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R. Narayanan
Project Manager, M/S National Contracting Company Ltd. Coimbatore – 41 Tamil Nadu.

R. Hamsalakshmi
Assistant Professor in Commerce, LRG Government Arts College for Women, Palladam Road, Tirupur–4.

Correspondence:
R. Narayanan
Project Manager, M/S National Contracting Company Ltd. Coimbatore – 41 Tamil Nadu.

Leverage analysis of selected Indian power sector companies

R.Narayanan, R.Hamsalakshmi

Abstract
India has stepped its development agenda and power is an inevitable element of economic growth and development. Growth in the power sector is related to India's GDP growth rate and hence, in order to sustain the growth of 8-9% in GDP, India needs to continuously add power generation capacity to commensurate with this pace. Although, the Indian power sector is one of the fastest growing sectors in the world and energy availability has increased by around 36% in the past 5 years, the demand for power outstrips its supply. Nearly 60 crore Indians do not have access to electricity. The energy and peaking deficits have been hovering around double digits for the past two years and the condition might worsen in the coming years considering the huge demand of power from India's rising population and rapid industrialization and urbanization. Hence, there is no slowing down of demand for the Power Sector, thus offering ample scope for rapid capacity expansion. It is very important that while investing in a company, an investor selects an industry, where the long-term future prospects are bright it has seen that in the long run the Indian Power sector is expected to have good growth. With this background an empirical analysis is carried out in this paper to examine the leverage position of the selected power generating and distributing companies listed in BSE. The study carried an analysis for five financial years from 2009-10 to 2013-14 with application of appropriate statistical tools and it is concluded that Sales and operating cost is more influencing variable and interest is next contributing variable to influence profit before interest and taxes. Once the companies target to increase profit before interest and taxes then growth rate of sales and earnings per share can be achieved and it reflects in their market prices.

Keywords: Power Generating and Distributing Companies, Financial and Operating Leverage, Profit before interest and taxes, Earnings per share and Market price

1. Introduction
In India Power Generation, transmission and Distribution has made significant progress after Independence. In 1947 Power generation capacity was 1,362 MW only and that also primarily by hydro power and thermal power generation plants. Few private utilities were involved in generation and distribution of electrical power. After 1947, all power generation, transmission and distribution were taken over and controlled by State and Central government agencies. As such State Electricity Boards (SEB) came into existence. India's power sector was regulated and dominated by SEBs until economic reforms began in 1991. The SEBs controlled the entire electricity supply chain from generation, transmission to distribution within a state. The unviable tariff structure, lack of political will and vote bank considerations resulted into high transmission and commercial losses that lead to almost bankrupt SEBs and erratic, poor quality power and the last but not the least insufficient power supply.

2. Methodology
2.1 Statement of the Problem
The most important change was the promulgation of Central Electricity Act 2003, This Act superseded all the previous electricity Acts, Rules, mandatorily requiring restricting of SEBs and separation of trading function from transmission and system operation. The intent and purpose was to create an open and transparent environment for attracting investment in the sector and promotion of competition. Orissa was the first state to introduce reforms that failed. The GNCT of Delhi also followed the suit by introducing private players i.e. BSES and Tata Power.
In spite of all the reforms, the sector did not show a healthy picture and the performance Report of Power Sector for the year released by Power Finance Corporation on 11-09-2013.

The report presents a dismal picture of entire power sector. Some of the shocking revelations were the total income excluding subsidy for utilities selling directly to consumers increased, the total energy sold by these utilities increased, total subsidy booked by utilities selling directly to consumers increased, the aggregate book losses of all the utilities increased in 2011-12 compared to 2010-11, the losses despite accounting for subsidy on realizable basis for all utilities increased in 2011-12, the aggregate book losses for all the utilities in the states increased in 2011-12 and the net worth decreased and it turned into negative as on 31st March 2012. It indicates that the situation is alarming. Despite incentives offered by the Central Government, the fixation of remunerative price by the CERC to Generators, the manifold increase in the power tariffs payable by the consumers, still the sector is sinking.

The huge money pumped in the sectors seems to have just disappeared and it draws some of the inferences that the investment worth thousands corers of rupees seems to have gone down the drain, the investment claimed to have been invested has failed to achieve the targeted results because the investment was made only on paper. This is the situation despite creation of three Public Sector Undertakings to serve the sector- Power Grid Corporation, Power Finance Corporation and Power Trading Corporation.

To examine the above said deficiency of the sector, an empirical study is made focusing on finding the major financial variables which is contribution towards changes in financial and operating leverage which affects profitability of the selected power generation and distribution companies in India.

