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## **An Empirical Analysis Of The Profitability Of Indian Oil Refineries**

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**Abstract:**

*It can be inferred from the study that operating efficiency of selected oil refineries in India was satisfactory and the management generally succeeded in investing capital funds. The performance of Reliance Industries Ltd and Chennai Petroleum Corporation Ltd was good during the study period. Mangalore Refinery Petrochemicals Ltd and Essar Oil Ltd have not performed well during the period of study. Further, owner's funds were utilized profitably by all the selected oil refineries in India except Mangalore Refinery and Petrochemicals Ltd and Essar Oil Ltd. It is significant to note that the position regarding earnings per share and dividend payout ratio in all the selected oil refineries during the period under review shows better performance and prospects from the point of view of shareholders. The results showed that Hindustan Petroleum Corporation Ltd, Bharat Petroleum Corporation Ltd, Mangalore Refinery and Petrochemicals, Essar Oil Ltd and Reliance Industries Ltd experienced a strong tendency in profitability to decline over the study period. The falling tendency of profit rate of these companies is the proof of adverse effect of various controls on process, output, expansion, investment and distribution imposed by government on these companies over time. Only in the case of Mangalore Refinery and Petrochemicals Ltd, Chennai Petroleum Corporation Ltd and Reliance Industries Ltd, the time trend co-efficient is positive implying the tendency of profit rate to rise over time. The study concluded that the analysis of profitability of the selected oil refineries reveals that majority of the companies under review highlighted better performance and prospects from the point of view of owners.*

**Keywords:** Profitability, Indian Oil Refinery, Profitability Trend, Return on Capital Employed, Solvency, Debt-Equity Ratio and Earnings Per Share

### **1.Introduction**

The objectives of business are to provide goods and services which the society needs at a price which it can afford to pay. Profit is merely a measure of the approval of the society for the work done for them. Profit is necessary for existence of business and profit is the engine that drives the business enterprises. Profit and profitability play the same role in the business as “blood” and “pulse” in the human body. The survival of a human being is not possible in the absence of adequate blood and ability to generate blood. The same may be applied to business. A business needs profit not only for its existence but for expansion and diversification. Profit and profitability are, therefore, the nerve-knot of a business and without it; the existence of a firm is like a body without the backbone. If an enterprise fails to earn profits, invested capital is eroded and if this situation prolongs, the enterprise may ultimately cease to exist. Therefore, the overall object of a business is to earn at least a satisfactory return on the fund invested in it consistent with a sound financial position.

The growth of the corporate sector in India during the last few decades has been rapid. The economic growth of a nation largely depends upon the growth and development of its corporate sector. The corporate sector is not only an institution for the maximization of shareholder's wealth, but also an administrative and social organization possessing the capacity for initiating its own growth and thereby contributing to the economic growth of the country. The growth of an enterprise is based on its success and profit is the primary test of the success of an enterprise. The greater the profit, the greater will be the entrepreneurial activity; greater the profit, larger is the accumulation of capital; and greater the profit more will be the technological innovations and thereby higher will be the economic growth. The growth of a firm can be measured in terms of changing investment, sales, profit or profitability. Thus growth in profitability means all round growth of a business firm. Hence, at this juncture an analysis of profitability in the Indian corporate sector is relevant.

### **2.Review of Literature**

Vijayakumar and Venkatachalam (1995)<sup>1</sup> studied the impact of working capital on profitability in sugar industry of Tamil Nadu by selecting a sample of 13 companies; 6 companies in co-operative sector and 7 companies in private sector over the period from 1982-83 to 1991-92. They concluded through correlation and regression analysis that liquid ratio, inventory turnover ratio, receivables turnover ratio and cash turnover ratio

had influenced the profitability of sugar industry in Tamil Nadu. Sidhu and Gurpreet Bhatia (1998)<sup>2</sup> studied the factors affecting profitability in Indian textile industry. From the analysis, there was no apparent relationship between current profitability and capital intensity. The age of the firm had generally negative but statistically insignificant relationship with current profitability which pointed towards the fact that firms in Indian textile industry were absolute and needed modernization. Kuldip Kaur (1998)<sup>3</sup> studied size, growth and profitability of firms in India. It was in this context that the study of various facets of 235 firms of India was undertaken, covering the period from 1970-71 to 1989-90. The analysis of the study showed that there was no systematic tendency for average profitability to increase/ decrease as the size of the firm changed. Vijayakumar (1998)<sup>4</sup> examined the determinants of corporate size, growth and profitability of Indian industries. Inter industry analysis revealed that the growth was positively and significantly associated with the size and in all the industry groups except textiles. He also found that the size was positively and significantly associated with the profitability in all the industries. Agarwal (1999)<sup>5</sup> studied the profitability and growth in Indian Automobile manufacturing industry. The study finds no evidence to show that firms have made super normal profits. Profitability was found to be explained mainly by the age of the firms, vertical integration, diversification and industry policy dummy variable. Simon Feeny and Mark Rogers (1999)<sup>6</sup> studied on overview of the performance of large Australian based private companies using a data set of 653 companies for the period from 1993 to 1996. Four aspects of performance such as profitability, growth of revenue, export intensity and innovation had been considered in this study. In addition, two important company characteristics – the debt to equity ratio and Tobin's Q are considered. The study concluded that manufacturing firms tend to have higher profitability than non-manufacturing firms.

