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The Scenario of National Thermal Power Corporation Pre and post Disinvestments - A paired t test analysis

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Abstract

According to the global restructuring trend, the reform and restructuring process in the Indian electrical industry has been ongoing since 1992. This paper describes the current state of the Indian power industry and highlights the government's recent restructuring efforts and policies. Several essential parts of the reform agenda have been executed with differing degrees of success in various Indian states. A reorganization concept for UPPCL is offered. If necessary, this model may be implemented at the national level with appropriate revisions. Many developing and transition nations have implemented market-oriented reforms in their electric power sectors since about 1990. Despite extensive use of a uniform policy model, reform procedures and results have often fallen short of expectations. This study examines common elements of non-OECD electrical reform and reassesses reform programs and underlying assumptions based on a comprehensive literature analysis and case studies in Asia, Africa, Latin America, and Eastern Europe. In contrast to the sector-focused policy aims of deregulation in OECD nations, non-OECD changes are shaped by national fiscal crises, macroeconomic reforms, and lobbying by international lenders. It also emphasizes reform's reliance on recruiting foreign money and, as a result, its susceptibility to fluctuating international financial circumstances. A wide variety of non-OECD reform experiences show that a restricted emphasis on finance and cost recovery, when implemented rigidly, typically leads in poor outcomes. According to the study, strengthening reform would need a larger range of goals, such as service supply, public benefits, effective regulation, and social/political legitimacy. Reforms must, above all, be founded on realistic evaluations of national needs and capacities.

Keywords: restructuring, reform, OECD, regulation, electrical industry

Introduction

The National thermal Power Corporation Ltd. (NTPC) was incorporated in November, 1975 as a Central Generating Company with the objective of planning, promoting and organising the integrated development of thermal power generation and execution of thermal power projects and associated

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transmission lines. The authorized share capital of the Corporation isRs.8000 crores. As on March, 1991, the paid-up capital of the NTPC was Rs.6355.11 crores, which is wholly subscribed by the government of India.

During 1989-90, the NTPC earned a net profit of Rs.563.56 crores. The return on capital employed and return on Net worth were 10.21% and 10.74% respectively (excluding prior period income). As per the provisional estimates, NTPC earned a net profit of Rs.605.47 crores during the year 1990-91.

The NTPC is presently engaged in the execution of nine Super Thermal Power Projects with an aggregate approved capacity of 13240 MW and four gas based combined cycle projects with approved capacity of 2527 MW. The NTPC has also undertaken the construction of transmission lines with a total length of about 20200 ckt. kms. of high voltage lines including about 816 ckt. kms. of HVDC transmission line and85 substations/sub-station extension. The total approved cost of the NTPC projects including associated transmission system isRs.18439.09 crores.

Since the 1990s, India's electricity supply industry has been primarily public sector. However, the Indian constitution includes energy on the "concurrent" list, therefore states are in charge of power sector development and rates. China's electrical industry has traditionally been centralised. Most production, transmission, and distribution assets are owned by governments, and state electrical boards manage them. NTPC, NHPC, North Eastern Electric Power Corporation, Neyveli Lignite Corporation, and Nuclear Power Corporation of India Ltd. are central public sector utilities (NPCIL).

GOI formerly used CPSUs, notably NTPC, to lead the industry and "force" SEBs to change. In fact, CPSUs owned and operated 37% of the nation's total installed generating capacity by 2010–11. NTPC generates 27.4% of the nation's electricity and controls 19% of generating capacity. State utilities have less success than it. Thus, public ownership of the power supply sector may not be the issue; rather, the entrenched interests of a coalition of parties have hampered energy supply development and public utility performance.

Public Sector Enterprises have always been crucial, and many development theories stress how the government works via state-run firms. However, there were two schools of thought: the classical school, which advocated a laissez-faire economy, and current economists, such as John Maynard Keynes, who favoured a mixed economy with public and private sectors.

India's public sector firms have been growth engines for decades. In pre-Independent India, private enterprises dominated growth, hence small firms had minimal impact. After independence, PSUs might help the country flourish quickly.

