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AN EMPIRICAL STUDY OF CAPITAL STRUCTURING AND PROFITABILITY RATIOS OF SELECTED POWER COMPANIES IN INDIA

Dr. Anshu Gupta* Prakash Chandra**

*Assistant Professor, Department of Commerce, Deen Dayal Upadhyaya Gorakhpur University, U.P.

**Research Scholar, Department of Commerce, Deen Dayal Upadhyaya Gorakhpur University, U.P.

ABSTRACT:

India's economy is expanding quickly, and its long-term prosperity depends on a stable power supply. The power industry is one of the most varied in the world, and our nation is the world's sixth-largest energy consumer One major power source that has a big impact on social and economic development is electricity. Any nation's development depends on the power industry, and the amount of electricity consumed indicates how advanced a country is. With a significant share of its installed capacity coming from renewable energy, India is the world's third-largest producer of energy. In this study, the financial performance and capital structure of the power sector played a crucial role which has been analyzed with the profitability of selected Indian power companies. The purpose of the study is to understand and explore the concept of capital structure and its relationship with the financial performance and profitability ratios of selected power companies in India. Descriptive and quantitative analysis has been done in this study. The study is based on secondary data which is collected from the annual reports of the selected companies and money controls The statistical tools that have been used are ANOVA and financial ratio to check the financial performance of the power sector companies.

Keywords: Power sector, India, capital structuring, financial performance, profitability ratios

INTRODUCTION:

The economy of India is expanding at the quickest rate in the world, and a reliable supply of energy is critical to the country's long-term success. Electricity is one of the sources of energy that is utilized the most frequently and has an impact on the social and economic growth of a nation. Any nation's economic expansion, human advancement, and overall quality of life for its population can be directly attributed to the Power Sector's contributions. This is true regardless of which country is being considered. The amount of electricity that a country uses is one of the most significant indicators of the degree of development that the country has reached. Power is one of the most important aspects of the nation's infrastructure, and its reliability is essential to the country's overall health and prosperity. As of April 2022, India had an installed power capacity of 401.01 gigawatts (GW), making it the third-largest producer and user of energy in the whole globe (Ministry of Power govt. of India). The installed capacity of renewable energy sources in India was at 158.12 gigawatts (GW) as of April 2022 (Ministry of Power govt. of India). This figure represented 39.43% of the total installed power capacity. It is predicted that solar energy contributes 55.34 gigawatts, followed by wind power with 40.53 gigawatts, biomass with 10.68 gigawatts, small hydropower with 4.85 gigawatts, and hydropower with 46.72 gigawatts.

ASSOCIATION BETWEEN CAPITAL STRUCTURE AND FINANCIAL PERFORMANCE

Capital Structure is the term used to describe the many methods by which a company might finance its assets. These methods can include a mix of stock, debt, and securities. In the business sector, the composition or' structure' of a company's obligations is referred to as the company's capital structure. Keeping in mind the primary purpose of financial management, which is to maximise the wealth of shareholders, all choices about financing need to be made in consideration of this purpose. The significance of the idea of capital structure can be traced back to the correlation that exists between the amount of financial leverage and the amount of profits that are made accessible to equity owners. When favourable financial leverage is taken into consideration, a rise in sales, and especially an increase in profits before interest and tax (EBIT), will have the effect of magnifying the earnings per share (EPS). Therefore, the company ought to adopt such a capital structure or financial leverage that would maximise the predicted EPS. This may be accomplished by using either leverage. The choices that are made regarding the capital structure, the financial leverage, and the financing mix should all be based on the fundamental purpose of financial management, which is either the goal of maximising the wealth of shareholders or the goal of satisfying the basic objective of financial management.

The method in which a corporation funds itself by mixing long term debt, short term debt, and equity is referred to as its capital structure. Decisions regarding a company's capital structure are essential in light of the fact that businesses must continually choose among several investment options in order to maintain and expand their operations. Debt and equity are the two primary types of finance, and each kind is connected with a unique combination of degrees of risk, reward, and control. The act of obtaining financial support from a third party under the terms of an agreement to repay the borrowed sum in addition to an established rate of interest is referred to as incurring debt. Debt is a reasonably inexpensive type of financing that not only allows the ownership of the firm to be preserved but also offers the benefit of a tax shield for the interest that is accrued. Debt inherently introduces risk into the company and diminishes its ability to stay ahead of the

competition. The second option is known as equity financing, and it entails obtaining financial backing from investors or business partners in return for a portion of the company's ownership.