2.2 Objectives of the Study

1. This study primarily aims to measure the contribution of the selected financial variables responsible for financial leverage and operating leverage which affects profitability of the selected power generation and distribution companies.
2. To examine the general performance of the selected variables affects leverages.
3. To examine that there is any significant difference between the mean of the selected variables among the companies during the study period.

2.3 Sources of Data and Tools Used

To carry out the above said objectives the top five Power Generation and Distribution companies in India, which are listed in the Bombay Stock Exchange were selected based on their Market Capitalisation as on March 2014.

The study covered a period of five financial years from 2009-10 to 2013-14. The financial year starts from 1st day of April of a year and ends on 31st day of March of the following year.

Related financial data were taken from money control corporate database. The companies selected for the present study are NTPC, Power Grid Corp, TATA Power, NHPC, Reliance Power.

2.4 Frame Work of Analysis

In order to identify the performance of leverages prominent variables namely Earnings before Interest and Taxes, Interest, Profit before Taxes, Operating cost and Sales turnover were selected for a period of five financial years. To examine the above said objectives financial tool namely financial and operating leverages were applied. The statistical tools namely summary statistical measures and to test the hypotheses of mean performance one way ANOVA was applied. To find out the relationship among the selected variables Pearsons Correlation was applied.

3. Review of Literature

Thermal Power: - In India, major proportion of power is generated from thermal sources where the main raw material used is coal. Around 83% of thermal power is generated using coal as a raw material whereas 16% of thermal power is generated with the help of Gas and 1% of thermal power is generated with the help of Oil.

Hydro Power: - Hydroelectric power or hydroelectricity is electrical power which is generated through the energy of falling water. India has hydro power generation potential worth 1,50,000 MW, of which only 25 % has been harnessed till date.

Nuclear Power: - A Nuclear Power Plant is a thermal power station in which the heat source is one or more nuclear reactors. A nuclear reactor is a device to initiate and control a sustained nuclear chain reaction. In the process, heat is generated which is then used to generate electricity.

Renewable Energy Sources: – The energy obtained from renewable sources like sun, wind, biomass can be converted into power. Renewable energy sources have great potential to contribute to improving energy security of India and reducing green-house gas emissions. India is among the five largest wind power generators in the world.

Government of India (1980) constituted an Expert Committee to make a comprehensive study to examine financial performance of the SEBs in the pre-reform period. The main objective of the study was to identify weaknesses in the system and suggest some appropriate measures to improve the financial health of SEBs. The study used the information on average tariff, cost of supply and electricity subsidy paid by respective state governments as indicators of financial performance. The Expert Committee concluded that the average revenue realised was not adequate to cover the cost of supplying power to various consumer categories and respective state governments should pay adequate amount of subsidies to compensate for the financial losses to distribution utilities on account of subsidised power supply to agriculture sector.

A study was conducted by **CRISIL (2009)** to examine the pricing policy followed by various State Electricity Regulatory Commissions (SERCs). The study was mainly based on the analysis of tariff & other related orders of SERCs. The time period for the study was taken for the period from FY 2004-05 to FY 2008-09. The study focused on the issues in tariff rationalisation and the commitment in making timely subsidy payments on part of the state governments. In the study, it was pointed out that one of the key objectives of setting up the SERCs is rationalization of end-users‟ tariffs. Therefore, tariff rationalisation is a very important aspect of the power sector reforms in India. The tariff structure is marked by high levels of cross subsidies and no. of consumer categories/ slabs is very high across various states. The Electricity Act 2003 and the National Electricity Policy (2005) has provided adequate focus on the reduction of the cross subsidies existed in the electricity tariff structure. The policy mandated the respective SERC to notify a roadmap to eliminate the high cross-subsidies in the power sector. It was stated that the tariff for various consumer categories should be fixed within a limit of 20% plus and minus of the average cost of supply. The study concluded that some of the SERCs have taken initiatives for reducing the cross subsidy and rationalizing the tariff structure for consumer

categories. However, a clear roadmap specifying milestones to bring down the cross subsidy levels to the required limit has not been notified by any of the SERCs.

With the thermal power generation segment facing the issue of shortages of coal (major raw material), other power generation sources like nuclear, hydro and renewable energy sources will get attention in the coming years.

Nuclear power projects account for 2.75% of India's total installed capacity which is about 4.77 GW. The Planning Commission's expert committee on an Integrated Energy Policy has suggested in its report that there is a possibility of reaching a nuclear power capacity of 21-29 GW by 2020 and 48-63 GW by 2030.

The **hydro power segment** offers investment opportunities as India is considered to have hydro power generation potential worth 1,50,000 MW; of which only 25% has been harnessed till date.

