# ANALYSIS OF A COST STRUCTURE OF TATA POWER AND JSW ENERGY

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## Abstract

Cost-benefit analysis is a critical topic in today's business world. Cost analysis is required for cost comparisons across time to regulate and plan costs. The goal of this research is to look into the cost structures of Tata Power and JSW Energy. The mean, standard deviation, covariance, and ANOVA were used to examine the cost structure of each company. Some of the major cost components are taken for this research, like the cost of power purchased, cost of fuel, and employee benefit expenses. Each cost component has been expressed as a percentage of total sales. The study reveals that the cost structure of sample companies was not uniform and varies from company to company. The result shows the difference in the cost component to net sales in the selected companies was significant.

**Keywords:** Cost-benefit analysis, cost of production, cost structure, cost component.

## Introduction

Power is among the most critical component of infrastructure, crucial for the economic growth and welfare of nations. The existence and development of adequate infrastructure are essential for the sustained growth of the Indian economy.

India’s power sector is one of the most diversified in the world. Sources of power generation range from conventional sources such as coal, lignite, natural gas, oil, hydro and nuclear power to viable non-conventional sources such as wind, solar, and agricultural and

domestic waste. Electricity demand in the country has increased rapidly and is expected to rise further in the years to come. To meet the increasing demand for electricity in the country, massive addition to the installed generating capacity is required.

In May 2018, India ranked fourth in the Asia Pacific region out of 25 nations on an index that measured their overall power. India was ranked fourth in wind power, fifth in solar power, and fifth in renewable power installed capacity as of 2018. India ranked sixth in the list of countries to make significant investments in clean energy at US$ 90 billion.

## Literature Review

**G. Kalaiselvi & Dr. J. Shunmugananda Vadivel (2015): Cost Structure Analysis of Selected Oil and Natural Gas Companies in India:** From this analysis, researchers have concluded that the cost structure of sample companies was not uniform and vary company to company. The mean ratio of raw material cost as a percentage of net sales in BPCL, power and fuel cost as a percentage of net sales in GAIL, and wages and salaries cost as a percentage of net sales in OIL were above the industry average. Hence, these companies should give proper attention to reducing the cost by adopting the technology of the companies where the cost of production is low.

**Dr.J.P.Kumar & Mrs.S.Vimala (2016): A Study on Impact of Cost Structure on Financial Performance of Selected Pharmaceutical Companies in India:** From this analysis, it is concluded that the cost structures were not identical and diverse from company to the company among the sample companies during the study period. The mean ratio of raw material cost, power and fuel cost, and financial charges as a percentage of net sales in AURO PHARMA as a percentage of net sales in AURO PHARMA was very high. The percentage of employee wages costs, selling and administration cost, and depreciation cost as a percentage of net sales in DR REDDY, was above the industry average. Manufacturing expenses as a percentage of net sales in SUN PHARMA were above the industry average. Hence, these companies should take at most effective to cut down the cost by adopting new strategies and technologies which reduce the cost of production. Finally, this study concludes that the expenses of AURO PHARMA and

DR REDDY were very high and the management should take necessary steps to reduce the cost by application of effective cost control techniques and minimization of material wastage.

## Research Methodology

**The objective of the study:**

The main objective of the study is to analyze the cost elements of selected private power sector companies of India.

**The hypothesis of the study:**

H0 = There is no significant difference in the ratio of cost of power purchased to total sales between selected companies during the study period.

H0 = There is no significant difference in the ratio of cost of fuel sales to total sales between selected companies during the study period.

H0 = There is no significant difference in the ratio of employee benefit expenses to total sales between selected companies during the study period.

H0 = There is no significant difference in the ratio of finance cost to total sales between selected companies during the study period.

H0 = There is no significant difference in the ratio of other expenses to total sales between selected companies during the study period.

**The scope of the present study:**

Two private power sector companies have been taken for the study during the period from 2016-17 to 2020-21.

**Sample of the study:**

The universe of the study is all power sector companies in India. Two private sector power companies have been selected on the base of a convenient sampling method. These companies are:

(1) Tata Power

(2) JSW Energy

**Period of the study:**

The researcher has undertaken the study for 05 years from 2016-17 to 2020-21.

