.02012	2.104	.333	11.952	.656
RPAK	51	-0014	.02413	-.485	.333	1.871	.656
RSLK	51	-0037	.02118	.207	.333	.292	.656
RBSE	51	-0043	.03083	.742	.333	-023	.656
RNPL	51	-0043	.02910	2.228	.333	9.471	.656
RBGD	51	-0073	.04774	-.051	.333	.672	.656
Valid N (listwise)	51						

On the analysis of the risk-return relationship for 2010 period, Sri Lanka shows higher risk and also the return, followed by Bangladesh. Risk associated with Indian stock market in relation to its return seems high comparatively. Bhutanese stock has negative return but the risk is also the lowest when compared with others. Huge gap between risk and return exist for Nepalese stock market. The return is negative but the risk is quite high (.02088). With al most the similar level of risk (.02163), Bangladesh provided a return that stand at second position among the SAARC countries.

In 2011, all the stock markets except Bhutan showed negative return. In fact it is interesting to note that when all other markets in the region had shown dip in return Bhutanese stock market was doing well. Similar situation was also seen in 2008. In 2011 Bhutan showed the lowest risk (.02012) and the highest return (.0026) compared to other markets that had negative return and higher level of risks. Does it mean that the Bhutanese stock market was unaffected by the regional economic down turn or it is simply because the stock index in Bhutan does not represent the over all macro economic performance of the country. Probably the latter is true given the fact that the stock index used for this study in Bhutan includes only six companies that really do not capture over all economic variation.

So far we have analyzed the risk return relationship, firstly for the full study period (2006 – 2011) and secondly with split data year-wise for five of the eight SAARC countries stock market. We found that the stock markets with higher risk are associated with higher returns in in some years but results were quite confusing for some years. It was with Nepalese stock we found that the average risk was much higher than the average return for the (2006 – 2011) period compared to other countries.In the first two years Nepal although had positive returns (higher than in other countries) but the risk levels were also very high. From 2008 – 2011, Nepal had negative return continuously (the lowest among all nations) but the risk level remained still high (higher than in many other countries). It may have been the effect of unstable political scenario that may have distorted the stock market risk return relationship in Nepal. We know that Nepal has been and still is undergoing a very volatile political situation. It was noticed that Bhutanese stock was the only one that showed positive returns in 2008 and 2011. All other markets showed negative returns in these two years.

Given the differences in the risk return pattern in the region for different stock markets for different time period, investors can take advantage. However, several World Bank Reports suggest, capital market in the region must bring about reforms in creating good environment for capital movement that is absent currently.

Market-wise Risk-Return Trends

In Indian stock market, the biggest gap between return and risk existed in 2008, the return was 0.0119 and the risk was 0.04624. In 2010, the risk was 0.03083, third highest risk level in five years but the return was negative. Although Indian stock market is the most matured and the oldest one in the region but it is has substantial systematic risk or the elements of market

inefficiency or both due to which investors were not able to estimaterisk and return. Figure 3 presents the risk-return plot for Indian stock market.

Risk and return trend in Bhutanese stock market seems to follow quite a similar movement compared to Indian stock market. Both the countries have negative returns with comparatively similar risk levels in 2010. It is observed that the Bhutanese stock returns is less volatile compared to the Indian stock market in the present scenario as depicted by the differences in the risk and return.

Nepal stock market showed very wide gap in 2006 and 2007 between risk and return**.** Gradually the gap stared closing up but the return became negative since 2008 onwards and continuously remained negative. The risk levels have stabilized since 2008 and remained between 0.020 – 0.029. On the whole due to very wide gap in the early years that correspond to intense political volatility, the average risk level given the average return remained one of the highest in the region.

The risk return gap in Sri Lankan market was highest in 2008. However, before and after 2008, return and risk are quite similar.

Stock market risk and return trend for Pakistani market showed quite unpredictable scenario also. It showed a wide gap initially, the gap closed a bit in 2007, reached a very high level in 2008, narrowed down a bit in 2009 and stared widening up since 2010. The highest risk level (0.04201) in Pakistan in the last six years was associated with its highest average return of 0.01202 but the gap is also the highest in this year.

The similar trend was found for Bangladesh stock market risk and return trend. Year 2008 shows quite a wider gap compared to the earlier years but the gap become wider after 2009. In fact Bangladesh stock market shows the highest gap among all nations in 2010 and 1011.

On the whole we observe that 2008 seems to have produced the wider gap between risk and return in the majority of the stock markets of the SAARC region. In particular, it is distinctly observed for India, Pakistan and Sri Lanka. Bhutan also showed wide gap in 2008 although the gap was wider gap in 2007. Even in Bangladesh we observe a wide gap in 2008 although the recent years have shown much wider gap. Unlike other countries the gap in Nepal was much higher in 2006 and 2007 compared to 2008 period.

It may be concluded that the similar economic phenomena must be in operation across the region that made the risk return trend similar in the region. Of course, the country specific political and other factors seems to have specific effects as we see major volatility in Sri Lanka and Nepal corresponding to their difficult political periods.

Conclusion

It is through the descriptive analysis in this paper we confirm that the stock market returns in Bhutan is quite similar to that of Indian stock market. In fact, all the SAARC countries have similar market returns. However, risks associated with returns are not similar across the countries. Nepal seems to have one of the highest risks but in terms of returns it is some where at

number three among the SAARC countries when full sample period is considered. Most of the other countries have more or less matching ranks on returns and risk.

On comparing mean returns of countries across SAARC region, we found that all nations have similar returns with that of India. There were some differences of individual countries returns with Bhutanese returns on a year-wise data. Particularly the differences of Bhutanese returns were observed with Nepal, Sri Lanka and Bangladesh for 2010, Pakistan for 2008.

The difference in risk compared to similar returns across countries could provide opportunity to minimize risk levels for given returns if cross boarder investment in stock markets in the region were open. However, investors in south Asia do not have such opportunity, as economic integration in the region is very poor;economic integration in the region is very poor as stated by Dubey (2007).

Looking at the average return and standard deviation associated with returns of Bhutanese and Indian markets for full research period and also for the annually split data, we do not find noticeable differences in returns although differences were noticed in risks. Bhutanese and Indian investors including others in the region have opportunities to maximize their capital investment returns for similar risks or minimize risk for similar returns if capital mobility is promoted.

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Analyzing the Relationship Between Macroeconomic Variables and Corporate Bonds: Study of the Thai Bond Market

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This study aims to examine the relationship of macroeconomic variable, namely, yield to maturity and market rate and growth of the bond market. It examines the growth of the bond market with the corporate bonds. The period of the study is from 2001 to 2011. Based on Correlation analysis, this study finds that the corporate entities do not depend on trading in the secondary bond market in order to issue the bond, while the investors make investment decisions based on the spread between yield to maturity and market rate. This study suggests that the authorities should encourage the corporate entities to generate resources from bond issues and attract investors to invest in bonds by giving fiscal incentives.

Introduction

Bond, also known as debt instrument or fixed income security, plays a key role to facilitate the flow of long-term funds from surplus units to deficit units. The bond market mobilizes funds directly from investors (lenders). The Thai bond market can be broadly divided into two main markets, namely: government bond market and corporate bond market. It is dominated by the government bond market, which currently accounts for approximately 78% of the total outstanding issues of the market as on December 2011. Corporate bond market, compared to government bond market, its trade value is small and lacks market infrastructure.

There are no array/variety of debt instruments in the market. The government debt instruments are mostly short-term and medium-term with coupon bonds. This leads the market participants that do not have the long-term debt instruments to construct long-term yield curve and long-term bond index for benchmark to make investment decisions. Corporate debt instruments also have no varieties with short-term maturities, they become burdensome and costly for the market participants and investors.

Finally, most of debt instruments in the market are traded in over-the-counter market between dealer-to-dealer and dealer-to-client, such as Government Pension Fund and Social Security Office. There is a need to study the relationship of macroeconomic variables such as the spread between yield to maturity and market rate with growth of the bond market, growth of the government bond and growth of the secondary bond markets with corporate bonds.

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Objective

The aim of this study is to examine the relationship of macroeconomic variables such as the spread between yield to maturity and market rate with growth of the bond market, growth rate of the government bond market and growth rate of the bond market with corporate bonds.

Literature Review

The Thai bond market is one of the financial services of Thailand, which provides an alternative way for government, corporate entities and sovereign governments to mobilize the funds directly from investors. It also makes the financial market more balanced and economy more stable. A large number of researchers dwelt on "bond or fixed income or debt market" to understand it in detail and to develop the bond markets in the world.

Filippo (2002) showed that bonds which are traded infrequently are priced at discount and have a typically smaller outstanding amount, suggesting that issue size is related to bond liquidity. Moreover, this study found a supporting evidence that liquidity premium in corporate bonds co vary with other factors are related to investors' liquidity preferences. Jonathan, Thomas and Pongsak (2004) found that the credit spreads of these sovereign bonds tend to be negatively related to changes in interest rates on U.S. benchmark bonds and positively related to changes in the slope of the yield curve. The asset and exchange rate variables were only significant for spreads on Philippine bonds where it was negatively related to changes in the local stock market index, and positively to changes in the exchange rate. Akkharaphol and Sakkapop (2005) suggested that actions and announcements done by the authorities play an important role in determining spreads, widening bid-ask spread of government bonds and also how the fiscalization of Financial Institutions Development Fund losses occurred in market uncertainty of public policy. With this in mind, authorities involved can help to reduce bid-ask spreads by ensuring that any potentially sensitive announcements are effectively communicated with market stakeholders. Junbo (2005) study showed that the generalized model with liquidity and default risks has explained the municipal anomalies with a reasonable success. Municipal bond yields are strongly affected by default and liquidity risks. The study found that both liquidity and information risks have a significantly positive effect on expected bond returns.

Anastasia (2008) concluded that unstable macroeconomic environment, poor institutional characteristics and political uncertainty hinder the development of the domestic debt market and its securitization. The macroeconomic environment, political stability and soundness of institutions are crucial for the development of domestic debt market, increased securitization of both domestic and international government debt, and higher the reliance on long-term debt denominated in local currency. Satoshi (2008) concluded that the Thai corporate bond market is not well developed in comparison with the Korean and Malaysian corporate bond markets. The Malaysian corporate bond market had expanded and the issuance of corporate debt instruments had gained profits as same as banking lending. The Korean

and Thai corporate entities mostly relied and borrowed a long-term fund from the loan markets. Tadashi (2008) concluded that the development of corporate bond markets has been constrained in many emerging economies, partly because the regulatory model is implicitly designed for stand-alone public offerings. Corporate bonds are intrinsically more suitable for non-retail investors than for retail investors.

Hypotheses

The hypotheses of this study are as follows:

H_1: There is no relationship between the spread of yield to maturity (YTM) and market rate and the bond available in the secondary market.

H_2: There is no relationship between the growth of the secondary bond market and Corporate bonds.

H_3: There is no relationship between the growth of long-term debt instrument market and Corporate bonds.

Research Methodology

The research is both descriptive and investigative. The descriptive approach provides background and conceptual information of the bond market focusing on the Thai bond market. The financial data used in this study are: 1) the trading value in secondary bond market, 2) the issued amount of corporate bonds, 3) yield to maturity (YTM) and 4) term deposit rates with maturity 1 year. These are collected from the Thai Bond Market Association, the Bank of Thailand, and the Bond Electronic Exchange market. These data are monthly data during the period 2001 to 2011. Correlation analysis is used to test the relationship between macroeconomic variables and other variables related to the bond market. The variables are the spread between yield to maturity and term deposit rates with maturity 1 year, the trading value in the secondary bond market, and issued amount of corporate bonds.

Analysis

Table 1: Spread between yield to maturity and market rate

Year	Yield to Maturity	Market Rate	Spread between Yield to Maturity and Market Rate	Trading Value Unit: THB Million	ln (Trading Value)
2001	2.75	3.03	-0.28	132,684.95	11.77
2002	2.06	2.57	-0.51	178,753.34	12.07
2003	1.42	1.44	-0.01	217,220.00	12.28
2004	1.73	1.00	0.73	247,455.76	12.40
2005	3.24	1.72	1.52	323,729.41	12.67
2006	4.92	4.26	0.67	579,599.73	13.24
2007	3.60	2.80	0.81	1,496,431.96	14.19
2008	3.31	2.57	0.75	3,945,674.54	15.17
2009	1.42	0.94	0.54	8,706,506.64	16.09
2010	1.82	1.03	0.78	12,868,705.22	16.37
2011	3.17	2.40	0.77	17,026,329.90	16.65

Source: BoT and ThaiBMA

The Table 1 shows the spread between yield to maturity (YTM) and market rate and trading value in the secondary bond market during the period 2001 to 2011. The spread between yield to maturity and market rate is computed from yield to maturity of debt instruments with maturity of 1 year minus by the market rate. The yield to maturity is collected from the ThaiBMA. The market rate is an average interest rate which is computed from term deposit with maturity of 1 year of five commercial banks in Thailand including Bangkok Bank, Krung Thai Bank, Siam Commercial Bank, Kasikorn Bank and Bank of Ayudhya. The spread between yield to maturity and market interest was negative in 2001 and 2003, after that it was positive from 2004 until 2011. The trading value in the secondary bond market indicates the bond available in the secondary market. The trading value increased every year.

Table 2: Trading value in the secondary bond market and issued amount of corporate bond

Year	Trading Value Unit: THB Million	Growth of the secondary Market	Issued Amount of Corporate Bonds Unit: THB Million	(Issued Amount of Corporate Bonds)
2001	132,684.95		8,889.97	9.09
2002	178,753.34	0.35	8,219.76	9.01
2003	217,220.00	0.22	16,317.29	9.70
2004	247,455.76	0.14	10,752.59	9.28
2005	323,729.41	0.31	16,050.78	9.68
2006	579,599.73	0.79	73,665.68	11.21
2007	1,496,431.96	1.58	97,248.99	11.49
2008	3,945,674.54	1.64	105,602.43	11.57
2009	8,706,506.64	1.21	82,161.91	11.32
2010	12,868,705.22	0.48	80,817.71	11.30
2011	17,026,329.90	0.32	99,680.14	11.51

Source: BoT and ThaiBMA

The above table depicts the trading value, growth of the secondary market and issued amount of corporate bonds during the period 2001 to 2011. The growth of the secondary market is computed from the trading value in the secondary bond market. This indicates the growth of the secondary bond market. The issued amount of corporate bonds is converted to ln (natural logarithm, log to base e where e is the constant 2.71828) that helps to examine the hypothesis more accurately. The trading value in the secondary bond market was positive in 2001 and 2008, after that it was negative. The issued amount of corporate bonds increased every year.

Table 3: Trading value of government bonds and issued amount of corporate bonds

Year	Trading Value Government Bond Unit: THB Million	Growth of Government Bond	Issued Amount of Corporate Bonds Unit: THB Million	(Issued Amount of Corporate Bonds)
2001	76,372.72		8,889.97	9.09
2002	98,101.02	0.28	8,219.76	9.01
2003	96,214.87	-0.02	16,317.29	9.70
2004	87,896.16	-0.09	10,752.59	9.28
2005	65,421.72	-0.26	16,050.78	9.68
2006	52,593.11	-0.20	73,665.68	11.21
2007	92,688.58	0.76	97,248.99	11.49
2008	97,740.76	0.05	105,602.43	11.57
2009	123,699.72	0.27	82,161.91	11.32
2010	146,200.42	0.18	80,817.71	11.30
2011	126,958.14	-0.13	99,680.14	11.51

Source: BoT and ThaiBMA

Table 3 depicts the trading value of the government bonds, growth of the government bonds and issued amount of corporate bonds from 2001 to 2011. The trading value of the government bonds and issued amount of corporate bonds are collected from the ThaiBMA. The trading value of government bonds indicates the growth of the secondary government bond market. The growth of government bonds is computed from the trading value of government bonds. The issued amount of corporate bonds is the amounts of debt instruments which are issued by the corporate entities. The corporate entities were continuously issued the corporate bonds every year as well as the issued amount of corporate increased every year. This data are converted to ln (natural logarithm, log to base e where e is the constant 2.71828) that helps to examine the hypothesis more accurately.

Pearson's Correlation Analysis

Testing hypothesis 1

Ho_1: There is no relationship between the "spread of yield to maturity (YTM) & market rate" and the bond available in the secondary market.

Table 4: Spread between yield to maturity (YTM) & market rate with the bond available in the secondary bond market

		Spread between Yield to Maturity (YTM) & Market Rate	Bond Available in the Secondary Market
Spread between Yield to Maturity (YTM) & Market Rate	Pearson Correlation	1	.371**
	Sig. (2-tailed)		.000
	N	132	132
Bond Available in the Secondary Market	Pearson Correlation		
	Sig. (2-tailed)		
	N	132	132

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

The results show that there is a moderate relationship between the spread between yield to maturity (YTM) & market rate and the bond available in the secondary bond market. This means that changes in the spread between yield to maturity (YTM) & market rate are moderately correlated with changes in the bond available in the secondary market. For this reason, we can conclude that there is a moderate relationship between the spread between yield to maturity (YTM) & market rate and the bond available in the secondary market. Moreover, we can conclude that the spread between yield to maturity (YTM) & market rate increases in value, the bond available in the secondary bond market also increase in value. This is called a positive correlation. Finally, we can conclude that there is a statistically significant correlation between the spread between yield to maturity (YTM) & market rate and the bond available in the secondary bond market. That means that there is relationship between the "spread of yield to maturity (YTM) & market rate" and the bond available in the secondary bond market.

Testing hypothesis 2

Ho_2: There is no relationship between the growth of the secondary bond market and Corporate bonds.

Table 5: The growth of the secondary bond market and issued amount of corporate bond

		Growth of the Secondary Bond Market	Issued Amount of Corporate Bonds
Growth of the Secondary Bond Market	Pearson Correlation	1	.042
	Sig. (2-tailed)		.633
	N	132	132
Issued Amount of Corporate Bonds	Pearson Correlation	.042	1
	Sig. (2-tailed)	.633	
	N	132	132

The result shows that there is a weak relationship between the growth of the secondary bond market and the issued amount of corporate bonds. In other words, this means that changes in the growth of the secondary bond market are not correlated with changes in the issued amount of corporate bonds. We could conclude that the growth of the secondary bond market and issued amount of corporate bonds were not strongly correlated. This is called a positive correlation. In other words, when the growth of the secondary bond market increases, the issued amount of corporate bonds also increases.

Finally, we can conclude that there is no statistically significant correlation the growth of the secondary bond market and the issued amount of corporate bonds. That means, there is no relationship between the growth of the secondary bond market and Corporate bonds.

Testing hypothesis 3

Ho_3: There is no relationship between the growth of long-term debt instrument market and Corporate bonds.

Table 6: The growth of the long-term debt instrument market and issued amount of corporate bond

		Growth of Long-Term Debt Instrument Market	Issued Amount of Corporate Bonds
Growth of Long-Term Debt Instrument Market	Pearson Correlation	1	.029
	Sig. (2-tailed)		.738
	N	132	132
Issued Amount of Corporate Bonds	Pearson Correlation	.029	1
	Sig. (2-tailed)	.738	
	N	132	132

This result indicates that there is a weak relationship between the growth of long-term debt instrument market and the issued amount of corporate bonds. In other words, this means that changes in growth of long-term debt instruments are not correlated with changes in the issued amount of corporate bonds. This is a negative correlation. We could conclude that when the growth of long-term debt instrument increases, the issued amount of corporate bonds decreases.

Finally, we can conclude that there is no statistically significant correlation between the growth of long-term debt instrument market and the issued amount of corporate bonds. This means, there is no relationship between the growth of long-term debt instrument market and Corporate bonds.

Conclusion

The study finds that there is relationship between the spread of yield to maturity (YTM) & market rate and the bond available in the secondary bond market. There is no relationship between the growth of the secondary bond market and the issued amount of Corporate bonds. Moreover, there is no relationship between the growth of long-term debt instrument market and Corporate bonds, too. Finally, we can conclude that the corporate entities do not depend on trading in the secondary bond market in order to issue the bond, but the trading value in the secondary bond market depends on the spread between yield to maturity and term deposit rates with maturity 1 year.

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A Study of Profitability in Selected Indian Steel Companies

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Iron and steel industry forms the indispensable part of the large scale industrial sector of India. It contributes 2% of the GDP and 10% of the total industrial output. Further, with a share of approximately 10% of the iron and steel sector is amongst the largest contributor to central excise. India's rapid economic growth and soaring demand by sectors like infrastructure, real estate and automobiles at home and abroad has put Indian steel industry on the global map. This paper analyses the profitability of the selected steel companies in India and offer various suggestive measurements for the improvement of profitability of the steel companies.