However, the investors will be engaged in the decision making of the company, which is the one and only downside of equity financing. On the other hand, it is less hazardous since one does not have to pay it back. When making choices on capital structure, the purpose is to make efficient use of a variety of sources of funding. Finding the optimal capital structure, which may include selecting either debt or equity, is intended to maximise the value of owners. The cost of capital has a negative relationship with the value of the company, hence it is important that it be kept as low as possible. When choosing their sources of financing, companies should do it in such a manner as to minimise their total cost of capital and, thus, maximise the value of their businesses. When compared to the returns offered by an all-equity company, the returns offered by a company with the optimum capital structure are superior than those offered by companies with other types of capital structures. Because of this, it is very vital for a company to be aware of where it may get the necessary funding. The observed capital structures of the different companies all displayed a high degree of diversity from one another. Researchers in this field have attempted, both theoretically and empirically, to discover solutions to concerns such as whether companies ought to look for debt or equity funding at the time of necessity and how much debt and equity the business ought to take on. When it comes to the process of capital raising, does the timing of the markets have a significant impact at all? and a great many more. Because of this, many different hypotheses on the structure of capital have been presented and put to the test. A significant portion of the published work in the field of finance over the course of the last four decades has been on the many theories that attempt to explain just precisely what factors are significant in deciding capital structure. The paper provides a comprehensive overview of the recent developments in the field of capital structure choices, focusing on the positive and negative effects that various capital structures have had, respectively, on the financial performance of companies and the wealth of their owners.

REVIEW OF THE LITERATURE

In his study, **Khan (2017)** examined the effect that liquidity, solvency, and the effectiveness of asset management had on the profitability of NTPC Ltd. during the period of time spanning 2006-07 to 2015-16. The company's annual reports were mined for the pertinent information, which was obtained. This research made use of a number of different financial statistics, including return on capital employed, return on assets, return on equity, current ratio, debt-equity ratio, inventory turnover ratio, and many more. Using a method called multiple regression, the researcher came to the conclusion that the current ratio and the inventory turnover ratio both had a substantial and favorable influence on the profitability ratios of the firm during the course of the time that was the subject of the study.

In their study**, Rashid and Manivanan (2017)** examined NTPC Ltd.'s liquidity as well as the company's profitability from 2011-12 all the way through 2015-16. The study analyzed several liquidity ratios, such as the current ratio, the quick ratio, and the cash position ratio. Additionally, the study analyzed various profitability ratios, such as the gross profit ratio, the net profit ratio, the net operating profit ratio, the return on investment ratio, and the return on capital employed ratio. During the time period covered by the investigation, it was discovered that the company's profitability increased to a respectable level, despite the fact that its liquidity had worsened.

Through the use of the multiple regression approach, **Mishra and Shukla (2017)** were able to determine the extent to which NTPC Ltd.'s liquidity, solvency, and asset management efficiency influenced the company's profitability from 2010-2011 to 2015-2016. Their research covered the period of time from 2010-2011 to 2015-2016. According to the findings of the study, neither NTPC Ltd.'s current ratio nor its inventory turnover ratio had a significantly positive effect on the company's profitability.

In their analysis of the economic performance of the power industry in Tamil Nadu, India, **Angappapllai and Kandasamy (2017)** focused primarily on the cost of production and the price of subsidized energy. This research made use of the data collected by the Tamil Nadu Electricity Board from 1986–1987 all the way up to 2013–2014. In order to do a comparison analysis, the research period was split into two parts: the first covered the years 1986–1987 through 1997–1998, and the second covered the years 1998–1999 through 2013–2014. The researchers used straightforward methods from the fields of mathematics and statistics. According to the findings of the study, the firm was able to keep a decent level of profitability throughout the first half of the study period; nevertheless, during the second half of the study period, the company, on average, suffered a massive loss.

In his study, **Narang (2018)** sought to create a comparison between the financial performance of NTPC Ltd. during the pre-disinvestment period and that of the post-disinvestment period. This comparison was made between the pre-disinvestment period and the post-disinvestment period. This study made use of data spanning from the academic years 1997-1998 to 2010-2011. The years 1997-1998 through 2002-2003 were regarded to be part of the "pre-disinvestment period," whereas the years 2003-2004 through 2010-2011 were deemed to be part of the "post-disinvestment period." Measures of profitability included operating profit margin, net profit margin, return on total assets, return on capital employed, and return on net worth. Indicators of efficient asset management included total assets turnover ratio, fixed assets turnover ratio, current assets turnover ratio, and inventory turnover ratio. According to the findings of the study, the profitability of the business improved throughout the period after it had stopped making certain investments.

Saha (2018) performed a comparative analysis of the financial performance of several units that were chosen from the Indian power sector for his research. The researcher utilized the Capitaline database maintained by Capital Market Publishers (I) Ltd. to compile information on NTPC Ltd., NHPC Ltd., Tata Power, and Reliance Infra for the years 2001-02 through 2015-16. The current ratio and the acid test ratio were utilized to evaluate the level of liquidity; the return on capital employed and the return on owners' equity were utilized to evaluate the level of profitability; and the working capital turnover ratio and the fixed assets turnover ratio were utilized to evaluate the level of efficiency with which the selected companies managed their assets. At the relevant points during the research, statistical methods such as one-way ANOVA and statistical tests such as the F test, test of homogeneity of variances, Welch's and Brown-Forsythe's robust test of equality of means, etc. were utilized. The study discovered that all of the ratios chosen for the study were considerably different for the firms that were being analyzed, and in most of the situations, NTPC Ltd. demonstrated itself to be the top performer in the Indian power industry throughout the period that was being analyzed.