Mohammed Rafiqul Islam (2000)<sup>7</sup> studied the profitability of Fertilizer Industry in Bangladesh from 1985-86 to 1994-95. The findings of the study indicated that none of the selected units were consistent and all the units were plagued with declining profits. The study concluded with suggestions for improvement of the profitability of fertilizer industry in Bangladesh. Debashish Rei and Debashish Sur (2001)<sup>8</sup> attempted to measure the profitability scenario of Cadbury India Ltd. and analyzed the relationship among various profitability ratios and their joint impact using multiple correlation co-efficient and multiple regression method. The study on the inter-relation between the selected ratios regarding the company's position and performance and profitability of the

company revealed both negative and positive association. Vijayakumar (2002)<sup>9</sup> in his study on “Determinants of Profitability” – A Firm Level Study of the Sugar Industry in Tamil Nadu”, developed various determinants of profitability viz., growth rate of sales, vertical integration and leverage. Apart from these three variables he had selected current ratio, operating expenses to sales ratio and inventory turnover ratio. Econometric models were used to test the various hypotheses relating profitability with other variables. The researcher noted in his conclusion that efficiency in inventory management and current assets are important to improve profitability. Vijayakumar and Kadirvel (2003)<sup>10</sup> studied the determinants of profitability of Indian Public Sector manufacturing industries. It was evident from the results that age was the strongest determinant of profitability followed by the variables vertical integration, leverage, size, current ratio, inventory turnover ratio, operating expenses to sales ratio and growth rate. The selected variables had both positive and negative contribution in variation of profit rate. The study concluded that firms should consider all these possible determinants while considering its profitability. Marcos A. M. Lima and Marcelo Resend (2004)<sup>11</sup> in their work on profit margins and business cycles in the Brazilian industry: a panel data study investigated the relationship between profit margins and business cycle in the Brazilian industry during the period from 1992 to 1998, taking as reference a dynamic panel data model founded around a conjectural variation framework. The empirical results indicated pro- cyclical behavior of profit margins for the aggregate business cycle but were less clear in the case of sector-specific business cycle variables. Among the most robust results, one could highlight the roles of lagged profitability and import intensity and the negligible role of union density.

Patel (2004)<sup>12</sup> in his study made an attempt to examine the profitability of Colour – Chem Limited during the period from 1981 to 1999. The multiple correlation coefficient technique was used for analyzing the impact of net fixed assets, sales and net worth on profitability. The result of the study showed that sales and net fixed assets, sales and net worth, and net fixed assets and net worth had significant effect on net profit of Colour – Chem limited. The analysis of profitability ratios showed that the company was in a sound financial position. Eljelly (2004)<sup>13</sup> examined the relation between profitability and liquidity on a sample of joint stock companies in Saudi Arabia using correlation and regression analysis. The study found that the cash conversion cycle was of more importance as a measure of liquidity than the current ratio that affects profitability. The size variable was found to have significant effect on profitability at the industry level. The

results were stable and had important implications for liquidity management in various Saudi companies. The study clearly showed that there was a negative relationship between profitability and liquidity indicators such as current ratio and cash gap in the Saudi sample examined. Jain and Surendra Yadav(2005)<sup>14</sup> assessed the financial performance of Central Public Sector Enterprises primarily in terms of profitability. The analysis was carried out to find out whether the profits earned by the PSE are adequate and whether the rate of return earned by them are satisfactory. They found that PSEs have earned a satisfactory rate of return on capital employed. Manor Selvi and Vijayakumar (2007)<sup>15</sup> made an attempt to examine the trends in rates of profit of selected Indian Automobile Industry over the period from 1991-92 to 2003-04. Further an effort was also made to find out the company wise variations in the series of profit rates, which revealed the dispersion of the series for each company over the study period. Findings of the study showed that the declining trend of profitability was proof of adverse effect of various controls on prices, output, expansion and investment etc., exerted by government on these industries over time.

### **3.Statement Of The Problem**

The efficiency of the business is measured by the amount of profit earned. The greater the profit, the more efficient is the business. The profit of a business may be measured by studying the profitability of investment in it. Profitability is referred to as earning power or operating performance of the investment concerned. Profitability is a relative term and its relation with the other factors by which the profit is affected. It is the test of efficiency, powerful motivating factor and the measure of control in any business. Hence, an attempt has been made to study the profitability of selected oil refineries in India by using vital profitability ratios. In the financial statement analysis literature, more importance is given to financial ratios for assessing a firm's financial performance and condition. Items of the income statement alone or along with the items of balance sheet also can generate a number of profitability ratios. But, many ratios reveal similar things. The analyst is always at a loss to find out which ratios to use to determine the profitability of a firm. An attempt is made to find out the inter-relationship between and among the profitability ratios, in order to select a few ratios which can possibly give maximum information about the profitability of a firm. The study also intends to empirically examine whether the rates of profit in selected oil refineries in India have a tendency to rise or fall over a long period of fifteen years from 1994-95 to 2008-09.

#### **4. Selection of Oil Refinery Industry**

The Indian oil and gas sector is one of the six core industries in India and has very significant forward linkages with the entire economy. Petroleum Refining Industry is a generator of fuel required for energy purposes in all sorts of industry. Hence, this industry can be regarded as the heart of economy. It is a source of energy for domestic, industrial, agricultural and transport services and as feed stock for fertilizer, chemical and other industries. It has also created an impetus for allied sectors such as engineering, procurement, construction firms, project management consultancy firms and other such service providers. The rapidly growing number of petroleum and petrochemicals industries in the country during the last three decades have generated considerable employment at all levels. The petroleum sector in India is particularly favorable to foreign investment because the industry is one of the fastest growing segments, and it has shown a staggering growth rate of around 13 per cent in the recent past. Apart from the tremendous growth rate in the Indian petroleum industry today, it also boasts of technology of international standards, easy availability of infrastructure at very cheap rates, high demand for petroleum products, and increased spending habits of the middle-class people. All these factors make investments in the Indian petroleum sector an attractive proposition for foreign investors. India is the 22<sup>nd</sup> largest producer in the world and fifth largest petroleum refining country with a share of 3 per cent of global capacity. The expansion of Indian petroleum retail market is triggered by the growth in automobile sales that has resulted in major foreign investments. The growth is estimated to sustain and the market is likely to expand further by 20 million every year till 2030, placing India at the world map in terms of being the biggest automobile market. This has encouraged the researcher to analyze the Profitability and Productivity Performance of Oil Refinery Industry in India.

#### **5. Hypotheses**

The hypothesis of the present study includes:

- There is no significant difference in the mean percentage of profitability ratios between the companies and years.
- There is no significant differences between the Industry mean profitability ratio and individual company mean profitability ratio.