Using **renewable sources** to generate electricity has several advantages like a perennial energy source, potential for lower reliance on imported fossil fuels and lower CO2 emissions. However, at present the major hurdle facing rapid expansion of renewable power is high initial cost as compared to the competing fuels. But taking in to consideration the environmental concerns, this segment receives encouragement from the Government. Its share in the country's total generation capacity has increased from 1.1% in 2001-02 to 10.63% as on 31st March, 2011 and is expected to increase in the future.

These three non-thermal sources of power also offer good investment opportunities. Companies are diversifying their power portfolios to take advantage of opportunities available in hydro power and renewable energy sources.

Roadblocks (Challenges): -

Power Sector is a highly capital-intensive industry with long gestation periods, before the commencement of revenue generation. Since most of projects have a long time frame (4-5 years of construction period and operating period of over 25 years), there are some inherent risks which this sector faces.

Availability of Coal: -

Coal is the mainstay of the power production in India and is expected to remain so in the future. India has limited coal reserves, plus, availability of domestic coal is a challenge on account of various bottlenecks such as capacity expansion of Coal India Limited (the largest coal producing companies in the world, coal block allocation, tribal land acquisition, environmental and forest clearances, etc.

Transportation of coal is a big concern in itself. Within the country, coal is transported by Indian Railways and in case of imports; coal is to be unloaded at ports. In both cases, India currently faces capacity shortage. Hence, a project developer has to account for and manage its logistics chain in a manner that ensures regular fuel supply which is a big challenge.

Dependence on Equipment Suppliers: -

The power sector is heavily dependent on Equipment suppliers. In fact, equipment shortages have been a significant reason for India missing its capacity addition targets for the 10th five year plan. While the shortage has been primarily in the core components of boilers, turbines and generators, there has been lack of adequate supply of Balance of Plant (BOP) equipment as well. These include coal handling, ash-handling plants, etc. Apart from these, there is shortage of construction equipment as well. Hence, inadequate supply of equipments is a cause of concern for the power companies.

Aggregate Commercial and Technical Losses: -

The Aggregate Technical and Commercial Loss (AT&C) is defined as the power lost due to inefficient transmission and distribution infrastructure. India's AT&C losses are as high as 30% compared with 5-10% in the developed markets which means out of every 100 units produced, 30 are lost during transmission and distribution. Technical losses are due to inadequate investments over the years for system improvement works. Commercial losses are mainly due to low metering efficiency, pilferage and theft of power. This is a huge problem for the power sector.

Other Roadblocks leading to Demand Supply Gap: -

The power sector has other concerns like shortage of skilled manpower for construction and commissioning of projects, contractual disputes between project authorities, contractors and their sub-vendors, delay in readiness of balance of plants by the executing agencies. Difficulties have been experienced by developers in land acquisition, rehabilitation, environmental and forest – related issues, inter-state issues, geological surprises (particularly for Hydro projects) and contractual issues. These issues continue to pose challenges to maintain the pace of development of power projects.

4. Analysis and Interpretations

4.1 Performance of selected financial variables which affects Leverages.

Employment of an asset or source of funds for which the firm has to pay a fixed cost or return has a considerable influence on the earnings available for equity shareholders. The fixed cost or return acts as the fulcrum and the leverage magnifies the influence. It must be noted that higher is the degree of leverage, higher is the risk as well as return to the owners. The leverage associated with the employment of fixed cost assets is referred as operating leverage, while the leverage resulting from the use of fixed cost source of funds is known as financial leverage. Every firm has to make its own decision regarding the quantum of funds to be borrowed. When the amount of debt is relatively large in relation to capital stock, a company is said to be trading on their equity. On other hand if the amount of debt is comparatively low in relation to capital stock, the company is said to be trading on thick equity.

From the above said scope the following table explains the performance of Financial and Operating Leverage of the selected companies during the study period.

Table 4.1 Performance of Financial Leverage

Name on the Company	2014	2013	2012	2011	2010
Ntpc	1.173	1.116	1.143	1.136	1.172
Power Grid	1.504	1.451	1.42	0.6	1.582
Tata Power	1.582	1.398	1.306	1.413	1.327
Nhpc	1.49	1.12	1.096	1.23	1.213
Reliance Power	2.879	1.043	1.194	1.167	1.005
Sd	0.663501	0.18509	0.131035	0.304233	0.213981
Mean	1.7256	1.2256	1.2318	1.1092	1.2598
Cv	38.45044	15.10199	10.63769	27.42814	16.98528

From the table 4.1 the mean performance of financial leverage in the year 2014 is high during the study period and implies that performance of earnings before interest and taxes are comparatively high among the selected companies. In the year 2014 deviation of financial leverage among the selected companies are high during the study period and financial leverage is consistent in the year 2012.