OBJECTIVES OF THE STUDY:

1. To understand and explore the concept of capital structure and its relationship with financial performance power sector companies.
2. To study the profitability ratios of selected power companies in India.

HYPOTHESES

H0: There is no significant difference in Gross profit margin between selected Power companies.

H0: There is no significant difference in Operating profit margin between selected Power companies.

H0: There is no significant difference in the Return on capital employed Ratio between selected Power companies.

H0: There is no significant difference in Net profit margin between selected Power companies.

H0: There is no significant difference in the Asset Turnover ratio between selected Power companies.

RESEARCH METHODOLOGY

The research methodology adopted descriptive and quantitative, the study is based on secondary data which is collected from annual reports of selected companies, money control, Angle One and grow. The study incorporates statistical tools financial ratios and ANOVA analysis.

ANALYSIS OF THE STUDY:

TABLE –1 GROSS PROFIT MARGIN (In percentage %)

POWER SECTOR										
YEAR	PUBLIC (GOVERNMENT) POWER SECTOR COMPANY					PRIVATE POWER SECTOR COMPANY				
	NTPC	POWER GRID	NHPC	SJVN	NLC INDIA	TATA POWER	TORRENT POWER	RELIANCE POWER LTD	ADANI POWER	JSW ENERGY
2013-14	19.45	45.60	63.41	1.95	40.71	6.68	21.33	69.82	0.00	3.47
2014-15	23.89	43.67	61.21	3.86	37.23	8.67	7.65	70.42	-26.81	13.27
2015-16	18.36	40.83	40.80	2.73	36.56	7.50	3.16	71.42	-8.68	12.17
2016-17	12.57	36.50	44.43	4.31	39.68	4.50	7.10	72.66	-6.89	20.17
2017-18	14.26	36.10	40.26	4.34	20.45	8.06	11.00	68.32	1.46	20.95
2018-19	15.60	36.24	44.20	0.80	28.27	11.08	5.87	69.83	-27.68	10.73
2019-20	13.71	44.47	39.19	4.80	25.42	11.64	12.16	73.81	-10.23	4.81
2020-21	14.61	25.72	46.24	8.08	25.94	17.10	9.60	67.47	-4.08	9.46
2021-22	14.59	38.24	32.59	4.85	22.72	14.51	3.48	72.73	8.55	13.12

2022-23	13.27	38.56	46.52	3.42	22.89	15.04	12.74	87.76	8.72	15.62
AVERAGE	16.03	38.59	45.88	3.91	29.98	10.47	9.40	72.42	-6.56	12.37
MINIMUM	12.57	25.72	32.59	0.80	20.45	4.50	3.16	67.47	-27.68	3.47
MAXIMUM	23.89	45.60	63.41	8.08	40.71	17.10	21.30	87.76	8.72	20.95

(Source: Annual Reports of selected Power companies in India during the study period from 2013-14 to 2022-23

Above Table –1 shows that Gross Profit margin of selected top 10 companies during the study period from 2013-14 to 2022-23. By interpreting the above Table and Figure shows that Gross profit margin of reliance power Ltd have higher among all other selected companies. NTPC Ltd have highest Gross profit margin ratio is 23.89 in the year 2014-15 while lowest in the year 2016-17 which is 12.57. Power Grid Ltd have higher Gross profit margin is 45.60 in the year 2013-14 while lowest in the year 2020-21 which is 25.72. NHPC Ltd have higher Gross profit margin is 63.41 in the year 2013-14 while lower in the year 2021-22 which is 32.59. SJVN Ltd have highest Gross profit margin is 8.08 in the year 2020-21 while lowest in the year 2018-19 which is 0.8. NLC India Ltd have highest Gross profit margin is 40.71 in the year 2013-14 while lowest in the year 2017-18 which is 20.45. Tata power Ltd have higher Gross profit margin is 17.10 in the year 2020-21 while lower in the year 2016-17 which is 4.50. Torrent Power Ltd have highest Gross profit margin is 21.33 in the year 2013-14 while lowest in the year 2015-16 which is 3.16. Reliance power Ltd have higher Gross profit margin is 87.76 in the year 2022-23 while lower in the year 2020-21 which is 67.47. Adani Power Ltd have higher Gross profit margin is 8.72 in the year 2022-23 while lower in the year 2018-19 which is -27.68. JSW Energy Ltd have highest Gross profit margin is 20.95 in the year 2017-18 while lower in the year 2013-14 which is 3.47. Reliance power Ltd has the highest gross profit margin, which helps in measuring the company's efficiency in generating a profit after the manufacturing and sales processes. The company intends to increase its gross profit margin. A higher ratio indicates that the company is more efficient in its production. In basic terms, it means that the company has efficient management, low-cost production, and higher sales prices.

