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Profitability Performance Evaluation of Selected Power Companies By Using Du Pont Model

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ABSTRACT

Due to its dependence on climatological conditions, solar and wind energy system power generation is highly variable. For management and operating strategies to make the most of these volatile energy sources, accurate forecast information is required. In this paper, the major goal of this research is to assess selected top five power company's profitability using the Du Pont model's various ratios. The period of this paper is 10 years start from 2011-12 to 2020-21. Various table and tools are used for evaluating profitability of the company.

Keywords: Profitability Analysis, Return on Asset, Return on Equity, Net profit margin, Financial Leverage, Asset Turnover ratio

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I. INTRODUCTION

With India was watching at a rapid industrialisation and urbanisation over the following three decades, the demand for the power within the country is being gone to extend. The power generation situation within the country has improved within the previous couple of years. In June 2017, the Minister of Power announced that India has become an energy surplus country, with no shortage of electricity or coal. Recently, India produces a massive of its energy from thermal sources. Although, with the commitment to the Paris Agreement (on climate change), there has been a force towards increasing the renewable generation capacity within the country. With solar and wind generation is becoming cheaper, cleaner sources of energy have also become affordable.

Power is among the foremost critical component of infrastructure, crucial for the economic growing and welfare of countries. The existence and expansion of adequate infrastructure is vital for sustained growth of the Indian economy. India's power sector is one among the most diversified in the world. Sources of power generation range from conventional sources like coal, lignite, natural gas, oil, hydro and nuclear power to usable non-conventional sources like wind, solar, and agricultural and domestic waste. Electricity demand within the country has increased rapidly and is predicted to rise further within the years to return.

India's energy sector stands-out amongst the foremost classified power sector within the world. Generation of energy extends from conventional sources like coal, hydro, gaseous petrol, oil, lignite and nuclear energy to reasonable non-conventional sources like wind, sunlight based, and household & agricultural wastages. In the world Bank's list of electricity availability for 2017, India has gone up 73 spots to rank 26th, according to Piyush Goyal, former Minister of State (Independent Charge) for coal, power, solar power and mines, Government of India.

There are the primary segments in the electricity sector: generation, transmission, and distribution. Generation is that the process of manufacturing power using different fuels and is administered in generating stations. Transmission uses carry bulk power from the generation plants to the distribution substations through a grid and at high voltages. Distribution helps supply electricity from the substations to individual consumers through a distribution network. Distribution is the retail stage and operators at lower voltages.

II. LITERATURE REVIEW

(Ajmera, 2012) "Analysis of Financial Health of Banking Industry through DuPont Model". The study's major goal is to look at the banks' consistency, stability, and overall trends, as well as management efficiency, solvency, and profitability, using the DuPont Model's various measures. From 2006-07 to 2010-11, the study period lasted five years. The research was based on secondary information. The Significant association between different ratios of selected banks was investigated using the ANOVA test. According to this research, Canara Bank has the best financial situation among the five banks. Then there's Dena Bank, Corporation Bank, SBI, and BOB, which all have minimal profitability.

(Burja & Marginean, 2014), "The study of factors that may influence the performance by the Du Pont analysis in the Furniture Industry" – According to the research, strong positive correlations between turnover and net income, total assets, and equity can be identified using financial data analysed using the Du Pont model. As a result, injection of investment cash allocated, to develop and increase the firm's assets, can be viewed as one of the strategies to boost sales of a company in the furniture industry.

(Padake & Soni, 2015), "Measurement of efficiency through Du Pont analysis: A study of top 12 banks in India." The study's major goal was to use the Du Pont model to evaluate bank performance. The top 12 banks that make up BSE bankex were chosen to assess the banking sector's performance in India. From 2007 to 2013, a period of six years was observed. The Du Pont model assisted in capturing the banks' effectiveness.

(Sahare & Philip, 2018), "Du Pont analysis of Mahindra and Mahindra from year ending 2013 to 2017." The corporation Mahindra and Mahindra was subjected to a Du Pont analysis in the study. This model assists in identifying the company's strengths and weaknesses. The study's data was obtained from Mahindra and Mahindra's annual reports. The study's financial year covers from 2013 to 2017. The Du Pont analysis of the company helps in identifying the assets turnover ratio as the primary cause of the company's decreasing return on assets and return on equity.

