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A COMPARATIVE STUDY ON FINANCIAL PERFORMANCE OF POWER GENERATING COMPANIES IN INDIA

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Abstract *Electricity is one of the most important factor which helps in building the economy of any nation. Various amendments in electricity laws have been made to improve the performance of electric power sector companies. The electric power companies are controlled by both the government and private sector. The government of India keeping in view the improvement of power sector companies have made lot of changes in various ways. The main objective of this paper is to analyse the financial performance of power generating companies. The findings of this paper is that the financial performance of government owned power generating companies are more efficient than the private sector power generating companies in India.*

Keywords: *Generation, Ratio Analysis, Financial Performance Analysis*

JEL Classification: *M49*

INTRODUCTION

Sukla and Singh, (2019), "Indian lenders have been suffering a lot due to the 12 strained loan accounts in the power sector. The Central Bank gave the directive to scrutiny a huge debt of 52 billion dollar. The value of the 34 stressed assets worth 1.8 trillion rupees has been identified in power sector depending on coal according to the reports by government agencies and State Bank of India. Fourteen out of thirty-five projects worth 500 billion rupees have already been transferred to insolvency court according to the report given by SBI, Managing Director, and Arijit Basu."

Sharma, Layak, and Baiju (2018), The lending in power sector by the government owned banks has drastically reduced from 2016 to 2018. Only few banks such as SBI, Bank of Baroda, Central Bank and Union Bank of India has remained as lenders out of 21 government owned banks. The problem in power sector has directly affected banks in the form of bad loans due to which the overall economy is getting affected. The overall problem lies in the power generation sector as the electricity deficit was 4.2% in 2014 which was then reduced to 0.7% in 2017. The main problem being the mismatch in demand and supply of electricity. As noted, 34 thermal power projects were commissioned producing nearly 40 GW (gigawatts) of electricity out of which nearly INR 1.74 lakh crore investments turned out to be bad loans. The solution became the problem, Electricity Act 2003, which allowed the private players to enter into the business of power generation. In no time they started generating supplementary electricity. Nearly 54279MW (megawatts) electricity was generated by the private players alone, achieving 116% of the target. The power supply was more than the demand in the market, ultimately the private players had to suffer as the government entities were sponsored by the government funds. Although, most of the industry experts are positive in near future for the demand to grow for electricity, the private players have to bear the loss in the present term.

Ghosh (2018), Many power generating companies are on the verge of insolvency procedure in NCLT (National Company Tribunal Law) under the directives of RBI (Reserve Bank of India). Fearing the consequences, defaulting power generating companies knocked the door of supreme court. The supreme court of India bargained some time for the debt ridden power generating companies worth 17.22 billion dollars with a cumulative capacity of 13 GW. This is a sign of relief for short term but not a permanent solution. The power sector contributes to 5.9% of banking sector's total bad loans worth INR 4.73 trillion.

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The problem in power sector is clear to everyone and can witness the rippling effect on the economy as a whole. The problem in power sector is not new and it has not evolved over night. It had started a decade ago. Today is just the reflection of yesterday's deed. Many researchers and intellectuals have written multiple articles but still the problem persists. The main reason not being the research but the implementation of the policies. Various acts were passed in India from 1910 to 2007 in-order to improve the financial conditions of the power sector companies. The main objective of all the acts was directly or indirectly related with the growth of the power sector in India. The purpose of the Electricity Act 1910 was to bring the power sector within the legal jurisdiction. Electricity Act 1991 was crucial as it encouraged the private players within the power sector in India. The main objective of the Electricity Act 2003 was to separate generation, transmission and distribution corporations in order to encourage competition and efficiency. Ultimately, Electricity (Amendment) Act 2007 was passed to make power sector commercially viable and increase the momentum of growth rate within the power sector in India.

On an explicit note, the Acts from 1910 to 2007 focused on the following objectives:

- To bring power sector within the legal jurisdiction.
- To encourage private players.
- To separate generation, transmission and distribution entity.
- To make power sector commercially viable.
- To increase the momentum of the growth rate in the power sector.
- To encourage transparency.

Power generating companies are just a fragment of power sector companies in India. Power sector means the sector which focuses on the production and trading of electricity in a narrow sense. Power sector in India is divided into three segments viz. power generating companies, power transmission companies and power distribution companies. Power sector companies are under the control of central government, state government, private owners or stake holders, partnership between central government and state government, central government and private owners and state government and private owners. Indian power sector in 21st century has transformed a lot since its inception from the 19th century. Electricity Act, 2003 specifically has stated to separate power generating companies, power transmission companies and power distributing companies into separate entities. Earlier these three power companies were not distinctly separated/categorised. It is still not hundred percent segregated as mandated by the Electricity Act of 2003.

This paper is a revisit into the financial performance of power generating companies. A comparative analysis between the private and government power generating companies has been conducted in order to get an overview of the power generating sector. An in-depth financial analysis has been conducted across the financial data extracted from the annual reports. The findings and suggestions can be of help to the management and effective strategies can be framed accordingly to improve the financial position by the concerned firm.

LITERATURE REVIEW

Literature Related to Financial Performance Analysis

Paun (2017), has studied the financial performance of power sector companies in Romania. His main objective was to see if any differences exist in the financial performance among the different energy producers, it was found that the companies using fossil fuel to generate electricity were performing better. It was also found that most of the power sector companies were in bad financial condition. The researcher concluded by pointing out that the power sector companies should innovate and improve business processes to improve profitability.