The public sector was intended to spark economic revolutions. The government used the public sector in early planning to maintain control over key industries. The public sector was really used to create a "socialist state." Before 1991, monopoly and state backing benefitted the Central Public Sector Enterprises.

The licencing Raj policy, which encouraged corruption and red tape to gain a licence to start a business, was eliminated. Industries were licenced to establish up under this policy. The US, World Bank, IMF, and

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other international organisations pushed "The Washington Consensus," a set of policy initiatives that would enable developing nations to lower their ownership interest in public companies in favour of private actors and enhance their performance.

Due of private engagement, several states used this disinvestment technique to punish corporations. China, Hungary, the UK, and South Africa have used disinvestment to boost their economies. After disinvestment, these countries' disinvested enterprises' revenues usually increased. Electricity powers our lives. The nation's economic growth and development also depend on affordable electricity. It's made and utilised instantly. Due to increased demand, India's power conditions are poor.

Many state-owned companies produce and distribute power inside the state (formerly known as SEBs). Private sector companies, together with PSUs and state-level organisations, are significant in generation, transmission, and distribution. The national grid is built and electricity is transferred by PGCIL. democratic India. Allowing individuals to choose is democracy. Competitiveness is encouraged wherever feasible. This circumstance requires a good power market model. Competition in healthy marketplaces gives clients a range of alternatives and high-quality services. Economic growth and power planning are essential for power sector transformation. Deregulation promotes competition in the electrical industry to provide reliable, high-quality electricity at reasonable prices. Deregulation's advantages have made it popular in various countries. Restructuring in telecommunications and aviation has benefited it. Since 1990, developing and transitional countries have implemented market-oriented electrical reform, similar to power deregulation in OECD nations. Despite their differences, these processes are vital for the global electrical industry's future.

The investment climate, availability to oil and gas sources, regional power commerce, and climate change legislation link power sectors in OECD and non-OECD nations. With over 10 years of electrical reform experience, there is an opportunity and a need to merge the expertise from Asia, Africa, Latin America, and Eastern Europe. This research helps us comprehend non-OECD energy reform issues. Although short, it focuses on four aims using examples from each non-OECD region: Creating a useful set of categories for understanding reform; emphasising the national and global factors that affect reform processes and results; comparing OECD deregulation and non-OECD reform; and (iv) identifying relevant issues and ideas. We hope this essay will draw attention to underappreciated policy issues and the need for analytical advances in non-OECD reforms.

Deregulation

NTPC Limited, a Maharatna Company of the Government of India, this is the major power generator in India with inclusive in-house abilities in project construction and operations of power stations. NTPC has share capital of Rupees 10,000 Crores, while the paid-up capital is Rupees 9,697 Crores. As on 31st December, 2021, 51.1%equity is held by the Government of India. For positive power sector reform, the role of power forecasting is very important as well as economic growth of the country. The main objective of deregulation is to boost competition in electricity market to deliverconsistent and good quality power supply at lowest cost. Due to these advantages of deregulation, many countries have already adopted this concept. It has been encouraged by the benefits of restructuring in telecommunication, airline industries etc(*Mishra et al. 2019*)

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Assessing financial performance is crucial for businesses in the manufacturing sector in the current constrained climate. The examination of financial performance replicates the company's financial situation and profitability as well as its level of competitiveness within its industry and provides specific details about the cost and profit centers inside the company. When making investment and tactical planning decisions managers, investors and creditors can use the various accounting evidence that financial analysis provides. The study focuses on the monetary results of the Indian aluminium manufacturing businesses HINDALCO and NALCO. From 2005–2006 to 2014–2015, data was self-possessed from information provided on various websites. To analyze the financial performance of HINDALCO and NALCO, various financial ratios and a t test have been used (*Patjoshi, 2016*).

