



Sales Trend and Cost Structure of Indian Oil Industry – An Analysis

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In Indian oil industry there are highly profitable units as well as loss-making units. Therefore, in this paper an attempt has been made to study the different elements of cost in Indian oil industry. To analyze the revenue aspect of industry the trend analysis is also made. To give justification to analysis several statistical tools been also used in this.

Importance of Oil Industry

India is fast emerging as a major global market for petroleum products. The critical requirement for achieving higher growth rates is clearly the production and supply of sufficient amount of energy resources. However, not only will India continue to remain deficient in energy, but the gap between demand and domestic production is expected to grow considerably in the near future, crude oil expected to grow considerably in the near future, crude oil is particularly important in view of its crucial role in the transportation sector, especially for a large country like India, with a population of billion people and growing. Much of the investment in the upstream and downstream sectors is likely to flow through existing and new domestic and international companies.

Exploration of Domestic oil and Gas

India has an estimated sedimentary area of 3.14 million sq.km, comprising 26 sedimentary basins. Prior to the adoption of the new exploration licensing policy (NELP). Only 11 per cent of India's sedimentary basin was under exploration. Since operationalization of the NELP in 1999, the Government of India has awarded 47.3 per cent of it for exploration. So far 87 oil and gas discoveries have been made by private/ joint venture (JV) companies in 26 blocks and more than 640 MMT of oil equivalent hydrocarbon reserves have been added. As on 1 October 2010, investment made by Indian and foreign companies was of the order of US \$ 14.8 billion of which, US \$ 7.5 billion was in hydrocarbon exploration and US\$7.3 billion in development of discoveries.

Trend analysis examines the tendencies by a) selecting a representative year as the base and b) expressing the figures of the remaining years in relation to the base year. The significance of the choice of base lies in the fact that the values of the items in the base year are assumed to be 100 and the index numbers are calculated for other years based on the amount of that item in those years. It is not necessary that a year should be chosen as the base. If there is no year which quality to be the base, for whatever reason, then an 'average concept' can be employed.

In India, the financial analysis made by the stock exchange authorities follows the 'average concept' in presenting trend data. According to the stock exchange official directory, "A trend analysis has been made showing the percentage of major items in the balance sheet and profit and loss statement compared to a base value for the purpose of calculation the base value has been taken as the average for each item over the last five years or as many years for which the data is available".

Trend analysis is effective only when relevant and related items are studied together. Thus, the results which are shown are an enterprise has to be viewed in conjunction with the resources employed. For instances, sales trend have to be

studied along with debtors, inventory and even fixed assets, because it would be unhealthy development if a downward trend in sales is accompanied by an upward trend in inventories and trade debts, or by a market increase in plant and equipment, especially if financed by borrowed funds.

In present paper, an attempt has been made to study the cost component of oil units under study. For the purpose of analysis of cost component all component cost been calculated as percentage of sales. While to analyze the sales position of units' trend analysis is made.

OBJECTIVES OF THE STUDY

This study is aimed at attempting the following objectives;

- To analyze the cost structure of the oil companies in India
- To study the sales trend analysis of the oil companies in India

Methodology of the study

A study has been made by using data from financial statements of top four oil companies of India, viz., oil and Natural Gas Corporation Limited. [ONGC] Bharat Petroleum Corporation Limited, [BPC] Hindustan Petroleum Corporation Limited [HPC] and Indian oil corporation Limited [IOC]. For the purpose of analysis data has been collected from annual reports of respective companies, information has also been collected from different websites and magazines. The study covers a period of 4 years from 2005=06 to 2009-10.

Hypothesis for the study

1. The cost structures of oil companies are uniform.
2. The sales trends of oil companies are uniform

Techniques of analysis

For the purpose of analysis of data, various components of cost has been calculated as percentage of sales and sales analysis has been made through trend moreover, the simple statistical techniques such as standard deviations, average and ANOVA test were also applied. In present study data has been converted into relative measures such as ratios, percentages rather than the absolute data.

Analysis of sales trend

'Sales' is the value of the output supplied to the customers. It is the life blood of a business enterprise. Without which the business cannot survive. Further, 'sales' is the indicator of the operational efficiency of management in how efficiently the management has used the assets of the business. The higher the volume of sales, the more efficient the management. Sales is also related to profitability of an enterprise, if other things remain constant. The higher the amount of sales, the more profitable the business is and vice versa. The matching of costs incurred during a certain period with sales generated during that period reveals the net income or net loss.

The trend of sales indicates the direction in which a concern is going on, and on the basis of which forecast for further can be made.