In the study made by Vyas (2015), out of the five selected power sector companies NTPC's financial performance was found out to be better. The suggestions given by the researcher was that the power sector as a whole should reduce too much dependence on coal and needs to generate enough power to fill the demand gap and should also focus on the quality and reliability in order to support econmic growth of the country.

According to Khurana and Banerjee (2015), in their book has mentioned, in 2012 cabinet committee on economic affairs had approved a financial rescue of INR 1.9 trillion to resuscitate the power generation sector. They have conducted a study on the financial performance mainly on the state electricity boards from the year 2003 to 2011. They have focused on the financial crisis of 2011 faced by the power sector in India.

Ranganathan (2005), the loss in power sector jumped from INR 4.56cr in 1992–1993 to INR 33cr. in 2001–2002. The main catalyst to increase the cost price gap was found to be T&D loss.

Sankar (2003), APSEB was the only SEB running in profit but by the year 2000 it was the SEB making one of the highest losses. The main reason for the loss was that the tariff was not hiked as required including various other factors.

Kannan and Pillai (2001), has mentioned that most of the SEBs were found to be over employed mostly in the non-technical and administrative level. The compensation system of the government was the main reason for the substantial losses faced by SEBs. The SEBs would be able to perform better if allowed to perform as autonomous-cum-service corporation, as mandated by the E(S) act.

Das and Parikh (2000), has given the insight of how Maharashtra state electricity board can be converted into profit making institution when the total loss of all the SEBs in India mounted to INR 10,684 crore in the year 1997–1998. The findings of the researcher was- hike in tariff rate, Capital restructuring and improvement in technical performance and manager level efficiency could really bring the differences in the financial position of MSEB.

Reddy and Sumithra (1997), has revealed about the financial problems faced by Karnataka SEB and how it used irrigation pump sets (IPS) to conceal its T&D losses.

LITERATURE RELATING TO POWER SECTOR

Kapur (1983), has articulated how the energy consumption worldwide has changed from steam engine to oil and to other renewable source of energy. According to the article India should focus in renewable source of energy as in future the country can no longer depend only in oil and coal.

Singh (1990), the findings of their study was that large dams are inappropriate in terms of technology and the environment and social relations.

Sant and Dixit (1996), the findings of their study was that the agriculturist can afford the marginal hike in power tariffs. Marginal hike will not have adverse impact on the marketable food grains as large portion of irrigation water is used for non-food cash crops.

Wood and Kodwani (1997), has focused on the privatisation of electricity supply industry in India which is the important sector to boost economic development. The article has been concluded in the following points, it is not necessary to have generation, transmission and distribution activities performed by one entity.

Dixit, Sant, and Wagle (1998), has critically analysed about the most praised power sector model of Orissa framed by World Bank.

Baijal (1999), has focused on the efficiency of restructuring on the power sector. The writer writes that privatisation will bring more potential in the power sector gradually reducing the lacunas faced when owned by the government.

Ranganathan, restructuring Indian power sector (1999), reviewed special secretary of power Pradip Baijal's article. According to the article the focus should be in creating a healthy competition in the wholesale electricity market.

Gurtoo and Pandey (2001), Uttar Pradesh power sector reforms is a desperate move to cover past mistakes rather than conscious and structured planning.

Phadke and Rajan (2003), has written about the effectiveness of privatisation in power sector can be achieved only through proper competition.

Santhakumar (2003), stated that the reforms in Kerala was not the outcome of external agencies like World Bank and IMF but it was the sole decision of the left front political party. The author analyses the loss and gains to different sections by such anti liberalisation seeking decisions of the party. The finding of the study was that the subsidy was given to middle class avoiding the lower class.

Ranganathan, Electricity Act 2003: Moving to a Competitive Environment (2004), the findings of the study was that the electricity act 2003 has not touched the transmission sector even though the act has encouraged competition in the generation and privatisation in the distribution sector.

Mathur and Johal (2004), the distribution segment was the most risky one in the entire value chain. This paper focuses on the return from equity based on various risk associated with the power sector.

According to Raghavan (2004), in the last quarter of nineteenth century the private operators used to run the power sector in India. The private operators at that time mostly confined their services to urban areas.

Jain (2004), the Punjab should first look into the internal problems faced by its state electricity board rather than jump into introducing power sector reforms funded by the World Bank.

Katiyar (2005), has highlighted that the T&D losses was mostly due to illegal hooking of lines both in domestic and agricultural category.

Abhyankar (2005), the findings of the study was that the reason for the problems in the SEB of Madhya Pradesh was due to the bifurcation of state into two i.e., Chhattisgarh was separated from MP. The restructuring of power sector in Madhya Pradesh backed by Asian Development Bank also could not bring fruitful results.

According to Sinha (2005), the power sector in India has followed the path set by the World Bank in terms of unbundling, privatisation, corporatisation and regulation. Orissa was the first to implement the exact model, failure of the same clearly indicated the lessons to be learnt.

Shreekumar, Reddy, and Raghu (2007), has critically analysed about Andhra Pradesh electricity boards. APSEB has been

successful in many grounds yet with some limitations like less focusing on the increasing rural electrification and demand.

RESEARCH PROBLEM

The main objective of this research work is to focus on the financial performance of power generating companies listed in BSE. The power generating companies are immune to various types of risks or factors, due to which most of the power generating companies are not able to book profits.

SIGNIFICANCE OF THE STUDY

This paper focuses in the in-debt analysis of the changes in the selected financial variables of power generating companies in India. Also to give more sense, a comparative analysis between the government owned power generating companies and privately owned power generating companies have been conducted. It will give an insight about the financial position of the power generating companies.