The success of any organization is primarily determined by its successful financial management techniques, which begin with the acquisition of funds and finish with their effective application. Internal and external customers such as shareholders, government, bankers, creditors, financial institutions, researcher analysts and so on are concerned with the company's success and solvency; for them, the financial health of an enterprise is critical. They employ several accounting methods like as ratios, trend analysis, decision theory and so on to measure an enterprise's financial health. The findings produced by these tools are absolute and represent the current position rather than the future. A novel model for predicting the financial health of company concerns, known as the "Z- Score Model," was first created by Edward I. Altman, a professor of finance at New York University. He took into account five ratios, gave each one a weight and came up with a single number that represents the financial stability of the business concerns. This study attempts to forecast financial outcomes.Altman's Z-Score Model was used to assess the health of the power industry, with a focus on NTPC and NHPC Ltd., over a five-year period from 2010-11 to 2014-15. It was discovered that NTPC is in a too healthy zone where it is successful in its financial performance and does not go bankrupt, whereas NHPC is in a not healthy zone where failure is certain and extremely likely and would occur properly within a period of two years, viability is considered not healthy (*Patidar et al. 2016*).

Profit is a measure of how efficient and effective a company is. Profit maximization is now a widely accepted goal for any business, regardless of ownership. The rate of return or profitability, or ROE is a critical indicator for determining the firm's efficiency. The goal is to evaluate and analyze NTPC Ltd.'s financial performance after disinvestment from 2011-12 to 2019-20 using the three-step and five-step DuPont models. National Thermal Power Corporation was disinvested using the minority disinvestment method in 2009-10. According to the findings, the ROE was high in the early years. The equity multiplier is the most stable factor within the DuPont framework whereas other factors fluctuated, indicating that NTPC had less financial leverage duringthe study period's first years (Jani,2021).

Electricity is one of the most significant factors in the development of any country's economy. Various amendments to electricity laws have been made in order to improve the performance of electric power sector companies. Electric power companies are owned by both the government and the commercial sector. The Indian government has made numerous changes in order to improve the performance of power sector companies. The primary goal of this research is to examine the financial performance of power generation firms. According to the findings of this paper, the financial performance of government-owned

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power generation companies in India is more efficient than that of private-sector power generation companies (*Rai et al. 2019*).

Thermal power plants now generate the majority of the world's electricity. As a result, it is critical to examine earning capacity and performance expectations, including both expected behaviours and expected results for the upcoming rating cycle. The capacity utilization and efficiency performance are analyzed to see whether capacity utilization has an impact on the NTPC's efficiency management. The purpose of this research is to evaluate NTPC's capacity utilization and efficiency performance(*Rashid et al. 2017*).

The two most prevalent productivity indicators for businesses are total factor productivity (TFP) and labour productivity. This study expands on the Du Pont method by linking productivity and profitability through financial statements. To determine a new productivity rate of return, the first section employs a deductive methodology. The second section uses the financial statement analysis approach to create an empirical application of the findings. The major finding is that there is a functional link between TFP, ROOA, and labour productivity. The study derives a productivity rate of return from it that combines the two productivity indicators. Productivity, price change, and a cross-effect between turnover and price change are the three components that make up the ROOA. The model created in this paper enables analysts and managers to learn more about the factors that affect margin and turnover, and subsequently, the factors that affect ROOA. Insofar as the distinction between the effects of productivity and price change adds clarity to our understanding of the causes of ROOA, it also provides a basis for more accurate decision-making to enhance corporate performance (Bosch-Badia,2010).

Now we delve in the factors that influence the financial performance of Pakistan's energy sector. For the period 2009-16, the sample consisted of twenty-nine companies listed on the Pakistan Stock Exchange from the four sectors of the energy industry. ROA and ROE have been used to assess financial performance. In this study, the firm-specific and macroeconomic determinants of Pakistan's energy industry were examined, as well as their impact on financial performance. For hypothesis one, financial leverage, growth, size, age, risk, liquidity, and GDP all have a significant impact on ROA. Financial leverage and age have a significant and negative impact on ROA. ROA is significantly and favourably impacted by growth, size, risk, liquidity, and GDP. According to hypothesis number two, ROA is determined to be unaffected by tangibility, market share, interest rates, and inflation rates.The following factors have a big impact on ROE: GDP, INF, financial leverage, growth, risk, tangibility, and risk. It is discovered that risk, tangibility, and INF have a considerable, detrimental impact on ROE. ROE is significantly and favourably impacted by financial leverage, growth, liquidity, and GDP. The ROE is determined to be unaffected by factors like size, age, market share, and rate of INT. It has been determined that macroeconomic influences and firm-specific factors both significantly affect the financial performance of the energy industry (*Ahmad et al.2017*).