Anova: Single Factor

POWER SECTOR	SUMMARY				
	Groups	Count	Sum	Average	Variance
PUBLIC (GOVERNMENT) POWER SECTOR COMPANY	NTPC	10	160.31	16.031	12.3649
	POWER GRID	10	385.93	38.593	32.9321
	NHPC	10	458.85	45.885	91.8382
	SJVN	10	39.14	3.914	3.8397
	NLC INDIA	10	299.87	29.987	59.8796
PRIVATE POWER SECTOR COMPANY	TATA POWER	10	104.78	10.478	16.7530
	TORRENT POWER	10	94.09	9.409	28.7216
	RELIANCE POWER LTD	10	724.24	72.424	33.0202
	ADANI POWER	10	-65.64	-6.564	161.0537
	JSW ENERGY	10	123.77	12.377	32.6613

TABLE – 1.1 ANOVA SUMMARY

Source of Variation	SS	Df	MS	F	F crit
Between Groups	49990.09	9	5554.45	117.41	1.98
Within Groups	4257.58	90	47.30		
Total	54247.67	99			

Note: SS – Sum of Square df – Degree of Freedom MS – Mean Square F crit – F critical

The above ANOVA Summary calculated F value which is 117.41, with df being V1 = 9, and V2 = 90, which is higher than the table value of 1.98, since F value > F is critical the null hypothesis is rejected. It can be concluded that there is a significant difference in Gross profit margin between considered power companies.

TABLE –.2. OPERATING PROFIT MARGIN (In percentage %)

	POWER SECTOR									
	PUBLIC (GOVERNMENT) POWER SECTOR COMPANY					PRIVATE POWER SECTOR COMPANY				
YEAR	NTPC	POWER GRID	NHPC	SJVN	NLC INDIA	TATA POWER	TORRENT POWER	RELIANCE POWER LTD	ADANI POWER	JSW ENERGY
2013-14	0.21	0.46	0.62	0.09	0.39	0.07	0.23	0.70	0.05	0.06
2014-15	0.23	0.44	0.59	0.06	0.34	0.08	0.08	0.70	-0.27	0.16
2015-16	0.20	0.41	0.42	0.03	0.38	0.08	0.03	0.72	-0.09	0.17
2016-17	0.14	0.37	0.39	0.04	0.34	0.05	0.08	0.77	-0.07	0.21
2017-18	0.15	0.36	0.41	0.08	0.21	0.10	0.12	0.64	0.01	0.19
2018-19	0.16	0.37	0.45	0.04	0.30	0.11	0.06	0.77	-0.10	0.11

2019-20	0.14	0.34	0.38	0.02	0.25	0.11	0.12	0.73	-0.10	0.10
2020-21	0.16	0.33	0.37	0.02	0.14	0.09	0.10	0.63	-0.04	0.09
2021-22	0.16	0.34	0.39	0.05	0.21	0.09	0.11	0.66	-0.05	0.12
2022-23	0.16	0.42	0.52	0.10	0.26	0.19	0.13	0.86	5.12	0.37
AVERAGE	0.17	0.38	0.45	0.05	0.28	0.09	0.10	0.71	0.44	0.15
MINIMUM	0.14	0.33	0.37	0.02	0.14	0.05	0.03	0.63	-0.27	0.06
MAXIMUM	0.23	0.46	0.62	0.10	0.39	0.19	0.23	0.86	5.12	0.37

(Source: Annual Reports of selected Power companies in India during the study period from 2013-14 to 2022-23)

Above Table – 5.2.2 shows that Operating profit margin of selected top 10 companies during the study period from 2013-14 to 2022-23. By interpreting the above Table and Figure shows that Operating profit margin of RELIANCE POWER Ltd have higher among all other selected companies. NTPC Ltd have highest Operating profit margin is 0.23 in the year 2014-15 while lowest in the year 2016-17 which is 0.14. Power Grid Ltd have higher Operating profit margin is 0.46 in the year 2013-14 while lowest in the year 2020-21 which is 0.33. NHPC Ltd have higher Operating profit margin is 0.62 in the year 2013-14 while lower in the year 2020-21 which is 0.37. SJVN Ltd have highest Operating profit margin is 0.10 in the year 2022-23 while lowest in the year 2019-20 which is 0.02. NLC India Ltd have highest Operating profit margin is 0.39 in the year 2013-14 while lowest in the year 2020-21 which is 0.14. Tata power Ltd have higher Operating profit margin is 0.19 in the year 2022-23 while lower in the year 2016-17 which is 0.05. Torrent Power Ltd have highest Operating profit margin is 0.23 in the year 2013-14 while lowest in the year 2015-16 which is 0.03. Reliance power Ltd have higher Operating profit margin is 0.86 in the year 2022-23 while lower in the year 2020-21 which is 0.63.

Adani Power Ltd have higher Operating profit margin is 5.12 in the year 2022-23 while lower in the year 2014-15 which is -0.27. JSW Energy Ltd have highest Operating profit margin is 0.37 in the year 2022-23 while lower in the year 2013-14 which is 0.06. SJVN Ltd has the highest operating profit margin in this classification. Operating margins that are highly variable are a key indicator of business risk. By the same token, looking at a company past operating margins is a good way to see if its performance has improved. Better management controls, more efficient resource use, improved pricing, and more effective marketing can all help to increase the operating margin.

