RESEARCH ARTICLE

AN ANALYSIS OF RELATIONSHIP AND FACTOR INFLUENCING THE PROFITABILITY OF SELECTED OIL COMPANIES IN INDIA

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ARTICLE INFO	ABSTRACT
	The Indian Oil Industry occupies an important place in the economy of the country because of its contribution to the industrial output, employment generation and foreign exchange earnings. The Oil that is produced by the Oil Industry in India provides more than thirty five percent of the energy that is primarily consumed by the people of India. This amount is expected to grow further with both economic and overall growth in terms of production as well as percentage. The demand for oil is predicted to go higher and higher with every passing decade and is expected to reach an amount of nearly 250 million metric ton by the year 2024. Profit earning is the aim of business. In the course of analysis of this study various statistical techniques have been made. The statistical techniques used are correlation, t-test and multiple regression analysis to find out the relationship between the variable and to identify the factor influencing the profitability. Based on the analysis net sales and net profit have some relationship and working capital management was highly influencing factor to find out profitability of selected oil companies in India. Companies must concentrate with other influencing factor for better more of the company.

INTRODUCTION

After the Indian Independence, the Oil Industry in India was a very small one in size and Oil was produced mainly from Assam and the total amount of Oil production was not more than 250,000 tonnes per year. This small amount of production made the oil experts from different countries predict the future of the oil industry as a dull one and also doubted India's ability to search for new oil reserves. But the Government of India declared the Oil industry in India as the core sector industry under the Industrial Policy Resolution bill in the year 1954, which helped the Oil Industry in India vastly. Oil exploration and production in India is done by companies like NOC or National Oil Corporation, ONGC or Oil and Natural Gas Corporation and OIL who are actually the oil companies in India that are owned by the government under the Industrial Policy Rule. The National Oil Corporation during the 1970s used to produce and supply more than 70 percent of the domestic need for the petroleum but by the end of this amount dropped to near about 35 percent. This was because the demand on the one hand was increasing at a good rate and the production was declining at a steady rate. Oil Industry in India during the year 2004-2005 fulfilled most of demand through importing oil from multiple oil producing countries. The Oil Industry in India itself produced nearly 35 million metric tons of Oil from the year 2001 to 2005. The Import that is done by the Oil Industry in India comes mostly from the Middle East Asia.

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The Oil that is produced by the Oil Industry in India provides more than 35 percent of the energy that is primarily consumed by the people of India. This amount is expected to grow further with both economic and overall growth in terms of production as well as percentage. The demand for oil is predicted to go higher and higher with every passing decade and is expected to reach an amount of nearly 250 million metric ton by the year 2024. Profit earning is the aim of business. A business will be able to survive under unfavorable situation only if it has some past earnings to rely upon. Profits are the main sources of finance for the growth of a business.

Statement of the problem

The Indian oil industry occupies an important place in the economy of the country because of its contribution to the industrial output, employment generation and foreign exchange earnings. At present, the oil industry is the second largest employment provider in India. The oil industry is the engine of India's economy. Finance is regarded as the lifeblood of a business enterprise. This a because in the modern money oriented economy, finance is one of the basic foundations of all kinds of economic activities. Profit earnings are the main aim of every economic activity. No business can survive without earning profit. Profit is a measure of efficiency of a business enterprise; profits also serve as a protection against risk, which cannot be insured. So the study contains analyzing the profitability of selected listed oil industry companies in India.

Objectives

- ➢ To study the relationship between Net Sales and Net Profit of selected oil companies in India.
- ➢ To study the factor influencing profitability of selected oil companies in India.

METHODOLOGY

This study is mainly based on the secondary data. The required data was collected from the corporate data house and other relevant data used is collected from the secondary sources like journals, magazines, prowess database and websites. The study period covers 10 years from 1999-2000 to 2008-2009 and they are collected from 5 companies. The samples techniques used for the study is convenient sampling. A sample of 5 oil companies has been selected based on the availability of data for research process. In the course of analysis of this study various statistical techniques have been made. The statistical techniques used are correlation, t-test and multiple regression analysis to find out the relationship between the variable and to identify the factor influencing the profitability.

Correlation Analysis

Correlation is a statistical device which helps us in analyzing the covariation of two or more variables. The problem of analyzing the relation between different series should be broken into three steps.

- ➢ Determining whether a relation exists, if it does, measuring it.
- ➢ Testing whether it is significant.
- ➢ Establishing the cause and effect relation, if any.

It should be noted that the detection and analysis of correlation (i.e Covariation) between two statistical variables require relationship of some sort which associates the observation in pairs, one of each pair being a value of each of the two variables. In general, the pairing relationship may be of a almost any nature, such as observations at the time or place or over a period of time of different places.