OBJECTIVES OF THE STUDY

- To analyse the financial performance of power generating companies listed in BSE.
- To conduct comparative financial performance analysis between public sector power generating companies and private sector power generating companies listed in BSE.

HYPOTHESES OF THE STUDY

- $\mathbf{H_{o1}}$: There is no significant difference in the financial performance of power generating companies listed in BSE from 2010 to 2017.
- $\mathbf{H_{o2}}$: There is no significant difference between the financial performance of public sector power generating companies and private sector power generating companies listed in BSE.

LIMITATIONS OF THE STUDY

The study is based on the secondary data source, so all the limitation are inherited as the data from secondary sources. All the ratios are not considered and the time period taken is also only eight years.

RESEARCH METHODOLOGY

Nature of the study: The study can be termed as empirical in nature because of acquiring deeper insights into the various significant aspects of the problem as relativity of the objectives of the study. Facts and information available in various secondary sources will be utilized to make critical evaluation and thus from this point of view, the nature of the study will also become analytical. The other methods used will be according to the requirement of the study.

Period of the study: Study will be conducted from 2010 to 2017.

Sources of data: Secondary data will be used for the study. The following characteristics of the data from secondary source has been checked before using it for the analysis:- 1) reliability of data, 2) suitability of data and 3) adequacy of data.

Sample

Six large power generating companies in terms of capitalization has been selected, three from private and three from public sector.

The power sector is divided into power generating companies, power distributing companies and power transmission companies. Some of the companies are controlled by central government, state government and even private owners or stake holders, it also includes combined ownership of central government and state government, central government and private ownership, state government and private ownership. Some companies specialize only in generation, transmission or distribution and some companies focus on all the generation, transmission and distribution business.

The power sector is quite a complicated sector to study and even to segregate. After careful analysis, a thoughtful decision has been taken and all the power generating companies listed in BSE has been selected. As the topic suggests only the power generating companies listed in BSE will be considered for the research purpose.

There are the eighteen power sector companies listed in Bombay Stock Exchange which are related to power generation, transmission and distribution. The main objective of this research is to conduct financial performance analysis of power generating companies listed in BSE. Six power generating companies listed in BSE will be selected for this research.

Table 1: Power Generating Companies Listed in BSE

Sl. No	Security Code	Security Name	Security Group
1.	532939	RPOWER	A
2.	533098	NHPC	A
3.	532555	NTPC	A
4.	532708	GVKPIL	B
5.	517300	GIPCL	B

Sl. No	Security Code	Security Name	Security Group
6.	533122	RTNPOWER	A
7.	513023	NBVENTURES	A
8.	533206	SJVN	A
9.	532778	LITL	B
10.	534597	RTNINFRA	B
11.	532219	ENERGYDEV	B

Source: S&P BSE utilities.

Out of eleven listed power generating companies as given in Table 1, three power generating companies are controlled by central government and the other eight companies are controlled by the private owners or stake holders.

Table 2: Power Generating Companies Controlled by Central Government and Private Owners

Sl. No	Central Government	Sl. No	Private Owner
1	NHPC	1	RPOWER
2	NTPC	2	GVKPIL
3	SJVN	3	GIPCL
		4	RTNPOWER
		5	NBVENTURES
		6	LITL
		7	RTNINFRA
		8	ENERGYDEV

Source: BSE.

Tools and Techniques

It is an empirical study, so the scientific approach is being followed to design the research methodology for investigation. The following classified tool and techniques will be used in the study:
1) Accounting techniques; 2) Statistical technique.

Accounting technique: Ratio analysis will be used, which is a quotient of two numbers and the relation expressed between two figures. Ratio analysis will be specifically designed to suit the study in power sector.

Statistical technique: The following statistical tools are used for the analysis.

Arithmetic mean: It is the average of difference of the values of items from some average of the series. It is briefly referred as mean and can be calculated by adding all the variables and dividing it by the total number of years taken.

Standard deviation: Karl Pearson developed the concept of standard deviation in the year 1823. It is mostly used as a measure of dispersion of a series. Standard deviation is the square root of the average of squares of deviations, when such deviations for the values of individual items in series are obtained from the arithmetic average.

Co-efficient of variation: It is calculated as the percentage of the standard deviation to the mean. Higher the variability the greater would be the co-efficient of variation therefore for the stability of the results, co-efficient of variations must be low.

Co-efficient of variation = (standard deviation ÷ arithmetic mean) * 100.

One way analysis of variance test (ANOVA): It is useful for inter unit comparisons. ANOVA single factor will be used at specific level for accepting as rejecting the null hypothesis.

DATA ANALYSIS AND INTERPRETATION

Profitability Ratio

This ratio is normally used to measure the performance of any organisation. The greater the profitability ratio, the companies' performance is assumed to be better than its competitors. Not only this, but it can also be said that if the ratio has been increasing as compared to the previous years it is considered to be a good sign. This ratio also has drawbacks, as it solely cannot signify the financial health of any corporation.

Table 3: Profitability Ratio (Net Income / Total Revenue)

Year	NHPC	NTPC	SJVN	RPOWER	GVKPIL	GIPCL
2010	43.00%	4%	51%	81%	9%	11%
2011	44%	16%	47%	40%	8%	15%
2012	41%	14%	50%	31%	2%	9%
2013	43%	19%	55%	19%	−12%	15%
2014	14%	15%	53%	19%	−13%	13%
2015	39%	14%	51%	14%	−36%	10%
2016	29%	14%	48%	10%	−28%	14%
2017	32%	13%	49%	8%	−33%	17%
Average	36.0000%	14.00%	51.00%	28.00%	−13.00%	13.00%

Source: Compiled by the researcher.