Anova: Single Factor

POWER SECTOR	SUMMARY				
	Groups	Count	Sum	Average	Variance
PUBLIC (GOVERNMENT) POWER SECTOR COMPANY	NTPC	10	1.71	0.171	0.0009
	POWER GRID	10	3.84	0.384	0.0020
	NHPC	10	4.54	0.454	0.0082
	SJVN	10	0.53	0.053	0.0008
	NLC INDIA	10	2.82	0.282	0.0067
PRIVATE POWER SECTOR COMPANY	TATA POWER	10	0.97	0.097	0.0014
	TORRENT POWER	10	1.06	0.106	0.0028
	RELIANCE POWER LTD	10	7.18	0.718	0.0048
	ADANI POWER	10	4.46	0.446	2.7042
	JSW ENERGY	10	1.58	0.158	0.0077

TABLE –2.1 ANOVA SUMMARY

Source of Variation	SS	Df	MS	F	F crit
Between Groups	4.02	9	0.44	1.63	1.98
Within Groups	24.65	90	0.27		
Total	28.67	99			

Note: SS – Sum of Square df – Degree of Freedom MS – Mean Square F crit – F critical

The above ANOVA Summary calculated the F value which is 1.63, with df being V1 = 9, and V2 = 90, which is lower than the table value of 1.98, since F value > F critical the null hypothesis is accepted. It can be concluded that there is a significant difference in Operating profit margin between considered power companies.

RETURN ON CAPITAL EMPLOYED

Return on Capital Employed evaluates the business's overall performance about the total investment made by bondholders and shareholders. This ratio is quite similar to ROE, but it is more complete because it also accounts for capital gains made by bondholders.

When evaluating the performance of businesses in capital-intensive industries like utilities and telecommunications, ROCE can be extremely helpful. This is so that ROCE may take into account both debt and equity, unlike other fundamentals like return on equity (ROE), which solely analyses profitability connected to a company's shareholders' equity. Financial performance analysis for businesses with high debt levels may be reduced by doing this.

TABLE –3 RETURN ON CAPITAL EMPLOYED (In Percentage %)

POWER SECTOR										
	PUBLIC (GOVERNMENT) POWER SECTOR COMPANY					PRIVATE POWER SECTOR COMPANY				
YEAR	NTPC	POWER GRID	NHPC	SJVN	NLC INDIA	TATA POWER	TORRENT POWER	RELIANCE POWER LTD	ADANI POWER	JSW ENERGY
2013-14	7.29	4.13	5.90	-2.24	7.61	2.07	10.9	10.36	-0.75	1.16
2014-15	8.28	4.41	4.78	-0.16	7.13	2.70	2.85	9.31	-5.85	5.91
2015-16	6.69	3.74	2.25	-0.52	6.93	2.49	0.62	9.13	-0.71	4.78
2016-17	5.43	3.65	4.43	0.30	6.96	0.92	2.13	12.30	-1.98	8.44
2017-18	5.73	4.00	4.50	1.52	0.37	2.13	5.04	9.55	1.10	6.54
2018-19	7.94	9.33	8.94	1.89	16.74	7.68	8.99	13.34	-13.46	2.62
2019-20	7.04	9.03	6.74	9.88	12.74	9.64	4.75	12.36	8.41	0.34
2020-21	7.54	9.87	6.94	8.52	6.52	8.86	10.11	13.47	9.39	9.54
2021-22	7.74	10.32	7.23	9.44	8.94	8.77	12.91	13.67	7.13	10.01
2022-23	7.84	11.20	7.71	6.80	8.09	9.01	12.42	13.67	12.3	8.64
AVERAGE	7.15	6.96	5.94	3.54	8.20	5.42	7.07	11.7	1.55	5.79
MINIMUM	5.43	3.65	2.25	-2.24	0.37	0.92	0.62	9.13	-13.46	0.34
MAXIMUM	8.28	11.20	8.94	9.88	16.74	9.64	12.91	13.67	12.30	10.01

(Source: Annual Reports of selected Power companies in India during the study period from 2013-14 to 2022-23)

Table 3 shows the Return on capital employed ratio of selected top 10 companies during the study period from 2013-14 to 2022-23. By interpreting the above Table and Figure the Return on capital employed ratio of Reliance Power Ltd is higher among all other selected companies. NTPC Ltd had the highest Return on capital employed ratio is 12.5 in the year 2010-11 while the lowest in the year 2013-14 which is 8.36. Power Grid Ltd have a higher Return on capital employed ratio is 7.56 in the year 2021-22 while lowest in the year 2010-11 which is 1.98. NHPC Ltd have a higher Return on capital employed ratio is 1.07 in the year 2021-22 while lower in the year 2010-11 which is 0.48. SJVN Ltd have highest Return on capital employed ratio is 151 in the year 2015-16 while lowest in the year 2010-11 which is 83.59. NLC India Ltd have highest Return on capital employed ratio is 8.37 in the year 2019- 20 while lowest in the year 2010-11 which is 2.9. TATA POWER Ltd have higher Return on capital employed ratio is 93.08 in the year 2017-18 while lower in the year 2010-11 which is 42.18. Torrent Power Ltd have highest Return on capital employed ratio is 28.75 in the year 2021-22 while lowest in the year 2010-11 which is 14.65. RELIANCE POWER Ltd have higher Return

on capital employed ratio is 0.79 in the year 2021-22 while lower in the year 2014-15 which is 0.47. Adani Power Ltd have higher Return on capital employed ratio is 7.71 in the year 2017-18 while lower in the year 2010-11 which is 1. JSW Energy Ltd have highest Return on capital employed ratio is 6.17 in the year 2017-18 while lower in the year 2010-11 which is 2.69.