(Manjunatha & Pravin Gujjar, 2018), "A study of Indian Software and Networking Companies Using Extended DuPont Model" The expanded DuPont Model is used to look at return on equity. The DuPont Model is frequently used to evaluate the performance of software and networking companies, and there is a favourable association between gross margin, asset turnover, and Return on Equity, according to the findings. The primary goal of this study is to see if Indian software and networking companies can provide a positive return on equity for their investors. The researcher also suggests that the five-step DuPont model be used to other industries to determine if it can explain the entire variation in return on equity as well as it has in Indian IT firms.

III. RESESRCH METHODOLOGY

❖ RESEARCH DESIGN

For this study, the researcher selected top five power companies in India which is based on market capitalization. Researcher used the Analytical Research type. In order to do so, the researcher collected data that was already available and examined it in depth.

❖ OBJECTIVE OF THE STUDY

The main objective of the paper is to know profitability performance of selected power company by using Du Pont model. The objective of the study is:

- To evaluate the profitability performance of selected power companies by using Du Pont Model.
- To analyses the performance indicators like NPM, AT, ROA, FL and ROE by using Du Pont Analysis of selected power companies.

❖ HYPOTHESIS OF THE STUDY

H_{01}: There is no Significant difference in the Net Profit Margin of selected Power company during the study period.

H_{02}: There is no Significant difference in the Total Asset Turnover of the selected Power company during the study period.

H_{03}: There is no Significant difference in the Financial Leverage of the selected Power company during the study period.

H_{04}: There is no Significant difference in the Return on Assets of the selected Power company during the study period.

H_{05}: There is no Significant difference in the Return on Equity of the selected Power company during the study period.

❖ PERIOD OF THE STUDY

Researcher has undertaken 10 years financial data start from 2011-12 to 2020-21 for the study.

❖ SOURCES OF DATA COLLECTION

The research is based on secondary information. Secondary data was gathered from a variety of sources, including research papers, published reports, and the sample unit's annual reports, and to complement the data, various publications, books, journals, and websites relevant to the power business were examined.

IV. DATA ANALYSIS & INTERPRETATION

1. NET PROFIT MARGIN

The percentage by which a company's total sales or revenue exceeds or falls short of the sum of its expenses is known as the net profit margin. A positive net profit margin indicates that a company made more money than it spent during a certain period, whereas a negative net profit margin indicates that the company spent more money than it earned.

Net Profit Margin = REVENUE – COST

REVENUE

TABLE – 1.1.1

NET PROFIT MARGIN

YEAR	NTPC	POWER GRID	NHPC	TATA POWER	NLC INDIA
2011-12	1.10	1.07	1.17	1.01	1.15
2012-13	1.10	1.04	1.22	1.01	1.10
2013-14	1.13	1.03	1.21	1.00	1.17
2014-15	1.12	1.03	1.13	1.01	1.11
2015-16	1.05	1.02	1.14	1.00	1.06
2016-17	1.06	1.02	1.20	1.02	1.06
2017-18	1.07	1.01	1.13	1.01	1.05
2018-19	1.13	1.01	1.10	1.02	1.09
2019-20	1.15	1.02	1.09	1.01	1.12
2020-21	1.16	1.08	1.25	5.32	1.62
AVERAGE	**1.11**	**1.03**	**1.16**	**1.44**	**1.15**
MINIMUM	**1.05**	**1.01**	**1.09**	**1.00**	**1.05**
MAXIMUM	**1.16**	**1.08**	**1.25**	**5.32**	**1.62**
S.D.	**0.03**	**0.02**	**0.05**	**1.36**	**0.16**
C.V.	**3.46**	**2.27**	**4.65**	**94.28**	**14.68**

(Source: Money Control.com published annual reports)

This ratio compares a company's profits to the total amount of money it brings in. It measures how effectively a company operates. The above Table 1.1.1 shows the net profit margin ratio of Tata Power Ltd in which the highest percentage of net profit margin ratio in the year 2020-21 which is 5.324 which is good for the company while lowest in the year 2015-16 which is 1.003. The average ratio of the company is 1.4454%. Standard deviation and Co-efficient variance are 1.362 and 94.28 respectively which is indicate the stability of the performance of the company.