The formula for computing Pearson (r) is

$$r = \frac{N\sum xy - (\sum x)(\sum y)}{\sqrt{n\sum x^2 - (\sum x)^2} \quad \sqrt{n\sum y^2 - (\sum y)^2}}$$

Where

r = Correlations Co-efficient
x = Net Sales
y = Net profit
n = Number of years
Formula for calculating t value

$$t = \frac{r\sqrt{n-2}}{\sqrt{n-(r)^2}}$$

Where

r = Correlation Co-efficient
n = Number of years

Hypothesis H_0: There is no significant relationship between Net Sales and Net Profit.
Hypothesis H_1: There is significant relationship between Net Sales and Net Profit.

Table 1. Relationship between Net Sales and Net Profit of Selected Oil Companies in India

Name of the Companies	Correlation	Significant (s) / Not Significant (NS)
BPCL	0.963	S
CPCL	0.762	S
EOL	0.332	NS
HPCL	0.955	S
IOCL	0.954	S

Note: Significant at 0.01 level (2 tailed)
Sources: Computed

The table 1 reveals that co-efficient of correlation for Net Sales and Net Profit and t-value of selected oil companies in India. Bharat Petroleum Corporation Limited, Hindustan Petroleum Corporation Limited and Indian Oil Corporation Limited observed that there was highest positive relationship between Net Sales and Net profit. Calculated value is greater than the table value. So the null hypothesis was rejected and alternative hypothesis was accepted that there is a relationship between Net Sales and Net Profit. Chennai Petroleum Corporation Limited observed that there was positive relationship between Net Sales and Net profit. Calculated value is greater than the table value. So the null hypothesis was rejected and alternative hypothesis was accepted that there is a relationship between Net Sales and Net Profit. Essar Oil Limited observed that there was lowest positive relationship between Net Sales and Net profit. Calculated value is lower than the table value. So the null hypothesis was accepted and alternative hypothesis was rejected that there is no significant relationship between Net Sales and Net Profit. The above table concluded that positive relationship implies that an increase in Net Sales leads to an increase in Net Profit.

Multiple Regression Analysis

Multiple regression analysis represents a logical extension of two variable regression analysis. Instead of a single independent variable, two or more independent variables are used to estimate the values of a dependent variable. The multiple regression equation describes the average relationship between these variables and this relationship is used to predict or control the dependent variable. The formula for calculating multiple regression

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5$$

Where

Y	= Profitability (dependent variable)
a	= Constant
X_1	= Short Term Liquidity
X_2	= Long Term Solvency
X_3	= Turnover
X_4	= Fixed Assets Management
X_5	= Working Capital Management
b_1 to b_5	= Regression coefficient

Hypothesis H_0: There is no significant relationship between dependent variable and independent variable.
Hypothesis H_1: There is significant relationship between dependent variable and independent variable.

Table 2 reveals that Bharat Petroleum Corporation Limited had the explanatory variables which jointly account for about 48 per cent of variation in profitability. The co-efficient of short-term liquidity and turnover was positively related to the

Table 2. Factor influencing profitability of selected oil companies in India

Companies	a	b_1	b_2	b_3	b_4	b_5	R Square	F Value
BPCL	13.724	8.408	-11.561	0.172	-1.439	-0.297	0.447	0.647
CPCL	-17.788	-0.179	15.639	4.460	-1.162	2.240	0.617	1.290
EOL	1.899	-0.066	0.085	-0.106	-0.235	0.043	0.804	3.275
HPCL	223.873	-161.870	12.147	10.648	-22.576	-0.340	0.756	2.482
IOCL	9.072	37.854	33.586	-9.829	2.904	-0.211	0.779	2.814
OVERALL	40.280	-29.581	22.359	1.480	-4.758	-0.729	0.916	8.725

Sources: Computed

profitability. The co-efficient of long-term solvency, fixed assets management and working capital management was negatively related to the profitability. The five explanatory variables the short-term liquidity was highly influenced with profitability. The calculated value of F is lower than the table value at 5 per cent level of significant. The difference in sample means is not significant.

Chennai Petroleum Corporation Limited had the explanatory variables which jointly account for about 62 per cent of variation in profitability. The co-efficient of long-term solvency, turnover and working capital management was positively related to the profitability. The co-efficient of short-term liquidity and fixed assets management was negatively related to the profitability. The five explanatory variables the long-term solvency was highly influenced with profitability. The calculated value of F is higher than the table value at 5 per cent level of significant. The difference in sample means is significant.

