

# A DETAILED STUDY OF FINANCIAL PERFORMANCE OF COAL INDIA LIMITED POST DISINVESTMENT USING DUPONT ANALYSIS

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## Abstract

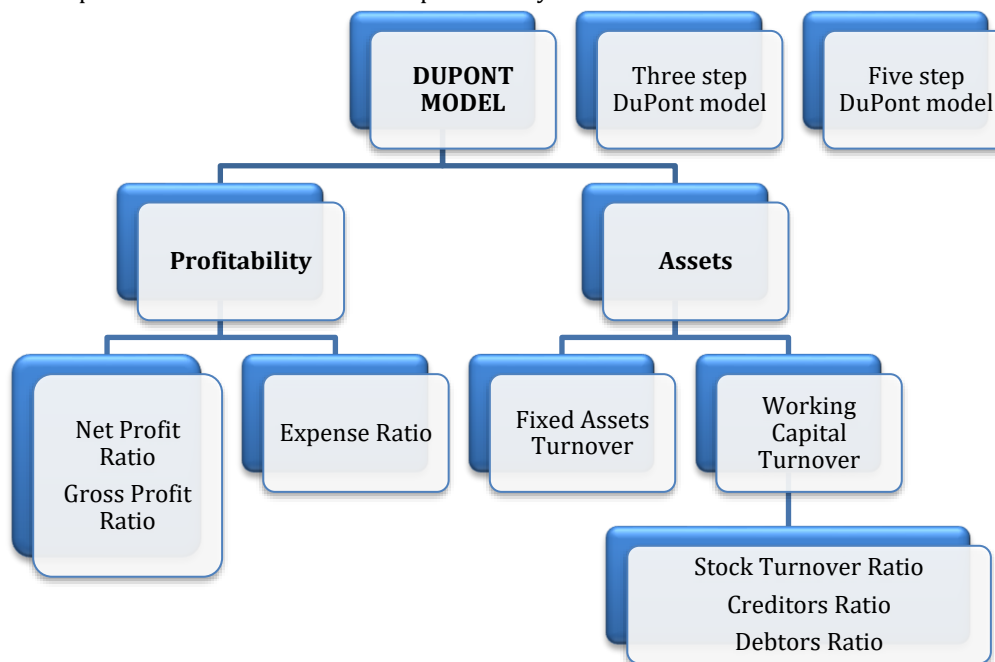
*“Profit is the engine that drives the business enterprise” (Lord Keynes). A business needs profit not only for its existence but also for expansion and diversification. The return on investment becomes a yardstick to measure efficiency because return influences various operations. Economics & Financial 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 Coal India Limited after disinvestment during the period from 2011-12 to 2019-20 using three step & five step DuPont model and assets utilization. Coal India Limited was disinvested with 10% in the year 2015 by offer for sale. After repeated rounds of disinvestment, the stake of government in 2020 was 66.4%. The results suggest that assets turnover ratio was decreasing indicating inefficient use of assets. ROE was stable in initial years and was highest in the year 2018-19. Equity multiplier was the most stable factor within the DuPont framework while other factors were fluctuating which indicates that Coal India Limited had less financial leverage in initial years of the study period.*

**Key Words** - Profitability, Ratio Analysis, Return on Equity, DuPont Model, Asset Utilization, Coal India Limited

## INTRODUCTION

Generally, DuPont model is used to evaluate profitability position and trend of a company given the appropriate data regarding tax burden, interest burden, operating income margin, assets turnover, net profit margin and equity multiplier.

