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A STUDY OF FINANCIAL PERFORMANCE OF NTPC LTD USING DUPONT ANALYSIS

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Abstract

Profit is a measure of the company's efficiency and effectiveness (Pandey). Profit maximization is now generally acceptable goal of any enterprise irrespective of its ownership. Economics & Financial literature has accepted rate of return or profitability or ROE as a vital indicator to gauge efficiency of the firm. The objective of this paper was to evaluate and analyze financial performance of NTPC Ltd. after disinvestment during the period from 2011-12 to 2019-20 using three step and five step DuPont model. National Thermal Power Corporation was disinvested in the year 2009-10 by minority disinvestment method (offer for sale). The results suggests that ROE was high in initial years. Equity multiplier is the most stable factor within the DuPont framework while other factors were fluctuating which indicates that NTPC had less financial leverage in initial years of the study period.

Keywords: *Profitability, Ratio Analysis, Return on Equity, DuPont Model, NTPC*

INTRODUCTION

The DuPont model was created in 1919 by a finance executive at E .I. du Pont de Nemours & Co. DuPont analysis is a technique that can be used to analyze the profitability of a company using traditional performance management tools. Till 1970, an important goal of financial management was maximizing Return on Assets. But after 1970s, the generally accepted goal of financial management became maximization of shareholder's wealth and therefore the focus shifted from Return on Assets to ROE. This was responsible for the induction of leverage in addition to profitability and efficiency in evaluating financial performance of firms. DuPont Pyramid is a technique to decompose different drivers of Return on Equity. DuPont Pyramid consists of three formulas explained here under:

Name	Formula	Usefulness
Net Profit Margin or Return on Sales	Net profit ÷ Sales or Revenue	Shows operating efficiency
Asset Turnover Ratio or Capital Turnover Ratio or Asset Use Efficiency Ratio	Sales or Revenue ÷ Assets	Shows how efficiently the business is utilizing its assets / utilization efficiency
Equity Multiplier or Financial Leverage	Assets ÷ Equity	Shows how financially leverage the business is

Combining these three ratios, we get ROE as shown below:-

ROE = [(Net Profit/Sales) × (Sales or Revenue/Assets) × (Assets/equity)]

ROE = EAT/ Equity

"Really" Modified DuPont Model

In 1999, Hawawini & Viallet modified the DuPont model of 1970 to develop five step DuPont Model which considers five different ratios that are combined in such a way so as to give Return on Equity when multiplied. These five ratios are:_

Name	Formula	Usefulness
Operating Profit Margin	EBIT ÷ Sales / Revenue	Shows operating decisions of the management (acquisition and disposal of fixed assets & operating assets and operating liabilities)
Capital Turnover or Assets Turnover ratio	Sales/ Revenue ÷ Invested capital / Total assets	Shows operating decisions of the management

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		(acquisition and disposal of fixed assets & operating assets and operating liabilities)
Financial Cost ratio or Interest Burden ratio	EBT ÷ EBIT	Shows financing decisions of the management (mix of debt and equity used to fund the firm's operating decisions)
Financial Structure ratio or Equity Multiplier	Invested capital / Total assets ÷ Equity	Shows financing decisions of the management (mix of debt and equity used to fund the firm's operating decisions)
Tax Effect ratio or Tax Burden ratio	EAT / NI ÷ EBT	Shows the incidence of business taxation or shows the proportion of profits retained after paying taxes

Combining these five ratios, we get ROE as shown below:-

ROE = [(EBIT/Sales) × (Sales/Invested Capital) × (EBT/EBIT) × (Invested Capital/Equity) × (EAT/EBT)]