- There is no significant difference between actual values and trend values of profitability among different years in selected oil refineries in India.

### **6.Sampling Design**

Keeping in view of the scope of the study, the oil refineries operating in India were considered for the study. It was decided to include all the companies working in India under private sector as well as public sector from the year 1994-95. However, owing to several constraints such as non-availability of financial statements or non-working of the company in a particular year etc., it was decided to restrict the number of sample companies to seven. The Capitaline and CMIE database publish key financial data of Indian corporate sector systematically. Hence Capitaline and CMIE databases proved to be complimentary to finalize the sample for the study. The exhaustive list of oil refineries in India from Capitaline was cross checked with CMIE database to sort out companies to fit in as the sample for the study. The comprehensive list of companies prepared from the database was modified by sorting out the firms using the following criteria: which were not in operation for a year during the period of study; which were in operation but non-availability of data for the whole study period; which were merged with another company during the period of study and which were not listed in Bombay Stock Exchange. There are 20 refineries operating in India. Of these, 17 refineries are in the public sector and 3 are in private sector. Out of the oil refineries operating in India, only 15 companies' data are available in the databases. Among the 15 companies, 9 companies are listed in a stock exchange, and 2 of them are merged companies, and so the remaining seven companies have been taken for the present study. The selected companies includes in the present study are: Indian Oil Corporation Ltd(IOCL), Bharat Petroleum Corporation Ltd(BPCL), Hindustan Petroleum Corporation Ltd(HPCL), Mangalore Refinery and Petrochemicals Ltd(MRPL), Essar Oil Ltd(EOL), Chennai Petroleum Corporation Ltd(CPCL) and Reliance Industries Ltd(RIL). The period from 1996-97 to 2010-11 is selected for the study of selected Indian oil refineries. This 15-year period is chosen in order to have a fairly long, cyclically well balanced period, for which reasonably homogeneous, reliable and up-to-date data would be available.

### **7.Source of Data**

The study is mainly based on secondary data. The data analyzed and interpreted in this study related to all companies selected are collected from "Capitaline" and "PROWESS"



databases, which are the most reliable on the empowered corporate database of Bombay Stock Exchange and Centre for Monitoring Indian Economy (CMIE) respectively. Besides Capitaline and PROWESS databases, relevant secondary data have also been collected from BSE Stock Exchange Official Directory, CMIE Publications, Annual Survey of Industry, Business Newspapers, Reports on Currency and Finance, Libraries of various research institutions and the Internet. As the study required a variety of data, various websites have been comprehensively searched.

### **8.Data Analysis**

The financial and statistical analysis approach plays a vital role in the financial environment. To enjoy the benefit of financial and statistical analysis researcher has collected, assembled and correlated the data, classified the data appropriately and condensed them into a related data series, stated the resultant information in a comprehensive form, text, tables and analyzed and interpreted the reported data. It is well known that management is considered with efficient performance, profitability and solvency. For this purpose it has to study certain specific ratios, because investors look upon certain ratios, which are concerned with an organization's operating and financial performance. For the purpose of this study, the researcher has used ratios namely, operating profit margin, gross profit margin, return on assets, return on net worth, earnings per share, dividend payout ratio, total assets turnover ratio, fixed assets turnover ratio, current assets turnover ratio and inventory turnover ratio. The role of statistical tools is important in analyzing the data and drawing inferences there from. In order to derive the results from the information collected through secondary data, various statistical tools such as mean, standard deviation, variance, compound annual growth rate, regression, tests of hypotheses both parametric and non-parametric have been accomplished through EXCEL, SX and SPSS software.

### **9.Discussion**

#### *9.1.Analysis Of Profitability*

Profitability is the main indicator of the efficiency and effectiveness of a business enterprise in achieving its goal of earning profit. Profitability of a firm can be measured by its profitability ratios. The profitability ratios can be determined on the basis of either investment or sales and for this purpose a quantitative relationship between the profit and



the investment or the sales is established. The profitability of the company should be evaluated in terms of its investment in assets and in terms of capital contributed by creditors and owners, as such if a company is unable to earn a satisfactory return on investments, its survival is threatened. The profitability of selected oil refineries in India has been analyzed from the view point of financial management and shareholders.

### *9.2. Profitability From The View Point Of Financial Management*

A financial manager is very much interested in locating and pinpointing the causes which are responsible for low or high profitability. The financial manager should continuously evaluate efficiency of his company in terms of profit. The profit margin ratio is a profitability ratio which measures the relationship between the profit and sales. It indicates the efficiency or effectiveness with which the operations of business are carried on. Profit margin varies with disproportionate variations in sales revenue in comparison to cost or vice-versa. To judge profitability from the view point of financial management of selected oil refineries in India, the following ratios have been computed and analyzed. Table 1 shows a fluctuating trend in the operating profit margin ratio of the selected refineries during the study period. Such a fluctuating trend could be attributed to the poor performance of selected oil refineries due to poor market condition, difficulty in getting raw material and all round rise in the input cost without corresponding increase in selling price. On an average the oil refinery industry had the overall operating profit margin ratio of 10.78 per cent with a co-efficient of variation of 0.50. The average operating profit margin ratio varied from company to company, the highest average was 24.42 per cent in Reliance Industries Ltd followed by 17.19 per cent in Mangalore Refinery and Petrochemicals Ltd and 10.36 per cent in Essar Oil Ltd. The performance of Reliance Industries Ltd and Mangalore Refinery and Petrochemicals Ltd was satisfactory because their average operating profit margin ratio was higher than the industry average. The average operating profit margin of rest of the companies was less than the industry average. The CV value shows that Mangalore Refinery and Petrochemical Ltd and Essar Oil Ltd have registered higher fluctuation in their operating profit during the study period. Such fluctuation could be attributed to the differences in the growth rates of operating profit margin and sales because of the factors such as high operating expenses, market condition and government policy. CAGR of operating profit ratio witnessed a negative trend in all the selected companies along with industry average. This showed the poor performance of selected oil refineries during the study

period. It can be viewed from the Table 1 that the mean operating profit margin ratio of all the selected oil refineries except Essar Oil Ltd showed significant differences from the industry average as per the t-value during the study period. The rejection of the null hypothesis as per ANOVA would indicate that there is a significant difference in the mean per cent of operating profit margin ratio between the years and companies. Thus, the overall analysis of profitability of the selected oil refineries in India measured through operating profit margin ratio is satisfactory.