Table 4.2: Performance of Operating Leverage

Name on the Company	2014	2013	2012	2011	2010
Ntpc	1.56	1.3	1.45	1.63	1.33
Power Grid	1.575	1.544	1.537	-0.167	1.637
Tata Power	1.9	1.48	1.42	1.62	1.61
Nhpc	1.773	1.307	1.441	1.6	1.638
Reliance Power	0.218	0.022	0.055	0.044	0.029
Sd	0.678665	0.628846	0.630812	0.922255	0.694109
Mean	1.4052	1.1306	1.1806	0.9454	1.2488
Cv	48.29666	55.62052	53.43144	97.55186	55.58204

From the table 4.2 it is observed that operating leverage is high in the year 2014. The more deviation of Operating Leverage is found in the year 2011 among the selected companies. In the year 2011 performance of operating cost is more inconsistent among the selected companies.

Table 4.3: Performance of Combined Leverage

Name on the Company	2014	2013	2012	2011	2010
Ntpc	1.83	1.45	1.65	1.85	1.56
Power Grid	2.369	2.24	2.183	-0.1	2.588
Tata Power	3	2.073	1.857	2.292	2.139
Nhpc	2.641	1.464	1.579	1.97	1.988
Reliance Power	0.629	0.023	0.066	0.051	0.03
Sd	0.923525	0.873034	0.817556	1.142067	0.982993
Mean	2.0938	1.45	1.467	1.2126	1.661
Cv	44.10758	60.20925	55.72978	94.18335	59.18082

From table 4.3 it is found that the performance of combined leverage is comparatively high in the year 2014 and performance NHPC is increased compared to other selected companies during the study period.

4.2 Analysis of Relationship between the selected variables which affects Leverages

To examine the relationship between the selected financial variables which affects earnings before interest and taxes Karl Pearsons Correlation coefficient was applied.

Table 4.4: Relationship between the selected variables of NTPC

Pearsons Correlation						
		EBIT	INT	PBT	OC	SALES
EBIT	Pearson Correlation	1	.642	.994**	.659	.746
	Sig. (2-tailed)		.243	.001	.226	.147
Interest (INT)	Pearson Correlation	.642	1	.555	.553	.622
	Sig. (2-tailed)	.243		.332	.334	.263
PBT	Pearson Correlation	.994**	.555	1	.637	.722
	Sig. (2-tailed)	.001	.332		.248	.169
Operating cost(OC)	Pearson Correlation	.659	.553	.637	1	.986**
	Sig. (2-tailed)	.226	.334	.248		.002
SALES	Pearson Correlation	.746	.622	.722	.986**	1
	Sig. (2-tailed)	.147	.263	.169	.002	
**. Correlation is significant at the 0.01 level (2-tailed).						

From table 4.4 a significant relationship is found out between profit before taxes and earnings before interest and taxes similarly between sales and Operating cost of NTPC.

Table 4.5: Relationship between the selected variables of Power Grid Corpn

Pearsons Correlation						
		EBIT	**INT**	**PBT**	**OC**	**SALES**
EBIT	Pearson Correlation	1	.767	.996**	.658	.990**
	Sig. (2-tailed)		.130	.000	.228	.001
INT	Pearson Correlation	.767	1	.707	.966**	.849
	Sig. (2-tailed)	.130		.182	.007	.069
PBT	Pearson Correlation	.996**	.707	1	.593	.974**
	Sig. (2-tailed)	.000	.182		.292	.005
OC	Pearson Correlation	.658	.966**	.593	1	.750
	Sig. (2-tailed)	.228	.007	.292		.144
SALES	Pearson Correlation	.990**	.849	.974**	.750	1
	Sig. (2-tailed)	.001	.069	.005	.144	
**. Correlation is significant at the 0.01 level (2-tailed).						

Table 4.5 explains the relationship between the selected variables of Power Grid corporation and it is found that a significant relationship between earnings before interest and taxes profit before tax and sales.

Table 4.6: Relationship between the selected variables of TATA Power

Pearsons Correlation						
		EBIT	INT	PBT	OC	SALES
EBIT	Pearson Correlation	1	.809	.902*	.536	.959**
	Sig. (2-tailed)		.098	.036	.352	.010
INT	Pearson Correlation	.809	1	.476	.038	.690
	Sig. (2-tailed)	.098		.418	.952	.198
PBT	Pearson Correlation	.902*	.476	1	.780	.932*
	Sig. (2-tailed)	.036	.418		.120	.021
OC	Pearson Correlation	.536	.038	.780	1	.735
	Sig. (2-tailed)	.352	.952	.120		.157
SALES	Pearson Correlation	.959**	.690	.932*	.735	1
	Sig. (2-tailed)	.010	.198	.021	.157	
*. Correlation is significant at the 0.05 level (2-tailed).						
**. Correlation is significant at the 0.01 level (2-tailed).						