The trend analysis of sales helps to understand the growth of a business enterprise. For proper trend analysis, the trend should be studied at least over period of 5 or more years.

To study the trend the sales in oil companies under study the year 2005-06 has been chosen as the base year and figure of sales in the base year have been taken equal to 1. Index numbers have been calculated for the remaining years based on the amount of sales for the base year. Table -1 shows the trend of sales in the companies under study.

Table: 1
Sales Trend

Year	2005-06	2006-07	2007-08	2008-09	2009-10	Average	S.D
ONGCL	100	118.595	105.538	106.558	94.138	104.9658	330.517
BPCL	100	127.833	114.138	121.655	89.665	110.6582	982.323
HPCL	100	125.611	116.259	119.769	85.885	109.5048	1058.618
IOC	100	123.788	114.253	124.161	87.706	109.9818	979.759
Average	100	123.957	112.547	118.036	89.3485	108.778	

Sales trend of units under study showed a fluctuating trend. ONGCL and BPCL indicate an increasing trend throughout the study period. HPCL, IOC indicated a fluctuating trend. The average trend of units under study was 108.778. While the average trends of BPCL and HPCL were higher than this, on other hand ONGCL and IOC trend were level than the average of units under study. The standard deviation figure shows a high fluctuation is trend value of all the units under study.

Structure of cost in oil companies under study:

The data of total cost in various oil companies under study have been rearranged and classified under the following heads:

a. Raw materials and stores consumed:

Raw material consumed during the course of manufacturing. Further the figure has been arrived at by adding the cost of closing stock. It also includes the amount spent an octerioi, carriage inwards as well a stores consumed etc.

Sales Table -2

Source of variation	Sum of squares	Df	ms	f	Fcrit
Between Groups	239554.356	4	59888.589	3.04	3.26
With in Groups	236518.117	12	19709.843		
Total	476072.473	16			

Table -3

Raw materials and stores cost as percentage of sales

Year	2005-06	2006-07	2007-08	2008-09	2009-10	Average	S.D
ONGCL	11.799	14.368	14.025	17.039	4.036	12.2534	98.245
BPCL	94.609	91.909	92.319	90.989	94.732	92.9116	11.2478
HPCL	95.919	92.366	96.284	91.757	93.863	93.7772	14.157
IOC	90.919	89.280	90.239	89.120	89.363	89.7842	2.367
Average	71.11075	71.98075	18.3042	72.2263	70.4985	72.1816	
Total	292.443	287.925	292.867	288.905	281.994		

Table 3 indicates the percentage of raw materials and stores cost to sales. The cost showed a fluctuating trend in all units under study. The average raw material cost of the centre study was 72.1816 percent, Where as the average raw materials cost of HPCL was 93.7772 percent, which was highest among all units under study. While the raw material cost of ONGCL was 12.2534 percent. Which is lowest among all units under study. The average raw material cost BPCL and IOCL were 92.9116 and 89.7842 percent respectively. The standard deviations of ONGCL, indicates high fluctuation is cost.

Raw materials and stores consumed cost and ANOVA test: Table - 4 ANOVA

Source of variation	Sum of squares	df	ms	f	Fcrit
Between Groups	19.5159	4	4.878	0.002	3.26
With in Groups	24115.092	12	2009.59		3.26

H₀ = There is no significant difference in percentage of raw materials and stores consume cost in companies.

It is evident from Table - 3 that there is not difference in raw

materials and stores consumed among the units under study because calculated value of F (0.002) is lower than table value of 3.26.

b) Salaries and wages:

The amount paid to employees by way salaries, wages, bonus, gratuities and contribution towards the provident funds, superannuation funds, family pension scheme. gratuity funds have been classified as salaries and wages in the present study.

Table 5
Wages and Salaries Cost as Percentage of Sales

Year	2005-06	2006-07	2007-08	2008-09	2009-10	Average	S.D
ONGCL	6.282	6.984	9.728	7.088	9.324	7.8812	9.484
BPCL	1.167	1.039	1.177	1.406	1.781	1.314	0.3114
HPCL	0.967	0.813	0.832	0.910	1.507	1.0058	0.3287
IOC	1.029	1.195	1.170	1.852	2.131	1.4754	0.944
Average	2.36125	2.50775	3.22675	2.814	3.68575	2.9191	

Wages and salaries cost as percentage of sales has been presented in Table - 4. The portion of this cost in total cost is very low. It ranged between 1 to 7 percent. The average wages and salaries cost of study was 2.9191 percent, while the HPCL cost id lowest (1.0058 percent) among all units under study. The standard deviation of BPCL also indicates that very low fluctuation is cost wages and salaries cost and ANOVA test.