Year	IOCL	HPCL	BPCL	MRPL	CPCL	EOL	RIL	Industry Average
1994-95	4.50	6.42	5.74	46.40	9.98	22.89	30.12	18.01
1995-96	4.76	7.27	6.11	48.10	12.25	23.77	30.61	18.98
1996-97	5.33	7.30	5.40	45.90	13.57	4.60	30.28	16.05
1997-98	6.36	6.38	5.90	41.06	13.94	25.08	39.74	19.78
1998-99	7.12	6.65	6.00	19.52	12.72	24.36	31.23	15.37
1999-00	6.19	5.10	4.91	4.70	6.66	25.11	30.02	11.81
2000-01	4.60	4.43	4.26	3.86	5.47	27.00	24.17	10.54
2001-02	6.53	4.52	5.00	4.64	4.89	26.98	19.92	10.35
2002-03	8.43	5.78	5.88	4.47	8.64	3.38	18.74	7.90
2003-04	8.69	6.17	6.13	8.40	8.42	-4.91	19.45	7.48
2004-05	5.46	3.62	3.15	10.02	9.19	-15.00	19.52	5.14
2005-06	4.67	1.51	1.64	4.06	5.36	-10.22	16.82	3.41
2006-07	6.08	3.29	4.02	5.15	5.31	-3.91	17.35	5.33
2007-08	5.24	2.57	3.42	6.05	7.70	2.16	20.78	6.85
2008-09	3.22	2.92	2.78	5.46	-3.46	4.16	17.58	4.67
Mean	5.81	4.93	4.69	17.19	8.04	10.36	24.42	10.78
SD	1.49	1.83	1.41	18.07	4.44	15.15	7.00	5.41
CV	0.25	0.37	0.30	1.04	0.55	1.46	0.28	0.50
CAGR	-2.20	-5.11	-4.71	-13.29	-193.18	-10.75	-3.52	-8.60
t-value	-3.33*	-5.42*	-5.09*	1.83***	-2.70**	-0.14	19.43*	

*Table 1: Operating profit margin ratio of selected oil refineries in India (in %)*  
 ANOVA: *F.Value (Between the years) – 3.19\*\* (Critical value 1.81); F.Value (Between the companies) –12.02\*\* (Critical value 2.21); \*- Significant at 0.01 per cent level; \*\*-Significant at 0.05 level; \*\*\*- Significant at 0.10 per cent level.*

The primary objective of making investment in any business is to obtain satisfactory return on the capital invested. Hence, the return on capital employed is used as a measure of success of a business in realizing this objective. It is the chief profitability ratio and the most important measure of performance as it indicates the comparative efficiency with which the whole company runs properly. Therefore, return on capital employed is a

valuable yardstick to measure the overall performance of an undertaking. The return on capital employed shows the earning power of capital invested. It indicates how the management has used the funds supplied by creditors and owners. The higher the ratio, the more efficient can be considered the enterprise in using fund entrusted to it.

Year	IOCL	HPCL	BPCL	MRPL	CPCL	EOL	RIL	Industry Average
1994-95	12.88	19.54	18.83	4.57	7.15	9.71	12.95	8.30
1995-96	13.50	20.49	21.13	-3.83	6.60	3.32	11.80	9.30
1996-97	12.28	18.01	16.72	3.56	6.66	2.39	9.41	10.40
1997-98	12.16	15.79	16.16	0.82	7.65	0.71	9.20	10.20
1998-99	12.70	16.22	18.71	0.28	10.98	0.45	8.65	14.30
1999-00	10.58	16.82	16.31	-5.07	6.98	0.49	11.18	10.70
2000-01	9.28	14.07	15.77	-3.28	5.41	0.20	12.04	8.50
2001-02	9.59	9.82	14.69	-9.19	2.78	0.45	9.96	6.80
2002-03	21.49	20.24	21.00	-7.26	11.94	0.35	9.19	15.10
2003-04	23.78	23.8	25.56	7.58	12.11	0.15	10.99	18.30
2004-05	14.19	15.22	12.57	15.19	15.80	-1.21	14.70	15.00
2005-06	10.99	4.16	2.67	6.66	11.95	-0.70	15.32	11.40
2006-07	13.92	13.52	12.36	9.73	3.17	-0.33	16.50	14.80
2007-08	11.52	7.56	8.97	23.36	24.02	-4.01	20.55	15.70
2008-09	4.41	3.33	3.93	19.08	-6.85	3.01	10.55	6.30
Mean	12.88	14.57	15.03	4.15	8.42	1.00	12.20	11.67
SD	4.65	6.01	6.23	9.64	6.84	2.98	3.31	3.63
CV	0.36	0.42	0.41	2.33	0.81	0.33	0.27	0.31
CAGR	-6.89	11.12	-9.91	9.99	0.28	-7.51	-1.35	-1.82
t-value	1.55	1.91***	2.07***	-3.15*	2.53**	-	0.504	7.12*

Table 2: Return on capital employed ratio of selected oil refineries in India (in %) ANOVA: F.Value (Between the years) – 1.63 (Critical value 1.81); F.Value (Between the companies) –12.89\*\* (Critical value 2.21). \*- Significant at 0.01 per cent level; \*\*- Significant at 0.05 level; \*\*\*- Significant at 0.10 per cent level  
Source: Computed