HYPOTHESIS:

H_0: There is no Significant difference in the Net Profit Margin of selected Power companies during the study period.

H_1: There is Significant difference in the Net Profit Margin of the selected Power companies during the study period.

TABLE – 1.1.2

ANOVA SUMMARY

Source of Variation	SS	df	MS	F	F crit
Between Groups	0.96	4	0.24	0.63	2.57
Within Groups	17.02	45	0.37		
Total	17.98	49			

The above ANOVA Summary calculated F value which is 0.63, with df being $V_1 = 4$ and $V_2 = 45$, which is higher than the table value of 2.57, since F value > F critical the null hypothesis is rejected. It can be concluded that there is significant difference in Net profit margin between selected power companies for the given period.

2. ASSET TURNOVER RATIO

The asset turnover ratio compares the value of a company's assets to the value of its sales or revenues. The asset turnover ratio is a metric that measures how effectively a company uses its assets to generate revenue.

Asset Turnover Ratio = NET SALES
AVERAGE TOTAL ASSETS

TABLE – 1.1.2

ASSET TURNOVER RATIO

YEAR	NTPC	POWER GRID	NHPC	TATA POWER	NLC INDIA
2011-12	0.4	0.11	0.11	0.42	0.22
2012-13	0.36	0.12	0.10	0.49	0.24
2013-14	0.36	0.11	0.11	0.49	0.24
2014-15	0.33	0.11	0.12	0.45	0.23
2015-16	0.31	0.12	0.13	0.42	0.26
2016-17	0.31	0.13	0.14	0.33	0.33
2017-18	0.29	0.13	0.12	0.32	0.29
2018-19	0.26	0.14	0.13	0.35	0.21
2019-20	0.25	0.15	0.13	0.32	0.19
2020-21	0.24	0.15	0.11	0.06	0.13
AVERAGE	**0.31**	**0.12**	**0.12**	**0.36**	**0.23**
S.D.	**0.05**	**0.01**	**0.01**	**0.12**	**0.05**
C.V.	**16.04**	**12.33**	**9.99**	**34.33**	**22.77**
MIN	**0.24**	**0.11**	**0.10**	**0.06**	**0.13**
MAX	**0.40**	**0.15**	**0.14**	**0.49**	**0.33**

(Source: Money Control.com published annual reports)

The higher the asset turnover ratio, the more efficient a company is at generating revenue from its assets. If a company has a low asset turnover ratio, it indicates that it is not efficiently using its assets to generate sales. In the above Table 1.1.2 shows that the highest asset turnover ratio of Tata power ltd is in the year 2013-14 which is 0.499 which shows that company generating good revenue from its sales while lowest in the year 2020-21 which is 0.063 The average ratio of the company is 0.3685%. Standard deviation and Co-efficient variance of the company are 0.1265 and 34.33 respectively.

H_0: There is no Significant difference in the Total Asset Turnover of the selected Power companies during the study period.

H_1: There is Significant difference in the Total Asset Turnover of the selected Power companies during study period.

TABLE – 1.1.3

ANOVA SUMMARY

Source of Variation	SS	df	MS	F	F crit
Between Groups	0.48	4	0.12	27.53	2.57
Within Groups	0.19	45	0.00		
Total	0.67	49			

The above ANOVA Summary calculated F value which is 27.53, with df being $V_1 = 4$ and $V_2 = 45$, which is higher than the table value of 2.57, 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.

3. FINANCIAL LEVERAGE RATIO

The use of debt to purchase more assets is known as financial leverage. To increase the return on equity, leverage is used. Excessive financial leverage, on the other hand, raises the risk of failure by making debt reduction more difficult. When the activities to which debt can be put generate returns greater than the interest expense related with the debt, financial leverage is profitable.