Reliance Power Ltd has the highest return on capital employed ratio. A high ROCE value indicates that a larger portion of profits can be reinvested in the business to benefit shareholders. Reinvested capital is reinvested at a higher rate of return, contributing to higher earnings-per-share growth. A high ROCE is thus indicative of a successful growth company.

Anova: Single Factor

POWER SECTOR	SUMMARY				
	Groups	Count	Sum	Average	Variance
PUBLIC (GOVERNMENT) POWER SECTOR COMPANY	NTPC	10	71.52	7.152	0.8994
	POWER GRID	10	69.68	6.968	10.2482
	NHPC	10	59.42	5.942	3.8615
	SJVN	10	35.43	3.543	21.2573
	NLC INDIA	10	82.03	8.203	18.0975
PRIVATE POWER SECTOR COMPANY	TATA POWER	10	54.27	5.427	13.0155
	TORRENT POWER	10	70.74	7.074	20.4218
	RELIANCE POWER LTD	10	117.16	11.716	3.6791
	ADANI POWER	10	15.58	1.558	62.0382
	JSW ENERGY	10	57.98	5.798	12.2000

TABLE –3.1 ANOVA SUMMARY

Source of Variation	SS	Df	MS	F	F crit
Between Groups	659.41	9	73.26	4.42	1.98
Within Groups	1491.47	90	16.57		
Total	2150.88	99			

Note: SS – Sum of Square df – Degree of Freedom MS – Mean Square F crit – F critical

The above ANOVA Summary calculated F value which is 4.42, with df being V1 = 9, and V2 = 90, which higher than the table value of 1.98, since F value > F critical the null hypothesis is rejected. It can be concluded that there is significant difference in Return on capital employed ratio between considered power companies.

NET PROFIT MARGIN

The amount of net income or profit earned as a percentage of revenues is expressed as the profit margin, or generally net margin. It is the proportion of a company's or business segment's net profits to revenues. Although it can also be given in decimal form, net profit margin is frequently reported as a percentage. A company's net profit margin indicates how much of every dollar in revenue it receives is converted into profit. One of the most crucial indications of a company's financial condition is the net profit margin. A corporation may examine if existing procedures are effective and estimate earnings based on revenues by analyzing

changes in its net profit margin. Because organizations define their net profit margin as a percentage instead of a dollar number, the profitability of two or more enterprises of any size may be compared.

TABLE –4 NET PROFIT MARGIN (In percentage %)

YEAR	POWER SECTOR									
	PUBLIC (GOVERNMENT) POWER SECTOR COMPANY					PRIVATE POWER SECTOR COMPANY				
	NTPC	POWER GRID	NHPC	SJVN	NLC INDIA	TATA POWER	TORRENT POWER	RELIANCE POWER LTD	ADANI POWER	JSW ENERGY
2013-14	1.10	1.07	1.17	1.01	1.15	1.03	1.07	1.10	1.04	1.02
2014-15	1.10	1.04	1.22	1.01	1.10	1.02	1.04	1.14	1.02	1.02
2015-16	1.13	1.03	1.21	1.00	1.17	1.02	1.04	1.12	1.01	1.02
2016-17	1.12	1.03	1.13	1.01	1.11	1.02	1.07	1.15	1.01	1.02
2017-18	1.05	1.02	1.14	1.00	1.06	1.04	1.06	1.18	1.02	1.02
2018-19	1.06	1.02	1.20	1.02	1.06	1.07	1.0	1.26	1.03	1.02
2019-20	1.07	1.01	1.13	1.01	1.05	1.05	1.04	1.17	1.04	1.05
2020-21	1.13	1.01	1.10	1.02	1.09	1.04	1.0	1.10	1.10	1.04
2021-22	1.15	1.02	1.09	1.01	1.12	1.04	1.02	1.14	1.05	1.03
2022-23	1.16	1.08	1.25	5.32	1.62	1.71	1.04	1.29	62.95	2.47
AVERAGE	1.11	1.03	1.16	1.44	1.15	1.10	1.05	1.17	7.23	1.17
MINIMUM	1.05	1.01	1.09	1.00	1.05	1.02	1.02	1.10	1.01	1.02
MAXIMUM	1.16	1.08	1.25	5.32	1.62	1.71	1.07	1.29	62.95	2.47

(Source: Annual Reports of selected Power companies in India during the study period from 2013-14 to 2022-23)