ROE = EAT/Equity

LITERATURE REVIEW

- Isberg (1998) has established a strong case for using DuPont ratio as a very useful tool in financial statement analysis for variety of reasons. The author has suggested the use of DuPont ratio in the process of company analysis which generally begins with qualitative inquiries of policies and strategies, creating a context for investigation. Subsequently goals and objectives of a company are defined which provides a basis for interpreting the results. The author has theoretically analyzed various ratios making up DuPont analysis. At the same time the author frankly highlights various limitations of DuPont ratio.
- Liesz (2002) showed how a relatively complex financial analysis can be made simple and also useful by using the modified DuPont model of ratio analysis. Through his elegant theoretical analysis he laid down various choices before the firm to improve Return on Equity. Further he demonstrated the usefulness of DuPont model in financial strategy formulation. The evolution of Return on Assets into simple DuPont model into modified five step DuPont Model has been succinctly and elaborately described by the author.
- Xu & Rounds (2019) has conducted exhaustive and comprehensive research which concluded that DuPont Model provides visual and theoretical augmentation to the discipline specific instructions by providing a uniform platform with consistent and easy to understand measurements. In their pedagogical practice, they discovered that students using DuPont Model are better equipped with holistic understanding of business system dynamics. Authors suggested to use five – step DuPont Model to show how the tax reduction affects Return on Equity.
- After having carried out a comprehensive study of three listed Indian software companies, Gujjar & Manjunatha (2016) concluded that Return on Equity (ROE) remained same by both the methods (3 step method and 5 step method) of DuPont analysis. Five step DuPont model is more useful to business owners, managers and consultant for evaluating financial performance of firm, and recommended the necessary changes to increase profitability further.
- Bansal , Kar & Mishra (2016) analyzed and concluded that BP had highest Return On Equity from 2010 to 2014 compared to RDS and all Indian oil companies. All Indian oil companies' Return on Assets is lower across the board compared to BP and RDS which means that Indian companies were not that good in turning investment into profit. DuPont Model also showed that Indian companies were good in earning profits whereas BP and RDS were more liquid and stable in comparison to others.
- Raza et al. (2013) concluded that higher profitable companies are not fruitful for investors. Investors should prefer effort method (DuPont model) as compared to effect method (Net Income) because there is positive correlation between all variables (Net Income, Return on Equity, Asset Turnover Ratio & Financial Leverage). DuPont model is efficient method for ranking of a company.
- On the basis of 5 – point DuPont Analysis along with the support of T-test, Singhal & Narang (2016), concluded that Oil and Gas sector was impacted and could not fully recover from the effects of global financial crisis of 2008 even until 2013. Two companies named ONGC Ltd and Reliance Industries Ltd had much larger impact to ROE of the whole sector as compared to other Oil and Gas companies. T-test analysis

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concluded that Tax Burden and Equity Multiplier did not play significant role while Interest Burden, Operating Profit Margin and Asset Turnover played a crucial role in determining the ROE at the time of recession.

OBJECTIVES

1. To study the financial performance of NTPC by applying DuPont model using three factor testing.
2. To study the financial performance of NTPC by applying DuPont model using five factor testing.
3. To study the impact of Equity Multiplier and Return on Assets on Return on Equity.

(Return on assets includes Net profit margin and Asset Turnover)

4. To study the impact of Net Profit Margin and Assets Turnover on Return on Equity.

(Net profit margin includes tax burden, interest burden and operating margin)

5. To test whether NTPC is able to generate positive ROE post disinvestment for the shareholders.

An introduction to NTPC

NTPC Limited, formerly known as National Thermal Power Corporation Private Ltd was incorporated on 7th November, 1975 with authorized capital of Rs. 125 crore (currently authorized capital is Rs. 10,000 crore). NTPC Ltd is India's largest power utility company with an installed capacity of 63925 MW (including JVs) plans to become a 130 GW company by 2032. It is a company incorporated under the Companies Act 1956 and is under the ownership of Ministry of Power , Government of India. NTPC's core business is the generation and sale of electricity to state-owned power distribution companies and State Electricity Boards in India. The company also undertakes consultancy and turnkey project contracts that involve engineering, project management, construction management, and operation and management of power plants. On 30th September, 1976, the word 'Private' was deleted in the company's name consequent upon the notification issued by the Government of India (GoI) exempting government companies from the use of word 'private' in their name.

On 30th September, 1985, the company was converted from a private limited company into a public limited company. After 10 years from this, company was conferred with 'Navratna' status granted by GoI. The company incorporated three wholly owned subsidiaries in the year 2002 named NTPC Electric Supply Company Ltd NTPC Hydro Ltd and NTPC Vidyut Vyapar Nigam Ltd. In November, 2004, the company become a listed company with the Government holding 89.5% of the equity share capital. On October 28, 2005, the name of the company was changed from National Thermal Power Corporation Ltd to NTPC Ltd to reflect the diversification of their business operations beyond thermal power generation to include among others generation of power from hydro nuclear and renewable energy sources and undertaking coal mining and oil exploration activities.