H₀ = There is no significant difference in percentage of salaries and wages cost in companies.

Table - 5
ANOVA

Source of variation	Sum of squares	Df	ms	f	Fcrit
Between Groups	4.695	4	1.174	0.085	3.26
With in Groups	164.718	12	13.727		
Total	169.413	16			

It is clear from Table - 5 that there is no difference in wages and salaries cost in all units under study, because of table value of f is higher than calculated value of f. Standard deviation also indicates very low fluctuations in cost.

c) Indirect Taxes

The indirect taxes include excise duty charged at the time of production by the central government has been consider under this head.

Table - 6
Indirect Taxes as percentage of sales

Year	2005-06	2006-07	2007-08	2008-09	2009-10	Average	S.D
ONGCL	14.484	15.256	14.129	14.887	13.183	14.3878	2.5313
BPCL	0.154	0.989	0.916	0.195	0.685	0.5878	0.6204
HPCL	1.139	0.779	0.366	0.221	0.714	0.4438	0.333
IOC	1.024	1.362	1.255	0.444	1.442	1.1054	0.644
Average	3.95025	4.5965	4.1665	3.93675	4.006	4.1312	

Table - 6 showed a portion of indirect taxes as percentage of sales in oil industry. The data showed fluctuating trends in all units under study. The average ratio of units under study was 4.1312 percent. out of four units under study the average cost of two units were below the study average. HPCL indirect cost was lowest (0.4438 Percent) among all units under study. The result of standard deviation also indicates very fluctuation in all units under study expect HPCL.

Table 7
ANOVA
Indirect taxes and ANOVA test

Source of variation	Sum of squares	Df	ms	f	Fcrit
Between Groups	179.1089	4	44.777	0.765	3.29
With in Groups	702.53	12	58.544		

Ho= There is no significant difference in percentage of indirect cost in companies. From the above table, it is clear that there is no difference in indirect cost of all units. Because the calculated value of F is lower than table value of F.

(d) Power and fuel:

Electricity expenses in oil industry played a vital role. For the purpose of analysis any expenses related to electricity and for other fuel have been considered under this head.

Table 8
Power and fuel cost as percentage of sales

Year	2005-06	2006-07	2007-08	2008-09	2009-10	Average	S.D
ONGC	0.407	0.563	0.528	0.423	0.432	0.4706	0.018
BPCL	0.063	0.069	0.056	0.050	0.197	0.087	0.052
HPCL	0.026	0.016	0.016	0.015	0.231	0.0608	0.036
IOC	0.125	0.135	0.145	0.146	0.137	0.1375	0.1361
Average	0.621	0.783	0.745	0.634	0.997		

Power and fuel cost as percentages of sales presented in Table 8. The range of power and fuel cost in selected units was between 0.4706 to 0.0608 percent. The average power and fuel cost of the study was 0.1889 percent. While the average power and fuel cost of HPCL (0.0608) and BPCL (0.087 percent) were lower than the average of study. The standard deviation of ONGC indicates high fluctuation in cost, while standard deviation of HPCL (0.0608) indicates a low fluctuation is cost.

Table 8
Power and fuel cost and ANOVA test

Source of variation	Sum of squares	df	ms	f	Fcrit
Between Groups	0.768	4	0.192	1.729	3.29
With in Groups	1.331	12	0.111		

Ho = There is no significant difference in percentage of power and fuel cost in companies.

ANOVA table indicate there is no significance difference in power and fuel cost among all the units under study because calculated value of F is lower than table value of F at 5% level of significance.

(e) Depreciation

In the cost structure of Indian oil industry the absolute figure of depreciation is very high. So the amount of depreciation of all fixed assets is considered under this head in present study.

Table
Depreciation cost as percentage of sales

Year	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	Average	S.D
ONGC	8.028	5.786	6.519	6.805	8.701	7.1678	5.552
BPC	1.017	0.936	0.996	0.802	1.033	0.9568	0.036
HPC	0.964	0.785	0.816	0.785	1.085	0.887	0.07
IOC	1.259	1.196	1.095	0.938	1.198	1.1372	0.067
AVERAGE	2.817	2.176	2.357	2.333	3.004	2.5372	

Depreciation cost as percentage of sales presented in Table 10 the average depreciation cost of ONGC, BPC, HPC and IOC were 7.1678 percent, 0.9568 percent, 0.887 percent and 1.1372 percent respectively. The table data and standard deviation indicates a low fluctuation in the cost in all units under study.