Introduction

Profitability is the test of efficiency, powerful motivational factor and the measure of control in any business. Actual profitability is highly sensitive and it affects by product prices, quantities, cost of production, capital, size, market share and growth of the company. It is difficult to build a theory of profitability which accounts for all such factors. An efficient use of financial resources is necessary to enhance the profitability and to avoid financial distress. By keeping this, it is an attempt to have an insight into the profitability of the selected steel companies.

Literature Review

Chellasamay and Sumathi (2009) concluded that working capital management is the highly influencing factor to determine the profitability of selected textile companies. Amsaveni (2009) found that there is no relationship between degree of financial, operating and combined leverage and earning per share. Debasish and Kanshik (2009) found that there is a joint influence of fixed asset, inventory and debtor's management on profitability. Virani Varsha (2010) suggested that the company should reframe its capital structure and capacity utilization to ensure further profitability and operating and financial leverages in future. Balwinder (2011) concluded that the cooperative banks in Punjab have responded to the on going financial reforms in a positive manner.

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Objectives of the Study

- To analyse the profitability of selected steel companies in India
- To offer suggestions to improve the profitability of selected steel companies

Methodology

The period of study has been confined to ten years, from 2000-01 to 2009-2010. Out of 118 companies quoted in the list, 38 steel companies (which constitute 32.2 % of total listed companies) have been selected for the analysis. Collected data have been analysed with the help of Gross Profit Margin Ratio, Operating Profit Margin, Net Profit Margin, Return on Capital Employed and Return on Assets, Mean, Standard Deviation, Co-efficient of Variation, Compound Annual Growth Rate and Linear Growth Rate The determinants of profitability among firm characteristics are identified using Correlation and Multiple Regression Analysis.

Gross Profit Margin (GPM)

Table 1 reveals that the GPM of small size companies varied between 3.76 in 2000-01 and 3.63 in 2009-2010 with the negative growth rate of -3.46%. The GPM of the medium size companies for the study period ranges in between 8.30 in 2000-01 to 14.09 in 2009-2010 with the growth rate of 69.76%. The GPM is the highest in 2008-09 for both small (4.79) and medium (19.32) size companies. In the case of large and pooled companies, the ratio shows a fluctuating trend and it is as 23.17 and 22.57 in 2009-2010 with the growth rate of 76.47% and 78% respectively. It is highest in 2005-06 for large (32.92) and pooled companies (31.31). The average GPM is 2.25, 9.41, 21.55 and 20.69 for small, medium, large and pooled companies respectively. The CV is higher for small size companies than large and pooled companies. Hence, it is clear that GPM of small size companies is highly inconsistent during the study period.

From the analysis, it is found that there is a notable growth in GPM of selected steel companies. The growth in GPM of small size steel companies is insignificant when measured in terms of CAGR, whereas it is marginally significant at an average of 0.65% every year when measured in actual terms (LGR). It is also found that there is a significant increase in GPM of all selected steel companies especially in large and pooled companies during the study period.

It varies from 3.05 in 2000-01 to 11.03 in 2009-2010 by registering a growth rate of 261.64% for medium size steel companies. The OPM of small and medium size companies is at its maximum of 3.63 and 15.84 in 2008-09 respectively. In large and pooled companies, the OPM is in a fluctuating trend and is the highest in 2005-06 for large (28.45) and pooled (26.86) companies respectively and these companies have registered a growth rate of 211.52% and 217.45% respectively. The average OPM is -0.1, 4.65, 16.05 and 15.27 for small, medium, large and pooled companies respectively. The CV is highly volatile for medium companies. The CV of small size companies is negative. It is due to negative mean.

Table 1: Gross profit margin of selected steel companies

Size	Small			Medium			Large			Pooled		
Year	NS	GP	GPM	NS	GP	GPM	NS	GP	GPM	NS	GP	GPM
2000-01	438.56	16.47	3.76	1975.16	163.97	8.30	27758.70	3645.37	13.13	30172.42	3825.81	12.68
2001-02	373.79	-27.37	-7.32	2009.21	93.53	4.66	30611.61	4820.47	15.75	32994.61	4886.63	14.81
2002-03	391.44	1.74	0.44	2056.16	67.87	3.30	30627.38	3024.82	9.88	33074.98	3094.43	9.36
2003-04	419.73	10.42	2.48	2430.75	307.07	12.63	39872.58	6380.41	16.00	42723.06	6697.90	15.68
2004-05	522.43	15.07	2.88	2810.91	98.54	3.51	50072.21	11526.80	23.02	53405.55	11640.41	21.80
2005-06	679.30	23.75	3.50	3635.25	188.39	5.18	70827.91	23314.42	32.92	75142.46	23526.56	31.31
2006-07	654.51	30.90	4.72	4587.94	648.35	14.13	72170.16	17621.35	24.42	77412.61	18300.60	23.64
2007-08	745.52	26.60	3.57	6612.32	596.04	9.01	90246.31	25589.49	28.36	97604.15	26212.13	26.86
2008-09	866.62	41.51	4.79	5930.13	1145.61	19.32	105913.40	30591.83	28.88	112710.15	31778.95	28.20
2009-10	885.30	32.15	3.63	6474.01	911.96	14.09	119300.88	27640.10	23.17	126660.19	28584.21	22.57
Mean	597.72	17.12	2.25	3852.18	422.13	9.41	63740.11	15415.51	21.55	68190.02	15854.76	20.69
SD	194.97	19.46	3.58	1904.64	382.61	5.44	33224.07	10809.49	7.56	35250.93	11141.33	7.25
CV	32.62	113.67	159.47	49.44	90.64	57.84	52.12	70.12	35.06	51.70	70.27	35.04
GR	101.87	95.20	-3.46	227.77	456.17	69.76	329.78	658.22	76.47	319.79	647.14	78.00
CAGR	**10.87***	**23.99**	**12.21**	**17.25***	**32.74***	**13.21**	**19.46***	**31.83***	**10.35***	**19.25***	**31.84***	**10.56***
t-Value	8.29	2.54	1.52	10.84	4.36	2.09	17.81	7.28	3.36	17.71	7.39	3.48
LGR	**61.22***	**4.96***	**0.65**	**594.02***	**108.19***	**1.15**	**10707.5***	**3361.73***	**1.88**	**11362.7***	**3474.88***	**1.84***
t-Value	8.68	3.42	1.85	8.11	4.69	2.35	12.61	7.91	3.23	12.66	8.12	3.40

Note: Both Net Sales (NS) and Gross Profit (GP) are Rs. in Crores; Gross Profit Margin (GPM); t-Table value for 8 d.f @10% = 1.85; @5% = 2.30 @1% = 3.35; *Significant at 1% level; ? Significant at 5% level; ? Significant at 10% level.

Table 2: Operating profit margin of selected steel companies

Size	Small			Medium			Large			Pooled		
Year	NS	EBIT	OPM	NS	EBIT	OPM	NS	EBIT	OPM	NS	EBIT	OPM
2000-01	438.56	2.81	0.64	1975.16	60.31	3.05	27758.70	1736.26	6.25	30172.42	1799.38	5.96
2001-02	373.79	-41.73	-11.16	2009.21	10.54	0.52	30611.61	2691.37	8.79	32994.61	2660.18	8.06
2002-03	391.44	-11.41	-2.91	2056.16	-74.63	-3.63	30627.38	593.04	1.94	33074.98	507.00	1.53
2003-04	419.73	-1.43	-0.34	2430.75	144.78	5.96	39872.58	3771.33	9.46	42723.06	3914.68	9.16
2004-05	522.43	2.79	0.53	2810.91	-55.41	-1.97	50072.21	8592.38	17.16	53405.55	8539.76	15.99
2005-06	679.30	12.01	1.77	3635.25	20.03	0.55	70827.91	20150.10	28.45	75142.46	20182.14	26.86
2006-07	654.51	20.69	3.16	4587.94	427.80	9.32	72170.16	14204.35	19.68	77412.61	14652.84	18.93
2007-08	745.52	15.44	2.07	6612.32	383.20	5.80	90246.31	21811.24	24.17	97604.15	22209.88	22.76
2008-09	866.62	31.42	3.63	5930.13	939.62	15.84	105913.40	26633.43	25.15	112710.15	27604.47	24.49
2009-10	885.30	22.24	2.51	6474.01	714.20	11.03	119300.88	23231.46	19.47	126660.19	23967.90	18.92
Mean	597.72	5.28	-0.01	3852.18	257.04	4.65	63740.11	12341.50	16.05	68190.02	12603.82	15.27
SD	194.97	20.82	4.36	1904.64	348.94	6.14	33224.07	10044.88	8.94	35250.93	10338.87	8.61
CV	32.62	394.17	-	49.44	135.75	132.17	52.12	81.39	55.71	51.70	82.03	56.40
GR	101.86	691.45	292.18	227.77	1084.21	261.63	329.77	1238.01	211.52	319.78	1232.00	217.44
CAGR	**10.87***	**33.27***	**22.63***	**17.25***	**49.06 ?**	**27.89 ?**	**19.46***	**45.82***	**22.07 ?**	**19.25***	**46.85***	**23.15**
t-Value	8.29	4.87	3.77	10.84	3.18	2.00	17.81	4.99	2.97	17.71	4.78	2.88
LGR	**61.22***	**5.43***	**0.95**	**594.02***	**94.56***	**1.45***	**10707.5***	**3090.90***	**2.34***	**11362.7***	**3190.90***	**2.29***
t-Value	8.68	3.65	2.49	8.11	4.06	2.88	12.61	7.25	3.68	12.66	7.42	3.84

Note: Both Net Sales (NS) and EBIT Earning Before Interest and Tax (EBIT) are Rs. in Crores; Operating Profit Margin (OPM); t-Table value for 8 d.f; *Significant at 1% level;

*Significant at 5% level; ? Significant at 10% level.

It is found that the OPM is negative for the small size steel companies upto 2003-04. However, there is a shift in OPM from negative zone to positive zone from 2004-05 and remained positive upto 2009-2010. It is identified that the medium size companies showed a positive OPM in all the years except for two years i.e., 2002-03 and 2004-05. It is observed that the position of OPM is good for large and pooled companies especially after 2004-05. On the whole, it is found that there has been a significant uptrend in OPM for selected companies during the study period. But during 2009-2010, the OPM is relatively low for all size of the companies which indicates their high operating expenses or reduction in gross profit level.

Net Profit Margin (NPM)

It is clear from the Table 3 that NPM of small size steel companies is in negative trend from -5.11 in 2000-01 to -0.25 in 2005-06. It is gradually decreased from 1.99 (2006-07) to 0.30 (2009-2010). The NPM of medium size companies is negative upto 2005-06. It started to improve and stood at 4.64 in 2009-2010. Though the NPM of large and pooled companies marked a fluctuating trend during the study period, it is positive and stood at 10.33 and 9.97 in 2009-2010 respectively. On an average, this ratio is -3.00, -4.26, 6.49 and 5.80 for small, medium, large and pooled companies respectively. It is clear that the CV of net profit margin of all selected steel companies is highly inconsistent during the study period due to their high CV. It is found that the NPM for small and medium size steel companies are not at satisfactory level in the first half of the study period. But, there has been a slight improvement in the second half of the study period. For large and pooled companies, there is a significant growth in NPM during the study period.

Return on Capital Employed (ROCE)

Table 4 shows that the ROCE of small size companies in 2000-01 is positive (0.92). From 2001-02 to 2003-04, it is in negative trend. From 2004-05 to 2009-2010, it indicates a positive trend and gradually increasing. ROCE of medium size steel companies is in positive trend and it reached a maximum of 30.75 in 2008-09 with the growth rate of 427.42%. In the case of large and pooled companies, though the ROCE registered a fluctuating trend, it is positive throughout the study period. The ROCE reached the maximum of 37.06, 35.97 in 2005-06 for large and pooled companies with the growth rate of 246.87% and 252.69% respectively. The average of ROCE is 2.35, 8.84, 16.27 and 15.97 for small, medium, large and pooled companies respectively. The CV of ROCE is highly volatile for large and pooled companies which shows their inconsistent performance.

It is found that the small and medium size steel companies showed a negative trend during the first half of the study period. This shows that their overall profitability is not at satisfactory level. Small and medium size steel companies turn up at a high ROCE in 2004-05 by either increasing their profit or more efficiently utilizing its capital to increase sales. In the case of large and pooled companies the ROCE shows a positive result throughout

Table 3: Net profit margin of selected steel companies

Size	Small			Medium			Large			Pooled		
Year	NS	PAT	NPM	NS	PAT	NPM	NS	PAT	NPM	NS	PAT	NPM
2000-01	438.56	-22.43	-5.11	1975.16	-194.06	-9.83	27758.70	-1436.35	-5.17	30172.42	-1652.84	-5.48
2001-02	373.79	-60.33	-16.14	2009.21	-241.68	-12.03	30611.61	-592.32	-1.93	32994.61	-894.33	-2.71
2002-03	391.44	-34.50	-8.81	2056.16	-381.06	-18.53	30627.38	-2376.07	-7.76	33074.98	-2791.63	-8.44
2003-04	419.73	-8.77	-2.09	2430.75	-156.24	-6.43	39872.58	563.37	1.41	42723.06	398.36	0.93
2004-05	522.43	-8.36	-1.60	2810.91	-285.45	-10.16	50072.21	5070.60	10.13	53405.55	4776.79	8.94
2005-06	679.30	-1.69	-0.25	3635.25	-183.35	-5.04	70827.91	12611.92	17.81	75142.46	12426.88	16.54
2006-07	654.51	13.02	1.99	4587.94	246.38	5.37	72170.16	8234.40	11.41	77412.61	8493.80	10.97
2007-08	745.52	1.19	0.16	6612.32	26.07	0.39	90246.31	12808.88	14.19	97604.15	12836.14	13.15
2008-09	866.62	13.77	1.59	5930.13	534.27	9.01	105913.40	15393.01	14.53	112710.15	15941.05	14.14
2009-10	885.30	2.63	0.30	6474.01	300.14	4.64	119300.88	12328.25	10.33	126660.19	12631.02	9.97
Mean	597.72	-10.55	-3.00	3852.18	-33.50	-4.26	63740.11	6260.57	6.49	68190.02	6216.52	5.80
SD	194.97	22.94	5.66	1904.64	299.35	8.85	33224.07	6847.58	9.07	35250.93	7093.41	8.94
CV	32.62	-	-	49.44	-	-	52.12	109.38	139.62	51.70	114.11	154.05
GR	101.87	-111.73	-105.87	227.77	-254.66	-147.20	329.78	-958.30	-299.81	319.79	-864.20	-281.93
CAGR	**10.87***	**-20.94**	**-28.87**	**17.25***	**43.51**	**30.84**	**19.46***	**50.75***	**25.97**	**19.25***	**58.02***	**32.11**
t-Value	8.29	-1.48	-2.18	10.84	2.16	1.47	17.81	4.51	2.75	17.71	4.52	2.94
LGR	**61.22***	**6.03***	**1.40**	**594.02***	**80.15***	**2.50***	**10707.5***	**2074.29***	**2.44***	**11362.7***	**2160.47***	**2.44***
t-Value	8.68	3.71	3.21	8.11	3.92	4.67	12.61	6.51	3.96	12.66	6.74	4.16

Note: Both Net Sales (NS) and Profit After Tax (PAT) are Rs. in Crores; Net Profit Ratio (NPR); t-Table value for 8 d.f;*Significant at 1% level; *Significant at 5% level;

*Significant at 10% level.

Table 4: Return on capital employed of selected steel companies

Size	Small			Medium			Large			Pooled		
Year	EBIT	CE	ROCE	EBIT	CE	ROCE	EBIT	CE	ROCE	EBIT	CE	ROCE
2000-01	2.81	306.68	0.92	60.31	1573.39	3.83	1736.26	40244.81	4.31	1799.38	42124.88	4.27
2001-02	-41.73	233.04	-17.91	10.54	1538.32	0.69	2691.37	40684.14	6.62	2660.18	42455.50	6.27
2002-03	-11.41	198.99	-5.73	-74.63	1191.90	-6.26	593.04	40377.75	1.47	507.00	41768.64	1.21
2003-04	-1.43	189.58	-0.75	144.78	1333.17	10.86	3771.33	41330.28	9.12	3914.68	42853.03	9.14
2004-05	2.79	187.00	1.49	-55.41	1559.37	-3.55	8592.38	42894.70	20.03	8539.76	44641.07	19.13
2005-06	12.01	199.32	6.03	20.03	1549.52	1.29	20150.10	54365.20	37.06	20182.14	56114.05	35.97
2006-07	20.69	237.06	8.73	427.80	2398.72	17.83	14204.35	63819.84	22.26	14652.84	66455.61	22.05
2007-08	15.44	255.90	6.03	383.20	2995.17	12.79	21811.24	85465.71	25.52	22209.88	88716.78	25.03
2008-09	31.42	266.24	11.80	939.62	3055.53	30.75	26633.43	124479.85	21.40	27604.47	127801.62	21.60
2009-10	22.24	173.02	12.85	714.20	3535.89	20.20	23231.46	155412.25	14.95	23967.90	159121.17	15.06
Mean	5.28	224.68	2.35	257.04	2073.10	8.84	12341.50	68907.45	16.27	12603.82	71205.23	15.97
SD20.82	42.52	9.16	348.94	847.15	11.74	10044.88	40759.62	11.07	10338.87	41549.90	10.84	
CV394.17	18.93	390.64	135.75	40.86	132.73	81.39	59.15	68.00	82.03	58.35	67.85	
GR691.46	-43.58	1296.74	1084.21	124.73	427.42	1238.02	286.17	246.87	1232.01	277.74	252.69	
CAGR	33.27*	-1.34	37.43*	49.06	11.83*	34.58	45.82*	16.56*	25.11	46.85*	16.35*	26.21
t-Value	4.87	-0.64	6.74	3.18	4.91	2.54	4.99	6.57	2.68	4.78	6.54	2.66
LGR5.43*	**-3.22**	**2.47***	**94.56***	**245.37***	**2.90** ?	**3090.90***	**11681.6***	**2.28** ?	**3190.90***	**11923.7***	**2.30**	
t-Value	3.65	-0.67	3.99	4.06	5.16	3.19	7.25	4.94	2.25	7.42	4.96	2.37

Note: Both Earning Before Interest and Tax (EBIT) and Capital Employed (CE) are Rs. in Crores; Return on Capital Employed (ROCE); t-Table value for 8 d.f @10% = 1.85; @5% = 2.30 @1% = 3.35; *Significant at 1% level; ?Significant at 5% level;? Significant at 10% level.

Table 5: Return on assets of selected steel companies

Size	Small			Medium			Large			Pooled		
Year	PBT	TA	ROA	PBT	TA	ROA	PBT	TA	ROA	PBT	TA	ROA
2000-01	-20.68	463.52	-4.46	-191.36	3033.70	-6.31	-1375.55	57931.47	-2.37	-1587.59	61428.69	-2.58
2001-02	-59.50	411.85	-14.45	-237.92	3015.27	-7.89	-534.50	59419.96	-0.90	-831.92	62847.08	-1.32
2002-03	-33.97	389.44	-8.72	-376.28	2947.61	-12.77	-2517.37	59943.06	-4.20	-2927.62	63280.11	-4.63
2003-04	-6.70	398.78	-1.68	-142.77	2906.69	-4.91	826.52	60082.61	1.38	677.05	63388.08	1.07
2004-05	-6.93	423.69	-1.64	-274.65	2936.77	-9.35	6348.53	62070.03	10.23	6066.95	65430.49	9.27
2005-06	3.13	456.33	0.69	-130.75	3125.96	-4.18	17884.17	76119.64	23.49	17756.55	79701.93	22.28
2006-07	13.71	440.86	3.11	272.39	4342.42	6.27	11826.43	88476.98	13.37	12112.53	93260.26	12.99
2007-08	7.46	498.09	1.50	149.18	5483.58	2.72	19018.46	113470.62	16.76	19175.10	119452.29	16.05
2008-09	23.87	555.75	4.30	761.13	5442.87	13.98	22883.26	158544.68	14.43	23668.26	164543.30	14.38
2009-10	14.22	587.18	2.42	503.13	5933.91	8.48	17932.49	200739.00	8.93	18449.84	207260.09	8.90
Mean	-6.54	462.55	-1.89	33.21	3916.88	-1.40	9229.24	93679.81	8.11	9255.92	98059.23	7.64
SD	25.41	66.24	5.88	375.00	1254.85	8.75	9799.89	49569.29	9.26	10124.81	50794.41	9.08
CV	-388.64	14.32	-310.61	1129.17	32.04	-626.63	106.18	52.91	114.17	109.39	51.80	118.82
GR	-168.762	26.67846	-154.26	-362.923	95.59976	-234.39	-1403.66	246.5111	-476.793	-1262.13	23739.95	444.961
CAGR	**43.07***	**3.60***	**32.92***	**41.49***	**9.21***	**28.93**	**52.73***	**14.69***	**23.74**	**57.47***	**14.41***	**28.00**
t-Value	5.30	3.49	4.03	4.64	5.30	3.13	4.81	6.52	2.19	4.85	6.51	2.41
LGR	**7.13***	**17.11***	**1.58***	**104.61***	**365.28***	**2.44***	**2969.16***	**14218.3***	**2.20**	**3080.90***	**14600.6***	**2.22**
t-Value	4.55	3.55	3.97	4.46	5.28	4.45	6.52	4.95	2.93	6.70	5.00	3.10

Note:Both Profit Before Tax (PBT) and Total Assets (TA) are Rs. in Crores; Return on Assets (ROA); t-Table value for 8 d.f @10% = 1.85; @5% = 2.30 @ 1% = 3.35; *Significant at 1% level;? Significant at 5% level; ? Significant at 10% level.

the study period. It depicts that they utilized the capital profitably and their overall profitability and efficiency is good during the study period.