From table 4.6 a high degree of significant is found between sales and earnings before interest and taxes and it is observed that sales and operating cost is also related to some extent.

Table 4.7: Relationship between the selected variables of NHPC

Pearsons Correlation						
		EBIT	INT	PBT	OC	SALES
EBIT	Pearson Correlation	1	-.282	.926*	.410	.869
	Sig. (2-tailed)		.645	.024	.493	.056
INT	Pearson Correlation	-.282	1	-.624	-.288	.224
	Sig. (2-tailed)	.645		.261	.638	.717
PBT	Pearson Correlation	.926*	-.624	1	.448	.620
	Sig. (2-tailed)	.024	.261		.450	.265
OC	Pearson Correlation	.410	-.288	.448	1	.267
	Sig. (2-tailed)	.493	.638	.450		.665
SALES	Pearson Correlation	.869	.224	.620	.267	1
	Sig. (2-tailed)	.056	.717	.265	.665	
*. Correlation is significant at the 0.05 level (2-tailed).						

Table 4.7 explains the relationship between the selected variables of NHPC and a significant relationship is found between profit before interest and taxes to profit before taxes and a high relationship is found between sales and earnings before interest and taxes.

Table 4.8: Relationship between the selected variables of Reliance Power

Pearsons Correlations						
		EBIT	INT	PBT	OC	SALES
EBIT	Pearson Correlation	1	-.572	.976**	-.577	-.599
	Sig. (2-tailed)		.314	.005	.309	.286
INT	Pearson Correlation	-.572	1	-.738	.922*	.969**
	Sig. (2-tailed)	.314		.154	.026	.007
PBT	Pearson Correlation	.976**	-.738	1	-.721	-.752
	Sig. (2-tailed)	.005	.154		.169	.143
OC	Pearson Correlation	-.577	.922*	-.721	1	.986**
	Sig. (2-tailed)	.309	.026	.169		.002
SALES	Pearson Correlation	-.599	.969**	-.752	.986**	1
	Sig. (2-tailed)	.286	.007	.143	.002	
**. Correlation is significant at the 0.01 level (2-tailed).						
*. Correlation is significant at the 0.05 level (2-tailed).						

Table 4.8 explains the relationship of selected variables of Reliance Power which affects leverages and a high significant relationship is found between profit before taxes and earnings before interest and taxes, interest and sales, operating cost and sales.

4.3 Test of Hypotheses

To examine mean performance of financial leverage and Operating leverages among the selected companies the following hypotheses were framed and tested with One Way ANOVA.

Hypothesis No: 1

Ho: There is no significant difference in the mean of financial leverage of the selected companies.

Table 4.9: Test of Hypothesis – One Way ANOVA

Financial Leverage					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	.318	4	.079	.475	.754
Within Groups	3.345	20	.167		
Total	3.663	24			

The table value at 5% level of significance is 2.87 and the calculated F value is 0.475, the F value is less than the table value hence the difference in the mean values of the sample is not significant.

Hypothesis No: 2

Ho: There is no significant difference in the mean of Operating leverage of the selected companies.

Table 4.10: ANOVA

Operating Leverage					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	8.105	4	2.026	14.446	.000
Within Groups	2.805	20	.140		
Total	10.910	24			

From table 4.10 it is found that the F value is 14.446 and it is more that the table value hence the null hypothesis is rejected and the alternate hypothesis has been accepted that there is a significant difference is found between the mean performance of operating leverage of the selected companies during the study period.

V. Conclusion

Analysing the performance over this time frame is essential to understand how a company has fared during the good as well as bad times. The five most important parameters that one needs to look at are Net Sales Growth Rate, EPS Growth Rate, Book Value Per Share (BVPS) Growth Rate, Return on Invested Capital (ROIC) and Debt to Net Profit Ratio.

From this background the above said study is carried out to examine the impact of the selected variables influence towards leverages. It is found that Sales and operating cost is more influencing variable and interest is next contributing variable to influence profit before interest and taxes. Once the companies target to increase profit before interest and taxes growth rate of sales and earnings per share can be achieved, it reflects in their market prices. In case of the power sector, though, it is poised for good growth in the future, it remains to be seen whether the above companies can completely take benefit of this growth and reflect it in their performances.

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