Above Table – 5.2.4 shows the Net Profit Margin of the selected top 10 power companies during the study period from 2013-14 to 2022-23. By interpreting the above Table and Figure shows that the Net profit margin of Adani Power Ltd is higher among all other company. NTPC have highest net profit margin is 1.165 in the year 2022-23 while lowest in 2017-18 which is 1.051. Power Grid have highest net profit margin is 1.084 in the year 2022-23 while lowest in the year 2019-20 which is 1.016. NHPC have highest net profit margin is 1.258 in the year 2022-23 while lowest in the year 2021-22 which is 1.095. SJVN Ltd have highest net profit margin is 5.324 in the year 2022-23 while lowest in the year 2017-18 is 1.003. NLC India Ltd have highest net profit margin is 1.627 in the year 2022-23 while lowest in the year 2019-20 which is 1.051. TATA POWER Ltd. have highest net profit margin is 1.716 in the year 2022-23 while lowest in the year 2016-17 which is 1.022. Torrent Power Ltd. have highest net profit margin is 1.078 in the year 2016-17 while lowest in the year

2021-22 which is 1.026. RELIANCE POWER Ltd. have highest net profit margin is 1.294 I the year 2022-23 while lowest in the year 2020-21 which is 1.106. Adani Power Ltd. have highest net profit margin is 62.95 in the year 2022-23 while lowest in the year 2017-18 which is 1.024. JSW Energy Ltd. have highest net profit margin is 2.471 in the year 2022-23 while lowest in the year 2017-18 is 1.024. In this case, a higher net profit margin indicates that a company is more effective at converting sales into actual profit. The higher a company's net profit margin, the better it is at cost control. This ratio can be used to evaluate the overall performance of the company. When the net profit margin is higher, the company's ability to pay a profit share to shareholders and repay debts obtained from creditors improves. As a result, in terms of overall performance, Adani Power Ltd. has outperformed other companies.

Anova: Single Factor

POWER SECTOR	SUMMARY				
	Groups	Count	Sum	Average	Variance
PUBLIC (GOVERNMENT) POWER SECTOR COMPANY	NTPC	10	11.113	1.1113	0.0014
	POWER GRID	10	10.373	1.0373	0.0005
	NHPC	10	11.683	1.1683	0.0029
	SJVN	10	14.454	1.4454	1.8572
	NLC INDIA	10	11.567	1.1567	0.0288
PRIVATE POWER SECTOR COMPANY	TATA POWER	10	11.083	1.1083	0.0458
	TORRENT POWER	10	10.509	1.0509	0.0003
	RELIANCE POWER LTD	10	11.714	1.1714	0.0038
	ADANI POWER	10	72.311	7.2311	383.2841
	JSW ENERGY	10	11.759	1.1759	0.2071

TABLE –4.1 ANOVA SUMMARY

Source of Variation	SS	Df	MS	F	F crit
Between Groups	333.03	9	37.00	0.96	1.98
Within Groups	3468.89	90	38.54		
Total	3801.93	99			

Note: SS – Sum of Square df – Degree of Freedom MS – Mean Square F crit – F critical

The above ANOVA Summary calculated F value which is 0.96, with df being V1 = 9 and V2 = 90, which is less than the table value of 1.98, since F value < F critical the null hypothesis is accepted. It can be concluded that there is no significant difference in Net profit margin between selected power companies for the given period.

TABLE –5 ASSET TURNOVER RATIO (In percentage %)

YEAR	POWER SECTOR									
	PUBLIC (GOVERNMENT) POWER SECTOR COMPANY					PRIVATE POWER SECTOR COMPANY				
	NTPC	POWER GRID	NHPC	SJVN	NLC INDIA	TATA POWER	TORRENT POWER	RELIANCE POWER LTD	ADANI POWER	JSW ENERGY
2013-14	0.40	0.11	0.11	0.42	0.22	0.39	0.53	0.15	0.08	0.31
2014-15	0.36	0.12	0.10	0.49	0.24	0.35	0.46	0.13	0.12	0.43
2015-16	0.36	0.11	0.11	0.49	0.24	0.40	0.44	0.13	0.26	0.45
2016-17	0.33	0.11	0.12	0.45	0.23	0.39	0.50	0.19	0.32	0.48
2017-18	0.31	0.12	0.13	0.42	0.26	0.32	0.57	0.16	0.33	0.34
2018-19	0.31	0.13	0.14	0.33	0.33	0.21	0.47	0.16	0.31	0.29
2019-20	0.29	0.13	0.12	0.32	0.29	0.30	0.49	0.15	0.29	0.30
2020-21	0.26	0.14	0.13	0.35	0.21	0.31	0.52	0.17	0.35	0.35
2021-22	0.25	0.15	0.13	0.32	0.19	0.31	0.57	0.17	0.35	0.32
2022-23	0.24	0.15	0.11	0.06	0.13	0.12	0.50	0.14	0.00	0.11
AVERAGE	0.31	0.12	0.12	0.36	0.23	0.31	0.50	0.15	0.24	0.34
MINIMUM	0.24	0.11	0.10	0.06	0.13	0.12	0.44	0.13	0.00	0.11
MAXIMUM	0.40	0.15	0.14	0.49	0.33	0.40	0.57	0.19	0.35	0.48

(Source: Annual Reports of selected Power companies in India during the study period from 2013-14 to 2022-23)