Coal is the primary energy source in India. Any standard coal-fired unit's efficiency ranges from 34 to 38%. This document contains the efficiency calculations for the boiler, turbine, and condenser of a 210 MW plant. The study focuses on evaluating different parameters like dry flue gas loss, wet flue gas loss, moisture in fuel and hydrogen, condenser back pressure, turbine cylinder efficiency, soot formation, etc.

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and some optimization techniques are mentioned to minimize the same. These methods offer significant fuel savings, reduced emissions, enhanced heat rate, cost reduction, extended equipment life, etc. The annual fuel savings have been calculated by a cost analysis of heat rate deviation. Finally, a number of crucial factors are listed for further enhancing plant performance (*Singh et al. 2017*).

By using a balance scorecard to assess NTPC's efficacy in achieving its fundamental values and business goals, the study's goal is to examine the performance of NTPC as a whole. Since NTPC has broken down its goals into five categories—business performance, financial performance, customer orientation, R&D, and performance management—the four perspectives of the balance scorecard were the perfect fit for examining how well the company is managing and measuring its performance. The four perspectives of the Balance Scorecard—financial, customer, internal processes, and innovation & learning—are used to describe and analyze how well NTPC is performing. The performance is examined using secondary data sources such as annual reports, financial analysis, financial websites, and media. It was discovered that NTPC has set its objective statement with greatest clarity in order to improve performance with measurable goals. The implementation of the balance scorecard revealed a good relationship between the company's overall objectives and its performance. It would provide a comprehensive perspective of the total performance outcome as well as a chance to improve qualitative and quantitative performance in order to build better synergy and alignment of strategies with the performance management system (*Chakrawal et al. 2018*).

Objectives of the study

The objective of this study was to determine the Pre and post Disinvestments impact on the NTPC

Methodology

The t-test requires that observations are drawn from a normally distributed population and the two-sample t-test requires that the two populations have the same variance. According to Siegel (1956) old parametric tests should not be used forvery small samples, since these tests have numeroushard assumptions underlying their use and that these cannot be tested when the sample size is small. (*Campbell et al. 1995*)t-test in extremely small sample sizes, did not point out problems and Type I error rate did not exceed the nominal value of 5% concluding that paired t-test to be feasible with extremely small sample sizes, particularly when the within-pair correlation coefficient is high.The alternative non parametric test for paired t test is Wilcoxon Signed Rank Test. These derived equations are based on (*Blumanet al.2004*) and petrie and Sabin (2005)

Paired T-test is a test that is based on the differences between the values of a single pair, that is one deducted from the other. In the formula for a paired t-test, this difference is notated as d. The formula of the paired t-test is defined as the sum of the differences of each pair divided by the square root of n times the sum of the differences squared minus the sum of the squared differences, overall n-1.

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The formula for the paired t-test is given by

$$t = \frac{\sum d}{\sqrt{\frac{n(\sum d^2)-(\sum d)^2}{n-1}}}$$

where d: difference per paired value
n: number of samples

Table 1 Paired t test analysis

Scenario	**Null Hypothesis (Ho)**	**Alternative Hypothesis(H1)**	**T**	**p(one-tailed)**	**p(two-tailed)**	**d.f.**	**Accept**	**Reject**	**Conclusion**
1	There is no difference in parameters of company details before and after disinvestment in NTPC	There is difference in parameters of company details before and after disinvestment in NTPC	-1.999	0.0918	0.1836	2	Ho	H1	As p value > 0.05 we accept Ho and reject H1. So there is no difference in parameters of company details before and after disinvestment in NTPC
2	There is no difference in parameters of extract of profit and loss before and after disinvestment in NTPC	There is difference in parameters of extract of profit and loss before and after disinvestment in NTPC	-3.106	0.005	0.01	11	H1	Ho	As p value < 0.05 we reject Ho and accept H1. So there is difference in parameters of extract of profit and loss before and after disinvestment in NTPC