Return on Assets (ROA)

Table 5 depicts that the ROA of small size companies showed a negative trend from 2000-01 to 2004-05. It started to improve (2.42 in 2009-2010) with the growth rate of 154.26%. The ROA in medium size companies is in negative trend upto 2005-06. It started to increase from 2006-07 to the maximum of 13.98 in 2008-09 and then decreased to 8.48 in 2009-2010 with the growth rate of 234.39%. In the case of large and pooled companies, the ROA showed a negative trend upto 2002-03 then it started to progress from 2003-04 and then gradually decreased to 8.93 and 8.90 in 2009-2010 by registering the growth rate of 476.79% and 444.96% respectively. The average of ROA is -1.89, -1.40, 8.11 and 7.54 for small, medium, large and pooled companies respectively. The CV of ROA of medium size companies is highly inconsistent during the study period. It is found that the ROA is negative during the first half of the study period for the small and medium size companies. This indicates their inefficiency in utilizing the assets to generate earnings. After 2006-07, the high ROA depicts their high returns with less investment. In the case of large and pooled companies, the ROA is in positive trend after 2003-04. This reveals that their overall profitability is good through the effective utilization of assets.

Determinants of Profitability: Multiple Regression Analysis

Profitability is the primary measure of overall success, survival and growth of a company. It depends on a number of factors such as size, growth rate, degree of leverage, cost of operation, age and diversification. In the present study, the determinants of profitability among company's characteristics are identified using Multiple Regression

Analysis. In the model, the profitability variables, GPM, ROCE and ROA are used as the dependent variables. One separate regression for each profitability measures is run. The explanatory variables used in the present model are the financial variables considered by Kesavan and Nazir et al. (2009) in their profitability models. The specification of the model for the present study is:

$$Y_{it} = \alpha + \beta_1 \text{Gearing}_{it} + \beta_2 \text{CATA}_{it} + \beta_3 \text{CLTA}_{it} + \beta_4 \text{CATURN}_{it} + \beta_5 \text{CCC}_{it} + \beta_6 \text{SIZE}_{it} + \beta_7 \text{GROWTH}_{it} + \beta_8 \text{DER}_{it} + \varepsilon$$

Where,

Y_{it}	=	Dependent (GPM, ROCE and ROA of company 'i' at time't')
Gearing_{it}	=	Gearing ratio, calculated as Long Term Debt to Total Assets
CATA_{it}	=	Current Assets to Total Assets
CLTA_{it}	=	Current Liabilities to Total Assets
CATURN_{it}	=	Current Assets to Sales
CCC_{it}	=	Cash Conversion Cycle

Table 6: Correlation among financial variables in the regression model

	GPM	ROCE	ROA	GEARING	CATA	CLTA	CATURN	CCC	SIZE	GROWTH	DERATIO
GPM	1.00										
ROCE	0.45?	1.00									
ROA	0.67?	0.73?	1.00								
GEARING	-0.12?	-0.07	-0.24?	1.00							
CATA	-0.42?	0.14?	-0.01	-0.12?	1.00						
CLTA	-0.41?	0.08	-0.30?	0.51?	0.51?	1.00					
CATURN	-0.10*	-0.07	-0.14?	-0.12?	-0.09*	-0.08	1.00				
CCC	0.05	-0.12?	-0.06	-0.36?	0.10*	-0.25?	-0.16?	1.00			
SIZE	0.44?	0.16?	0.29?	0.36?	-0.55?	-0.19?	-0.16?	-0.23?	1.00		
GROWTH	0.02	-0.04	-0.01	0.05	0.09	0.003	-0.03	-0.03	-0.07	1.00	
DERATIO	0.03	0.05	0.05	0.14?	-0.12?	-0.18?	-0.05	-0.07	0.30?	-0.02	1.00

Note: *Significant at 10% level; ? Significant at 5% level; ?Significant at 1% level .

$SIZE_{it}$ = Natural logarithm of Total Assets
$GROWTH_{it}$ = Growth in sales calculated as $(SAL_t - SAL_{t-1})/SAL_{t-1}$
DERit = Debt Equity Ratio
α = Intercept term
= Estimated co-efficient
ε = Error term.

Before running the regression using the above model, Correlation Analysis is carried out in order to ascertain one to one relationship between dependent and independent variables as well as to identify the pairs of independent variables which are collinear (high correlation) with other. There is a collinearity between two variables if correlation between them is 0.90 and above. In the regression analysis, influence of one variable on dependent will be suppressed by another variable if there is a collinearity between them. The details of the findings relating to Correlation Analysis are shown in Table 6.

Table 6 reveals that there is a sufficient correlation among most of the explanatory variables, but none of variable pairs is found with correlation of 0.90 and above. There is no pair of variables with collinearity problem. Hence, there will not be any multi-collinearity problem if all variables in the independent set are used in the Regression Analysis. The details of the Regression Analysis are shown in Table 7.

$\beta_1.....\beta_8$

Table 7: Determinants of profitability small size steel companies

Independent variables	Dependent variables		
	Gross profit Margin	Return on Capital employed	Return on Assets
Small Size Steel Companies			
Intercept	13.94*	-5.62	-0.38
	(2.03)	-(0.69)	-(0.12)
Gearing Ratio (LTDTA)	-11.76	-27.75*	-7.16
	-(1.58)	-(3.14)	-(2.10)
Current Assets to Total Assets (CATA)	-26.43*	-10.87	1.75
	-(3.48)	-(1.21)	(0.50)
Current Liabilities to Total Assets (CLTA)	8.57	37.14*	-2.22
	(0.86)	(3.16)	-(0.49)
Current Assets to Sales (CATURN)	-0.27	-0.16	-0.20
	-(1.48)	-(0.76)	-(2.36)
Cash Conversion Cycle (CCC)	0.02 ?	0.00	0.00
	(1.91)	(0.38)	-(0.83)
Size (Size of Total Investments)	2.24	2.96	2.23*
	(1.43)	(1.59)	(3.10)

Contd...

Contd...

Growth (in Sales)	0.60	-0.86	-0.39
	(0.59)	-(0.71)	-(0.84)
Leverage (DER)	1.16	5.00*	1.09*
	(1.61)	(5.84)	(3.30)
R Square	0.2545	0.3850	0.3485
Adjusted R Square	0.1875	0.3297	0.2899
F value	3.80*	6.96*	5.95*
Degrees of Freedom	8, 89	8, 89	8, 89
Medium Size Steel Companies			
Intercept	13.56	9.57	6.40
	(1.30)	(0.53)	(0.97)
Gearing Ratio (LTDTA)	-3.91	-19.65*	-6.35
	-(0.95)	-(2.74)	-(2.42)
Current Assets to Total Assets (CATA)	14.27 ?	24.70 ?	16.93*
	(2.05)	(2.04)	(3.82)
Current Liabilities to Total Assets (CLTA)	-25.74*	13.46	-17.63*
	-(3.75)	(1.13)	-(4.04)
Current Assets to Sales (CATURN)	-3.34 ?	-3.12	-0.88
	-(2.47)	-(1.33)	-(1.03)
Cash Conversion Cycle (CCC)	-0.05*	-0.07*	-0.03*
	-(3.68)	-(2.99)	-(3.15)
Size (Size of total Investments)	3.11*	3.84 ?	1.61
	(2.76)	(1.97)	(2.25)
Growth (in Sales)	1.81	0.77	1.22
	(1.23)	(0.30)	(1.31)
Leverage (DER)	-0.95 ?	-2.19*	-0.55
	-(1.99)	-(2.62)	-(1.79)
R Square	0.3331	0.2056	0.4741
Adjusted R Square	0.2725	0.1334	0.4263
F value	5.50*	2.85*	9.92*
Degrees of freedom	8, 88	8, 88	8, 88
Large Size Steel Companies			
Intercept	10.29	-24.90*	-10.17
	(1.29)	-(3.34)	-(2.45)
Gearing Ratio (LTDTA)	-12.19 ?	-9.80 ?	-1.72
	-(2.23)	-(1.92)	-(0.61)
Current Assets to Total Assets (CATA)	9.28*	54.24*	27.89*
	(1.26)	(7.90)	(7.29)
Current Liabilities to Total Assets (CLTA)	-24.17*	-10.41 ?	-15.37*
	-(3.60)	-(1.66)	-(4.40)

Contd...

Contd...

Current Assets to Sales (CATURN)	0.960	4.66*	2.538
	(0.86)	(4.46)	(4.35)
Cash Conversion Cycle (CCC)	-0.01	-0.02	0.002
	-(0.73)	-(1.35)	-(0.16)
Size (Size of Total Investments)	2.53*	2.76*	1.23*
	(4.90)	(5.72)	(4.57)
Growth (in Sales)	3.55	2.93	2.05
	(1.53)	(1.35)	(1.69)
Leverage (DER)	-0.63 ?	-0.55 ?	-0.428*
	-(2.59)	-(2.40)	-(3.35)
R Square	0.4049	0.5326	0.4689
Adjusted R Square	0.3635	0.5000	0.432
F value	9.78*	16.38*	12.69*
Degrees of freedom	8, 115	8, 115	8, 115
Pooled Steel Companies			
Intercept	13.60*	-3.44	1.93
	(4.01)	-(0.74)	(1.06)
Gearing Ratio (LTDTA)	-7.27?	-15.45*	-6.04*
	-(2.53)	-(3.92)	-(3.92)
Current Assets to Total Assets (CATA)	-8.01?	18.32*	12.78*
	-(2.04)	(3.40)	(6.06)
Current Liabilities to Total Assets (CLTA)	-11.19*	9.87?	-10.64*
	-(2.59)	(1.67)	-(4.61)
Current Assets to Sales (CATURN)	-0.25?	-0.08	-0.18
	-(1.79)	-(0.41)	-(2.39)
Cash Conversion Cycle (CCC)	0.003	-0.02?	-0.01*
	(0.51)	-(2.11)	-(3.69)
Size (Size of total Investments)	2.20*	2.57*	1.44*
	(6.64)	(5.66)	(8.12)
Growth (in Sales)	0.96	-0.38	-0.06
	(1.37)	-(0.39)	-(0.17)
Leverage (DER)	-0.55?	0.10	-0.22
	-(2.54)	(0.32)	-(1.86)
R Square	0.3532	0.1535	0.3407
Adjusted R Square	0.3365	0.1316	0.3236
F value	21.16*	7.02*	20.02*
Degrees of freedom	8, 310	8, 310	8, 310

Note: Significant at 10% level; ?Significant at 5% level;*Significant at 1% level.

Table 7 reveals that regression results of GPM, ROCE and ROA for the selected financial variables as mentioned in the models for small size steel companies. The F values for all three models, i.e., regression models for GPM, ROCE and ROA are significant at 1% level. This indicates that the selected variables in the independent set together could significantly determine the profitability of small size steel companies. From R^2 value of 0.2545, 0.3850 and 0.3485, it is clear that 25.45 %, 38.50% and 34.85% of variance in GPM, ROCE and ROA is explained by independent variables together in the case of small size steel companies.

The R^2 values reveals the combined effect of all explanatory variables and co-efficient (also called as beta, beta co-efficient, estimated value, or estimated co-efficient) of each explanatory variable indicates the unique influence of the variable on the dependent variables. In the model for GPM, the estimated co-efficient is significant and negative for CATA ($p < 0.01$) whereas it is significant and positive for CCC ($p < 0.10$). The co-efficient of all other remaining explanatory variables in the model for GPM are insignificant.

In the model for ROCE, the estimated co-efficient of 'gearing ratio' is significant with negative sign whereas it is significant with positive sign for CLTA and DER (leverage). From the observation of co-efficient in the model for ROA, it is apparent that they are significant for gearing ratio, current assets to sales, size and leverage. But the sign is negative for LTDTA, CATURN, CLTA, growth and positive for size and leverage.

- GPM is likely to be higher for small size steel companies when current assets are less and cash conversion cycle is higher.
- ROCE is likely to be more for the small size steel companies with high leverage if long-term debt, current liabilities relative to sales is less and
- ROA of small size steel companies which rely more on debt over equity and increase its investments in assets tend to increase significantly when there is a notable decline in portion of long-term debt in total assets (gearing) and currents assets relative to sales i.e., there is a significant unique negative influence of gearing ratio (LTDTA) and positive influence of leverage ratio (DER) on net profitability of small size steel companies in India.

Table 7 reveals the regression results for profitability ratios of medium size steel companies. It is apparent that the regression models for GPM, ROCE and ROA are all fit significantly with explained variance of 33.31%, 20.56% and 47.41% respectively. From the estimated co-efficient specified in the model for GPM, it is found that they are positive and significant for CATA and negative and insignificant for CLTA, CATURN, CCC and Leverage with negative sign.

In the model for ROCE, the co-efficient of Gearing, CCC and Leverage with negative sign and that of Size with positive sign is significant at required level. In the case of ROA, the estimated co-efficient is significant with negative sign for Gearing, CLTA, CCC and Leverage and it is significant with positive sign for CATA and Size.

- GPM of medium size companies with less leverage, more investments in future assets is likely to increase if there is a notable decline in current liabilities, use of current assets in generating sales, cash conversion cycle when portion of current assets in total assets increase.
- The ROCE of medium size companies with less leverage and more investments in future (size) tend to increase when there is a significant decline in gearing ratio, cash conversion cycle, and when there is a significant increase in portion of current assets in total assets.
- It is found that it is highly likely for an increase in ROA of medium size steel companies with less leverage and future investment opportunity if there is a remarkable decline in Gearing, Current Liabilities, Cash Conversion Cycle and notable increase in current assets relative to total assets. Combining the results of the regression models for ROCE and ROA, it is found that the net profitability of medium size steel companies with less leverage having larger portion of current assets in total assets that keep adding more assets (increase in size) in their business tend to increase if there is a significant decline in gearing ratio, current liabilities and cash conversion cycle. The details of the findings of Regression Analysis for large size steel companies are shown in Table 7.

Table 7 depicts that the results of regression analysis of financial factors that have unique influence on profitability for large size steel companies. It is clear that the fit of regression model for GPM, ROCE and ROA with explained variance of 40.49%, 53.26% and 46.89% are significant respectively (F values are all highly significant at 1% level).

The estimated co-efficient of LTDTA (Gearing Ratio), CLTA and Leverage with negative sign, and that of Size with positive sign on GPM is significant at required level. With ROCE, the co-efficient of Gearing ratio, CLTA and Leverage is significant and negative whereas the coefficient of CATA, CATURN and Size is significant and positive. The co-efficient is negative and significant for CLTA and Leverage and it is positive and significant for CATA, CATURN, Size and Growth in the Regression model for ROA.

In nutshell, it can be concluded as:

- GPM of large size steel companies with less leverage and increase investments in assets is likely to increase when there is a significant reduction in long-term debt and short-term obligations.
- ROCE of large size steel companies with less leverage who tend to increase their investments in assets is likely to increase if there is a significant decline in Gearing ratio and current liabilities when there is a remarkable increase in the role current assets and
- ROA of large size steel companies with less leverage, future growth potential and increase in asset level tend to increase if there is a notable decline in short-term obligations and remarkable increase in current assets. It is found that the net profitability (combining the regression results for ROCE and ROA) of large size steel companies is positively determined by current assets, level of assets and negatively by short-term obligations. The determinants of profitability after pooling all steel

companies in the sample regardless of size are analyzed by Regression Analysis the selected firm specific financial ratios on GPM, ROCE and ROA.

Table 7 reveals that the regression models for GPM, ROCE and ROA are all fit significantly (F value of the model, 21.16 for GPM, 7.02 for ROCE and 20.02 for ROA is significant at 1% level). The explained variance by all explanatory variables together is 35.32% on GPM, 15.35% on ROCE and 34.07% on ROA.

From observation of the model for GPM, it is understood that the co-efficient of Gearing ratio, CATA, CLTA, CATURN and Leverage with negative sign and it is positive and significant with size. In the model for ROCE, the negative co-efficient of Gearing ratio and CCC and positive co-efficient of CATA, CLTA and Size is significant. Similarly, with ROA, the explanatory variables, Gearing Ratio, CLTA, CATURN, CCC and leverage have negative and significant co-efficient while CATA and Size have positive and significant co-efficient.

The co-efficient of CATA with GPM is negative whereas it is positive with ROCE and ROA, in turn indicating negative working capital (Current liabilities in excess of current assets), positive GPM, negative ROCE and negative ROA for steel companies in India. Based on the estimated co-efficient it is inferred as follows:

- There is a significant increase in GPM of steel companies if there is a significant decline in gearing ratio, leverage, short-term obligations (current liabilities) when there is a notable increase asset value regardless of negative working capital.
- The net profitability relative to capital employed of steel companies is determined negatively by gearing ratio, CCC and positively by asset value and current assets and
- The net profitability relative to total assets of steel companies is likely to go up with significant decline in gearing ratio, current liabilities, cash conversion cycle and leverage when portion of current asset in total assets increases and use of current assets in generating sales decreases. On the whole, it is found that net profitability of steel companies is determined negatively by gearing ratio, cash conversion cycle and positively by investments in assets especially current assets.

Conclusion

The inferences of the regression analysis results have led to the conclusion that there is a significant unique negative influence of Gearing ratio and positive influence of leverage ratio on net profitability of small size companies in India. On net profitability of medium size steel companies with less leverage having larger portion of current assets in total assets that keep adding more assets (increase in size), there is a significant negative influence of gearing ratio, current liabilities and cash conversion cycle. For large size companies, the net profitability is determined positively by current assets, level of assets and negatively by short-term obligations. Financial variables

such as gearing ratio and cash conversion cycle have negative influence on net profitability when there is a notable increase in current assets as well as in total assets in the case of pooled companies. Finally, it is concluded that the selected companies could reframe their optimum capital structure, capacity utilization and liquidity position for enhancing the further profitability in future.

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The Influence of Value Added Service Quality on Customer Satisfaction and Loyalty Intention in Telecommunication Industry

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Presently, various value added services such as non-voice communication {(Short Message Service (SMS), Multimedia Message Service (MMS), and Mobile Internet (GPRS)} and entertainment (downloading ringtone, calling melody, wallpaper, screensavers and music) have been intensively incorporated to sustain and serve the customer's need. Thus, this paper examines their effects on customer satisfaction and loyalty behavior intentions namely staying intention and word of mouth intention.