Unswervingly looking into the data as mentioned in Table 3, it can be observed that the SJVN has the highest profitability ratio, so it can be assumed that the SJVN has a better financial health, According to the above data GVKPIL has a lowest average profitability ratio, but if we have to observe more deeply, growth rate has to be calculated. As average profitability ratio may not give the clear picture. The growth rate for profitability ratio has been calculated in Table 4 below, for each power generating companies to have a clear view.

Table 4: Profitability Ratio (Growth Rate)

Year	Nhpc Growth Rate	NTPC Growth Rate	SJVN Growth Rate	RPOWER Growth Rate	GVKPIL Growth Rate	GIPCL Growth Rate
2011	2%	300%	−8%	−51%	−11%	36%
2012	−7%	−13%	6%	−23%	−75%	−40%
2013	5%	36%	10%	−39%	−700%	67%
2014	−67%	−21%	−4%	0%	8%	−13%
2015	179%	−7%	−4%	−26%	177%	−23%
2016	−26%	0%	−6%	−29%	−22%	40%
2017	10%	−7%	2%	−20%	18%	21%
Average growth rate	13.7455%	41.19%	−0.38%	−26.67%	−86.46%	13%
Standard deviation	77.41%	115.54%	6.68%	15.79%	281.54%	38.79%

Source: Compiled by the researcher.

After calculating growth rate using the data from Table 3 in Table 4, it is confirmed that even though SJVN's average profitability ratio is highest, NTPC has a highest average growth rate. According to the growth rate NTPC is efficient. It is also very much important to see the deviation of the value from the mean value to check the stability in the growth rate. Observing the data relating to standard deviation SJVN has the lowest standard deviation. GIPCL has a positive growth rate of 13% and standard deviation is also the second lowest i.e., just 38.79%, so in terms of growth rate in profitability ratio and stability in the growth rate GIPCL is good.

Hypothesis

H_{01}: Profitability ratio of all units is not same during the period of study.

H_{02}: Profitability ratio of all units is same during the period of study.

Table 4.1: Profitability Ratio (ANOVA)

Groups	Count	Sum	Average	Variance
NHPC	8	2.9	0.36	0.010627
NTPC	8	1.1	0.14	0.001855
SJVN	8	4	0.51	0.000686
RPOWER	8	3.1	0.39	0.113371
GVKPIL	8	−1	−0.13	0.032927
GIPCL	8	1	0.13	0.000771

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between groups	2.117135	5	0.423427	15.85498	9E-09	2.438
Within groups	1.121663	42	0.026706			
Total	3.238798	47				

Observing the value of '*F*' which is 15.86 is more than the table value 2.438 at 5% level of significance. It indicates that the null hypothesis is rejected and the alternate hypothesis is accepted. It means that there is significant difference of profitability ratio between the units undertaken for the period of study.

ASSET TURNOVER RATIO

The above financial metric is used to measure the efficiency of organisation's assets in terms of generated revenues. In other words this ratio is used to check how efficiently assets are being used to generate revenue. Higher the ratio better it is for the organisation but it has some limitations too, the increase or decrease in the assets of the organisations may inflate or deflate the ratio.

It is also very much important to observe the growth rate of assets in any organisation to counter check the efficiency of this ratio. If the asset is constant and only the revenue

is increasing than it can be assumed that the company is efficiently using its asset to generate revenues but this is an ideal situation so in this paper growth rate of asset will be calculated and compared with the ratio to get the efficient result.

Table 5: Asset Turnover Ratio

	NHPC	NTPC	SJVN	RPOWER	GVKPIL	GIPCL
2010	14%	5%	21%	6%	26%	42%
2011	11%	10%	19%	12%	36%	41%
2012	13%	92%	35%	16%	20%	44%
2013	2%	443%	28%	30%	11%	48%
2014	13%	76%	16%	28%	10%	47%
2015	10%	40%	23%	17%	10%	42%
2016	14%	36%	19%	17%	16%	46%
2017	15%	37%	20%	17%	19%	43%
Average ratio	11.50%	92.38%	22.63%	17.88%	18.50%	44.13%
Average ratio growth rate	51%	166%	6%	24%	3%	0.39%
Asset growth rate	8%	63%	13%	29%	29%	6%

Source: compiled by the researcher.

Observing data from the above Table 5, NTPC has highest average asset turnover ratio and NHPC has the lowest average asset turnover ratio. Looking only in the average asset turnover ratio NTPC is very efficient in utilizing its assets. NTPC has the highest average asset growth rate of 63%. NHPC has the lowest average asset turnover ratio of 11.50%. But in terms of average ratio growth rate and asset growth rate GIPCL has the lowest ratio of 0.39% and 6%. It can be understood from the above data that NTPC is best among the selected sample companies.

Hypothesis

H_{01}: Asset turnover ratio of all units is not same during the period of study.

H_{02}: Asset turnover ratio of all units is same during the period of study.