In May 2010, NTPC was conferred Maharatna status by the Union Government of India, one of the only four companies to be awarded this status.

RESEARCH METHODOLOGY

This paper attempts to study the financial performance of NTPC by using three step and five step DuPont model which when mathematically multiplied leads to Return on Equity (ROE) for a period of 9 years from 2011-12 to 2019-20. The secondary data was collected from the annual report of NTPC, published records and journals.

ANALYSIS AND INTERPRETATION

Table 1: NTPC Datasheet for DuPont Analysis (Numbers are in Crores)

Years	Revenue	EBIT	EBT	Income Tax	Net Income / EAT/ Net Profit	Total Assets	Shareholder's equity
2011-12	64,830.65	14,037.80	12,326.16	3,102.43	9,223.73	1,40,837.80	73,291.17
2012-13	68,775.51	16,818.88	16,578.63	3,959.24	12,619.39	1,61,116.46	80,387.51
2013-14	74,707.82	16,311.24	13,904.65	2,929.91	10,974.74	1,79,554.18	85,815.32
2014-15	75,337.36	13,393.98	10,546.65	255.79	10,290.86	1,97,134.72	81,657.35
2015-16	72,009.16	13,880.09	10,583.68	(173.83)	10,769.60	2,15,138.32	91,293.70
2016-17	79,342.30	16,432.31	12,052.16	2,930.82	9,385.26	2,41,505.33	96,231.23
2017-18	85,207.95	16,323.71	12,339.46	5,257.14	10,343.17	2,67,832.09	1,01,777.77
2018-19	92,179.56	17,389.26	12,672.52	(2,918.71)	11,749.89	2,90,750.96	1,07,408.17
2019-20	1,00,478.41	21,247.89	14,465.92	9,181.95	10,112.81	3,27,667.45	1,13,569.44

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DuPont Testing Using 3 Factor Analysis for NTPC

Years	NP Margin (Net Income / Revenue)	Asset Turnover Ratio (Revenue / Total assets)	Equity Multiplier (Total assets / Equity)	ROE (Net Income / Equity)
	(A)	(B)	(C)	D = A*B*C
2011-12	14.2%	0.46	1.92	12.6%
2012-13	18.3%	0.43	2	15.7%
2013-14	14.7%	0.42	2.09	12.8%
2014-15	13.7%	0.38	2.41	12.5%
2015-16	15%	0.33	2.36	11.7%
2016-17	11.83%	0.33	2.51	9.8%
2017-18	12.14%	0.32	2.63	10.2%
2018-19	12.7%	0.32	2.71	11.1%
2019-20	10%	0.31	2.89	8.9%

DuPont Testing Using 5 Factor Analysis for NTPC

Year	Tax Burden (NI / EBT)	Interest Burden (EBT / EBIT)	Operating Income Margin (EBIT / Revenue)	Asset Turnover (Revenue / Total Assets)	Equity Multiplier (Total Assets / Equity)	ROE (Net Income / Equity)
	(A)	(B)	(C)	(D)	(E)	F = A*B*C*D*E
2011-12	0.75	0.88	21.7%	0.46	1.92	12.6%
2012-13	0.76	0.99	24.5%	0.43	2	15.7%
2013-14	0.79	0.85	21.8%	0.42	2.09	12.8%
2014-15	0.97	0.79	17.8%	0.38	2.41	12.5%
2015-16	1.02	0.76	19.3%	0.33	2.36	11.7%
2016-17	0.78	0.73	20.7%	0.33	2.51	9.8%
2017-18	0.84	0.76	19.1%	0.32	2.63	10.2%
2018-19	0.93	0.73	18.9%	0.32	2.71	11.1%
2019-20	0.70	0.68	21.1%	0.31	2.89	8.9%

Conclusion

NTPC had high ROE for the first five years (i.e. from 2011-12 to 2014-15). Except equity multiplier (being most stable factor), all the remaining factors reflects volatility from 2015-16 to 2019-20 which indicates that NTPC has less financial leverage in the initial years. DuPont model is affected by profitability and asset turnover. In last five years, ROE is declining not because of decrease in profitability but also due to inefficient use of assets. Operating income margin is increasing with decrease in interest burden which is not advisable.

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