Introduction

Customer loyalty has long been addressed in academic and many service industries such as manufacturing, health care, education and telecommunication. Customer loyalty is perceived as a critical focal point in any business for continuous customer relationship management that focuses on customer satisfaction and long-term business profitability. Numerous studies (Reichheld, 1996; Reichheld & Sassar, 1990; Sheth & Parvitiyar, 1995; Donio', Massari & Passiante, 2006) have reported that customers who show loyal behavior tend to lead to high profitability for a firm. However, customer loyalty is widely reported to be declining due to such factors as lowering levels of quality of product or service differentiation, lower risk of switching cost, intense competition, consumers becoming more demanding and showing increasing levels of dissatisfaction with pricing, core service failure and general inconvenience (Bennett & Rundle-Thiele, 2005; Dick & Basu, 1994; Keaveney, 1995). In addition, many scholars have argued that either SERVQUAL or SERVPERF conceptualizations have failed to measure service quality in new industries (Brady & Cronin, 2001; Carr, 2007; Dabholkar, Thorpe & Rentz, 1996; Gounaris, 2005; Kang, 2006; Kang & James, 2004; Philip & Hazlett, 1997). For instance, Kang (2006) and Kang and James (2004) developed service quality dimensions by incorporating the Gronroos' service quality model and SERVQUAL to measure service quality amongst mobile phone service providers. They argued that the SERVQUAL measurement is more focused on the processing of delivery service

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and does not reflect on service output (Seth, Deshmukh & Vrat, 2005; Lim et al., 2006; Kang, 2006; Kang & James, 2004).

Customer satisfaction has often been focused as an important corporate strategy and used as a measurement of marketing health. It is often used as a benchmark of an organization's performance (Bennett & Rundle-Thiele, 2004). Customer satisfaction is believed to be the main tool that can enhance the number of existing customers (Bennett & Rundle-Thiele, 2004; Fornell et al., 1996; Hallowell, 1996; Reichheld, 1996; Szymanski & Henard, 2001). Thus, many organizations have focused on implementing programs for measuring and improving customer satisfaction.

Understanding how customers behave related to loyalty intention (word of mouth and intention stay) among the mobile phone users has become an important way to satisfy customer satisfaction and also to sustain existing customers, which in turn lead to performance maximization. Therefore, it is worth exploring the impact of various dimensions of service quality as developed in the Gronroos' Model (Gronroos, 1984) which are different based on the nature of the service industry, currently existing competition, time and needs (Selth et al., 2005). Specifically, it is in relation to technical quality (core service and value-added service) and functional quality (customer care service) and their effects on customer satisfaction and customer loyalty. Thus, this study examines the effects of various value added services of pre-paid mobile phone on customer satisfaction, word of mouth and intention to stay among users in Thailand

Literature Review

Service Quality

Service quality has been studied over the last two decades in service marketing literature. Many scholars have agreed that the concept of service quality in the customer's mind is very subjective, complicated and personal as well as difficult to conceptualize and operationalize (Brady & Cronin, 2001; Cronin & Taylor, 1992; Dabholkar, Thorpe & Rentz, 1996; Parasuraman, Zeithaml & Berry, 1994; Rust & Oliver, 1994; Tea, 1993). Service quality has been conceptualized in two different approaches. The first approach of service quality has been conceptualized by Gronroos in 1984 which comprises of two dimensions; technical quality and functional quality. The technical quality refers to what is delivered to the customer as the outcome of interaction with a service provider (what is delivered). Whereas, functional quality is concerned with how the end results of the process was transferred to the customer (how it was delivered). This dimension is not directly related to core service offerings but includes a wide range of service delivery items, such as perceptions of a company's service center or customer care service and the manner of personal service. Technical quality can often be quite readily evaluated objectively and it is more difficult to do with functional quality. Hence, the author further conceptualized that the important impact of any previous experience of service quality in a corporate situation will act as a guide for customers to evaluate the technical and functional quality of the product and the company. The second approach is SERVQUAL which

was developed and refined by Parasuraman et al. (1985, 1988). It is a multi-item instrument with five dimensions to quantify customers' global assessments of a company's service quality. It consists of reliability, responsiveness, assurance, empathy, and tangibles.

Recently, there has been agreement in the literature that the outcome of the service counter significantly affects perceptions of service quality (Carmann, 2000; Gronroos, 1984, 2001; Johnson & Sirikit, 2002; McDougall & Levesque, 1994; Kang & James, 2004; Rust & Oliver, 1994). For instance, the outcome of service quality was labeled in terms of technical quality by Gronroos (1984, 2001). Moreover, Johnson and Sirikit (2002) and Lim et al (2006) suggested that the service context is often needed to consider the impact of both technical quality or service outcome and process quality that would have an impact on customer perceived service quality. Similarly, Selth et al. (2005) has revealed that several service quality models have different bases within the service industry, such as intense competition, time and need.

The present study will adopt Gronroos's model (1984) as a fundamental theoretical framework to measure perceived service quality in particular the technical and functional qualities. However, there is a need to incorporate other variables that may affect customer loyalty into the existing service quality model due to rapid switching behavior in telecommunication industry. Value added services such SMS, MMS, GPRS, downloading ringtone, calling melody, wallpaper, screensavers and music are critically important to customers as it not only provides additional features to the main service but also to fulfill their customers' needs (Johnson & Sirikit, 2002; Lim et al.; 2006; Kang, 2006 ; Kang & James, 2004 ; Olorunniwo & Hsu, 2006; Selth et al., 2005).

Customer Satisfaction

Quality is defined and measured as attribution performance (Churchill & Surprenant, 1982). The majority of marketing researchers have accepted that quality or performance leads to satisfaction (Dabholkar, Shepherd & Thorpe, 2000; Olsen, 2002; Olsen & Johnson, 2003). The study by Homburg, Koschate et al. (2005) examined satisfaction with "performance," a post consumption evaluation of perceived service performance without consideration of price. In addition, satisfaction has also been confirmed empirically to be linked to quality performance, especially when quality is framed as a specific belief evaluation and satisfaction as a more general evaluative construct (Grewal, Gotlieb & Marmorstein, 2000; Johnson, Andreassen, Lervik & Cha, 2001). Therefore, the mobile phone service industry is a continuing service and it can be expected that customer satisfaction responses towards a service provider should be affected largely by performance evaluations (Bolton & Drew, 1991; Homburg, Koschate et al., 2005; Oliver, 1989).

It is reiterated that, in this study service quality is considered a major factor leading to customer satisfaction (Brown, Churchill, & Peter, 1993; Fornell et al., 1996; Hallowell, 1996; Parasuraman, Zeithaml & Berry, 1988; Zeithaml

et al., 1996). Really, it is to be viewed as the primary determinant of consumer behavior, (Zeithaml et al., 1996) without even considering price as part of the customer's satisfaction judgment (Bolton & Drew, 1991; Homburg, Koschate et al., 2005; Oliver, 1989).

The definition of satisfaction comprised of three basic components: 1) consumer satisfaction as a response (affective or cognitive); 2) the response pertains to a particular focus (expectations, product, consumption experience, etc.); 3) the response occurs at a particular time (after consumption, after choice, based on accumulated experience, etc) (Giese & Cote, 2000). Many researchers conceptualize customer satisfaction as an overall post purchase evaluation based on the customer's comparison of product performance to pre-purchase expectations (Giese & Colgate, 2000). However, customer satisfaction has been broken into two different conceptualizations in the literature over the past decade; transaction-specific satisfaction and overall or cumulative satisfaction (Anderson & Sullivan, 1993; Johnson et al., 2001; Bolton & Drew, 1991; Cronin & Taylor, 1994; Olsen & Johnson, 2003).

The transaction-specific approach defined satisfaction as a customer's evaluation of his or her experience with and reactions to a particular product/ service transaction experience (Cronin & Taylor, 1992; Olsen & Johnson, 2003). Oliver (1997:13) defined customer satisfaction as the consumer's fulfillment response. It is a judgment that a product or service feature, or the product or service itself, provided (or is providing) a pleasurable level of consumption-related fulfillment, including levels of under- or over fulfillment. The cumulative satisfaction is defined as a customer's overall evaluation of the service provider's performance up to date (Johnson & Fornell, 1991).

However, an important advantage of the cumulative satisfaction construct over a more transaction-specific view is that it is a better predictor of subsequent behavior and economic performance (Olsen & Johnson, 2003). As a result, the most current emphasis on cumulative satisfaction has been on understanding customer evaluations and relationships over time (Garbarino & Johnson, 1999; Mittal & Kamakura, 2001; Mittal, Kumar & Tsiros, 1999). Customer satisfaction is described as evaluation of an emotion. It reflects the level of positive feelings or emotions towards a product or service (Oliver, 1997). Therefore in this study, customer satisfaction is defined as the consumer's overall or cumulative satisfaction using whatever evaluation they choose (including emotion-based evaluations) with all services (including performance and quality) which are made available by the service provider (Johnson & Fornell, 1991, Oliver, 1997). This is done without considering price as a part of the satisfaction judgment (Bolton & Drew, 1991; Homburg, Koschate et al., 2005; Oliver, 1989).

Loyalty Intention

Customer loyalty has been conceptualized and measured in three categories; a behavioral approach, an attitudinal approach and a composite approach (Dick & Basu, 1994; Jacoby & Chesnut, 1978; Sheth, 1968). Early views of loyalty focused on actual behavioral dimensions and used various behavioral measures drawn from panel data that was based on reported purchase

behavior or repeat purchase behavior (i.e., the pattern of past purchase or repeat purchase behavior) such as a function of purchasing frequency (e.g. Brown, 1952), a proportion of purchase or market share (e.g. Cunningham, 1956), probability of purchase frequency and pattern of purchase (Sheth, 1968). The behavioral approach ignores the cognitive processes underlying the reason to perform that behavior (Day, 1969). Therefore, the consideration of a solely behavioral perspective conceptualized in terms of overt behavior created many measurement and conceptual problems (Day, 1969; Jacoby & Chesnut, 1978). It was insufficient to explain how and why brand loyalty is developed and /or modified. The second conceptualization is attitudinal approach which emerged from a variety of situations (Day, 1969). For instance, a consumer buys the same brand again, not because of any strongly held attitude or deeply held commitment, but because it may reflect situational constraints. Attitudinal approach focuses on attitudes, where loyalty is considered to depend on psychological commitment and intention and ignores the behavioral outcomes of the attitudinal processes. This approach is based on the statement of preference or intention to behave, and not actual purchase behavior (Jacoby & Chestnut, 1978: 47; Oliver, 1999).

The third conceptualization is composite approach. According to Day (1969), a behavioral definition is insufficient because it does not distinguish between true loyalty and spurious loyalty. Day suggested that loyalty should be measured as a combination of attitudes and behavior, and proposed a loyalty index as a function of proportion of purchases and attitude towards the brand (Day, 1969).

However, researches have proposed measuring loyalty by means of an attitudinal dimension in addition to a behavioral dimension in this study. This rationale was also supported by Jacoby and Kyner (1973), Jacoby and Chesnut (1978) and Keller (1993) suggesting that loyalty is present when favorable attitudes for a brand are manifested in repeat buying behavior. Moreover, the popular conceptualization of customer loyalty is composite approach by Dick and Basu (1994) which is conceptualized as "a combination of repeat patronage and relative attitude towards the target (brand/service/store/vendor)." Cross-classifying relative attitude and behavioral loyalty identified four categories of customer loyalty: loyalty, latent loyalty, spurious loyalty, and no loyalty. Similarly, Oliver (1999: 35) defines loyalty as "a deeply held commitment to re-buy or re-patronize a preferred product/service consistently in the future, thereby causing repetitive same-brand of same brand-set purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior."

Objectives of the Research

The main objective of this research is to investigate the extent of the various value-added services in service quality dimensions (core service, non-voice communication and entertainment value added services and customer care service), and its influence on customer satisfaction and loyalty intention (staying intention and word of mouth intention) in mass services industry.

Theoretical Framework

In long-term relationship between the customer and the service provider, the important theory underlies the basic framework of this study are based on the social exchange theory (Thibuat & Kelly, 1959)The social exchange theory (Thibuat & Kelley, 1959) is a combination of economic, social psychological and sociological perspective.

As per social exchange theory each party has to perform both activities which are "give and take" at the same time. Persons that give much to others try to take much from them, and persons that take much from others are under pressure to give much to them (Homans, 1961). It posits that all human relationships are formed by use of subjective analysis to compare costs and benefits to choose the best alternative. In the social exchange situation, equivalent outcomes, in term of benefits and costs between two exchange parties will produce high satisfaction and interdependence (Thibaut & Kelley, 1959; Kelly & Thibaut, 1978). Hence, when two interacting people face various contingencies or alternatives they may have to modify their resources to match each other's needs by negotiating or through some form of enforcement (Hallen, Johnson & Seyed-Mohamed, 1991).

An individual's satisfaction with the relationship is not always followed by his or her intention to remain in and maintain the relationship. It is possible for a person to be satisfied, while not intending to continue a relationship. On the other hand, it is also possible for a person to continue the relationship while he or she is not satisfied or even dissatisfied with it (Thibuat & Kelley, 1959). In order to evaluate a person's tendency to maintain a current relationship, it may be advantageous to consider the comparison level of alternatives and satisfaction (Thibuat & Kelley, 1959). An individual's comparison level represents the average relationship outcome (benefits received minus costs paid) that the individual has come to expect, and is influenced by past experiences and comparisons to the current relationship. Kelly and Thibuat (1978) stated that satisfaction with the relationship is a function of the discrepancy between the relationship outcome and the individual's comparison level. Service Quality and Loyalty Intention

The relationship between service quality and consumer behavior dimensions has also been examined empirically. Many studies have found the positive relationship between service quality and consumer behavior. For instance, Boulding et al. (1993) found a positive relationship between service quality and repurchase intention and willingness to recommend to others. The important study by Zeithaml et al. (1996) also showed the consequence of service quality as a loyal behavior, in ways such as repurchase intention, willingness to recommend (WOM), resistance to switching, complaint behavior, propensity to leave in future, duration to stay in future. However, many studies have also reported that service quality was not significant on loyal behavior. For example, the study by Cronin and Taylor (1992) that were using the SERVQUAL vs. SERVPERF compared the measurement of service quality and the relationships between service quality, customer satisfaction and behavioral intentions; namely repurchase intention. Their major study failed to establish the service quality effect on customer

behavioral intentions. Similarly, Caruana and Malta (2002) did not find any significant support for the link between service quality and service loyalty in the banking context. Moreover, Caceres and Paparoidamis (2007) also reported that the direct relationship of service quality and loyal behavior was not supported. Likewise, Johnson and Sirikit (2002) did not find any support for the link between service quality by using SERQUAL and word of mouth, purchase intentions, price sensitivity, or complaining behavior in Thai telecommunication. Aydin & Ozer (2005) revealed service quality in term of call quality, value-added services and customer support having a positive significant relationship on loyal behavioral intention in the telecommunication service industry. Thus, in the context of this study, four dimensions of service quality [core service, value added services (non-voice and entertainment) and customer care service] would have a significantly positive effect on loyalty intention (staying intention and word of mouth).

The first hypothesis tested in the study is as follows:

H_1 : There is a positive relationship between customer's perception of service quality (core service, non-voice value added service, entertainment value added service and customer care service) and loyalty intention (staying and word of mouth).

Service Quality and Customer Satisfaction

Most marketing researchers accept that quality performance leads to satisfaction (Dabholkar et al, 2000; Olsen, 2002; Oslen. & Jonson, 2003). The satisfaction is followed by quality performance and has also been confirmed empirically; especially when quality is framed as a specific belief evaluation and satisfaction as a more general evaluative construct (Jonson et al., 2001). Therefore, the relationship between customer satisfaction and service quality has received much attention in the marketing literature (Bolton & Drew, 1994; Ismail, Haron, Ibrahim, & Isa, 2006; Parasuraman, 2002). Empirical findings also support a positive relationship between the consumers' perception of service quality and satisfaction (e.g., Fornell et al., 1996; Kim et al, 2004; McDougall & Levesque, 2000; Olsen, 2002). However, De Ruyter, Bloemer, and Peeters, (1997) found that customers do not mainly consider the importance of highest quality as being more important than price, convenience or availability for buying. They may have poor perceived service quality but have service satisfaction.

The result of previous empirical research on the relationship between service quality (call quality, value added services and customer care service) and customer satisfaction has indicated a positive relationship (Lim et al., 2006; Kim et al., 2004). However, the operational definition of service quality is different. Thus, this study postulates that various dimensions of service quality (core service, value added services and customer care service) would have a positive significant effect on customer satisfaction. The second hypothesis tested in the study is as follows:

H_2 : There is a positive relationship between customer's perception of service quality (core service, non-voice value added service, entertainment value added service and customer care service) and customer satisfaction.

H2.1 : There is a positive relationship between customer's perception of core service and customer satisfaction.

H2.2 : There is a positive relationship between customer's perception of non-voice value-added service and customer satisfaction.

H2.3 : There is a positive relationship between customer's perception of entertainment value-added service and customer satisfaction.

H2.4 : There is a positive relationship between customer's perception of customer care service and customer satisfaction

Methodology

In mass service context, mobile phone service industry in Thailand is considered rapidly evolves due to high switching behavior and its competitive market (Johnson & Sirikit, 2002). Hence, the service providers must always find ways to improve their services in order to keep their customers. The applicability of value added services is considered one of the ways that can provide and enhance existing customer's satisfaction among the pre-paid mobile phone users in Thailand.

The value added services such as SMS (Short Message Service), MMS (Multimedia Message Service) and GPRS (Mobile Internet), Downloading Ring Tones or Calling Melody, Downloading Music and Downloading Wallpaper or Screensavers would be a central focus in this study. The unit of analysis of this study is individual mobile phone users who are currently using a pre-paid mobile phone service in Thailand and have full control over their decision to continue or discontinue the services at any time. Multistage area sampling was employed together with simple random sampling to choose provinces from each region in Thailand and convenience stores and shopping mall from each province. Convenience sampling was used to choose respondents within sampling area. A total of 998 completed questionnaires from nine provinces were collected using structured questionnaire and were self-administered to avoid bias from research assistants.

Statistical Package for Social Science (SPSS) version 15.0 for Windows was used for data analysis and hypotheses testing. Descriptive statistics, factor analysis, reliability analysis, multiple regression analysis were used to analyze the studied variable in this research.

Measuring Instruments

Technical quality is viewed as the quality of the output service (that is delivery) (Gronroos, 1984) comprised of; (a) core service, (b) non-voice communication value-added services and (c) entertainment value added service. Functional quality refers to the quality of customer care service which is viewed as a supplementary to the output service (Gronroos, 1984; Lim et al., 2006).

Core Service refers to the quality of the main needed output from the service provider (Gronroos, 1984) in term of call quality. Three items are used to measure by customer accessibility and successful communication in terms

of network quality and clarity of voice without any connection breakdowns (Aydin & Ozer, 2005; Gerpott et al., 2001; Kim et al., 2004; Lim et al., 2006). The modification of Question 1 was adapted from Kim et al. (2004) and Aydin and Ozer (2005). Question 2 and 3 were adapted from Lim et al. (2006). A five-point Likert scale ranging from (1) "Strongly disagree" to (5) "Strongly agree" was employed.

Value added service is viewed in terms of the quality of output service (Gronroos, 1984) that focuses on the additional services in order to fulfill customers' needs. It comprises of non-voice communication and entertainment value added service (Lim et al., 2006). Six items were employed to measure the quality of them. They were chosen by asking the respondents about the value-added service they were using. Non-voice communication questions regarding SMS (Short Message Service) and MMS (Multimedia Message Service) were adapted from Lim et al. (2006). Question about GPRS (Mobile Internet) were self-developed. Entertainment value-added service questions including Downloading Ring Tones was adapted from Lim et al. (2006) by adding downloading calling melody. Question about Downloading Music and Downloading Wallpaper or Screensavers were self-developed. A five-point Likert scale ranging from 1 - Poor, 2 - Fair, 3 - Good, 4 - Very Good, and 5- Excellent were used in this study.

Customer Care Service: The measurement for functional quality viewed as customer care service in this study was determined by using six items which had been adapted from Kim et al. (2004) and Lim et al. (2006). Questions 1, 2 and 3 were adapted from Lim et al. (2006). Questions 4, 5, and 6 were adapted from Kim et al. (2004). Each item would be measured on a five-point Likert scale ranging from (1) "Strongly disagree" to (5) "Strongly agree."

Customer Satisfaction

For this study, customer satisfaction was measured as overall satisfaction toward service quality using a five-item scale which was taken from Lim et al. (2006). They were adapted, and slightly modified from the Lim et al. (2006) study. A scale from (1) "Strongly disagree" to (5) "Strongly agree" on a 5-point scale were employed. However, after the pre-test analysis, the two negative statements were not polite and appropriate to in the Thai culture. Therefore, the statement, "I am unhappy that I use mobile service from X." was reversed into positive statement, "I am happy that I use mobile phone service from X." and "I feel bad regarding my decision to choose mobile phone service from X." was dropped from the final questionnaire. Written similarly to the study by Lim et al. (2006) and adapted and slightly modified from Anderson and Srinivasan's work results revealed a coefficient alpha of 0.94, however, the original result was 0.89.