Table 2 indicates that a fluctuating trend in the return on capital employed ratio of the whole industry in India and had an average of 11.67 per cent ranging from 6.30 per cent in 2008-09 to 18.3 per cent in 2003-04. The average return on capital employed varied from company to company. The highest average was 15.03 per cent in Bharat Petroleum Corporation Ltd followed by Hindustan Petroleum Corporation Ltd (14.57 per cent) and Indian Oil Corporation Ltd (12.88 per cent). The performance of Reliance Industries Ltd, Bharat Petroleum Corporation Ltd, Hindustan Petroleum Corporation Ltd and Indian Oil Corporation Ltd was satisfactory because their average return on capital employed ratios were higher than the industry average. The CV value of this ratio showed moderate

fluctuations during the study period except Mangalore Refinery and Petrochemicals Ltd and Essar Oil Ltd. Both had very high fluctuations during the study period. The fluctuation in this ratio could be attributed to the differences in growth rate of EBIT and the capital employed. The compound annual growth rate of this ratio was negative in all the selected oil refineries except Mangalore Refinery and Petrochemicals Ltd and Chennai Petroleum Corporation Ltd.

It can be seen from Table 2 that all the selected oil refineries showed significant differences in their return on capital ratio from the industry average as per t-value during the study period except Indian Oil Corporation Ltd and Reliance Industries Ltd. ANOVA reveals that differences in the return on capital employed ratio is insignificant between the years, but there are significant differences in the return on capital employed ratio of selected oil refineries in India. The overall analysis of this ratio of return on capital employed decreased significantly due to wide fluctuations in the growth rate of EBIT and capital employed in the selected oil refineries in India during the study period.

#### **10.Profitability From The View Point Of Share Holders**

The owners-the shareholders-have permanent stake in the enterprise and as such they have to share prosperity marked by higher profitability and adversity marked by losses. The financial welfare of owners increases when net profit after tax has increased and also when they receive larger share of dividend. Hence, in this part, analysis has been made about profitability of selected oil refineries in India from the view point of shareholders. Net profit margin enables one to measure the relationship between sales and net profit and it is an indicator of the efficiency of the management in manufacturing, selling and financing. A high net profit margin would ensure adequate return to the owners as well as enable a firm to withstand adverse economic conditions when the selling price is declining, cost of production is rising and demand for the product is falling. In case the net profit margin is inadequate, the company will not be in a position to pay off its debts and give a satisfactory return to its shareholders.

Year	IOCL	HPCL	BPCL	MRPL	CPCL	EOL	RIL	Industry average
1994-95	1.01	2.80	2.17	5.28	3.87	12.62	19.76	1.90
1995-96	1.32	3.40	2.57	-1.94	4.37	13.01	22.82	2.20
1996-97	1.71	3.33	2.38	7.81	4.22	-23.74	20.56	2.50
1997-98	2.29	2.97	2.16	2.06	4.91	8.11	17.02	2.90
1998-99	3.13	3.19	2.66	-0.41	5.61	7.73	16.00	4.00
1999-00	2.52	3.08	2.01	-10.69	2.66	2.91	15.21	2.70
2000-01	2.03	2.24	1.67	-9.73	180	6.51	11.49	2.40
2001-02	2.48	1.74	1.97	-15.72	1.03	1.51	7.07	2.32
2002-03	4.62	2.84	2.58	-3.94	3.75	-15.29	8.23	4.30
2003-04	4.99	3.16	3.19	1.58	4.58	-6.51	9.08	4.90
2004-05	3.13	1.72	1.33	4.15	4.22	-16.52	10.37	4.10
2005-06	2.18	0.23	0.29	1.16	2.26	-14.89	10.18	3.00
2006-07	3.09	1.29	1.79	1.72	2.29	-7.21	10.10	3.80
2007-08	2.44	0.66	1.20	3.26	3.99	-1.28	13.97	4.30
2008-09	0.71	0.33	0.50	2.89	-1.23	-1.50	10.69	1.70
Mean	2.51	2.20	1.90	-0.83	15.10	-2.30	13.50	3.13
SD	1.18	1.13	0.80	6.55	45.65	11.40	4.86	1.01
CV	0.47	0.51	0.42	-0.13	3.02	-4.95	0.36	1.70
CAGR	-2.30	-13.28	-9.32	-2.91	-	-13.23	-4.01	-0.58
t-value	-	-	-4.38*	-	1.011	-	7.51*	-
	4.35*	2.44**		2.36**		1.78***		

Table 3: Net profit margin ratio of selected oil refineries in India(in %)

ANOVA: *F.Value (Between the years) – 0.99 (Critical value 1.81); F.Value (Between the companies) – 2.14 (Critical value 2.21). \*- Significant at 0.01 per cent level; \*\*-*

*Significant at 0.05 level;*

*\*\*\*- Significant at 0.10 per cent level*

*Source: Computed*

Table 3 demonstrates a fluctuating trend in the net profit margin ratio of the selected oil refineries in India during the study period. Industry average was also fluctuating trend during the period of study. The oil refineries in India had the overall net profit margin ratio of 3.13 per cent with a co-efficient of variation of 1.70. Industry average and all the selected oil refineries in India has registered negative compound annual growth rate. The highest average was 15.10 per cent in Chennai Petroleum Corporation Ltd followed by 3.50 per cent in Reliance Industries Ltd and 2.51 per cent in Indian Oil Corporation Ltd. Mangalore Refinery and Petrochemicals Ltd had negative net profit margin during the period of study. The performance of Reliance Industries Ltd and Chennai Petroleum Corporation Ltd was good because their average net profit margin ratios were better than that of the industry average. Mangalore Refinery Petrochemicals Ltd and Essar Oil Ltd have not performed well during the whole period of study, as their

average net profit margin ratios had negative sign and were lower than the industry average due to rising cost of production, reduction in selling price, inventory losses and foreign exchange rate fluctuations and under recoveries of selected oil refineries. In these circumstances, these companies failed to achieve satisfactory return on shareholders' funds and these cannot withstand in adverse economic conditions.