**Source of data:**

This study mainly depends on the secondary data, the researcher collected the data from Annual reports of the companies' websites.

**Tools and techniques:**

The following are the tools used to analyze the collected data.

- Arithmetic Mean ($\bar{X}$)
- Standard Deviation (S.D.)
- Co-efficient of Variation (C.V.)
- Analysis of Variance (ANOVA)

**Elements of cost structure**

1. Cost of Power purchased to total sales ratio
2. Cost of Fuel to total sales ratio
3. Employee Benefit Expenses to total sales ratio
4. Finance Costs to total sales ratio
5. Other Expenses to total sales ratio

## Analysis of various components of cost structure

**Table 1. Ratio of cost of power purchased to total sales**

| Year | Tata Power | JSW Energy |
|---|---|---|
| 2016-17 | 6.74 | 0.83 |
| 2017-18 | 5.47 | 0 |
| 2018-19 | 5.54 | 0.27 |
| 2019-20 | 5.92 | 0 |
| 2020-21 | 8.16 | 0 |
| **Mean** | 6.37 | 0.22 |
| **S.D.** | 1.12 | 0.36 |
| **C.V.** | 17.65 | 163.35 |

Source: Secondary data

**Table 1 (A)**

| ANOVA-TEST (ONE-WAY) | | | | | |
|---|---|---|---|---|---|
| **Source of Variation** | **SS** | **df** | **MS** | **F** | **F crit** |
| Between Groups | 94.33954 | 1 | 94.33954 | 135.4552 | 5.317655 |
| Within Groups | 5.571705 | 8 | 0.696463 | | |
| Total | 99.91124 | 9 | | | |

Source: Computed (Level of Significance 5%)

The average cost of power purchased by Tata power was high as compared to JSW Energy. Variation was high in JSW Energy as compared to Tata power. From ANOVA analysis, F calculated value is greater than the table value so the null hypothesis is rejected. This shows that there is a significant difference in the ratio of cost of power purchased to total sales between selected companies during the study period.

**Table 2. Ratio of cost of fuel to total sales**

| Year | Tata Power | JSW Energy |
|---|---|---|
| 2016-17 | 33.84 | 67.34 |
| 2017-18 | 36.84 | 74.77 |
| 2018-19 | 38.38 | 77.36 |
| 2019-20 | 35.79 | 71.27 |
| 2020-21 | 35.37 | 61.37 |
| **Mean** | 36.04 | 70.42 |
| **S.D.** | 1.69 | 6.31 |
| **C.V.** | 4.70 | 8.96 |

Source: Secondary data

**Table 2 (A)**

| ANOVA-TEST (ONE-WAY) | | | | | |
|---|---|---|---|---|---|
| **Source of Variation** | **SS** | **df** | **MS** | **F** | **F crit** |
| Between Groups | 2954.358 | 1 | 2954.358 | 138.432 | 5.317655 |
| Within Groups | 170.7327 | 8 | 21.34159 | | |
| Total | 3125.091 | 9 | | | |

Source: Computed (Level of Significance 5%)

The average cost of fuel to total sales of JSW Energy was high as compared to Tata power. Variation was high in JSW Energy as compared to Tata power. From ANOVA analysis, F calculated value is greater than the table value so the null hypothesis is rejected. This shows that there is a significant difference in the ratio of cost of fuel sales to total sales between selected companies during the study period.

**Table 3. Ratio of employee benefit expenses to total sales**

| Year | Tata Power | JSW Energy |
|---|---|---|
| 2016-17 | 9.11 | 2.97 |
| 2017-18 | 7.92 | 2.54 |
| 2018-19 | 7.72 | 2.56 |
| 2019-20 | 7.90 | 2.75 |
| 2020-21 | 10.50 | 3.88 |
| **Mean** | 8.63 | 2.94 |
| **S.D.** | 1.18 | 0.55 |
| **C.V.** | 13.70 | 18.79 |