Loyalty intention

This loyalty intention is directly linked to intention to repurchase, complement by word of mouth (WOM) and show resistance to switching. Staying Intention is defined as a customer's intention to continue to make a phone call from the same service provider (Oliver, 1999) and resist changing

from his/her service provider (Morgan & Hunt, 1994). Word of Mouth Intention is defined as customer's intention to advertise the service from his/her current service provider to others by saying or recommendation (Oliver, 1999). Four items were adapted from Lim et al. (2006). A 5-point Likert scale ranging from (1) "unlikely" to (5) "very likely" was employed.

Results

Findings from a total of 998 respondents indicate that more than half of them are females (62.6%) which reflect a behavior in purchasing a prepaid mobile phone service which has not been reported in Thailand. Around 53% the respondents have a bachelor degree and in aged between 26-35 years old (38%). With regards to occupation, around 36% of the respondents were government employee/official/state enterprise. In terms of personal income, 35.6% of the respondents have a monthly income between Baht 5,000 – 9,999 (35.6%) (Table 1).

Six factors with Eigenvalues greater than 1 are extracted by the Principle Components Analysis and the Varimax Rotation Technique. The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) values exceed 0.50, the Barlett's test of sphericity was significant at 0.05, the anti-image correlations and the communalities of items was greater than 0.50 and the minimum requirement of factor loading above 0.05. The reliability of the studied variables achieved an acceptable level with Cronbach Alpha values (Sekaran, 2000; Nunnally, 1978) of between 0.68-0.90 to further test all the hypotheses generated (refer Table 2). In addition, the mean values of the service quality ranged from 2.05 to 3.79 with standard deviations ranging from 0.68 to 1.21; customer satisfaction mean values 3.82 and standard deviation of 0.82; loyalty intention behavior mean values ranging from 3.16-3.70, with standard deviations ranging from 0.76-0.97.

Table 1: The demographic profile of respondents

Demographic Variables	Categories	Frequencies	Percentage
Total number of respondents		998	%
Age	15– 20 years	160	16.0
	21 – 25 years	271	27.2
	26 – 35 years	377	37.8
	36 – 45 years	144	14.4
	46 – 55 years	20	4.0
	Over 55 years	6	0.6
Gender	Male		
	Female	373	37.4
		625	62.6
Education	Secondary School or	26	2.6
	Lower	184	18.4
	High School or	168	16.8

Contd...

Contd...

	Diploma	532	53.2
	Advance Diploma or Certificate	90	9.0
	Bachelor		
	Master or Higher		
Occupation	Student/	252	25.2
	Undergraduate	258	25.9
	Employee/ Private	362	36.3
	Company Employee	126	12.6
	Government Employee/ Official/ State Enterprise Employee		
	Business Owners		
Income	Less than Baht	150	15.0
	5,000	356	35.6
	Baht 5,000-9,999	190	19.0
	Baht 10,000-14,999	116	11.8
	Baht 15,000-19,999	60	6.0
	Baht 20,000-24,999	30	3.0
	Baht 25,000-29,999	96	9.6
	Over Baht 30,000		

This table shows the study's participants profile in term of demographic.

Table 2: Reliability coefficient, mean and standard deviation of the studied variables (N=998)

Variables	Number of Items	Cronbach's Alpha	Mean	Std. Deviation
Service Quality				
Core Service	3	.75	3.65	.79
Non-Voice Value-Added Service	3	.77	2.44	1.02
Entertainment Value-Added Service	3	.88	2.05	1.21
Customer Care Service	6	.90	3.10	1.06
Customer Satisfaction	4	.89	3.82	.82
Loyalty Intention				
Intention to Stay	2	.68	3.70	.76
Word of Mouth	2	.87	3.19	.97

This table presents the number of items of the studied variables and the result of reliability coefficient, mean and standard deviation by using 5point Likert-type scale.

Hypotheses Testing

Multiple regression analysis was performed to test all the hypotheses postulated in this study (Sekaran, 2003). It is generally agreed that there are at least five assumptions as to normality, linearity, multicollinearity, homoscedasticity, and autocorrelation which have not been violated (Hair et al., 2006). It is postulated that there is a positive relationship between four dimensions of service quality and loyalty intention and the relationship between four dimensions of service quality and customer satisfaction. The result is indicated in Table 3.

Table 3: The multiple regression analysis results for the relationship between service quality and loyalty intention (staying and word of mouth) and customer satisfaction

Independent Variables	Dependent Variable		
Service Quality	Staying Intention (Beta)	Word of Mouth Intention (Beta)	Customer Satisfaction (Beta)
Core Service	.287**	.140**	.505**
Non-Voice Value-Added Service	.109**	.113**	.130**
Entertainment Value-Added Service	-.053	.080*	.001
Customer Care Service	.149**	.221**	.162**
R2	.140	.132	.360
Adjust R2	.136	.128	.358
F change	39.819**	36.846**	136.788**

This table reports the result from multiple regression analysis for the relationship between four dimensions of service quality and loyalty intention in term of staying intention and word of mouth intention and the relationship between four dimensions of service quality and customer satisfaction respectively. * and ** indicated significant of * p<.05, **p<.01 levels respectively. Results in Table 3 reported, the extent of the variance of staying intention is explained by the quality of using voice to communicate, non-voice service and customer care service of 14 percent *(R2=.14, p<.01,* whereas, the four sub dimensions of the quality of services provided by their present network operator predicted word of mouth intention reaches a value of 13.2 percent *(R2=.132, p<.01).* The higher quality of four sub dimensions of service quality is the highest motivator of staying and word of mouth intention with a current service provider. However, entertainment value-added services failed to be a motivator of staying intention. Therefore, all hypotheses were accepted. However, Hypothesis related (entertainment value-added service and staying intention) was rejected.

In addition, the results in Table 3, the extent of the variance of intention of participants to use a mobile phone service in the prepaid market is explained by the quality of service as provided by the network operators with a variance

of 34.8 percent *(R2=.360, p<.01)* as indicated by the F value *(F Change = 136.788, p<.01).*

The quality of using voice to communicate *(â = .505, p <.01),* non-voice service *(â = .130, p <.01)* and customer care service *(â = .162, p <.01)* significantly predicted customer satisfaction. In addition, the higher quality of calling, non-voice service and customer care service led to the highest customer satisfaction. It seems that customers' perception toward calling quality is the most significant to provide satisfaction in using a mobile phone service in the prepaid market. However, the entertainment value-added service failed to be a predictor of customer satisfaction.

As the result from Table 3 reveals, it was indicated that hypotheses relating (core service and customer satisfaction), (non-voice value-added service and customer satisfaction) and (customer care service and customer satisfaction) were accepted. However, hypothesis relating (entertainment value-added service and customer satisfaction) was rejected. In sum, the hypothesis H2 (service quality and customer satisfaction) was partially supported.

Discussion

Results from this study indicate that service quality is a construct that consists of four dimensions, namely core service (voice service), non-voice value-added services, entertainment value-added service and customer care service. The results of multiple regression analyses reveal a positive significance in the relationship between service quality and loyalty intention. It is also proved that service quality dimensions, which were developed from Gronroos' Model (1984) that are comprised of core service, non-voice and entertainment value-added service and customer care service. This finding is consistent with previous research (Kang & James, 2004; Kang, 2006) that service quality measurements should not be focused only on delivery quality but also on service output.

It is also found that the greatest impact of service quality on staying intention and word of mouth is the quality of core service in terms of a good coverage network, high sound quality and few interruptions in the prepaid mobile phone service industry in Thailand. Possible reason for this indication is that the voice calls are the core purpose for using mobile phone services. This finding is consistent with previous studies in the telecommunication industry (Aydin & Özer, 2005). In regards to customer care services, a positive and significant effect upon customer attitudes (staying intention and word of mouth interactions) was established. This is understandable because mobile phone service providers supply a variety of customer support systems that are convenient to access, help customers to solve problems quickly and are friendly and polite. Thus, by helping customers to solve their problems through a variety of processes they develop the intention to stay longer with their network provider. This finding is consistent with previous studies (Aydin & Özer, 2005).

The non-voice value-added service is ranked the third in positively and significantly influence on staying intention and using word of mouth positively

on behalf of their network provider. This study also reveals that entertainment value-added service has only a significant relationship with word of mouth intention. The lack of significant findings on the relationship between the quality of entertainment value-added service and intention to stay may be due to the fact that the samples in this study only focused on the prepaid market which is commonly used by the low-middle income group. This may lead to lowering perceived benefits of using entertainment value-added services among the pre-paid users as their main purpose is to communicate rather than focusing on entertainment. Hence, the quality of entertainment value-added service would not be an important consideration when thinking about switching or staying with their service provider.

The results of this study prove that three dimensions of service quality (core service, customer care service, and non-voice value-added service) positively influence customer satisfaction. These results are also supported by Kim et al (2004) and Lim et al (2006) indicating that call quality, value-added services and customer support are significantly linked with customer satisfaction. This implies that the greater the quality of voice service, customer care service, and non-voice service are, the higher the customer's satisfaction will be. This reinforces the fact that the call quality of the telephone service is the top issue that directly creates satisfaction with mobile service providers. It also highlights the continuing growth of the importance of value-added services, including short message services, multimedia message services and mobile internet. One possible reason is that in order to communicate with a mobile phone service the network coverage, quality of sound, and uninterrupted calling are the top issues that directly create satisfaction amongst mobile subscribers. This is followed by customer care services that resolve customers' service difficulties immediately. This type of service is also important for creating customer satisfaction by providing a system whereby it is easy to contact either person or call center with speed, friendliness and politeness. Of least influence is the quality of the non-voice services which are comprised of short message service (SMS), multimedia message service (MMS) and mobile internet (GPRS). As mobile telecommunications technology evolves rapidly these types of services help customers to better communicate with the rest of the world. Therefore, it is not surprising that all investigated qualities add to customer satisfaction with their network operator. However, the results of the entertainment service dimension (downloading music, ringtone/calling melody and wallpaper/ screen severs) were found not to have a significant relationship with customer satisfaction. While this result was contrary to what was hypothesized, it is also slightly different from the previous research by Lim et al. (2006). Their studies found that data service, downloading ringtones, has a positive significant relationship on customer satisfaction in postpaid mobile phone services in the USA. A possible explanation is that entertainment service quality in Thailand is not of a good enough quality for general use nor is it related to the main purpose for use of a mobile phone service. The other reason probably is that the respondents in this study were mobile phone service users in the prepaid market that may not be particularly interested in using this service. Therefore, in particular, network providers must

concentrate on service quality that offers the main service such as voice service, non-voice services and customer care services to strengthen customer satisfaction.

Moreover, the findings support the social exchange theory in marketing perspectives that the exchange from customer toward firm or service provider will create feelings of satisfaction when he/she gets benefits which are related to the main objective for using the company's product or service. As a result, this finding demonstrated that three dimensions of mobile phone service quality comprised of voice service, non-voice service and customer care service have impact on customer satisfaction. Entertainment value-added services, however, had no impact on satisfaction. Therefore, in order to build satisfaction, service providers should supply the various value-added services which are more related to the main purpose for using a mobile phone service such as communication rather than entertainment services.

Conclusion

The study, the results indicate that all four sub-dimensions of service quality have positive effects on both dimensions of loyalty intention, but entertainment value-added services do not have any effect on intention to stay. This study also found that only three dimensions of service quality have significant impacts on customer satisfaction. The quality of calling (core service) has the most highly significant effect on customer satisfaction, followed by quality of customer care service and quality of non-voice value-added services.

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Post Merger Performance of Indian Banks

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This study attempts to identify the objectives of M & A in the Indian Banking sector and also analyze the financial performance of the merged bank through the model of EVA. On the basis of 15 cases of M & A in the Indian banking sector, it is concluded that M & A have taken place with multiplicity of objectives among Indian banks. It is also found that the EVA gives a clearer picture of the value added by the merger in the Indian banking sector. However, the positive results of the merger take some time to show.

Introduction

M & As existed in market economies since at least more than a century and quickly spread to the banking industry. Today, banking is becoming an increasingly global industry which knows no geographic and territorial boundaries. The global banking scenario is undergoing significant changes as a result of the recent financial crisis. This financial crisis had a lasting impact on the world economy and more importantly on banks. While financial institutions in the US were at the heart of the problem, European banks faced strikingly similar problems.

The banking system in India is significantly different from that of other Asian nations because of the country's unique geographic, social, and economic characteristics. These features have given the Indian banking sector its strengths and weaknesses. A big challenge facing Indian banks is how to attain operational efficiency suitable for modern financial intermediation under the current ownership structure. The inorganic growth through mergers and acquisitions is the most preferred route for this.

Even though mergers and acquisitions (M&A) have been an important element of corporate strategy all over the globe for several decades, research on M&As has not been able to provide conclusive evidence on whether they enhance efficiency or destroy wealth. There is thus an ongoing global debate on the effects of M&As on firms.

In recent years, mergers and acquisitions have become common in India. However, very little appears to be known about the long-term post-merger performance of firms in India, and the strategic factors that affect this performance.

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Objectives

1. To identify the motives of bank mergers in India.
2. To evaluate the post-merger financial performance of the merged banks using EVA as a metric of corporate performance.

Methodology

Scope of study

For the purpose of this study, 15 cases of mergers and acquisitions among commercial banks in the Indian banking sector have been considered, which took place during the period from 2000 to 2009.

Tools of data collection

The data used in this study have collected from the annual reports of the banks, websites of the banks involved in merger, website of RBI and BSE, IBA Bulletins, Business Magazines & Newspapers.

EVA as a tool for analysis

The post-merger financial performance of the merged banks has been evaluated in this study using Economic Vale Added or EVA as a metric of corporate performance. EVA is a new performance measure that seeks to measure the periodic performance in terms of shareholder value created or destroyed. Under conventional accounting, most of the companies appear profitable. However, actually many of them are destroying shareholder value because the profits they earn are less than their cost of capital. EVA corrects this error by estimating the true economic profit i.e. amount by which earnings exceed or fall short of the required minimum rate of return investors could get by investing in other securities at comparable risk. Expressed as a formula EVA for a given period is -

EVA = NOPAT - Cost of capital employed

= NOPAT-(WACC*CE)

(Where WACC is weighted average cost of capital and CE is capital employed.)

In this study NOPAT is calculated as

NOPAT = Net profit + Interest Expenses

The data used for calculation was easily available from the Profit & loss account of the respective bank. Weighted average cost of capital (WACC) is the minimum rate of return on capital required to compensate equity and debt investors for bearing risk. It is calculated as-

WACC = (Wd* Kd) + (We * Ke)

(Where Wd is weight of debt, We is weight of equity, Kd is cost of debt and Ke is cost of equity.)

Cost of Debt (Kd) = (Interest Expense *(1-tax rate))/Total borrowings

A tax rate of 30 percent per year was assumed in all cases for maintaining consistency over years in this study. Capital asset pricing model has been used to calculate the Cost of equity.

Cost of equity (ke) = Rf + Beta (Rm – Rf)

(Where Rm is the average market return and Rf is the risk free rate.)

In this study Rf is taken as same for all cases i.e. 365 days Treasury bills rate.

Capital employed represents the economic value of all funds invested in the business. It is composed of total equity in circulation and total amounts of debt raised. In this study it has been calculated as sum of total capital and liabilities as given in the Balance sheet of the respective bank.

CE = NW + TD + other liabilities and provisions

(NW (Networth) represents sum of share capital and reserves and total debt (TD) includes deposits and borrowings). These items have been easily obtained from balance sheet of the banks under study.

Limitations of the study

The main limitation of this study is that it is based on secondary data. Although, all efforts have been made to tap the data from authentic sources but there is no way to test the reliability of the data. The other limitation is that the present study deals with a limited time period i.e. from 2000 to 2009. The results are drawn on the basis of 15 cases of M & A in the Indian banking Industry.

Analysis

Performance measurement using EVA

This study also analyses the impact of M&A on the financial performance of the merged banks under study using EVA as a tool.

HDFC Bank & Times Bank Merger

As part of HDFC Bank's strategy of attaining great heights, it decided to merge with Times Bank in 1999-2000. This was the first market-led merger on the Indian banking scene. Total market value of the deal was 5775.75 Mmllion Rs and it was a total stock deal.

On analyzing the performance of HDFC Bank using the value added metrics of EVA (Table 1), it is found that the EVA has increased in the post merger years, indicating that the merger created value for the HDFC bank and proved to be beneficial.

Table 1 Eva of HDFC Bank

Year	NOPAT Rs Crores	WACC	Total Capital Rs Crores	EVA Rs Crores
2000	494.32	0.4221	11656.14	-4425.61
2001	963.87	0.0373	15617.33	381.06
2002	1370.78	0.0393	23787.38	436.60

Mergers Involving ICICI Bank

In 2000-01, ICICI bank merged with Bank of Madura (BoM). This was a merger between a traditional bank and a new age bank. Bank of Madura focused on traditional mass banking strategies where as ICICI bank being a 'new age' bank, emphasized on parameters like profitability in the interests of shareholders. With this merger ICICI Bank Limited was expected to become one of the largest private sector banks in India.

An analysis based on EVA reveals that its EVA decreased from 388.80 Crores in 2000-01 to 318.38 in 2001-02. This could be due to its reverse merger with its parent-ICICI Ltd in 2001-02.However, soon ICICI bank was able to make up for this, and then there was no looking back. A study of EVA values (table 2) over next few years reveals how the value has been created for ICICI bank.

Table 2: EVA of ICICI Bank

Year	NOPAT Rs Crores	WACC	Total Capital Rs Crores	EVA Rs Crores
2001	1009.24	0.031436	19736.59	388.8089
2002	1826.37	0.014485	104109.9	318.3843
2003	9150.18	0.065842	106812	2117.426
2004	8652.36	0.045333	125228.9	2975.422
2005	8576.09	0.033517	167659.4	2956.586
2006	12137.52	0.033587	251389	3694.181
2007	19468.72	0.03982	344658.1	5744.464
2008	27641.97	0.031724	399795.1	14959.05
2009	26484.06	0.0571	379300.96	4817.01
2010	21617.55	0.0377	363399.72	7923.80

Further, in 2007, RBI approved the scheme of amalgamation of Sangli Bank with ICICI bank and the scheme of amalgamation came into effect from Apr 19 2007. With this merger ICICI Bank gained Sangli Bank's network of over 190 branches and existing customer and employee base across urban and rural centers. A study of EVA reveals (Table 2) that in 2008, EVA of ICICI Bank increased manifolds from 5744.46 crores in 2007 to 14959.05 crores in 2008. This supports our hypothesis that merger results in value addition to the merged entity. However, next year it fell down drastically to 4817.01 crores. This could be due to its merger with Bank of Rajasthan in 2009. Next year in 2010, EVA increased to 7923.80 crores again validating the belief that positive results of merger take some time to show.

Bank of Baroda & Benaras State Bank Merger

This deal between the banks took place in 2002. The Central Government had made an Order of Moratorium in respect of Benaras State Bank Ltd with effect from the close of business on January 22 to July 21, 2002.Benaras

State Bank Ltd (BSB) was a bank based in Uttar Pradesh. Bank of Baroda (BoB) aimed to expand its customer base and there by increase its consumer banking business as a result of this merger.

An analysis based on EVA (table 3) reveals that BoB's value increased in the post merger years. Although BoB, a public sector bank had taken over an insolvent private sector bank, still this merger proved to be beneficial for both the banks involved and resulted in adding economic value for BoB.

Table 3: EVA OF BoB

Year	NOPAT Rs Crores	WACC	Total Capital Rs Crores	EVA Rs Crores
2001	4094.21	0.0455266	63322.04	1211.3752
2002	4622.04	0.0404553	70910.06	1753.3543
2003	4766.97	0.0421474	76417.84	1546.1581
2004	4542.48	0.0307986	85108.67	1921.2501

Punjab National Bank & Nedungadi Bank Merger

Public sector Punjab National Bank (PNB) took over Kozhikode-based Nedungadi Bank Ltd (NBL) in Feb 2003. This was a merger of north and south based banks. It was used as a bail out strategy for Nedungadi Bank where as PNB expected to gain a branch network across in Kerala from this merger.

As can be seen from the table 4, EVA shows an increasing trend in the post merger years thereby indicating the positive effect of the merger in the long run.