Table 3 shows that CV value of these ratios is on the higher side which indicates high fluctuation in the net profit margin ratios of selected companies during the study period. Such fluctuation could be attributed to the differences in the growth rates of net profit margin and sales because of the adverse economic conditions such as falling sales prices, increasing crude oil prices or declining demand for the product. All the selected companies and the whole industry witnessed negative compound annual growth rate of this ratio over the period of study. It is also observed from Table 3 that all the selected oil refineries have shown significant differences as per t-value from the industry mean except Chennai Petroleum Corporation Ltd during the study period. It is concluded from the ANOVA that the null hypothesis is accepted. The acceptance of null hypothesis would indicate that there is no significant difference in net profit margin ratios between the years and companies. Among the selected companies, Mangalore Refinery and Petrochemicals Ltd and Essar Oil Ltd failed to achieve satisfactory returns. In contrast, they incurred net losses over the period of study. But positive sign at tail end of the study period gives good hope for the companies in the years to come from the view point of shareholders.

Return on shareholders fund is of utmost importance to shareholders. Since it reflects the earning power of the funds belonging to them after all debts and charges of every description have been paid. The profitability of a company from the owner's point of view should, therefore be assessed in terms of the return on the owner's equity. The ratio measures the ability of the management of an enterprise to generate adequate returns for the capital invested by the owners of the company.

Year	IOCL	HPCL	BPCL	MRPL	CPCL	EOL	RIL	Industry average
1994-95	16.62	25.17	22.68	28.06	17.41	27.65	18.48	10.46
1995-96	17.27	23.12	24.67	24.05	13.28	6.97	16.60	11.18
1996-97	16.57	20.37	22.67	20.04	13.28	-3.64	15.86	13.16
1997-98	17.29	18.49	23.12	5.55	15.07	1.45	18.78	13.58
1998-99	19.35	19.32	25.29	-1.57	20.73	1.31	18.30	17.92
1999-00	18.56	19.57	21.60	-26.86	12.93	1.87	23.37	12.59
2000-01	18.11	17.75	21.99	-21.19	10.20	0.64	23.05	14.90
2001-02	18.44	12.73	21.04	-78.96	5.54	1.02	17.63	11.02
2002-03	35.72	24.45	28.59	-55.33	25.82	-0.31	15.58	20.41
2003-04	33.38	26.4	31.98	36.67	27.53	0.35	17.39	22.13
2004-05	19.95	15.79	15.78	48.24	33.02	0.39	21.82	19.43
2005-06	17.78	4.72	3.77	16.37	22.44	-3.30	21.90	15.00
2006-07	19.35	17.14	18.66	20.47	22.98	-2.53	22.45	19.29
2007-08	18.34	11.26	14.40	29.02	36.80	-1.50	21.64	20.33
2008-09	8.36	5.23	8.28	18.08	-12.16	-1.80	15.69	6.95
Mean	19.67	17.43	20.30	4.18	17.66	1.90	19.24	15.22
SD	6.63	6.62	7.31	35.39	11.91	7.58	2.85	4.48
CV	0.34	0.38	0.36	8.47	0.67	3.98	0.15	0.29
CAGR	-4.48	-9.94	-6.5	-2.89	-1.04	-1.00	-1.09	-0.95
t-value	3.84*	1.24	2.68**	-1.23	1.13	-5.15*	3.36*	

Table 4: Return on shareholders fund ratio of selected oil refineries in India(in %)

ANOVA: *F*.Value (Between the years) – 1.42 (Critical value 1.81); *F*.Value (Between the companies) –4.25\*\* (Critical value 2.21). \*- Significant at 0.01 per cent level; \*\*-

Significant at 0.05 level;

\*\*\*- Significant at 0.10 per cent level

Source: Computed

Table 4 clarifies how the selected oil refineries in India have used the resources of owners during the study period. All the selected oil refineries in India and the whole



industry registered a fluctuating trend during the study period. The average return on shareholders fund varied from company to company. The highest average return was 20.30 per cent in Bharat Petroleum Corporation Ltd followed by 19.67 per cent in Indian Oil Corporation Ltd and 19.24 per cent in Reliance Industries Ltd. All the selected oil refineries in India except Mangalore Refinery and Petrochemicals Ltd and Essar Oil Ltd have performed well in generating adequate return for the capital invested by the owners and used the resources of owners well. These companies have accomplished the most desirable objective of the companies. This achievement attracted the present shareholders and will attract the prospective shareholders. The averages of Mangalore Refinery and Petrochemicals Ltd and Essar Oil Ltd are far below the industry average during the study period. It may be inferred from the table that Mangalore Refinery and Petrochemicals Ltd and Essar Oil Ltd failed to attain the most desirable objective of the industry and failed to attract future investments. The CV value of this ratio shows very high fluctuations during the study period. The CV value of Mangalore Refinery and Petrochemicals Ltd and Essar Oil Ltd has erratically fluctuated. The fluctuations in this ratio could be attributed to the differences in growth rates of profit after tax and shareholders fund. All the selected companies registered a negative annual compound growth rate during the study period.

It is clear from Table 4 that majority of the selected oil refineries showed significant differences in the return on shareholders fund ratios from the industry mean during the study period. Such significant differences occurred in Indian Oil Corporation Ltd, Bharat Petroleum Corporation Ltd, Essar Oil Ltd and Reliance Industries Ltd at one per cent and five per cent level of significance. The rest of the companies remained stable during the study period. Differences in the average return on shareholders' fund was significant between the companies and insignificant between the years. To sum up, the fluctuating returns among the companies over the period denote unstable return in the whole industry.

Apart from the rates of return, the profitability of a company from the point of view of the equity shareholders is the Earning Per Share (EPS). It measures the profit available to the equity shareholders on a per share basis. Shareholders and financial analyst place considerable emphasis on reported earnings per share and anticipated growth in earnings per share. The earnings per share calculations made over the years indicate whether or not the firms' earning power on per share basis has changed over that period.