Financial Leverage = TOTAL DEBT

SHAREHOLDER'S EQUITY

TABLE – 1.1.3

FINANCIAL LEVERAGE RATIO

YEAR	NTPC	POWER GRID	NHPC	TATA POWER	NLC INDIA
2011-12	18.83	20.33	4.90	259.6	12.84
2012-13	21.67	24.49	5.06	283.5	13.84
2013-14	24.26	27.05	5.54	300.9	14.73
2014-15	26.63	30.73	5.71	278.9	15.35
2015-16	27.24	34.27	5.67	259.0	17.70
2016-17	30.14	37.40	5.86	306.5	21.91
2017-18	34.24	43.07	6.13	303.2	25.15
2018-19	35.04	47.28	6.64	311.1	32.65
2019-20	38.14	49.06	7.10	331.8	38.57
2020-21	41.14	48.89	7.28	309.3	38.88
AVERAGE	**29.73**	**36.25**	**5.99**	**294.3**	**23.16**
S.D.	**7.29**	**10.56**	**0.80**	**23.50**	**10.19**
C.V.	**24.53**	**29.13**	**13.36**	**7.99**	**44.01**
MIN	**18.83**	**20.33**	**4.90**	**259.0**	**12.84**
MAX	**41.14**	**49.06**	**7.28**	**331.8**	**38.88**

(Source: Money Control.com published annual reports)

The financial leverage ratio shows that too much debt can be dangerous for a company and its investors. The above Table 1.1.3 shows that the highest financial leverage ratio of Tata power company is 331.8 in the year 2019-20 while lowest in the year 2011-12 which is 4.901. The average ratio of the company is 294.38. Standard deviation and co-efficient variance of the company are 23.54 and 7.998 respectively.

H_0: There is no Significant difference in the Financial Leverage of the selected Power companies during the study period.

H_1: There is Significant difference in the Financial Leverage of the selected Power companies during the study period.

TABLE – 1.1.4

ANOVA SUMMARY

Source of Variation	SS	df	MS	F	F crit
Between Groups	590864.15	4	147716.03	896.49	2.57
Within Groups	7414.65	45	164.77		
Total	598278.80	49			

The above ANOVA Summary calculated F value which is 896.49, with df being V_1 = 4 and V_2 =45, which is higher than the table value of 2.57, since F value > F critical the null hypothesis is rejected. It can be concluded that there is significant difference in financial leverage between selected power companies for the given period.

4. RETURN ON ASSET RATIO

Return on assets (ROA) is a ratio that measures how profitable a company's assets are used. When comparing similar companies or a company's past data, ROA is the most key measurement. The return on investment (ROI) is expressed as a percentage; the higher the ROE, the better for the company.

Return on Assets = NET INCOME

TOTAL ASSETS

TABLE – 1.1.4

RETURN ON ASSET RATIO

YEAR	NTPC	POWER GRID	NHPC	TATA POWER	NLC INDIA
2011-12	0.44	0.11	0.13	0.42	0.26
2012-13	0.40	0.12	0.12	0.49	0.26
2013-14	0.40	0.11	0.14	0.50	0.28
2014-15	0.37	0.11	0.14	0.46	0.26
2015-16	0.33	0.12	0.15	0.42	0.28
2016-17	0.33	0.13	0.16	0.34	0.35
2017-18	0.31	0.13	0.14	0.33	0.30
2018-19	0.29	0.14	0.14	0.35	0.23
2019-20	0.29	0.15	0.15	0.33	0.21
2020-21	0.29	0.15	0.14	0.33	0.21
AVERAGE	**0.35**	**0.13**	**0.14**	**0.40**	**0.26**
S.D.	**0.05**	**0.01**	**0.01**	**0.06**	**0.04**
C.V.	**15.61**	**12.12**	**8.18**	**17.34**	**15.51**
MIN	**0.29**	**0.11**	**0.12**	**0.33**	**0.21**
MAX	**0.44**	**0.15**	**0.16**	**0.50**	**0.35**

(Source: Money Control.com published annual reports)

A higher Return on Asset indicates more asset efficiency. In the above Table 1.1.4 shows that the highest return on asset of the Tata power company is in the year 2013-14 which is 0.502 which is shows that the company is having good asset efficiency while Power grid ltd have lowest in the year 2019-20 which is 0.114. The average ratio of the company is 0.4004. Standard deviation and co-efficient variance of the company are 0.502 and 0.355 respectively.