Table 4: EVA OF PNB

Year	NOPAT Rs Crores	WACC	Total Capital Rs Crores	EVA Rs Crores
2003	5203.49	0.040196	86221.8	1737.761
2004	5263.68	0.030478	102331.75	2144.825
2005	5863.23	0.029362	126241.27	2156.562
2006	6356.7	0.027911	145267.39	2302.19

Global Trust Bank & Oriental Bank of Commerce Merger

This was a forced merger of Global Trust Bank (GTB), a pioneer private bank of new generation with Oriental Bank of Commerce (OBC). GTB's net worth was wiped out under the weight of bad debts and was found to be negative. Hence, the Reserve Bank of India (RBI) placed the operations of GTB under suspension to protect the interests of depositors and ensure the safety of funds in October, 2004.

For OBC there was an apparent synergy post merger as the weakness of GTB had been bad assets and the strength of OBC lay in recovery. In addition, GTB being a south-based bank was expected to give OBC the much-needed edge in the region apart from tax relief because of the merger. On the other hand, GTB had no choice as the merger was forced on it, by an RBI ruling, following its bankruptcy.

An analysis of EVA data of OBC, pre and post the merger, reveals that EVA decreased from 1190.417 Crores in 2004 (Year of merger) to 1161.042 Crores in 2005 and to 1040.686 in 2006. This indicates that due to this merger, its EVA declined due to the losses of the GTB. But soon the bank was successful in overcoming the situation and started reaping the benefits of the merger as a result of which its EVA increased to 1450.927 Crores in 2007 (Refer table 5). This indicates that bank did benefit from merger in the long run.

Table 5: EVA OF OBC

Year	NOPAT Rs Crores	WACC	Total Capital Rs Crores	EVA Rs Crores
2003	2546.88	0.048028	33987.64	914.5284
2004	2530.81	0.032687	41006.56	1190.417
2005	2774.29	0.029837	54069.46	1161.042
2006	3071.01	0.034449	58937.38	1040.686
2007	4054.39	0.035212	73936.28	1450.927

Bank of Punjab & Centurion Bank Merger

Combined entity, the Centurion bank of Punjab (CBoP) was expected to be the among the top 10 private sector banks in the country. As can be seen from the table, EVA was negative in 2004 i.e the premerger year. However, it increased to 51.31 Crores in 2005 i.e the year of merger and to 173.86 in 2006 i.e. the post merger year. (Refer table 6) This is an indication that this merger had positive effect on the shareholder's wealth. This positive performance had an intermingled effect of merger news with LKB which the bank was going through at that time.

Centurion Bank of Punjab & Lord Krishna Bank Merger

This merger took place in 2006. It was more of a RBI driven merger to safeguard the interest of the depositors. On analysis it is found that this merger was successful in adding to shareholder's wealth. The EVA of the bank increased from 51.31 Crores in 2005 to 173.86 Crores in 2006. This indicates positive impact of its merger with the Bank of Punjab in 2005.In 2007 its EVA further increased to 228.71 Crores. (Refer table 6)This is an indication that the market reacted positively to this merger and that the merger had positive effect on shareholder's wealth.

Table 6: EVA of CBOP

Year	NOPAT Rs Crores	WACC	Total Capital Rs Crores	EVA Rs Crores
2004	136.73	0.0450	3548.87	-23.1375
2005	198.15	0.0318	4611.68	51.31428
2006	526.48	0.0311	11330.19	173.8623
2007	820.38	0.0320	18482.78	228.7086

IDBI-IDBI Bank and IDBI Bank- United Western Bank Merger

The year 2005 witnessed the merger of IDBI Bank with the Industrial Development Bank of India Ltd. The new entity continued to its development finance role, while providing an array of wholesale and retail banking products. The following year i.e. in 2006, IDBI Bank acquired the distressed United Western Bank, which the central bank had put under moratorium on September 2, 2006.

For IDBI, which was in the process of establishing itself in the commercial banking segment, post its reverse merger with its banking arm in 2004, rehabilitating UWB was quite challenging. However, as can be seen from the table 7, the combination of IDBI and UWB added value in the long-term and helped IDBI expand its retail presence.

Table 7: EVA of IDBI Ltd

Year	NOPAT Rs Crores	WACC Rs Crores	Total Capital Rs Crores	EVA
2005	2762.48	0.026057	71036.58	911.5138
2006	5555.54	0.046498	79903.18	1840.222
2007	6138.69	0.045511	94058.28	1858.015

Ganesh Bank & Federal Bank Merger

The RBI had put Ganesh Bank of Kurundwad (GBK) under a moratorium on January 7, 06, thereby freezing the bank's operations, as its net worth had turned negative. The Union Government approved the merger of The Ganesh Bank of Kurundwad with the Federal Bank Ltd effective September 2, 2006. GBK was considered a good fit to improve agriculture and retail lending.

The table 8 shows clearly that this merger proved beneficial in the long run. The federal bank was able to capitalize on the inroads which it got from the GBK in the agricultural sector of Mahashtra. The EVA shows an increase from 230.05 Crores in 2005 to 1164.884 in 2008.

Table 8: EVA Of federal bank

Year	NOPAT Rs Crores	WACC	Total Capital Rs Crores	EVA Rs Crores
2005	778.84	0.0326	16820.96	230.0578
2006	1061.94	0.0319	20642.9	402.8208
2007	1377.69	0.0340	25089.94	524.0418
2008	2015.47	0.0262	32506.45	1164.884

Bharat Overseas Bank & Indian Overseas Bank Merger

Bharat Overseas Bank (BhOB) was a private bank based in Chennai. In 2007 it merged with Indian Overseas Bank, which took over all the bank's employees, assets, and deposits. An analysis of EVA in post merger years reveals that it increased in 2008 to Rs 2888.47 crores from 1609.32 crores in 2007. Next year it shows a slight decline but soon recovers, indicating that the positive results of merger take some time to appear

Table EVA of IOB

Year	NOPAT Rs Crores	WACC	Total Capital Rs Crores	EVA Rs Crores
2004	2667.45	0.032891	47322.02	1110.98
2005	2746.89	0.033077	50815.05	1066.084
2006	3122.44	0.032134	59357.82	1215.035
2007	4279.7	0.032464	82256.82	1609.323
2008	6491.13	0.035369	101859.7	2888.471
2009	8097.6	0.045751	121073.4	2558.363
2010	7784.87	0.039776	131096.4	2570.425

HDFC Bank & CBOP Merger

In February,2008 HDFC Bank approved the acquisition of Centurion Bank of Punjab (CBoP) for Rs 9,510 crore in the largest merger in the financial sector in India This merger helped HDFC Bank to consolidate its position as the third largest bank in India after SBI and Bank. An analysis of EVA reveals that EVA reduced in the immediate post merger year i.e. 2009 but soon after shows increase in 2010, again confirming the belief that mergers result in value addition to shareholders over a long period of time.

Table EVA of HDFC BANK

Year	NOPAT Rs Crores	WACC	Total Capital Rs Crores	EVA Rs Crores
2007	4561.99	0.03	91235.61	1706.82
2008	6477.30	0.02	133176.60	3376.34
2009	11156.04	0.04	183270.77	3097.17
2010	10735.00	0.03	222458.56	4507.63

Conclusion

On the basis of this study, it can be said that the mergers that took place in the period under study i.e 21st Century are a mix of restructuring of weak banks forced by RBI as well as voluntary mergers with the primary objective of expansion, diversification and overall growth. Two mergers were part of convergence exercise of financial institution into banks.

Further, it is also found that the value of a merger lies in its synergies but these synergies are not achieved over a short period of time. On analysis of performance using EVA, it can be said that EVA is a good method to study the long term effect of the efficiencies of the merger. It gives a better measure of the value which is added as a result of the merger.

On comparative analysis of EVA of banks under study, it is found that post merger, all banks added value over a long period. In some cases, like GTB-OBC merger and BSB-BoB merger, EVA was reduced in the immediate post merger year. However, in the subsequent years when the merger benefits were achieved, EVA increased by considerable value.

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Determinants of Profitability of Indian and Foreign Firms Under the Current Regulatory Framework

(With Special Reference to Food Industry in India)

RAJU DEEPA AND RAMACHANDAN AZHAGAIAH

This study has been carried out with particular reference to food industry in India. 157 firms belonging to food industry are analysed and the result shows that the type of firms does not influence its profitability. The business environment in India gives equal opportunity for both the Indian and foreign firms. However the foreign firms in India are found to have less stable market share when compared to their Indian counterparts therefore there is a need to increase their market share to prosper in Indian market at par with Indian firms.

Introduction

The commendable step taken by the Government of India towards liberalization is the introduction of Foreign Exchange Management Act, 1999 (FEMA), which has replaced Foreign Exchange Regulation Act, 1973 (FERA). FERA sought to control Foreign Exchange transactions while FEMA seeks to regulate the same. With the introduction of FEMA foreign collaborations and investments have become further easy. Foreign companies can directly submit applications for foreign collaboration approvals in their own name without tying with an Indian party or forming a company. Changes have been made in the foreign investment policy to create a more favourable fiscal environment for foreign collaborations and investment. Therefore, it becomes necessary to analyse the status of foreign firms in India and the marketing variables determining its profitability as distinguished from the Indian firms. This study has been carried out with particular reference to food industry in India.

Food Industry in India

India has diverse agro-climatic conditions and has a large and diverse raw material base suitable for food processing companies. India is becoming the eastern hub of the food industry. Not only does it have leading productions of various materials like milk, fruits and vegetables, grains and animal products but the food processing sector is also growing at a rapid rate to

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cater to the domestic needs and the export market (JS Pai, executive director, Protein Foods and Nutrition Development Association of India (PFDAI). National Food Security Act (NFSA) is envisaged as a path-breaking legislation, aimed at protecting all children, women and men in India from hunger and food deprivation. There were thirteen various laws governing the food industry in India until the introduction of Food Safety & Standard Act, 2006 which now lay down the standard for food safety. The firms entering the food industry should get a license or should be registered. The government is planning to allow100% FDI in food processing sector and also to provide tax benefits. Foreign direct investment (FDI) in agriculture has increased six-fold, rising from $96.4 million in 2004 to $656 million in 2008, recording the US as the largest source country followed by the Germany and the UK. The agriculture related FDI flows are shown in *table 1*.

Table 1: Agriculture related FDI inflows in India

FDI Inflows in India	in $ million	% to total
Sugar	5.0	0.76
Vegetable oil	44.1	6.72
Tea and coffee	52.4	7.99
Hybrid seeds and plantation	1.2	0.18
Horticulture	4.1	0.62
Food processing	150	22.86
Fermentation industries	388.7	59.23
Total	656.2	100

Source: "FDI in agriculture", *The Financial Express*, January 21, 2010: 9.

Objectives of the Study

- To study the relative market share of Indian and foreign firms in Indian Food Industry.
- To study the influence of firm type (i.e. Indian or foreign) on profitability in Food Industry.
- To study the determinants of profitability of Indian and foreign firms in Food Industry.

Hypotheses

$\mathbf{H_o^1}$: There is no significant influence of firm type on the profitability of firms of food industry in India.

$\mathbf{H_o^2}$: There is no significant relationship between marketing intensity and profitability of the firms of food industry in India.

$\mathbf{H_o^3}$: There is no significant relationship between market share and profitability of the firms of food industry in India.

$\mathbf{H_o^4}$: There is no significant relationship between age and profitability of the firms of food industry in India.

Methodology

Sources of Data and Period of Study

The study is based on secondary data, which are collected from Centre for Monitoring Indian Economy (*CMIE*) Prowess package for a period of 10 years on year to year basis ranging from 2000-2001 to 2009-2010.

Sampling Design

Multi-stage sampling technique is used for the study and the different stages followed are mentioned below:

Stage 1: 1711 food & beverage firms as on September 23rd, 2011 are taken as the total population.

Stage 2: Out of 1711 food & beverage firms, 341 BSE listed firms alone are considered. 98 firms belonging to NSE are not included in the study for obvious reasons.

Stage 3: Among the 341 BSE listed firms, only 157 firms were found to have complete data required for the study. Therefore, these 157 BSE listed firms constitute the final sample. The sample constitutes 142 Indian firms and 15 foreign firms, indicating that Indian firms dominate food industry in India and have less foreign competitors.

Descriptive statistics such as mean, median and standard deviation are used to neutralize the fluctuation in the value of explained as well as explaining variables. ANCOVA is used to study the impact of firm type on profitability of food industry in India. Correlation co-efficient is used to study one-to-one relationship between the variables. Multiple regression is also used to study various variables that determine the profitability (P) of the firms. Appropriate ratios as stated below are used to calculate individual relative properties of the selected variables. Description of ratios used in the study is shown in *table 2*.

Table 2: Description of ratios used

Variables	Ratios
Profitability (P)	PBITD / Total Assets
Marketing Intensity (MAR_INS)	Selling & Distribution Expenses / Sales
Market Share (MAR_SH)	Sales of the Firm / Total Sales of the Industry
Age (AG)	Total No. of Years from the Date of Incorporation

Dependent Variable

Profitability: *P* is used as the dependent variable and is calculated in proportion to total assets, which would portray the real picture on the ability to efficiently use their investment in asset to earn profit. To calculate *P* Profit before Interest Tax and Depreciation (PBITD) has been used since it displays the real profit earned and as there is tax rate difference between foreign and Indian firms in India.

Independent Variables

Marketing Intensity: The amount spent on selling and distribution shows how aggressively the firms market their product (Hsiao-Ping Chu, 2011). Therefore, the proportion of selling and distribution expenses in relation to their sales figure is measured and its impact on *P* is studied.

Market Share: *MAR_SH* shows the market coverage ratio of the firms which, in turn, increases the profitability of the firms. The Boston Consulting Group (BCG) has made an analysis of how the domestic firms are able to master their home market and what the MNCs have to learn from them. They have proved that domestic firms have the advantage of better understanding their local environment than MNCs. Therefore, the relative *MAR_SH* of domestic and foreign firms in India and their impact on *P* under the present regulatory framework is studied.

Age: The *AG* shows the number of years the firms has been carrying out business in India, which may help them to better understand the local business environment, culture and tradition of the home country. It also shows how they have positioned their products in the mind of the people. This also helps in increasing their *P*. So the relation between *AG* and *P* is studied.

Regression Equation

$$P = \acute{a} + \hat{a}_1 \, MAR_INS + \hat{a}_2 \, MAR_SH + \hat{a}_3 \, AG + \underline{a}$$

The Relative Market Share of Indian and Foreign Firms

The trend of relative share of Indian and foreign firms in Indian market over the study period shows that *(see chart A)* the market share has fallen drastically from the year 2004 in spite of the various measures taken by the Indian government to facilitate the foreign trade in India. The Indian firms stand in a superior position to foreign firms and are capable of retaining/ withholding the market share over the period of study.

Analysis of Impact of Firm Type on Profitability

The descriptive statistics shows that *(table 3)* the standard deviation of *MAR_INS* (6.223) is high while *P* shows lesser deviation (.067), indicating that there is much of variation in the amount spent on selling and distribution but it does result in relative increase in *P*. *MAR_SH* however shows lesser deviation (.01), indicating that there is less variation in *MAR_SH* among the Indian and foreign firms.

Table 3: Overall descriptive statistics of variables

Variables	N	Minimum	Maximum	Mean	Std. Deviation
P	157	-.149	.450	.10069	.067576
MAR_INS	157	-.104	43.938	1.21750	6.223338
MAR_SH	157	.000	.115	.00306	.010121
AG	157	0	53	14.95	11.161

The ANCOVA result shows that *(table 4)* the type of firms *(FR_TYPE)* (i.e. Indian or foreign) does not significantly influence the *P* of the firms. *MAR_SH* has highly significant 'F' value (19.039) at 1% level, indicating that *P* varies significantly with the variation in *MAR_SH.*

Table 4: ANCOVA result showing the influence of the independent variables on *P*

Variables	'F' value	Sig.
Intercept	60.705	.000
MAR_INS	.083	.773
MAR_SH	19.039**	.000
AG	1.580	.211
FR_TYPE	.409	.523

Source: Computed results based on compiled data collected from CMIE prowess Pvt. Ltd.
**Significant at 0.01 level;*Significant at 0.05 level

Analysis of Determinants of Profitability of Indian Firms

The analysis attempts to find which marketing strategy will help the firms increase their *P*, whether they have to aggressively spend money on selling and distribution or try to expand their *MAR_SH* or try to persist in the market for a longer period. The correlation result shows that *(table 5) MAR_SH* has highly significant correlation (.311) with *P* in case of Indian firms while the other variables are insignificantly correlated.

The regression result shows that *(see table 6) MAR_SH* only has highly significant co-efficient (1.839) with *P*. The F value (4.946) is highly significant, indicating that the dependent variable, *P* varies significantly with changes in predictor variable. However, the model fit is .077 indicating that there are other extraneous variables determining the *P* of Indian firms in food industry.

Table 5: Correlations matrix of determinants of *P* for Indian firms

Variables	*P*	*MAR_INS*	*MAR_SH*	*AG*
P	1	.025	.311**	.008
.769	.000	.928		
MAR_INS	.025	1	.030	-.099
	.769		.727	.239
MAR_SH	.311**	.030	1	-.031
	.000	.727		.712
AG	.008	-.099	-.031	1
	.928	.239	.712	

Source: Computed results based on compiled data collected from CMIE prowess Pvt. Ltd.

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

Table 6: Results of regression on determinants of *P* of Indian firms

Variables	Un standardized coefficients B	t	Sig.
(Constant)	.092	10.488	.000
MAR_INS	.000	.217	.829
MAR_SH	1.839**	3.838	.000
AG	.000	.235	.815
R Square	.097		
Adjusted R Square	.077		
F value	4.946** (.003)		

Source: Computed results based on compiled data collected from CMIE prowess Pvt. Ltd.

Note: Figures in parentheses are 'p' values;**Significant at 0.01 level;*Significant at 0.05 level.

Analysis of Determinants of Profitability of Foreign Firms

The correlation matrix shows that *(see table 7) MAR_INS* (.818) and *AG* (.516) have significant correlation with *P*. The correlation matrix shows that apart from increasing *MAR_INS* the foreign firms should also see that they persistently carry out business in India to increase *P*.

Table 7: Correlations matrix of determinants of *P* for foreign firms

Variables	*P*	*MAR_INS*	*MAR_SH*	*AG*
P	1	.042	.818**	.516*
		.883	.000	.049
MAR_INS	.042	1	.003	.071
	.883		.991	.800
MAR_SH	.818**	.003	1	.558*
	.000	.991		.031
AG	.516*	.071	.558*	1
	.049	.800	.031	

Source: Computed results based on compiled data collected from CMIE prowess Pvt. Ltd.

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

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

The regression result shows that *(see table 8)* MAR_SH has highly significant co-efficient (15.103) with P. The F value (7.650) is also highly significant and the model fit is over 50% (adj R^2 value is 0 .588), indicating that these predictor variables determine over 50% of influence unlike the case of Indian firms where the model fit is very poor.

Table 8: Results of regression on determinants of *P* of foreign firms

Variables	Un standardized coefficients B	t	Sig.
(Constant)	.060	1.996	.071
MAR_INS	.007	.194	.850
MAR_SH	15.103**	3.730	.003
AG	.001	.399	.697
R Square			.676
Adjusted R Square			.588
F value			7.650** (.005)

Source: Computed results based on compiled data collected from CMIE prowess Pvt. Ltd.

Note: Figures in parentheses are 'p' values;**Significant at 0.01 level;*Significant at 0.05 level.

Conclusion

Although the government treats the foreign firms at par with their Indian counterparts they still find it difficult to acquire a larger market share and are unable to compete with their Indian counterparts. The trend line also stresses the same, indicating that the *MAR_SH* keeps on decreasing over the study period while the Indian firms are able to maintain a stable rate. This indicates that the foreign firms have much to learn from the Indian firms to prosper in the Indian soil. With all the efforts made by the Indian government it is in the hands of these firms to understand the business environment and adapt to it. However, there is a red carpet welcoming environment created in India, with all new Acts implemented, to facilitate these foreign firms to flourish in the years to come with more smiling face.

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Analysis of Inventory Management of Selected Companies in India

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The analysis of profitability of individual firm may be helpful in projecting a clear picture of the profitability of the industry as a whole. This paper analyses the inventory management of selected companies in India.