Above Table – 5.2.5 shows the Asset Turnover ratio of selected top 10 companies during the study period from 2013-14 to 2022-23. By interpreting the above Table and Figure shows that Asset Turnover ratio of Torrent Power Ltd. is higher among all other company. NTPC have highest Asset turnover ratio is 0.400 in the year 2013-14 while lowest in the year 2022-23 which is 0.249. Power Grid Ltd. have highest Asset turnover ratio is 0.15 in the year 2022-23 while decreasing in 2013-14, 2015-16, and 2016-17. NHPC Ltd. have highest Asset turnover ratio is 0.14 in the year 2018-19 while lowest in the year 2013-14 which is 0.1. SJVN have highest Asset turnover ratio is 0.499 in the year 2015-16 while lowest in the year 2022-23 which is 0.063. NLC India Ltd. have highest Asset turnover ratio is 0.334 in the year 2018-19 while lowest in 2022-23 which is 0.134. TATA POWER Ltd. have increase Asset turnover ratio in the year 2015-16 which is 0.403 while decreasing in the year 2022-23 at 0.128. Torrent power Ltd. have highest Asset turnover ratio is 0.573 in the year 2017-18 while lowest in the year 2015-16 which is 0.446. RELIANCE POWER Ltd. have highest Asset turnover ratio is 0.193 in the year 2016-17 while lowest in the year 2014-15 which is 0.135.

Adani power Ltd. have highest Asset turnover ratio is 0.352 in the year 2021-22 while lowest in the year 2022-23 which is 0.006. JSW Energy Ltd. have highest Asset turnover ratio is 0.483 in the year 2016-17 while lowest in the year 2022-23 which is 0.110. In this case, a higher asset turnover ratio indicates that the company is more efficient in generating revenue from assets. It shows that the company is productive and generates little waste, as well as that your assets are still valuable and do not need to be replaced. A lower asset turnover ratio indicates that a company is not particularly efficient in generating revenue from its assets. So, according to the above table and figure, Torrent Power Ltd. has the highest asset turnover ratio, indicating that this company is generating more revenue by utilizing its efficient assets.

Anova: Single Factor

POWER SECTOR	SUMMARY				
	Groups	Count	Sum	Average	Variance
PUBLIC (GOVERNMENT) POWER SECTOR COMPANY	NTPC	10	3.156	0.3156	0.0025
	POWER GRID	10	1.27	0.127	0.0002
	NHPC	10	1.242	0.1242	0.0001
	SJVN	10	3.685	0.3685	0.0160
	NLC INDIA	10	2.382	0.2382	0.0029
PRIVATE POWER SECTOR COMPANY	TATA POWER	10	3.135	0.3135	0.0075
	TORRENT POWER	10	5.093	0.5093	0.0018
	RELIANCE POWER LTD	10	1.588	0.1588	0.0003
	ADANI POWER	10	2.436	0.2436	0.0158
	JSW ENERGY	10	3.416	0.3416	0.0111

TABLE – 5.2.5 ANOVA SUMMARY

Source of Variation	SS	Df	MS	F	F crit
Between Groups	1.31	9	0.14	24.97	1.98
Within Groups	0.52	90	0.00		
Total	1.84	99			

Note: SS – Sum of Square df – Degree of Freedom MS – Mean Square F crit – F critical

The above ANOVA summary calculated F value which is 24.97, with df being V1 = 9 and V2 =90, which is higher than the table value of 1.98, since F value > F critical the null hypothesis is rejected. It can be concluded that there is significant difference in Asset turnover ratio between selected power companies for the given period.

Conclusion

In conclusion, over the study period from 2013–14 to 2022–23, there were notable variances in both the gross profit margin and operational profit margin among the power sector enterprises. When it comes to operating and gross profit margins, Reliance Power Ltd. stands out as a particularly profitable and efficient company. NHPC Ltd and NTPC Ltd are two public sector firms that routinely maintain competitive profit margins. The results of the ANOVA tests show that the chosen power businesses had significantly different profit margins, demonstrating the range of performance levels in the industry. The significant variation in operating margins among the organizations highlights the significance of strategic decision-making and effective management techniques in optimizing profitability. Operating margins are a measure of operational efficiency and risk. All things considered, these results offer insightful information on the competitive environment and financial dynamics of the power industry, highlighting the necessity of ongoing observation and adjustment to guarantee steady growth and profitability in a changing market. Furthermore, the Return on Capital Employed (ROCE) analysis emphasizes how crucial effective capital use is to boosting profitability and shareholder value. The continually high ROCE of Reliance Power Ltd. highlights the importance of assessing this indicator for performance comparison and shows how well the company uses capital for growth. In the future, increasing ROCE may be a crucial tactic for power sector businesses looking to boost shareholder value and attain sustainable growth in the face of changing market conditions. This study is to determine the reforms that might be implemented by the Indian government in the future, in order to overcome the demand-supply gap and accomplish the same task effectively while keeping in mind the finite number of natural resources to achieve sustainable development. It is to make energy consumption more efficient so that we can get more use out of the potential supplies that are now available while also seeking new resources to develop.

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