Table 5.1: Asset Turnover Ratio (ANOVA)

Summary				
Groups	**Count**	**Sum**	**Average**	**Variance**
NHPC	8	0.92	0.12	0.001742857
NTPC	8	7.39	0.92	2.094483929
SJVN	8	1.81	0.23	0.003741071
RPOWER	8	1.43	0.18	0.006155357
GVKPIL	8	1.48	0.19	0.008171429
GIPCL	8	3.53	0.44	0.000669643

ANOVA

Source of Variation	SS	df	MS	F	*P*-value	*F* crit
Between groups	3.71565	5	0.74313	2.108205812	0.083258475	2.43769264
Within groups	14.80475	42	0.352494048			
Total	18.5204	47				

Observing the value of '*F*' in Table 5.1 which is 2.108205812 is less than the table value 2.438 at 5% level of significance. It indicates that the null hypothesis is accepted and the alternate hypothesis is rejected. It means that there is no significant difference of asset turnover ratio between the units undertaken for the period of study.

GROSS PROFIT RATIO

Gross profit ratio is one of the most popular financial ratios to understand the financial performance of any business. It compares two important variables, such as gross profit and net sales revenue. The main objective in using this ratio is to understand the proportion of the gross profit in the total net sales.

Gross profit ratio is calculated using the following formula:

Gross profit ratio = gross profit/net sales

Table 6: Gross Profit Ratio

Year	NHPC	NHPC	NTPC	NTPC	SJVN	SJVN	RPOWER	RPOWER	GVKPIL	GVKPIL	GIPCL	GIPCL
	Ratio	Adr[1]	Ratio	Adr	Ratio	Adr	Ratio	Adr	Ratio	Adr	Ratio	Adr
2010	64%	46%	23%	17%	64%	56%	3390%	579%	8	6	14	12
2011	50%	35%	22%	18%	63%	55%	75%	−12%	4	4	11	10
2012	62%	45%	20%	15%	70%	60%	7010%	15%	2.68	−1	12	11
2013	57%	38%	23%	22%	70%	56%	2436%	17%	−11	−16	21	20
2014	41%	23%	18%	15%	71%	59%	24%	17%	−10	−14	19	16
2015	38%	27%	13%	10%	77%	62%	1863%	14%	−42	−45	22	19
2016	40%	27%	14%	13%	63%	47%	13%	10%	−43	−47	18	16
2017	44%	27%	17%	16%	77%	51%	14%	9%	−38	−53	23	18
Average gross profit ratio	49.50%	33.50%	18.69%	15.71%	69.38%	55.75%	1853.13%	−63.64%	−16.165	−20.75	17.5	15.25
Average gross profit ratio growth rate	−4%	−5%	−2.80%	3.25%	3%	−0.66%	2365%	−52.50%	−42%	224%	11%	10%

Source: Compiled by the researcher.

According to the data in Table 6, R Power has the highest average gross profit ratio of 1853.13%. It is also very much important to see the growth rate of gross profit ratio. Looking into the average growth rate of gross profit ratio R Power has the highest average gross profit ratio growth rate of 2365%.

Adjusted gross profit ratio has also been calculated after deducting other income in order to have more accurate financial picture of the selected companies. According to adjusted gross profit ratio SJVN has the highest average adjusted gross profit ratio of 55.75% but GVKPIL has the highest adjusted average gross profit ratio growth rate.

Hypothesis

H_{01}: Gross profit ratio of all units is not same during the period of study.

H_{02}: Gross profit ratio of all units is same during the period of study.

Table 6.1: Gross Profit Ratio (ANOVA)

ANOVA: Single Factor				
Summary				
Groups	**Count**	**Sum**	**Average**	**Variance**
Year	8	16108	2013.5	6
NHPC GPR	8	3.96	0.495	0.010685714
NTPC GPR	8	1.495	0.186875	0.001478125
SJVN GPR	8	5.55	0.69375	0.003283929
R POWER GPR	8	148.25	18.53125	608.1578982
GVKPIL GPR	8	−129.32	−16.165	467.8178
GIPCL GPR	8	140	17.5	21.42857143

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P*-value	*F* crit
Between groups	27709123.8	6	4618187.301	29297.38394	2.71237E-85	2.290431783
Within groups	7723.93802	49	157.6313882			
Total	27716847.7	55				

Observing the value of '*F*' in Table 6.1 which is 29297 is, more than the table value 2.29 at 5% level of significance. It indicates that the null hypothesis is rejected and the alternate hypothesis is accepted. It means that there is significant difference of gross profit ratio between the units undertaken for the period of study.

Hypothesis

H_{01}: Adjusted gross profit ratio of all units is not same during the period of study.

H_{02}: Adjusted gross profit ratio of all units is same during the period of study.

Table 6.2: Adjusted Gross Profit Ratio (ANOVA)

ANOVA: Single Factor				
Summary				
Groups	**Count**	**Sum**	**Average**	**Variance**
Year	**8**	**16108**	**2013.5**	**6**
NHPC ADJ GPR	8	2.68	0.335	0.007828571
NTPC ADJ GPR	8	1.257	0.157125	0.001197554
SJVN ADJ GPR	8	4.46	0.5575	0.002392857
R POWER ADJ GPR	8	−5.0909	−0.63636	4.350794734
GVKPILADJ GPR	8	−166	−20.75	586.2142857
GIPCL ADJ GPR	8	122	15.25	14.5

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P*-**value**	*F* **crit**
Between groups	27828799.73	6	4638133	53130.71775	1.26218E-91	2.290431783
Within groups	4277.535496	49	87.29664			
Total	27833077.26	55				

Observing the value of '*F*' in Table 6.2 which is 53130 is more than the table value 2.290 at 5% level of significance. It indicates that the null hypothesis is rejected and the alternate hypothesis is accepted. It means that there is significant difference of adjusted gross profit ratio between the units undertaken for the period of study.