Introduction

The importance of liquidity management is reflected in the time most spent by financial managers in managing current assets and current liabilities. Maintenance of adequate liquidity is necessary in order to discharge day-to-day liabilities and protect the business from adverse effects in times of emergencies. It aims at protecting the purchasing power of assets and maximise the return on investment (zenoff, 1969). In other words, the goal of liquidity management is to minimise the cost of working capital while maximizing a firm's profits (Nargaard, 1985). Management is required to be vigilant in maintaining appropriate levels in the various working capital accounts (Donaldson, 1957). The liquidity management is concerned with determination of relevant levels of current assets and their efficient use as well as the choice of the financing mix. The efficiency of a firm to earn profits depends largely on its ability to manage working capital.

Profitability analysis reveals how the profit position stands as a result of total transactions made during a year. Such analysis is particularly interesting to suppliers of funds who can evaluate their investment and take decision accordingly. On the other hand, profit ratios are equally beneficial to the management because these ratios reflect the efficiency of the enterprise.

The profit motive remains one of the mainsprings of enterprise and spur to efficiency. It is clearly the desire to make profits which inspires the search for more effective methods, reduced unit cost, better organization and greater turnover (Taylor and Shearing, 1965). Profit of public enterprises are the propellers of socialistic administration (Omprakash).

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Objeectives

The objectives of the paper are:

- To examine the overall quantum of working capital maintained by the companies under study.
- To evaluate the amount invested in the various components of working capital of the companies.
- To carry out analysis on the liquidity position of the companies.
- To evaluate the extent of relationship between working capital and profitability.

Hypotheses

The present study will be based on the following hypotheses:

- There is improper and inefficient liquidity management in the companies.
- There is no adequate proportion of the components of working capital in the companies.
- There is no significant difference in the profitability of the companies under study.
- There is a positive correlation between working capital and profitability.

Research Methodology

Primary and secondary data relating to working capital management in the selected companies have been collected from the offices of the companies. The questionnaire was designed to collect primary data, personal interviews were held to obtain technical information and where clarification required. The secondary data were collected from the published annual reports and accounts of the companies and various other publications of the industry. To analyze the problem of managing liquidity various techniques have been used such as ratio analysis, common size analysis, and trend analysis. To present the broad view of the problem several statistical techniques have also been used for analysis such as average, standard deviation, coefficient of variation etc. The hypotheses have been tested by applying F Test i.e. analysis of variance. To find the relationship between liquidity and profitability coefficient of correlation has also been computed.

Sample

In the present study the method of convenient sampling has been used on the basis of which three major units of public sector has been selected. For the selection of samples three units i.e. one from Steel Sector, one from Shipping Sector and one from Heavy Product Sector have been selected. The present study is confined to: Bharat Heavy Electricals Limited (BHEL), Steel Authority of India Limited (SAIL) and Shipping Corporation of India (SCI). A five yearly period commencing from 2006-07 to 2010-11 has been covered.

Analysis of Inventory Management

The inventory management of the companies under study has been analyzed under the following heads:

Size of Inventory

The size of inventory is SCI showed a fluctuating trend throughout the period. The size of inventory during 2006-07 was Rs. 73.85 crores increased to Rs, 90.07 crores in 2007-08 but decreased to Rs. 63.34 crores during 2008-09. The size of inventory increased to Rs. 83.21 crores in 2009-10 and then to Rs. 146.50 crores in 2010-11. The average size of inventory in SCI was Rs. 91.39 crores which can not be regarded very high. As a matter of fact, SCI is a service sector unit, so a huge amount of inventory is not required and whatever the size of inventory is according to the requirement. The coefficient of variation was 31.71 percent denoting a fluctuating trend which should be controlled by the management.

In BHEL, the size of inventory showed an increasing trend during the whole period of study because during 2006-07 the size of inventory in BHEL was Rs. 4217.67 crores continuously kept on increasing and reached up to Rs. 11017.49 crores during 2010-11. Since BHEL is a production unit and sufficient stock of inventory is required, therefore the increasing trend of inventory is regarded favourable for the company. But the management of the company should be precautious about the spoilage of the inventory and out dating of raw material. The size of inventory in BHEL showed a fluctuating trend because the coefficient of variation was 31.83 percent which should be kept under control.

In SAIL, the size of inventory registered an increasing trend during the whole period of study except in the year 2009-10. Initially, during 2006-07 the balance of inventory was Rs.6756.50 crores which increased to Rs. 6857.23 crores in 2007-08 and further to Rs. 10121.45 crores but decreased to Rs.9027.46 crores in 2009-10. The level of inventory further increased to Rs. 11302.79 crores in 2010-11 being highest during the period of study. SAIL is also a manufacturing unit and during the last years there had been fluctuations in the cost of raw materials at global level so the management had to keep sufficient stock of inventory for uninterrupted production as well as to meet the demand. The average size of inventory in SAIL was Rs. 8813.09 crores denoting sufficient balance of inventory. The coefficient of variation was 20.30 percent denoting moderate fluctuating trend of the size of inventory.

To apply the test of significance, F test has been used and following hypotheses have been tested.

Null Hypothesis (Ho): There is no significant difference in the size of inventory of the companies.

Null Hypothesis (Ho): The intra-company the size of inventory does not differ significantly or the year-wise difference in the size of inventory of the companies is insignificant.

Table 1: Anova

Source	Sum	Degree of Freedom (d.f.)	Variance (Sum/d.f)	F Ratio
Between Companies (SSC)	22338285.15	(c-1)=(3-1)=2	111691425.08	F= 53.18 (Between Companies)
Within Years (SSR)	28537971.33	(r-1)=(5-1)=4	7134492.83	F= 3.40 (Within Years)
Error	16800465.22	(c-1)(r-1)=8	2100058.15	

F Test Between the Companies

$$F = \frac{\text{Higher Variance}}{\text{Smaller Variance}}$$

$$= 111691425.08/2100058.15 = 53.18$$

Critical value of F at 5 percent level of significance (for V1=2 & V2=8) =4.46

The null hypothesis is rejected because the computed value of F is greater than the critical value of F, hence it can be concluded that the difference in the size of inventory of the companies is significant.

F Test Within the Years

$$F = \frac{\text{Higher Variance}}{\text{Smaller Variance}}$$

$$= 71344492.83 / 2100058.15 = 3.40$$

Critical value of F at 5 percent level of significance (for V1=4 & V2=8) =3.84

The null hypothesis is accepted because the calculated value of F is less than the table value of F at 5 percent level of significance, therefore, it is concluded that the year-wise difference in the size of inventory of the companies under study is not significant or intra-firm difference in the size of inventory of the companies under study is not significant.

Inventory to Current Assets Ratio

The inventory to current assets ratio explains the relationship between inventory and current assets and indicates that what proportion of current assets has been invested in the inventory. A higher inventory to current assets ratio cannot be regarded favorable because it signifies that a major part of current assets is invested in inventory and excessive inventory may be dangerous to the business concern. Conversely, a low ratio indicates less inventory and higher current assets which is comparatively better situation but very low ratio is not favourable.

The inventory to current assets ratio has been calculated by the following formula:

The inventory to current assets ratio of SCI showed a fluctuating trend during the period of study. During 2006-07, it was 2.15 percent which increased to 2.92 percent in 2007-08 but decreased to 1.72 percent in 2008-09. The inventory to current assets ratio increased to 2.40 in 2009-10 and to 4.34 percent in 2010-11. The proportion of inventory to current assets was low as the average of the ratio was 2.70 percent. It was because of the reason that SCI is a service sector unit and not much inventory is required. The standard deviation of the inventory to current assets was 0.91 with coefficient of variation as 33.50 percent denoting a fluctuating trend which should be controlled by the management.

In BHEL, the inventory to current assets ratio showed an increasing trend during the period of study except in the year 2010-11. The inventory to current assets ratio of BHEL varied within the range of 22.17 percent in 2009-10 to 20.22 percent in 2006-07. The inventory to current assets ratio marginally came down to 21.73 percent in 2010-11. The average of the ratio was 21.26 percent indicating a reasonable proportion of inventory in the current assets and signifies that the company has not blocked its funds in current assets. The coefficient of variation was 3.44 percent denoting a consistent trend and it is suggested that the management of the company should try to maintain this position in future also.

In SAIL, the inventory to current assets ratio registered a fluctuating trend throughout the period of study. Initially, during 2006-07 the inventory to current assets ratio was 35.42 percent which decreased to 28.65 percent in 2007-08 but increased to 31.25 percent in 2008-09. This ratio further decreased to 25.26 percent in 2009-10 but again increased to 33.81 percent in 2010-11. The average of the ratio was 30.88 percent which is quite satisfactory and denotes that the company has maintained a reasonable proportion of inventory in the total current assets of the company. It was neither excessive nor inadequate. The coefficient of variation was 11.75 percent denoting a consistent trend and it is suggested that the management of the company should try to maintain this position in future also.

Inventory to Working Capital Ratio

The inventory to working capital ratio shows the relationship between Inventory and working capital and explains the proportion of inventory in working capital. A high ratio indicates that management of inventory is not proper or condition of saleable goods is not adequate or working capital has decreased. Conversely, a low ratio indicates less inventory and higher working capital which is comparatively a better situation.

The inventory to working capital ratio of SCI showed a mixed fluctuating trend during the period of study. During 2006-07 this ratio was 3.59 percent and increased to 4.40 percent in 2007-08 but decreased to 2.75 percent in 2008-09. The ratio in the later years showed an increasing trend and increased to 3.81 percent in 2009-10 and further to 6.46 percent in 2010-11. The average of the ratio was 4.20 percent denoting that only a small amount of working capital is invested in the form of inventory and liquidity position of the company is sound. The coefficient of variation was 29.69

percent showing a fluctuating trend which should be controlled by the management.

For BHEL, the inventory to working capital ratio registered an increasing trend through out the whole period of study except in the year 2010.11. Though the size of inventory showed an increasing trend during the period of study but during 2010-11 the amount of working capital of the company was proportionately high and it was the reason that the proportion of inventory to working capital reduced in 2010-11. During 2006-07 the inventory to working capital ratio was 65.52 percent which increased to 71.39 percent in 2007-08, to 98.15 percent in 2008-09 and to 100.31 percent in 2009-10. This ratio came down to 95.63 percent in 2010-11. The average of the ratio was 86.20 percent which is high and affects the liquidity position adversely. The management of the company should try to reduce this proportion. The coefficient of variation was 17.03 percent denoting a moderate fluctuating trend.

In SAIL, the inventory to working capital ratio showed a decreasing trend through out the period of study except in the year 2010-11. During 2006-07 this ratio was 105.44 percent which kept on decreasing and came down to 52.56 percent in 2009-10. During 2010-11, the ratio increased to 77.50 percent. The average of the ratio was 76.58 percent which can be regarded reasonable as SAIL is a producing unit. But the decreasing trend of the ratio is a good sign of effective inventory management otherwise during 2006-07 the amount of inventory was more than the amount of working capital denoting an unhealthy position of liquidity. The coefficient of variation was 22.08 percent denoting a fluctuating trend because of decreasing trend. However, it is suggested that the management of the company should try to control the fluctuations.

F Test for Inventory to Working Capital Ratio: - F test has been applied for inventory to working capital ratio to test the following hypotheses:-

Null Hypothesis (Ho):-There is no significant difference in the inventory to working capital ratio of the companies under study.

Null Hypothesis (Ho):- The year-wise difference in the inventory to working capital ratio of the companies under study is not significant.

Table 2: Anova

Source	Sum	Degree of Freedom (d.f.)	Variance (Sum/d.f)	F Ratio
Between Companies (SSC)	20091.32	(c-1)=(3-1)=2	10045.66	F= 34.89 (Between Companies)
Within Years (SSR)	211.64	(r-1)=(5-1)=4	52.91	F= 5.44 (Within Years)
Error	2303.54	(c-1)(r-1)=8	287.94	

F Test between the Companies

$$F = \frac{\text{Higher Variance}}{\text{Smaller Variance}}$$

=10045.66/287.94=34.89

Table value of F at 5 percent level of significance (for V1=2 & V2=8) =4.46

Since the calculated value of F is more than the table value, hence the null hypothesis is rejected and it is concluded that the difference in inventory to working capital ratio of the companies under study is significant.

F Test Within the Years

$$F = \frac{\text{Higher Variance}}{\text{Smaller Variance}}$$

= 287.94/52.91 = 5.44

Critical value of F at 5 percent level of significance (for V1=8 & V2=4) =6.04

As the computed value of F is less than the critical value of F, therefore, the null hypothesis is accepted and it can be said that intra-company wise or year-wise difference in the inventory to working capital ratio of the companies under study is not significant.

Inventory Turnover Ratio

Turnover of Inventory directly affects the profitability of a firm. The higher the turnover, the larger is the profits of the firms. Each turnover adds to the volume of profits. Inventory turnover Ratio helps in determining the liquidity of a concern as much as it is given the rate at which inventories are converted into sales then into cash. The ratio helps to judge the efficiency of inventory management.

Lower inventory turnover ratio shows that the stock is blocked and not immediately sold. It shows the poor performance of the business and inefficiency of the management. The ratio measures the effectiveness of the stock policy of the management. It should be the constant effort of the management to dispose of the stock at the earliest.The inventory turnover ratio of the companies under study has been shown in the following Table 3.

Table 3: Inventory turnover ratio of the Companies (2006-07 to 2010-11)

(In times)

Year	SCI	BHEL	SAIL
2006-07	39.18	2.95	2.92
2007-08	35.35	2.59	2.92
2008-09	40.93	2.74	2.93
2009-10	42.21	2.62	2.61
2010-11	26.20	2.58	2.64
Average	36.77	2.70	2.80
S.D.	5.77	0.14	0.15
C.V.(%)	15.69	5.16	5.22

Source: Annual Reports & Accounts the companies (2006-07 to 2010-11).

It can be observed from the above table that the inventory turnover ratio of SCI showed a fluctuating trend during the period of study. During 2006-07 the inventory turnover ratio was 39.18 times which decreased to 35.35 times in 2007-08. The inventory turnover ratio increased to 40.93 times in 2009-10 and again to 42.21 times in 2009-10 but this ratio decreased to 26.20 times in 2010-11. The average of the inventory ratio was 36.77 times which is quite satisfactory. The coefficient of variation was 15.69 percent indicating a consistent trend which should be maintained in future also.

For BHEL, the inventory turnover ratio registered a mixed fluctuating trend during the period of study and varied within the range of 2.95 times in 2006-07 to 2.58 times in 2010-11. This ratio during the year 2007-08 came down to 2.59 times but increased to 2.71 times in 2008-09 and again decreased to 2.62 times in 2009-10. The average of the ratio was 2.70 times which can not be regarded satisfactory and indicates poor performance of inventory management. The management of the company should try to improve this ratio in future. The coefficient of variation was 5.16 percent showing a consistent trend, but this consistency should be maintained after increasing the inventory turnover ratio.

For SAIL, the inventory turnover ratio showed an increasing cum decreasing trend during the period of study. Initially, during 2006-07 the inventory turnover ratio was 2.92 times which remained same in the next year and increased to 2.93 times in 2008-09. The inventory turnover ratio decreased to 2.61 times in 2009-10 and marginally increased to 2.64 times in 2010-11. The average of inventory turnover ratio was 2.80 times which can not be regarded satisfactory and indicates at the overstocking of inventory. The management of the company should try to use inventory efficiently and increase the ratio to increase the profitability also. The standard deviation was 0.15 with 5.22 percent as coefficient of variation denoting consistency in the ratio.

F Test for Inventory Turnover Ratio: F test has been calculated to test the following hypotheses-

Null Hypothesis (Ho): There is no significant difference in the inventory turnover ratio of the companies under study

Null Hypothesis (Ho): The year-wise difference in the inventory turnover ratio of the companies under study is not significant

Table 4: Anova

Source	Sum	Degree of Freedom (d.f.)	Variance (Sum/d.f)	F Ratio
Between Companies (SSC)	3858.80	(c-1)=(3-1)=2	1929.40	F= 141.55 (Between Companies)
Within Years (SSR)	57.64	(r-1)=(5-1)=4	14.41	F= 1.06 (Within Years)
Error	109.01	(c-1)(r-1)=8	13.63	

F Test between the Companies

$$F = \frac{\text{Higher Variance}}{\text{Smaller Variance}}$$

$$= 1929.40/13.63 = 141.55$$

Critical value of F at 5 percent level of significance (for V1=2 &V2=8) =4.46

The null hypothesis is rejected because the computed value of F is more than the table value, hence it can be concluded that the difference in inventory turnover ratio of the companies under study is significant.

F Test Within the Years

$$F = \frac{\text{Higher Variance}}{\text{Smaller Variance}}$$

$$= 14.41/13.63 = 1.06$$

Table value of F at 5 percent level of significance (for V1=4 &V2=8) =3.84

As the calculate value of F (1.06) is less than the critical value of F at 5 percent level of significance, therefore, the null hypothesis is accepted and it is concluded that year-wise difference in inventory turnover ratio of the companies under study is insignificant.

Conclusion

Profitability analysis today is of paramount significance in the context of overall performance of the business concern. In the analytical framework constructed for this purpose, the analyst should have both microscopic and macroscopic views of profitability.

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Awareness of Environmental Protection Laws and Green Marketing among the Customers of Automobile Industry

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International concern with environmental issues has escalated in the wake of the increase in adverse human practices towards the environment in recent years as a result of the massive population growth (MSEA, 2004). Concern about the impact of economic activity on the environment has been an issue of varying importance on society's agenda. The discipline of marketing is one of many that has had to come to terms with mounting environmental concern, first in the early 1970s, then in the late 1980s/early 1990s and more recently in the late 1990s. This paper aims at evaluating the awareness of environmental protection laws and benefits of green marketing among the customers of automobile industry.

Introduction

Many firms are beginning to realize that they are members of the wider community and therefore must behave in an environmentally responsible fashion. This translates into firms that believe they must achieve environmental objectives as well as profit related objectives. This results in environmental issues being integrated into the firm's corporate culture.

Literature Review

Environmental protection is a vital management function, it is perceived as being instrumental in the development of a positive corporate image and an important element to the success of a business enterprise. Not only does environmental responsiveness help organizations to remain competitive and increase market share (Chan, 2001; Fitzgerald, 1993; Porter and Van der Linde, 1995a) but also there is some evidence showing increases in customer loyalty. It appears that it is good business practice to be green as this strategy has a tendency to promote profitability, improve employee motivation and commitment in addition to customer loyalty (Forte and Lamont, 1998).

While various writers in the area of green marketing are questioning the influence of practicing environmentalism in business (Wasik, 1996;

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Drumwright, 1994), consequent to the accelerating number of green consumers globally, marketers have continued to grapple with the question of understanding consumer's buying intention towards green products. There are various issues that require exploration. Firstly, the implications that green products may have on the formulation and implementation of appropriate corporate strategies. Secondly, the influence of corporate reputation on consumers green purchase behavior. Thirdly, what can the influence of price and quality have on green consumer demand? Fourthly, what impact of consumer's overall perception about green products have on purchase behavior? Lastly, what is the existence of a viable potential market for green products? To answer these questions businesses would have to have a clear understanding of customers' perception towards green products. Clearly, there is a need for more specific investigation and discussion about consumer perceptions of green products from a broader view within the context of strategy formulation and implementation.

For many firms, the challenge is to balance their consumers' environmental concerns with their cash flow, profitability (Berry and Rondinelli, 1998), and the sustainable corporate strategic approach to the intensity of competition in their specific target markets.

Environmental Regulation

Environmental regulations have provided a clear parameter of the legally acceptable level of corporate responsibility, accountability, and expectations. At the same time, in anticipation of their target markets' expectations, businesses have formulated and implemented the strategy of caution with respect to the environmentally safe business conduct. Businesses have actively created and demonstrated an image of environmentally oriented organizations. The impact of environmental regulations on firm strategies has given rise to many academic debates (Porter and Van der Linde, 1995b; Rugman and Verbeke, 1998). With regards to environmental regulation, it was observed that a firm's key competencies and capabilities might hinder the leveraging of environmental competencies (Rugman and Verbeke, 1998). In addition, compliance towards regulatory measures is not cheap. Therefore, going beyond regulatory compliance may be inhibitive, and firms would be expected to avoid compliance whenever possible, and governments are expected to impose penalties severe enough to force regulatory compliance (Lyon, 2003). However, on the other hand, by over compliance firms tend to put themselves in a stronger public recognition of environmental efforts and higher customer value (Arora and Cason, 1996). At the same time, observing and demonstrating compliance to environmental regulation and trying to exceed the regulatory requirement to the benefit of the consumer may be perceived as a competitive advantage (Russo and Fouts 1997).