Year	IOCL	HPCL	BPCL	MRPL	CPCL	EOL	RIL	Industry average
1994-95	27.55	20.43	19.26	2.26	6.43	6.60	23.34	15.12
1995-96	32.08	24.85	25.72	-0.20	6.55	5.50	27.87	17.48
1996-97	35.78	28.96	28.51	2.18	6.87	1.70	28.85	18.98
1997-98	43.34	31.17	35.01	0.68	8.52	1.30	16.94	19.57
1998-99	55.43	38.74	45.37	0.18	13.58	0.55	17.56	24.49
1999-00	30.55	30.04	44.17	-3.77	9.04	0.51	22.04	18.94
2000-01	33.97	31.09	26.99	-2.33	7.96	0.67	24.63	17.57
2001-02	37.05	23.26	28.33	-6.19	4.28	0.28	30.78	16.83
2002-03	75.45	43.06	40	-2.84	19.88	0.45	28.62	29.23
2003-04	57.28	53.36	54.24	2.62	26.21	0.44	36.31	32.92
2004-05	39.85	35.59	30.46	4.88	38.37	0.08	53.3	28.93
2005-06	40.33	11.55	9.3	2.02	30.6	-0.86	63.7	22.38
2006-07	61.11	43.47	47.4	2.86	35.9	-0.59	84.28	39.20
2007-08	57.75	32.97	43.46	7.05	72.48	-0.35	131.97	49.33
2008-09	23.44	16.07	32.97	6.6	46.48	-4.27	95.24	30.93
Mean	43.40	30.97	34.08	1.07	22.21	0.80	45.70	25.46
SD	14.73	11.02	11.86	3.74	19.54	2.53	33.91	9.66
CV	0.34	0.36	0.35	3.50	0.88	3.16	0.74	0.38
CAGR	-1.07	-1.59	3.65	7.41	14.1	-197	9.82	4.89
t-value	5.91*	1.95***	3.288*	-	-1.095	-	2.97*	
				12.027*		8.553*		

Table 5 : Earnings per share of selected oil refineries in India ( in Rs)

ANOVA: *F*.Value (Between the years) – 2.85\*\* (Critical value 1.81); *F*.Value (Between the companies) – 22.33\*\*\* (Critical value 2.21). \*- Significant at 0.01 per cent level; \*\*-Significant at 0.05 level;

\*\*\*- Significant at 0.10 per cent level

Source: Computed

The earnings per share simply show the profitability of the firm on a per share basis but it does not reflect how much is paid as dividend and how much is retained in the business. But as a profitability index, it is a valuable and widely used ratio. Further, earnings per share are a good measure of profitability and when compared with earnings per share of similar other companies, it gives a view of the comparative earnings or earning power of the firm. Average earnings per share, coefficient of variations, compound annual growth rates, analysis of variance and paired sample t-test analysis are presented in Table 5. The whole industry and all the selected oil refineries in India registered a fluctuating trend in their EPS during the study period. The industry average earnings per share were Rs 25.46 per share ranging from Rs 15.12 per share in 1994-95 to Rs 49.33 per share in 2007-08. This indicated that there was a wide fluctuation in the earnings per share of oil refineries in India during the period of study. The average earnings per share varied from company to company. The highest average was Rs 45.70

per share in Reliance Industries Ltd followed by Rs 43.40 per share in Indian Oil Corporation Ltd and Rs 34.08 per share in Bharat Petroleum Corporation Ltd. The profitability performance of Indian Oil Corporation Ltd, Bharat Petroleum Corporation Ltd and Hindustan Petroleum Corporation Ltd was satisfactory on a per share basis as their average earnings per share were higher than the industry average earnings per share. Among the selected companies, Reliance Industries Ltd was the best performing company as its average earnings per share was the highest. Among the poor performers, Mangalore Refinery and Petrochemicals Ltd and Essar Oil Ltd were the worst performers because their average earnings per share were the least among the companies and below the industry average.

The CV value of this ratio showed very high fluctuations in the earnings per share of Indian Oil Corporation Ltd, Bharat Petroleum Corporation Ltd and Hindustan Petroleum Corporation Ltd and erratic fluctuation in Mangalore Refinery and Petrochemicals Ltd, Essar Oil Ltd and Reliance Industries Ltd. The fluctuation in this ratio could be attributed to the difference in the growth rates of earnings available to equity shareholders, utilization of borrowed and owners fund by the selected oil refineries in India. It can be observed from Table 5 that the differences in earnings per share of all selected oil refineries were significant between the companies and industry average except CPCL as per the t-value. Differences in earnings per share were significant between the years and companies. The above overall analysis shows that the performance of the selected oil refineries in India varied between the companies.

### **11. Analysis Of Profitability Trend**

Profitability of various industries would hardly diverge in a world of perfection, because, future can easily be predicted. However, real world is far from perfection. A number of dynamic forces (e.g., change in income, technology, population, etc.) operate simultaneously in a real imperfect and uncertain world. Consequently, profitability of different concerns and industries etc., are greatly affected. Rate of profit, which is one of the most used and popular financial measure of performance of a concern and an industry plays a pivotal role in the growth process of the concern, the industry and the whole economy. It reflects the financial stability and also enhances the earning capacity of a concern. It plays a dual role in the investment process of the economy by attracting fresh investment on one hand, and generating internal source of finance on the other hand. However, low rate of profit or loss reports any fresh inflow of investment and

induces existing capital to quit towards the fields of higher rates of profit. It thus reflects investors' and lenders' need of knowing financial indicator of performance and is a key factor in determining the commercial viability of the concern.

The current rate of profit is an indicator and source of and a need for the expansions of a business through re-investment and through attracting and observing new capital in the industry. Hence, investors and lenders are interested in knowing the profitability of a concern and industry over time or at a point of time. The celebrated tendency of rates of profit to fall over long period of time had been theoretically developed by classical economist like Adam Smith, David Ricardo, their critic Karl Marx and also by neoclassical writers like Alfred Marshall. The study therefore intends to empirically examine whether the rate of profit of selected oil refineries in India had a tendency to rise or fall over a period from 1994-95 to 2008-09. The objective is not to test the validity of classical hypothesis, as the economic conditions as assumed by classical writers do not prevail in the country. However, knowledge about whether profitability is raising or falling over the period from 1994-95 to 2008-09 would throw interesting results for formulation of future policies.