Essar oil Limited had the explanatory variables which jointly account for about 80 per cent of variation in profitability. The co-efficient of long-term solvency and working capital management was positively related to the profitability. The co-efficient of short-term liquidity, turnover and fixed assets management was negatively related to the profitability. The five explanatory variables the long-term solvency was highly influenced with profitability. The calculated value of F is higher than the table value at 5 per cent level of significant. The difference in sample means is significant. Hindustan Petroleum Corporation Limited had the explanatory variables which jointly account for about 76 per cent of variation in profitability. The co-efficient of long-term solvency and turnover was positively related to the profitability. The co-efficient of short-term liquidity, fixed assets management and working capital management was negatively related to the profitability. The five explanatory variables the long-term solvency was highly influenced with profitability. The calculated value of F is higher than the table value at 5 per cent level of significant. The difference in sample means is significant.

Indian Oil Corporation Limited had the explanatory variables which jointly account for about 78 per cent of variation in profitability. The co-efficient of short-term liquidity, long-term solvency and fixed assets management was positively related to the profitability. The co-efficient of turnover and working capital management was negatively related to the profitability.

The five explanatory variables the short-term liquidity was highly influenced with profitability. The calculated value of F is higher than the table value at 5 per cent level of significant. The difference in sample means is significant. The above table concluded that selected oil companies are having F value higher than the calculated value except Bharat Petroleum Corporation Limited. So null hypothesis is rejected and alternative hypothesis is accepted. There is a significant relationship between dependent variable and independent variable.

Conclusion

Profit earning is the aim of business. The relationship between Net Sales and Net Profit of selected oil companies in India, Bharat Petroleum Corporation Limited, Hindustan Petroleum Corporation Limited and Indian Oil Corporation Limited are highly correlated with Net Profit and Net Sales and other remaining companies are smaller correlation between Net Profit and Net Sales. Working capital management was highly influencing factor to find out profitability of selected oil companies in India. So the companies must concentrate with other influencing factor for better more of the company.

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Appendix **A**

Net Sales and Net Profit of Selected Oil Companies for the year 1999-2000 to 2008-2009   **(Rs. In Crores)**

Year	BPCL		CPCL		EOL		HPCL		IOCL	
	NS	NP	NS	NP	NS	NP	NS	NP	NS	NP
1999-00	23451.63	4095.90	5387.69	1239.27	125.36	256.35	28635.23	5621.13	82315.65	14676.03
2000-01	28561.32	4539.60	6971.06	1170.60	145.23	398.62	35625.32	5926.96	89565.23	17510.15
2001-02	39421.80	5159.96	6061.03	1142.02	292.64	387.78	39656.59	6484.98	99735.12	18779.79
2002-03	49951.74	5404.37	8067.77	1198.27	172.95	393.33	49838.75	6435.20	107832.60	21619.32
2003-04	54849.25	6045.69	8747.28	2579.68	1045.12	152.25	53161.78	6578.11	116923.40	22046.61
2004-05	62991.88	7000.12	14143.16	3373.53	636.63	152.57	63039.32	6943.64	134348.50	23380.79
2005-06	75850.79	9917.36	21155.84	3205.27	473.98	191.98	75011.11	7337.40	162418.30	25023.42
2006-07	97189.37	10981.05	24713.12	3080.63	651.93	203.89	93912.34	8820.84	201493.80	33370.22
2007-08	110743.60	11968.67	28153.49	3048.88	1250.36	437.70	109966.40	11929.28	229848.30	32771.82
2008-09	135251.80	11965.79	32162.90	2871.84	1563.23	605.84	129242.80	11654.75	288227.40	34778.45

Source: Computed from Annual reports of the respective units

Appendix B

Ratio Used for Calculating Multiple Regression Analysis Overall Multiple Regression Analysis

Year	Profitability	Short Term Liquidity	Long Term solvency	Turnover	Fixed Assets Management	Working Capital Management
1999-00	10.68	0.99	0.74	3.70	3.16	9.45
2000-01	11.10	1.08	0.81	4.07	3.29	8.70
2001-02	10.90	1.01	0.93	3.31	3.66	9.68
2002-03	17.39	0.86	1.02	3.68	4.14	5.99
2003-04	18.12	0.90	1.07	3.51	4.18	8.44
2004-05	14.97	0.95	0.85	4.49	4.38	4.48
2005-06	10.35	0.97	0.77	4.81	4.72	3.21
2006-07	13.14	0.92	0.94	5.01	5.28	5.84
2007-08	14.11	0.93	1.02	5.06	5.60	2.94
2008-09	6.70	1.05	1.05	6.38	5.98	8.80