Hypotheses

The following hypotheses referring to the attitudes towards the environment and green products were proposed.

Hypothesis 1 : There is no significant difference between male and female in their environmental attitudes.

Hypothesis 2 : There is no significant difference between male and female in their attitude on green products.

Hypothesis 3 : There is no significant relationship between consumer's attitude on the environmental protection and their attitude on green products.

Hypothesis 4 : There is no significant relationship between consumer's attitude towards government's role and their attitude on green products.

Hypothesis 5 : There is no significant relationship between the personal norm of consumers in environmental issues and their attitude on green products.

Methodology

For the study the data were collected from 150 customers of automobile products from an agency by applying simple random sampling method. In order to obtain reliable information from the respondents, established and validated scales were selected for data collection. In this study, the survey instrument of attitudes toward the environment as the independent variable was adopted from the scales developed by Tantawi et al. (2007). Only twenty items were used out of the original 38 items. The dependent construct, attitude towards green product was derived from Mostafa (2006) and consists of two items. The respondents were asked to rate each item on a 5 -point Likert scale from 1 = strongly disagree to 5 = strongly agree.

Results

With regard to the first hypothesis, the output of the t test revealed that there is significant difference in the environmental attitude among male and female customers, as the value of t, as per Table 1, is statistically significant at 5 per cent level of significance. Therefore, the null hypothesis may be rejected. So, it may be concluded that environmental attitude of male customers are more serious than female customers.

Table 1: Group statistics

Environmental attitude	N	Mean	Std. Deviation	Std. Error Mean
Male	100	4.4000	.69921	.22111
Female	50	3.0000	1.49071	.47140

Independent Samples t Test

t	2.689
df	148
Sig. (2-tailed)	.015

The attitude of the selected male and female customers towards green products is tested with independent sample t test and it is found that the value of t is statistically significant at 5 per cent level of significance. Further, it is inferred that the male customers are more conscious than female customers and their attitude is different from that of female customers. Therefore the second null hypothesis may be rejected.

Table 2: Group statistics

Environmental attitude	N	Mean	Std. Deviation	Std. Error Mean
Male	100	5.4000	.89921	.32111
Female	50	4.0000	1.89071	.47140

Independent Samples t Test	
t	3.789
df	148
Sig. (2-tailed)	.019

As highlighted in Table 3, the overall result for the regression model was significant (Significance = 0.000). It indicated that all the factors (environmental protection, government's role and personal norm) were simultaneously significant to the dependent variable; proven that the consumers' attitudes on the environment contributed significantly to the attitude on green products. From the adjusted R square value (Adjusted R^sup 2^= 0.196), the three factors contributed 19.6% to the dimension of attitude towards green product. The result indicated no significant relationship between consumers' attitude on the environmental protection and their attitude on green products. This means that consumers' attitudes on the green products are not facilitated by the positive attitudes of consumers towards environmental protection. It contrasted from the study by Tanner and Kast (2003) where the green food purchases were strongly facilitated by positive attitudes of consumer towards environmental protection. As the current study is not based on any specific green product, further investigation is required to study consumers' attitudes on the types of green products in the market. The perceived behavioral barriers are additional significant predictors of environmental behavior

Table 3: Regression analysis

Dependent variable: Attitude on green product	Standardized Coefficient (beta)	*t*-value	Significance
Constant		3.726	0.000
Factor 1: Environment Protection	-0.071	-0.828	0.409
Factor 2: Government's role	0.171	2.163	0.032
Factor 3: Personal Norm	0.408	5.241	0.000

R Square = 0.209 F-Value = 15.834
Adjusted R Square = 0.196 Significance = 0.000

Conclusion

The environmental attitude of the selected male customers is more positive than female customers and they are fully aware of environmental laws. More over they like green products and they are fully aware about the features of green products than their counterparts. Similarly the regression model indicated that there is no significant relationship between consumers' attitude on the environmental protection and their attitude on green products. This means that consumers' attitudes on the green products are not facilitated by the positive attitudes of consumers towards environmental protection

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Performance of Indian Public Sector after Economic Liberalization

GAGAN SINGH

The present study examines the performance of Indian public sector during 1991-2010 within the frame work of both macro economic stabilization and micro-structural change with special reference to it's the growth, development and contribution to the economic development of India after liberalization. Though the process of liberalization appears to have led to decline in the employment in public sector, yet exports, contribution to central exchequer in the form of payment of dividends, corporate taxes, excise duty, customs and other duties show an improvement after liberalization.

Introduction

Public enterprises occupy an important place in the national economies of most countries of the world irrespective of their political orientation. In most developing nations, a network of public enterprises was created in the post-World War II period as a matter of economic necessity rather than of any ideological commitment. Public enterprises, being an instrument for self-reliant economic growth of India in order to develop agriculture and industry, diversify public economy and overcome economic backwardness. The predominant considerations for continued large investments in PSEs were to accelerate the growth of core sectors of economy, to serve the equipment needs of strategically important sectors and provide strength for the economy to achieve a significant degree of self-sufficiency in the critical sectors (Singh, V. S., 1986). In India, the Industrial Policy Regulation of 1956 gave the public sector a strategic role in the economy. Massive investments have been made over the past five decades to set up a number of public sector enterprises (PSEs). Many of these enterprises successfully expanded production and opened up new areas of technology.

Literature Review

Ramaswamy (1972) analyzed the performance of Public Sector Enterprises (PSEs) in terms of their objectives like pattern of investment, earning per share, pattern of expenditures, development programmes, administration and marketing of objectives. Rao (1985) found pubic enterprises significantly

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influence the economic development of our country. While their performance can be judged either qualitatively or quantitatively, the author makes a quantitative assessment of Public Sector Enterprises (PSEs) through profitability criterion and examples the factors in flouncing it. Batra and Kaur (1993) emphasized that a proper open policy for creating a conducive environment for the investor's confidence and protection is essential. Ramu (2001) attempted to present the Indian privatization process and place it in a global context. Chandra (2004) pointed out that the performance of a very large number of public sector enterprises is disappointing, often owing to reasons beyond their control.

Objectives

The following objectives have been visualized for the present study:

- to evaluate the performance of Indian public sector after the inception of new economic policy; and
- to analyze the contribution of Indian public sector in the economic development of India after liberalization.

Hopothesis

To achieve these objectives the following hypothesis has been tested:

- There is no significant change in the contribution of Indian public sector enterprises in the economic development of India after liberalization.

Research Methodology

The objectives of the present study have been studied through the use of secondary data. The secondary data has been collected from published reports of Public Enterprises Survey and records of Government of India. In order to study the impact of new economic policy on the employment, per capita annual emoluments, turnover, profit, exports and central exchequer, the entire study period has been divided into two parts. The division of the study period has been made into two parts keeping in view the desirability to assess the impact of any policies or scheme which takes place at least five years to gear up its inception. The first half includes initial ten years and the second half includes the last ten years of the study period. The averages of the two halves with the help of mean have been calculated for certain identified variables. Further, t-test has been applied to study the change in the mean scores of employment, average annual per capita emoluments, turnover, profits, exports and central exchequer during the two halves of the study.

Results

It is evidenced from the table 1 that the number of employees in the public sector showing a decreasing trend after 1991-92. The highest number of employees has been recorded for the year 1991-92 as against the lowest for the year 2010-11. An increase in the number of employees has been recorded for the year 2001-02 but it has been due to inclusion of Bharat Sanchar Nigam Limited (BSNL) in the survey. After 2001-02 a declining trend has been recorded in the number of employees. The decline in the employment in the public sector may be due to the policy of liberalization in the Indian

public sector and various policies adopted by Indian Government like Voluntarily Retirement Scheme (VRS) and other's to reduce the number of employees in public sector. Further, to study the growth/decline in the number of employees, averages of first eight years and last eight years of the study period have been worked out and t-test has been applied which supported the above analysis that a significant reduction has been taken place in the number of employees after the introduction of liberalization and privatization of economy. While studying the average annual per capita emoluments, it is observed that there has been a multitime increase in the average annual emoluments in the year 2008-09 as compared to the year 1991-92.

Table 1: Employment and average annual emoluments

Years	No. of employees (in lakh)	Average annual per capita emoluments (Rs.)	% Increase in average annual emoluments
1991-92	21.79	56508	14.90
1992-93	21.52	64983	15.00
1993-94	20.70	72043	10.86
1994-95	20.62	82517	14.54
1995-96	20.52	106876	29.52
1996-97	20.08	110662	3.54
1997-98	19.59	129582	17.10
1998-99	19.00	138179	6.63
1999-00	18.06	168339	21.83
2000-01	17.40	219672	30.49
2001-02	19.92*	193554	-11.89
2002-03	18.66	225986	16.76
2003-04	17.62	248481	9.95
2004-05	16.93	286888	15.46
2005-06	16.49	284057	-0.98
2006-07	16.14	325774	14.68
2007-08	15.65	410898	26.13
2008-09	15.35	541716	31.84
2009-10	14.90	609816	12.57
2010-11	14.75**	615765**	0.98
$\bar{X}$ 1st 10 years (i.e. 1991-92 to 2000-01	19.93	114940.00	
$\bar{X}$ Last 10 years (i.e. 2001-02 to 2010-11	16.64	380290.00	
t - value	4.72	-4.70	
P	.000	.000	

* During the year 2001-02, BSNL has been included in the survey. ** Projected

Source: Public Enterprises Survey, 2009-10, vol. 1.

Table 2: Contribution of public sector enterprises in exports and central exchequer

(Rs. in Crores)

Years	Exports	Growth of exports	Contribution of central exchequer	central Growth cxchequer
1991-92	8980	26.72	19951	2.20
1992-93	10338	15.12	22449	12.52
1993-94	11872	14.84	22988	2.40
1994-95	13216	11.32	27472	19.51
1995-96	16269	23.10	30878	12.40
1996-97	18924	16.32	39009	26.33
1997-98	20483	8.24	42289	8.40
1998-99	18828	-8.07	46934	10.98
1999-00	19737	4.83	56157	19.65
2000-01	24772	25.51	61037	8.68
2001-02	20887	-15.68	62866	2.99
2002-03	26980	29.17	81926	30.31
2003-04	34894	29.33	89035	8.68
2004-05	42264	21.12	110599	24.22
2005-06	45954	8.73	125455	13.43
2006-07	65620	42.79	147728	17.75
2007-08	67678	3.14	165993	12.36
2008-09	74206	9.65	151543	-8.70
2009-10	77745	4.77	139830	-7.72
2010-11	78567*	1.06	140876*	.75
$\bar{X}$ 1st 10 years (i.e. 1991-92 to 2000-01	16342.00		36916.00	
$\bar{X}$ Last 10 years (i.e. 2001-00 to 2010-01	53480.00		121590.00	
t - value	-5.23		-7.22	
P	.000		.000	

Source: Public Enterprises Survey, 2009-10, vol. 1. * Projected

The highest percentage increase in the average annual emoluments has been recorded for the year 2000-01, which is 30.49 percent more than the year 1999-00. On the other hand, a decline of 11.89 percent has been worked out for the year 2001-02 as against the previous year. It may be on account of inclusion of Bharat Sanchar Nigam Limited (BSNL) where the emoluments of employees were less as compared to other public sector enterprises.

The average emoluments for the first ten years have been worked out Rs. 1,14,940.75 as against Rs. 3,80,290.00 for the last ten years of the study period. On applying t-test, a significant increase at 1 percent level of significance has been observed in the average per capita emoluments of

Table 3: Turnover of public sector enterprises in the era of liberalization

Sector	1st 10 Years (i.e. 1991-92 to 2000-01)			Last 10 Years (i.e. 2001-02 to 2010-11)			t-value	P
	Mean	S.D.	C.V.	Mean	S.D.	C.V.		
(A) Manufacturing enterprises								
Steel	17806.9	3410.37	19.15	43544.3	14720.807	33.81	-5.38	.000*
Minerals & Metals	5612.2	1192.82	21.25	12295.5	4644.8879	37.78	-4.40	.000*
Coal & Mines	15780.2	3558.52	22.55	35145.9	10467.348	29.78	-5.53	.000*
Power	12243.9	6703.62	54.75	40902.2	15756.86	38.52	-5.29	.000*
Petroleum	119643.9	72258.1	60.39	490144.6	163416.99	33.34	-6.55	.000*
Fertilizers	6846.7	1588.88	23.21	11201.2	3596.0483	32.1	-3.50	.003*
Chemicals & Pharmaceuticals	4488.3	1248.5	27.82	1753.3	1643.1155	93.72	4.19	.001*
Heavy Engineering	6048.9	1362.84	22.53	19281.8	11390.867	59.08	-3.65	.002*
Medium and Light Engineering	5880.9	1239.26	21.07	25661	50014.413	194.9	-1.25	.227
Transport Equipment	4462.3	1574.42	35.28	12384	6208.4454	50.13	-3.91	.001*
Consumer Goods	1526.6	217.138	14.22	2795.5	1645.4044	58.86	-2.42	.026**
Agro Based Industries	107.3	28.8485	26.89	348.7	274.62906	78.76	-2.76	.013**
Textiles	985	132.36	13.44	654.2	185.10646	28.3	4.59	.000*
Total (A)	201470.8	91486.00	45.41	691426.7	256639.86	37.12	5.69	.000*
(B) Enterprises producing services								
Trading & Marketing	27533.3	5418.35	19.68	97950	38401	39.2	-5.74	.000*
Transportation Services	10243.5	3539.8	34.56	22971.1	4839.6	21.07	-6.71	.000*
Contract & Construction Services	1446.9	306.762	21.2	6273.7	3996.61	63.7	-3.81	.001*
Industrial Development & Construction Services	2661.7	1365.57	51.3	5311.7	1095.2	20.62	-4.79	.000*
Tourist Services	335.5	90.2666	26.91	734.5	325.343	44.29	-3.74	.002*
Financial Services	4512.7	2356.8	52.23	12954.3	3637.39	28.08	-6.16	.000*
Telecommunication Services	7020.7	4406.21	62.76	33864	5812.6	17.16	-11.63	.000*
Sec. 25 Companies	98.7	52.3557	53.05	119.1	131.119	110.1	-.45	.653
Total (B)	53856.6	16615.2	30.85	180179.7	48489.1	26.91	-7.79	.000*
Grand Total (A+B)	255327.8	107425	42.07	876294	301665	34.43	-6.13	.000*

* Significant at 0.01 level.
** Significant at 0.05 level.
Source: Public Sector Enterprises (PSEs) Survey, Various Issues.

Table 4: Net profit of public sector enterprises in the era of liberalization

Sector	1st 10 Years (i.e. 1991-92 to 2000-01)			Last 10 Years (i.e. 2001-02 to 2010-11)			t-value	P
	Mean	S.D.	C.V.	Mean	S.D.	C.V.		
(A) Manufacturing enterprises								
604.8	1164.7	-192.6	5651.87	3852.03	68.16	-4.91	.000*	
Minerals & Metals	612.2	256.87	41.96	3832.1	2300.23	60.03	-4.39	.000*
Coal & Mines	718.6	790.78	110.00	7365.9	3819.74	51.86	-5.38	.000*
Power	2328.1	1451.00	62.33	10057.9	3373.09	33.54	-6.65	.000*
Petroleum	6062.2	3211.4	52.97	18832.6	6173.22	32.78	-5.80	.000*
Fertilizers	-1077.4	872.19	-80.95	-576.2	4001.98	-694.5	-.387	.703
Chemicals & Pharmaceuticals	72.00	285.06	395.9	-357.7	182.754	-51.09	4.01	.001*
Heavy Engineering	-10.3	338.44	-3286.00	1759.8	1681.49	95.55	-3.26	.004*
Medium and Light Engineering	-110.4	163.76	-148.3	-219.3	366.273	-167	.86	.402
Transport Equipment	-6.8	150.35	-2211.00	1577.6	1042.31	66.07	-4.75	.000*
Consumer Goods	-560.2	181.54	-32.41	-355	362.704	-102.2	-1.60	.127
Agro Based Industries	-8.1	11.328	-139.9	8.515	38.4649	451.7	-1.31	.207
Textiles	-554.9	801.11	-144.4	961.1	3704.38	385.4	-1.26	.222
Total (A)	6563.7	3154.2	48.05	48602.1	17986.9	37.01	-7.28	.000*
(B) Enterprises producing services								
Trading & Marketing	127.1	32.73	25.75	327.8	275.4	84.02	-2.28	.034**
Transportation Services	274.8	306.35	111.5	60.6	2440	4026	.27	.786
Contract & Construction Services	-168.6	339.43	-201.3	-47.3	398.8	-843.1	-.73	.473
Industrial Development & Construction Services	407.5	256.54	62.95	794.6	292.4	36.79	-3.14	.006*
Tourist Services	15.4	46.978	305.1	36.7	72.17	196.6	-.78	.444
Financial Services	764.6	423.73	55.42	3072.1	852.1	27.74	-7.66	.000*
Telecommunication Services	1458.3	1019.59	69.92	4956.7	5942	119.9	-1.83	.083
Sec. 25 Companies	39.8	24.99	62.81	55	59.41	108	-.74	.465
Total (B)	2872.9	1861.44	64.79	9265.4	7354	79.37	-2.66	.016**
Grand Total (A+B)	9437.3	4881.78	51.73	57804.6	16346	28.28	-8.99	.000*

* Significant at 0.01 level.
** Significant at 0.05 level.
Source: Public Sector Enterprises (PSEs) Survey, Various Issues.

employees after the introduction of Liberalization, Privatization & Globalization (LPG) in our country. Thus, the above analysis reveals that the mutlitimes increase in average per capita emoluments of employees may be the result of Government policies to retain efficient employees in these enterprises and to enhance their efficiency to compete in the global market. However, reduction in the number of employees is a matter of great concern which requires special attention of the management of these enterprises as well as Government.

It is noticed from the table 2 that the exports of public sector enterprises show an increase over the study period. It recorded Rs. 8,980 crores for the year 1991-92, which increased continuously except the years 1998-99 and 2001-02 and reached at Rs. 78,567 crores during the year 2010-11. On applying t-test on the mean scores of first eight years and last eight years of the study period, a significant increase has been recorded at 1 percent level of significance in the exports of these enterprises. The contribution of these enterprises towards national exchequer show multitime increase during the study period. Thus, the contribution of these units in the form of dividends, corporate taxes, excise duty, custom and other duties has increased manifold which clearly reveals the positive impact of liberalization process on the Indian economy. The calculated t-value for the mean scores of initial ten years and last ten years of the study period has been found significant at 1 percent level of significance, which leads to conclude that apart from generation of internal resources, these enterprises have been making substantial contribution to augment the resources of the central government through payment of dividends, corporate taxes, excise duty, customs duty and other duties, thereby helping in mobilization of funds for financing the needs for planned development of the country. The increase in the exports of the public sector enterprises is due to the combined efforts of both the manufacturing and service sectors. With the increase in the export, public sector is called upon to play a major role in easing the position in the context of the balance of payments position of a country.

Table 3 reveals that the turnover of the Indian public sector enterprises has shown remarkable increase in the mean scores of all the sectors whether they are manufacturing or services enterprises. Studying the manufacturing enterprises, a significant increase has been recorded in the steel sector, coal and mines sector, power sector and petroleum sector. On the other hand, there is a decline in the chemicals & pharmaceuticals sector, consumer goods sector and textiles sector. A recordable increase has been found in the turnover of manufacturing enterprises after liberalization. There is an upward movement in the mean scores of turnover of all the enterprises producing services. Furthermore, a significant increase has been found in the trading and marketing sector, transportation services sector, tourist services sector and telecommunication sector. Public sector enterprises as a whole has shown a significant increase in their turnover while applying t-test. Thus, it can be said that after adopting the policy of liberalization in the Indian public sector, there has been tremendous change in their performance.

Studying the profitability of the Indian public sector enterprises in the form of net profit, it has been found in Table 4 that there is an improvement in the net profit of power sector, petroleum sector and transportation equipment sector. However, there are few sectors in manufacturing enterprises, which are running at losses during the period under study. There is remarkable increase in the mean scores of their profit in transportation services sector, financial services sector and telecommunication services sector of enterprises producing services. On the other hand, contract and construction services sector has been running at losses throughout the period under study. As a whole, a significant increase in the profitability of public sector enterprises has been recorded.

Conclusion

The majority of the enterprises of both the categories have shown improvement in their profitability after liberalization. Still there are few enterprises which are running at losses. Thus, it is a matter of great concern to the management and Government to review their policies to make these enterprises to earn profit and compete in the global market.

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