An attempt has been made in the study to examine the trends in rates of profit of selected oil refineries in India over the period from 1994-95 to 2008-09. In this study a ratio of profits to capital employed and expressed in percentage term has been used for this purpose. The rate of profit on capital indicates the earning power of capital of long-term nature and thus examines long- term profitability better. The linear regression model fitted is as follows:

- $P = \alpha + \beta t + e$

Where P is rate of profit, t is the time and  $\alpha$  and  $\beta$  are the parameters (intercept and coefficient respectively) and e is the error term. The results of the application of the above stated model to the profitability of selected oil refineries in India are presented in Table 6.

S.No.	Companies	P= $\alpha$ + $\beta$ t+e		R <sup>2</sup>	F value
		$\alpha$	$\beta$		
1.	Indian Oil Corporation Ltd	13.59	-8.78 (-0.31)	0.01	0.093
2.	Hindustan Petroleum Corporation Ltd	21.51	-0.87 (-3.04)	0.42	9.26*
3.	Bharat Petroleum Corporation Ltd	22.10	-0.89** (-2.96)	0.40	8.77**
4.	Mangalore Refinery and Petrochemicals Ltd.	-6.85	1.37** (2.99)	0.41	8.90**
5.	Chennai Petroleum Corporation Ltd	7.35	0.13 (0.32)	0.01	0.10
6.	Essar Oil Ltd	4.30	-0.41** (-2.84)	0.38	8.08**
7.	Reliance Industries Ltd	9.04	0.40** (2.27)	0.28	5.16**
	<b>Whole industry</b>	<b>15.33</b>	<b>-4.97</b> <b>(2.12)***</b>	<b>0.26</b>	<b>4.48</b>

Table 6: Results of regression rates of profit on time for selected Oil Refineries in India (1994-95 to 2008-09)

Figures in brackets are *t* values;

\*-Significant at 0.01 level;

\*\* -Significant at 0.05 level;

\*\*\*-Significant at 0.10 level;

Source: Computed.

Table 6 reveals that the linear model of time trend of profitability has proved to be a “good fit” in the case of five out of seven selected companies during the study period. This is revealed from the value of R<sup>2</sup>, the co-efficient of determination. Among these companies Hindustan Petroleum Corporation Ltd, Bharat Petroleum Corporation Ltd and Essar Oil Ltd experienced a strong tendency in profitability to decline over the study period. The negative values of  $\beta$  the time trend co-efficient, confirms this trend as these are observed to be statistically significant. Negative value of  $\beta$  indicates a negative relationship between profitability and time over the study period. Only in the case of Mangalore Refinery and Petrochemicals Ltd, Chennai Petroleum Corporation Ltd and Reliance Industries Ltd, the sign for  $\beta$ , the time trend co-efficient is positive implying the tendency of profit rate to rise over time. The value of co-efficient of determination R<sup>2</sup> also varied in the case of companies having strong increasing tendency of profit rate over time, from 1 per cent for Chennai Petroleum Corporation Ltd to 41 per cent for Mangalore Refinery and Petrochemicals Ltd.

Table 6 further reveals that  $\beta$  assumes different values (negative) for selected companies ranging from -0.41 for Essar Oil Ltd to -8.78 for Indian Oil Corporation Ltd during the study period. This implies that profitability of the companies declined at different rates over this period. The value of co-efficient of determination  $R^2$  varied in the case of companies having strong declining tendency of profit rate over time, from 1 per cent for Indian Oil Corporation Ltd to 42 per cent for Hindustan Petroleum Corporation Ltd. Such variations in the value of  $R^2$  implies profitability variation of different companies in different degrees over time. Among the selected oil refineries no definite trend could be observed in Indian Oil Corporation Ltd and Chennai Petroleum Corporation Ltd, as the results are statistically insignificant. For the whole industry time explains the variations in profitability to the extent of 26 per cent over the study period. The analysis shows that majority of the selected oil refineries had a strong tendency for profit rate to fall over the study period as the results for  $R^2$  and  $\beta$  are statistically significant.

## **12. Conclusion**

The profitability measured through operating profit margin ratio is satisfactory in all the selected oil companies and found adequate to cover the fixed charges and dividend reserve during the study period. The overall analysis of return on capital employed ratio showed that this ratio has improved significantly during the study period which was on account of considerable increase in profit margin as well as assets turnover. Finally, it can be inferred that the operating efficiency of selected oil refineries in India was satisfactory and the management generally succeeded in investing capital funds. The performance of Reliance Industries Ltd and Chennai Petroleum Corporation Ltd was good during the study period. Mangalore Refinery Petrochemicals Ltd and Essar Oil Ltd have not performed well during the period of study. Further, owners' funds was utilized profitably by all the selected oil refineries in India except Mangalore Refinery and Petrochemicals Ltd and Essar Oil Ltd. It is significant to note that the position regarding earnings per share and dividend pay out ratio in all the selected oil refineries during the period under review shows better performance and prospects from the point of view of shareholders. The results showed that Hindustan Petroleum Corporation Ltd, Bharat Petroleum Corporation Ltd, Mangalore Refinery and Petrochemicals, Essar Oil Ltd and Reliance Industries Ltd experienced a strong tendency in profitability to decline over the study period. The falling tendency of profit rate of these companies is the proof of adverse effect of various controls on process, output, expansion, investment and

distribution imposed by government on these companies over time. Only in the case of Mangalore Refinery and Petrochemicals Ltd, Chennai Petroleum Corporation Ltd and Reliance Industries Ltd, the time trend co-efficient is positive implying the tendency of profit rate to rise over time. To sum up, the analysis of profitability of the selected oil refineries reveals that majority of the companies under review highlighted better performance and prospects from the point of view of owners.



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