RETURN ON CAPITAL EMPLOYED

Return on capital employed ratio is one of the most important parameter to test the efficiency of any organisation in using its capital. This ratio compares earnings before interest and tax with its capital employed. This ratio if combined with other important financial ratios will give a very appropriate result and clear understanding about the organisation's financial performance. Higher return on capital employed signals positive financial performance of business organisations.

Table 7: Return on Capital Employed

Year	**NHPC**	**NTPC**	**SJVN**	**RPOWER**	**GVKPIL**	**GIPCL**
2010	8%	38%	16%	2%	2%	7%
2011	5%	12%	14%	2%	4%	8%
2012	8%	11%	14%	2%	3%	12%
2013	7%	12%	11%	1%	2%	13%
2014	6%	38%	11%	1%	3%	12%
2015	7%	37%	16%	1%	1%	26%
2016	8%	61%	12%	28%	3%	26%
2017	9%	62%	13%	5%	11%	13%
Average	7.25%	33.88%	13.38%	5.25%	3.63%	14.63%

Source: Compiled by the researcher.

According to the data in the Table 7, NTPC has the highest average return on capital employed. Ratio of 33.88%. GVKPIL has the lowest average return on capital employed ratio of just 3.63%.

Hypothesis

H_{01}: Return on capital employed ratio of all units is not same during the period of study.

H_{02}: Return on capital employed ratio of all units is same during the period of study.

Table 7.1: Return on Capital Employed (ANOVA)

Summary				
Groups	**Count**	**Sum**	**Average**	**Variance**
NHPC	8	0.58	0.0725	0.000164
NTPC	8	2.71	0.33875	0.043584
SJVN	8	1.07	0.13375	0.000398
RPOWER	8	0.42	0.0525	0.008621
GVKPIL	8	0.29	0.03625	0.00097
GIPCL	8	1.17	0.14625	0.005427

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P*-**value**	*F* **crit**
Between groups	0.49565	5	0.09913	10.05302	2.2313E-06	2.43769264
Within groups	0.41415	42	0.009860714			
Total	0.9098	47				

Observing the value of '*F*' in Table 7.1 which is 10.05302 is more than the table value 2.438 at 5% level of significance. It indicates that the null hypothesis is rejected and the alternate hypothesis is accepted. It means that there is significant difference of return on capital employed ratio between the units undertaken for the period of study.

Long Term Debt Equity Ratio

This ratio is used to check how much debt company has taken as compared to shareholder's money. Higher ratio indicates that the company has taken more leverage. The general perception is that higher the long term debt equity ratio, higher is the investment risk. This ratio cannot be used in isolation.

Table 8: Long Term Debt Equity Ratio

Year	**NHPC**	**NTPC**	**SJVN**	**RPOWER**	**GVKPIL**	**GIPCL**
2010	113%	535%	41%	0%	2815%	704%
2011	111%	507%	55%	55%	2781%	572%
2012	132%	695%	59%	0.06%	7396%	501%
2013	168%	819%	68%	0.11%	9894%	430%
2014	182%	964%	74%	8%	13295%	362%
2015	176%	1188%	80%	8%	13125%	304%
2016	329%	1074%	80%	35%	138%	246%
2017	168%	1214%	74%	59%	35%	60%
Average	172.38%	874.50%	66.38%	20.65%	6184.88%	397.38%

Source: Compiled by the researcher.

According to the data as recorded in Table 8, it is very much clear that GVKPIL has highest average debt equity ratio of 6184.88%. SJVN has the lowest average debt equity ratio of 66.38%. It implies that business having higher long-term debt ratio indicates higher bankruptcy risk.

Hypothesis

H_{01}: Long term debt equity ratio of all units is not same during the period of study.

H_{02}: Long term debt equity ratio of all units is same during the period of study.

Table 8.1: Long Term Debt Equity Ratio (ANOVA)

Summary				
Groups	**Count**	**Sum**	**Average**	**Variance**
NHPC	8	13.79	1.724	0.47997
NTPC	8	69.96	8.745	7.813857
SJVN	8	5.31	0.664	0.018827
RPOWER	8	1.6517	0.206	0.063555
GVKPIL	8	494.79	61.849	3018.168
GIPCL	8	31.79	3.974	4.04317

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P*-**value**	*F* **crit**
Between groups	23429.38	5	4685.877	9.277167	5.22E-06	2.437693
Within groups	21214.11	42	505.0978			
Total	44643.49	47				

Observing the value of '*F*' in Table 8.1 which is 9.277167 is more than the table value 2.438 at 5% level of significance. It indicates that the null hypothesis is rejected and the alternate hypothesis is accepted. It means that there is significant difference of long term debt equity ratio between the units undertaken for the period of study.

DEBT EQUITY RATIO

This ratio shows the level of financial leverage generated by any organisation. This ratio is a comparison between total liabilities and stock holder's equity. Debt equity ratio is very much crucial as it compares how much debt has been used by the company to finance fixed assets as compared to shareholder's equity. This ratio shows the aggression of company in financing its growth through the use of debt. Excess debt is not good for the equity investors as well as for the company. Excess debt in the company may increase the risk of insolvency. Higher debt equity ratio without increase in the profitability ratio does not signify good financial health of an organisation.