Table 10
Depreciation cost and ANOVA test
ANOVA

Source of variation	Sum of squares	Df	MS	F	F unit
Between groups	2.006	4	0.5015	0.042	3.26
Within groups	143.15	12	11.926		

Depreciation cost and ANOVA test:

Ho= There is no significant difference in percentage of depreciation cost in companies.

Table 11 indicates that calculated value of F is lower than table value so, null hypothesis is accepted. It means there is no significant difference in the depreciation cost among all units under study.

Administrative, selling, Distribution and other expenses

The expenses relating to office and general administration of companies like the director's fees, auditors remuneration, legal expenses, rent, rates, taxes and deprecation of office building and equipment have been grouped as administrative and other expenses. Selling and distribution expenses include the amount spent during the course of sales, boosting the sales and delivery of goods sold have been termed as selling and distribution expenses. The expenses relating to advertisement, commission to selling agents, and other in centive and service change, delivery changes, freight and transportation etc, are covered under the above head.

Table 12
Administrative, selling, Distribution & other Expenses as percentage of sales

Year	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	Average	S.D
ONGC	2.142	0.911	2.238	5.406	20.407	6.2208	75.544
BPC	3.430	3.092	3.024	2.735	4.583	3.3728	2.076
HPC	4.312	3.969	3.065	2.871	3.704	3.5842	0.96
IOC	4.747	4.183	4.336	3.749	2.610	3.925	2.671
AVERAGE	3.658	3.039	3.166	14.761	8.826	4.2757	
TOTAL	14.631	12.155	12.663	14.761	31.304		81.251

Table 12 reveals administrative, selling, distribution and miscellaneous expenses as percentage of sales. The average ratio of 3.3728 percent, 3.5842 percent, 3.925 percent which were lower than the average ratio of industry. While ONGC ratio was 6.2208 per cent highest among all units under study.

Table 13
Administrative, selling, distribution and other expenses ages and salaries cost and ANOVA test

Source of variation	Sum of squares	df	MS	F	F unit
Between groups	962.736	4	240.684	4.325	3.26
Within groups	667.784	12	55.649		

Ho= There is no significant difference in percentage of administrative, selling, Distribution and other expenses cost in companies.

Table shows that there is no significant difference in administrative, selling, and Distribution and other expenses of units under study because of the acceptance of null hypothesis.

(f) Financial changes.

Indian oil industry structure indicates that most of the companies satisfied their financial needs through equity, preference, loans and debentures. So the portion of financial changes in the cost structure of industry was played vital role in the performance of the companies. Expenses related to interest and other financial changes have been considered under this head for the purpose of the study.

Table 14
Financial Changes cost as percentage of sales

Year	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	Average	S.D
ONGC	7.748	6.545	8.352	13.258	18.716	10.924	102.039
BPC	0.328	0.494	0.610	1.616	0.841	0.778	1.018
HPC	0.225	0.475	0.761	1.668	0.848	0.795	1.193
IOC	0.569	0.691	0.643	1.309	0.584	0.759	0.387
AVERAGE	0.218	2.051	2.592	4.463	5.247	3.314	

Table 14 reveals the ratio of financial charges to total sales oil industry of India. The ratio showed a fluctuating trend. The average ratio of study was 3.314 per cent whereas the ratio of ONGC and HPCL were higher than average ratio of study. The standard deviation of ONGC indicates high fluctuations.

Financial Charges cost and ANOVA test:

Ho = There is no significant difference in percentage of Financial charges cost in companies.

Table 13
Administrative, selling, distribution and other expenses
ages and salaries cost and ANOVA test

Source of variation	Sum of squares	df	MS	F	F unit
Between groups	33.502	4	8.375	0.260	3.26
Within groups	386.058	12	32.172		
Total	419.56	16			

Table 15 indicates that critical value of F is higher than calculated value of F, meaning null hypothesis and alternative hypothesis are accepted. Result of Anova indicates there is no significant difference in financial charges cost among all units under study.

Conclusion

The above analysis indicates that the most influencing factor in cost structure of oil industry is power and fuel cost. The portion of this cost in total cost was 21 per cent, where the portion of raw material cost and selling distribution and other cost in total cost structure were per cent and percent. So it can be concluded that to improve the profitability of units there is a need to give proper attention towards this cost by corporate. The closer view of analysis showed that the average cost in almost all element of was closer to the average of industry. The sales trend of also indicates the highest trend among all units under study, where the ANOVA result indicates there is a uniform cost structure in all the units under study.

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