H_0: There is no Significant difference in the Return on Assets of the selected Power companies during the study period.

H_1: There is Significant difference in the Return on Assets of the selected Power companies during the study period.

TABLE – 1.1.5

ANOVA SUMMARY

Source of Variation	SS	df	MS	F	F crit
Between Groups	0.57	4	0.14	72.55	2.57
Within Groups	0.08	45	0.00		
Total	0.66	49			

The above ANOVA Summary calculated F value which is 72.55, with df being $V_1 = 4$ and $V_2 = 45$, which is higher than the table value of 2.57, since F value > F critical the null hypothesis is rejected. It can be concluded that there is significant difference in Return on asset between selected power companies for the given period.

5. RETURN ON EQUITY RATIO

The return on equity (ROE) is a financial performance indicator that is computed by dividing net income by shareholders' equity. Because shareholders' equity equals a company's assets less its debt, the return on net assets is referred to as ROE.

Return on Equity = NET INCOME

SHAREHHOLDER'S EQUITY

TABLE – 1.1.5

RETURN ON EQUITY RATIO

YEAR	NTPC	POWER GRID	NHPC	TATA POWER	NLC INDIA
2011-12	8.36	2.40	0.66	110.6	3.35
2012-13	8.80	3.06	0.61	140.6	3.68
2013-14	9.90	3.08	0.78	151.0	4.15
2014-15	10.00	3.50	0.83	128.6	4.05
2015-16	9.02	4.22	0.85	109.3	4.99
2016-17	10.10	4.97	0.99	104.2	7.78
2017-18	10.90	5.69	0.86	100.7	7.77
2018-19	10.40	6.71	0.98	111.7	7.77
2019-20	11.40	7.56	1.07	109.8	8.37
2020-21	11.90	7.77	1.06	103.6	8.48
AVERAGE	**10.07**	**4.89**	**0.87**	**117.0**	**6.03**
S.D.	**1.13**	**1.96**	**0.15**	**17.10**	**2.15**
C.V.	**11.25**	**40.04**	**17.85**	**14.62**	**35.70**
MIN	**8.36**	**2.40**	**0.61**	**100.7**	**3.35**
MAX	**11.90**	**7.77**	**1.07**	**151.0**	**8.48**

(Source: Money Control.com published annual reports)

Return on equity measures profit as well as efficiency. The above Table 1.1.5 shows that the Tata power ltd having highest ROE in the year 2013-14 which is 151 which shows that the company is increasing its profit generation without needing as much capital. It is also indicating how well a company's management deploys shareholders capital. NHPC Ltd having lowest ROE in the year 2012-13 which is 0.619.

H_0: There is no Significant difference in the Return on Equity of the selected Power companies during the study period.

H_1: There is Significant difference in the Return on Equity of the selected Power companies during study period.

TABLE – 1.1.6

ANOVA SUMMARY

Source of Variation	SS	df	MS	F	F crit
Between Groups	99958.01	4	24989.50	412.66	2.57
Within Groups	2725.01	45	60.55		
Total	102683.03	49			

The above ANOVA Summary calculated F value which is 412.66, with df being $V_1 = 4$ and $V_2 = 45$, which is higher than the table value of 2.57, since F value > F critical the null hypothesis is rejected. It can be concluded that there is significant difference in Return on equity between selected power companies for the given period.

CONCLUSION

The major goal of this article is to use the Du Pont Model to assess the profitability of selected power companies in India. Because net profit and return on equity shows that the company generates profit without a huge amount of money, the above calculation reveals that the company's overall performance is good. As a result, it may be stated that among all selected power company Tata Power company's internal strength is effective. Through optimal capital gearing and a reduction in financial expenses, the company can improve its profitability even further.

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