Source: Computed from Annual reports of the respective units

Appendix C

Multiple Regression Analysis for Companies Bharat Petroleum Corporation Limited

Year	Profitability	Short Term Liquidity	Long Term solvency	Turnover	Fixed Assets Management	Working Capital Management
1999-00	7.56	0.75	0.32	5.25	3.18	9.03
2000-01	9.52	0.65	0.39	5.99	3.19	8.71
2001-02	11.25	0.80	0.35	4.56	3.25	10.31
2002-03	6.92	0.84	0.28	5.04	3.93	10.77
2003-04	7.95	0.88	0.25	5.06	4.03	19.51
2004-05	12.63	0.90	0.20	5.36	4.19	3.57
2005-06	13.29	0.86	0.25	5.67	4.44	3.70
2006-07	11.73	0.76	0.29	5.83	4.99	7.16
2007-08	6.55	0.73	0.32	5.94	5.17	3.19
2008-09	5.93	0.82	0.32	6.60	5.82	10.10

Source: Computed from Annual reports of the respective units

Appendix D

Multiple Regression Analysis for Companies Chennai Petroleum Corporation Limited

Year	Profitability	Short Term Liquidity	Long Term solvency	Turnover	Fixed Assets Management	Working Capital Management
1999-00	13.38	1.25	0.76	3.14	2.56	2.66
2000-01	12.27	1.93	0.80	3.50	2.68	2.33
2001-02	9.29	1.85	1.00	3.02	2.87	1.75
2002-03	21.41	1.25	1.17	3.95	3.56	1.42
2003-04	17.10	1.09	1.21	3.14	3.89	2.46
2004-05	26.05	1.05	0.98	3.82	3.97	9.77
2005-06	19.05	1.05	0.70	5.31	4.15	4.91
2006-07	22.52	1.09	0.55	6.04	4.25	4.75
2007-08	36.91	1.15	0.38	6.58	5.62	6.51
2008-09	7.15	1.17	0.30	7.10	5.98	1.43

Source: Computed from Annual reports of the respective units

Appendix E

Multiple Regression Analysis for Companies Essar Oil Limited

Year	Profitability	Short Term Liquidity	Long Term solvency	Turnover	Fixed Assets Management	Working Capital Management
1999-00	1.25	1.05	2.15	0.56	3.28	0.59
2000-01	0.89	0.83	2.24	0.44	3.65	0.76
2001-02	1.33	0.67	2.56	0.32	4.59	0.59
2002-03	0.78	0.57	3.02	0.35	4.89	0.47
2003-04	1.04	0.75	3.48	0.35	5.01	0.61
2004-05	0.41	1.00	2.76	3.71	5.36	0.44
2005-06	0.55	1.11	2.27	2.48	5.74	0.35
2006-07	0.17	1.01	2.74	1.63	6.81	0.31
2007-08	0.33	0.91	2.93	1.52	6.92	0.93
2008-09	0.72	1.56	2.85	6.02	7.01	22.42

Source: Computed from Annual reports of the respective units

Appendix F

Multiple Regression Analysis for Companies Hindustan Petroleum Corporation Limited

Year	Profitability	Short Term Liquidity	Long Term solvency	Turnover	Fixed Assets Management	Working Capital Management
1999-00	18.87	1.00	0.16	4.79	3.89	15.39
2000-01	18.24	1.08	0.21	5.53	3.96	11.26
2001-02	15.87	0.96	0.24	4.60	4.30	15.73
2002-03	29.97	0.83	0.16	5.19	4.98	11.01
2003-04	34.72	0.88	0.07	5.22	4.79	11.84
2004-05	17.16	0.91	0.04	5.52	5.14	5.30
2005-06	3.54	0.94	0.27	5.99	5.66	3.99
2006-07	13.46	0.88	0.69	6.71	6.36	11.34
2007-08	7.90	1.02	1.12	6.42	6.16	2.10
2008-09	9.86	0.95	1.40	6.66	6.33	3.57

Source: Computed from Annual reports of the respective units

Appendix G

Multiple Regression Analysis for Companies Indian Oil Corporation Limited

Year	Profitability	Short Term Liquidity	Long Term solvency	Turnover	Fixed Assets Management	Working Capital Management
1999-00	12.35	0.89	0.33	4.76	2.89	19.56
2000-01	14.56	0.91	0.40	4.88	2.98	20.45
2001-02	16.78	0.79	0.48	4.05	3.30	20.01
2002-03	27.87	0.79	0.47	3.88	3.32	6.26
2003-04	29.79	0.90	0.36	3.80	3.19	7.77
2004-05	18.61	0.90	0.29	4.03	3.22	3.32
2005-06	15.34	0.88	0.38	4.61	3.61	3.07
2006-07	17.84	0.85	0.43	4.84	3.97	5.64
2007-08	18.85	0.84	0.36	4.84	4.12	1.95
2008-09	9.84	0.76	0.39	5.53	4.76	6.46

Source: Computed from Annual reports of the respective units