Source: Secondary data

**Table 3 (A)**

| ANOVA-TEST(ONE-WAY) | | | | | |
|---|---|---|---|---|---|
| **Source of Variation** | **SS** | **df** | **MS** | **F** | **F crit** |
| Between Groups | 81.0135 | 1 | 81.0135 | 95.10904 | 5.317655 |
| Within Groups | 6.814368 | 8 | 0.851796 | | |
| Total | 87.82787 | 9 | | | |

Source: Computed (Level of Significance 5%)

The average employee benefit expenses to total sales of Tata power were high as compared to JSW Energy. Variation was high in JSW Energy as compared to Tata power. From ANOVA analysis, F calculated value is greater than the table value so the null hypothesis is rejected. This shows that there is a significant difference in the ratio of employee benefit expenses to total sales between selected companies during the study period.

**Table 4. Ratio of finance cost to total sales**

| Year | Tata Power | JSW Energy |
|---|---|---|
| 2016-17 | 19.05 | 13.19 |
| 2017-18 | 18.99 | 11.31 |
| 2018-19 | 18.17 | 8.05 |
| 2019-20 | 19.55 | 7.46 |
| 2020-21 | 24.57 | 7.25 |
| **Mean** | 20.07 | 9.45 |
| **S.D.** | 2.57 | 2.65 |
| **C.V.** | 12.79 | 28.09 |

Source: Secondary data

**Table 4 (A)**

| ANOVA-TEST (ONE-WAY) | | | | | |
|---|---|---|---|---|---|
| **Source of Variation** | **SS** | **df** | **MS** | **F** | **F crit** |
| Between Groups | 281.7287 | 1 | 281.7287 | 41.31692 | 5.317655 |
| Within Groups | 54.54979 | 8 | 6.818724 | | |
| Total | 336.2785 | 9 | | | |

Source: Computed (Level of Significance 5%)

The average finance cost to total sales of Tata power was high as compared to JSW Energy. Variation was high in JSW Energy as compared to Tata power. From ANOVA analysis, F calculated value is greater than the table value so the null hypothesis is rejected. This shows that there is a significant difference in the ratio of finance cost to total sales between selected companies during the study period.

**Table 5. Ratio of other expenses to total sales**

| Year | Tata Power | JSW Energy |
|---|---|---|
| 2016-17 | 14.61 | 6.45 |
| 2017-18 | 11.64 | 5.91 |
| 2018-19 | 9.71 | 4.09 |
| 2019-20 | 9.79 | 5.26 |
| 2020-21 | 12.39 | 6.68 |
| **Mean** | 11.63 | 5.68 |
| **S.D.** | 2.03 | 1.04 |
| **C.V.** | 17.47 | 18.37 |

Source: Secondary data

**Table 5 (A)**

| ANOVA-TEST (ONE-WAY) | | | | | |
|---|---|---|---|---|---|
| **Source of Variation** | **SS** | **df** | **MS** | **F** | **F crit** |
| Between Groups | 88.5919 | 1 | 88.5919 | 33.96704 | 5.317655 |
| Within Groups | 20.86538 | 8 | 2.608172 | | |
| Total | 109.4573 | 9 | | | |

Source: Computed (Level of Significance 5%)

The average other expenses to total sales of Tata power were high as compared to JSW Energy. Variation was high in Tata power as compared to JSW Energy. From ANOVA analysis, F calculated value is greater than the table value so the null hypothesis is rejected. This shows that there is a significant difference in the ratio of other expenses to total sales between selected companies during the study period.

## Limitation of the study

- The study period is restricted to 2016-17 to 2020-21 only.
- This study is based on secondary data taken mainly from annual reports and money control.

- The present study is mainly based on ratio analysis, which has its limitations.

## Conclusion

From the above analysis, it is concluded that the cost structure of selected sample companies was not identical and vary from company to company. The average ratio of cost of power purchased, employee benefit expenses to total sales, finance cost to total sales, and other expenses to total sales of Tata power was high as compared to JSW Energy. So Tata Power Company has to pay more attention to adopting technology to reduction of costs. The average ratio of cost of fuel to total sales of JSW Energy was high as compared to Tata power.

## References

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## Websites

www.tatapower.com

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