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3.	There is no difference in parameters of balance sheet before and after disinvestment in NTPC	There is difference in parameters of balance sheet before and after disinvestment in NTPC	-3.533	0.0062	0.0123	6	H1	H0	As p value < 0.05 we reject Ho and accept H1. So there is difference in parameters of balance sheet before and after disinvestment in NTPC
4	There is no difference in parameters of management ratios before and after disinvestment in NTPC	There is difference in parameters of management ratios before and after disinvestment in NTPC	-1.878	0.0785	0.157	3	Ho	H1	As p value > 0.05 we accept Ho and reject H1. So there is no difference in parameters of management ratios before and after disinvestment in NTPC
5	There is no difference in parameters of other key financial indicators before and after disinvestment in NTPC	There is difference in parameters of other key financial indicators before and after disinvestment in NTPC	-1.788	0.0741	0.1482	4	Ho	H1	As p value > 0.05 we accept Ho and reject H1. So there is no difference in parameters of other key financial indicators before and after disinvestment in NTPC
6.	There is no difference in parameters of physical production before and after disinvestment in NTPC	There is difference in parameters of physical production before and after disinvestment in NTPC	-1.124	0.189	0.3779	2	Ho	H1	As p value > 0.05 we accept Ho and reject H1. So there is no difference in parameters of physical production before and after disinvestment in

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									NTPC

Table 2. Parameters and components

Scenario	**Parameters**	**Components of parameters**
1.	Company details	Authorized Capital
		Paid up Share Capital (CG)
		No. of Employees
2.	Profit & Loss	Total Income
		Revenue from operations (net)
		Other income
		Total Expenditure (excl. Excise duty)
		Power & fuel
		Employee benefit expenses
		Depreciation, Amortization & impairment
		Finance cost
		Profit/Loss before Tax
		Tax provisions
		Profit/loss after tax from continuing operations
		PBIT
2	Balance Sheet	Equity & liabilities
		Share Capital
		Total Non current Liabilities
		Total Current Liabilities
		Total Assests
		Total Non current assets
		Total Current Assests
4	Management Ratios	Capital Employed
		Networth
		Net Value added
		No. of Employees
5	Key Financial Indicators	Capital Employed
		Networth
		Net Value added
		Return on Assests (%)
		PBDIT
6	Physical Production	Capacity (MW)
		Generation (MU)
		Plant Load Factor (%)

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Data analysis and results

Statistical analysis paired t test is used to compare Pre and current scenario of NTPC electricity sector Disinvestmentsand emphasizes the recent strategies and policies made by Government of India towards restructuring. With varying degree of success, various states of India have implemented several key elements of the reform program. Study results was interpreted to be significance of Scenario1 atAs p value > 0.05we accept Ho and reject H1. So there is no difference in parameters of company details before and after disinvestment in NTPC .Scenario 2 As p value < 0.05 we reject Ho and accept H1. So there is difference in parameters of extract of profit and loss before and after disinvestment in NTPCAs p value < 0.05 we reject Ho and accept H1. So there is difference in parameters of balance sheet before and after disinvestment in NTPC. Scenario 3 As p value > 0.05 we accept Ho and reject H1. So there is no difference in parameters of management ratios before and after disinvestment in NTPC. Scenario 4As p value > 0.05 we accept Ho and reject H1. So there is no difference in parameters of management ratios before and after disinvestment in NTPCScenario 5As p value > 0.05 we accept Ho and reject H1. So there is no difference in parameters of other key financial indicators before and after disinvestment in NTPCScenario 6 As p value > 0.05 we accept Ho and reject H1. So there is no difference in parameters of physical production before and after disinvestment in NTPC

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