Table 9: Debt Equity Ratio

Year	NHPC	NTPC	SJVN	RPOWER	GVKPIL	GIPCL
2010	126%	1321%	92%	4869%	3143%	754%
2011	387%	1525%	95%	522%	4640%	1044%
2012	429%	1708%	104%	5%	12293%	1008%
2013	260%	2167%	99%	6%	7930%	881%
2014	252%	2426%	109%	8%	18519%	818%
2015	245%	2663%	106%	23%	19576%	304%
2016	281%	1502%	99%	31%	310%	246%
2017	304%	1702%	94%	45%	312%	779%
Average	285.50%	1876.75%	99.75%	688.63%	8340.38%	729.25%

Source: Compiled by the researcher.

Analysing the data from Table 9, it is clear that GVKPIL has the highest debt equity ratio of 8340.38% whereas SJVN has the lowest debt equity ratio of 99.75%. One variable or financial ratio cannot give appropriate result. It becomes important to check the profitability ratio with debt equity ratio. No ratio can be used in isolation to check the financial performance of any organisation.

Hypothesis

H_{01}: Debt equity ratio of all units is not same during the period of study.

H_{02}: Debt equity ratio of all units is same during the period of study.

Table 9.1: Debt Equity Ratio (ANOVA)

ANOVA: single factor				
Summary				
Groups	**Count**	**Sum**	**Average**	**Variance**
NHPC	8	22.84	2.855	0.858714
NTPC	8	150.14	18.7675	23.37354
SJVN	8	7.98	0.9975	0.003707
RPOWER	8	55.09	6.88625	288.4236
GVKPIL	8	667.23	83.40375	5932.608
GIPCL	8	58.34	7.2925	8.930421

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P*-**value**	*F* **crit**
Between groups	40080.36	5	8016.07162	7.690264	3.31E-05	2.43769264
Within groups	43779.38	42	1042.36627			
Total	83859.74	47				

Observing the value of '*F*' which is 7.690264 is more than the table value 2.438 at 5% level of significance. It indicates that the null hypothesis is rejected and the alternate hypothesis is accepted. It means that there is significant difference of debt equity ratio between the units undertaken for the period of study.

EARNINGS PER SHARE

Earnings per share denotes the portion of total earnings in relation to one share. This ratio serves as the indicator to understand the company's performance in terms of profitability. Higher the earnings per share ratio better it is for the investors. In other words high earnings per share indicates better financial position of a company.

Table 10: Earnings per Share

Year	**NHPC**	**NTPC**	**SJVN**	**RPOWER**	**GVKPIL**	**GIPCL**
2010	108.17	10.72	2.37	1.14	1.02	7.06
2011	1.76	11.04	2.21	1.06	0.98	10.77
2012	2.25	11.19	2.58	1.11	0.39	7.83
2013	2.13	15.27	2.54	1.83	-2.13	14.47
2014	0.82	13.83	2.69	0.2	2.33	12.29
2015	1.92	12.11	4.05	0.09	5.29	8.35
2016	2.74	11.05	3.4	4.63	0.78	12.46
2017	2.35	11.06	3.73	0.23	1.72	15.16
Average	15.2675	12.03375	2.94625	1.28625	1.2975	11.04875

Source: Compiled by the researcher.

Observing the data from the above Table 10, NHPC has the highest average EPS of 15.2675 and RPOWER has the lowest average EPS of 1.28625. NTPC has the consistent EPS at an average of 12.03 over a period of eight years. Consistent EPS denotes stable financial condition of an organisation. According to the consistency of EPS, NTPC is in a better financial position as compared to NHPC even though NHPC has the highest EPS average.

Hypothesis

H_{01}: Earnings per share ratio of all units is not same during the period of study.

H_{02}: Earnings per share ratio of all units is same during the period of study.

Table 10.1: Earnings per Share (ANOVA)

Summary				
Groups	**Count**	**Sum**	**Average**	**Variance**
NHPC	8	122.14	15.2675	1409.437
NTPC	8	96.27	12.03375	2.720998
SJVN	8	23.57	2.94625	0.468198
RPOWER	8	10.29	1.28625	2.186655
GVKPIL	8	10.38	1.2975	4.314507
GIPCL	8	88.39	11.04875	9.39587

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P*-**value**	*F* **crit**
Between groups	1528.735	5	305.7469	1.28418	0.288817	2.437693
Within groups	9999.666	42	238.0873			
Total	11528.4	47				

Observing the value of '*F*' which is 1.28418 is less than the table value 2.438 at 5% level of significance. It indicates that the null hypothesis is accepted and the alternate hypothesis is rejected. It means that there is no significant difference of earnings per share ratio between the units undertaken for the period of study.

BOOK VALUE

Book value represents the net assets value of any organisation. This is calculated by deducting liabilities and intangible assets from the total assets. This denotes the security for stock investors, if the company is liquidated this value will be distributed among the shareholders. When compared with the share price one can know whether the share price of a particular company is overvalued or undervalued. If share price is below book value it is considered over valued and vice versa.

Table 11: Book Value

Year	NHPC	NTPC	SJVN	RPOWER	GVKPIL	GIPCL
2010	0.0001%	5%	21%	6%	26%	42%
2011	11%	10%	19%	12%	36%	41%
2012	13%	92%	35%	16%	20%	44%
2013	2%	443%	28%	30%	11%	48%
2014	13%	76%	16%	28%	10%	47%
2015	10%	40%	23%	17%	10%	42%
2016	14%	36%	19%	17%	16%	46%
2017	15%	37%	20%	17%	19%	43%
Average	9.75%	92.38%	22.63%	17.88%	18.50%	44.13%

Source: Compiled by the researcher.

From the above Table 11, NTPC has the highest book value of 92.38% and NHPC has the lowest book value of 9.75%. As mentioned book value cannot be used in isolation it has to be compared with other financial variables. Especially book value is compared with market share price.

Hypothesis

H_{01}: Book value of all units is not same during the period of study.

H_{02}: Book value of all units is same during the period of study.

Table: 11.1: Book Value (ANOVA)

Summary				
Groups	**Count**	**Sum**	**Average**	**Variance**
NHPC	8	0.780001	0.097500125	0.003193
NTPC	8	7.39	0.92375	2.094484
SJVN	8	1.81	0.22625	0.003741
RPOWER	8	1.43	0.17875	0.006155
GVKPIL	8	1.48	0.185	0.008171
GIPCL	8	3.53	0.44125	0.00067

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between groups	3.782091	5	0.756418236	2.144433	0.078725218	2.43769264
Within groups	14.8149	42	0.35273571			
Total	18.59699	47				

Observing the value of '*F*' in Table 11.1 which is 2.144433 is less than the table value 2.438 at 5% level of significance. It indicates that the null hypothesis is accepted and the alternate hypothesis is rejected. It means that there is no significant difference of book value ratio between the units undertaken for the period of study.

Table 12: Inclusive Performance

Ratios	Public Sector Power Generation Companies				Private Sector Power Generation Companies			
	NHPC	NTPC	SJVN	Average	RPOWER	GVKPIL	GIPCL	Average
Profitability ratio (net income/ total revenue)	36.00%	14.00%	51.00%	33.67%	28.00%	-13.00%	13.00%	9.33%
Asset turnover ratio	11.50%	92.38%	22.63%	42.17%	17.88%	18.50%	44.13%	26.84%
Gross profit ratio	49.50%	18.69%	69.38%	45.85%	1853.13%	-16.64%	17.5%	617.99%
Adjusted gross profit ratio	33.50%	15.71%	55.75%	34.98%	9%	-53%	18%	-8.66%
Return on capital employed	7.25%	33.88%	13.38%	18.17%	5.25%	3.63%	14.63%	7.84%
Long term debt equity ratio	172.38%	874.50%	66.38%	371.09%	20.65%	6184.88%	397.38%	2200.97%
Debt equity ratio	285.50%	1876.75%	99.75%	754.00%	688.63%	8340.38%	729.25%	3252.75%
Earnings per share	15.2675	12.03375	2.94625	10.0825	1.28625	1.2975	11.04875	4.544167
Book value	9.75%	92.38%	22.63%	41.59%	17.88%	18.50%	44.13%	26.84%

Source: Compiled by the researcher.

From the above data as mentioned in the Table 12, it is clearly observed that the financial performances of public sector power generating companies are better as compared to private sector power generating companies. Among the selected public sector power generating companies SJVN has the highest gross profit ratio, adjusted gross profit ratio and lower debt equity ratio and debt equity ratio. Whereas NTPC has better asset turnover ratio, return on capital employed and greater book value. NHPC has higher profitability ratio and earnings per share.

CONCLUSION

Despite many changes and efforts power sector in India has miles to go in the way of development. Financial performance are not just the numbers reflected in the financial statements but many factors are responsible for the performance of the power sector companies. This sector being capital intensive in nature requires huge capital investments. Also the proper and effective infrastructure is required to develop the profitability of both public and private sector power generating companies. The political factor is also one of the major problems, which makes major decisions that may hamper the profitability of the power sector companies. More amendments are required in the electricity generation law in order to curb financial losses faced by the private sector power generating companies.

The profitability ratio shows that the overall profitability of NHPC is highest as compared to other power generating companies both private and government. GVKPIL has the lowest profitability ratio in negative.

The asset turnover ratio shows that NTPC has the highest asset turnover ratio as compared to other power generating companies both private and government. This means NTPC is efficiently using the assets. NHPC in the other hand has the lowest asset turnover ratio even though it has high profitability ratio.

The gross profit ratio shows that SJVN has the highest gross profit ratio as compared to other power generating companies both private and government. GVKPIL has the lowest gross profit ratio in negative.

The adjusted gross profit ratio shows that SJVN has the highest gross profit ratio as compared to other power generating companies both private and government. GVKPIL has the

lowest adjusted gross profit ratio in negative. Adjusted gross profit has been calculated deducting the other income and income from operation has only been considered.

The return on capital employed ratio shows that NTPC has the highest return on capital employed ratio as compared to other power generating companies both private and government. GVKPIL has the lowest return on capital employed ratio.

The long term debt equity ratio shows that GVKPIL has the highest long term debt equity ratio as compared to other power generating companies both private and government. This means that GVKPIL has taken more debt as compared to other peers. SJVN has the lowest long term debt equity ratio.

The debt equity ratio shows that GVKPIL has the highest debt equity ratio as compared to other power generating companies both private and government. This means that GVKPIL has taken more debt as compared to other peers. SJVN has the lowest debt equity ratio.

The earnings per share ratio shows that NHPC has the highest earnings per share ratio as compared to other power generating companies both private and government. This means that NHPC has been able to generate more wealth to its shareholders as compared to other peers. SJVN has the lowest debt equity ratio. RPOWER has the lowest earnings per share.

The book value ratio shows that NTPC has the highest book ratio as compared to other power generating companies both private and government. NHPC has the lowest book value ratio. In order to give more meaning this book value can be compared with the current share price of the company.

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Footnotes

[1] ADR represents adjusted gross profit ratio. ADR has been calculated after deducting other income from the profit. This adjusted ratio will show the real growth in terms of profit from operation.