DuPont model has one more application which has gone unnoticed by many researchers. DuPont model helps in assessing asset utilization and its trends of a company given certain data. Assets utilization has an impact on profitability. Efficient asset utilization leads to an increase in sales, given other things, and thereby increases Return on Equity. It is required of the company to either maintain its Asset Turnover Ratio at current level or increase it further so that Return on Equity improves. The following chart meaningfully captures interrelationship between asset utilization and profitability:



DPM

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

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

$$ROE = [(Net\ Profit/Sales) \times (Sales\ or\ Revenue/Assets) \times (Assets/equity)]$$

$$ROE = EAT/ Equity$$

#### “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	Shows operating decisions of the management (acquisition and disposal of fixed assets & operating assets and operating liabilities)
Capital Turnover	Sales Invested capital	Shows operating decisions of the management (acquisition and disposal of fixed assets & operating assets and operating liabilities)
Financial Cost 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	Invested capital Equity	Shows financing decisions of the management (mix of debt and equity used to fund the firm's operating decisions)
Tax Effect ratio	EAT EBT	Shows the incidence of business taxation

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

$$ROE = [(EBIT/Sales) \times (Sales/Invested\ Capital) \times (EBT/EBIT) \times (Invested\ Capital/Equity) \times (EAT/EBT)]$$

$$ROE = EAT/Equity$$

DuPont analysis is an extension of return on investment ratio which measures the overall profitability and operational efficiency or assets utilization of the firm. Assets utilization includes fixed assets turnover ratio and working capital. Working capital is a combination of stock turnover ratio, debtors ratio and creditors ratio. In

short we can say, working capital is directly related to sales and the current assets like debtors, bills receivables, cash, inventory, etc with the change in increase or decrease in sales. The explanation is stated below:

Name	Formula	Usefulness
Fixed Assets Turnover	$\frac{\text{Sales / Revenue}}{\text{Total Fixed assets}}$	Used to measure how many times the fund invested in fixed assets circulate in one period (how efficiently the firm has utilized its fixed assets)
Stock Turnover Ratio	$\frac{\text{Sales}}{\text{Closing stock}}$	Used to indicate the number of times the stock has been turned over during the period and evaluates the efficiency of a firm with respect to managing its inventory
Creditors Ratio	$\frac{\text{Purchases}}{\text{Creditors + Bills Payables}}$	Used to measure the number of times the creditors circulate in one period
Debtors Ratio	$\frac{\text{Sales}}{\text{Debtors + Bills Receivables}}$	Used to measure the number of times debtors circulate in one period (measures whether the amount of resources tied up in debtors is reasonable or not and the company has been efficient in converting debtors into cash)

## 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.

Blumenthal (1998) has analyzed that the consensual view among the academics and managers is that DuPont system helps companies to visualize the critical blocks in Return on Assets and Return on Investments. Proponents of EVA have pointed to several limitations inherent in DuPont model. The biggest benefit of the expandable DuPont model is its flexibility which can enable finance executives to combine Return on Investment with measures that do incorporate growth prospects.

Herciu, Ogrea & Belascu (2009) has concluded that absolute measurements of profit are meaningless. Investors cannot base their decisions on absolute profit numbers. Hence profit ratios make sense. To have a common basis of comparison between several companies and to compose ranks – the relative sizes for measuring efficiency are necessary when calculating the ratio between effect (profit) and effort (given by either sales, total assets or stockholders' equity). The authors demonstrated that the most profitable companies are not the most attractive for investors. Unique feature of this paper is that the authors established interrelationship between ROS, ROA & ROE. They concluded that in order for ROE to increase, ROA & ROS should be higher because there is a direct relationship between the three ratios taken into consideration.

Almazari (2012) has given an excellent theoretical introduction to the need for using DuPont model in performance analysis of banks. The author has presented a model for the financial analysis of a bank based on DuPont system of financial analysis. Using various ratios he concluded that the impact of the financial crisis of 2008-2009 on the performance of Arab Bank of Jordan was the least.

AlAli & Alshamali (2019) has analyzed that the modified DuPont model doesn't consider the volatility and results in misleading information about the true financial position of the bank. The paper recommended using improved modified DuPont model which considers volatility.

Doorasamy (2016) has conducted detailed analysis of all financial ratios with reference to the selected three companies to assess their financial performance. This paper is illustrative of how one can apply the DuPont analysis to get an excellent idea of how a company is performing and the sources of financial troubles. This in

turns helps investors in taking correct decisions. By applying various financial ratios the author recommended which company is worth investing.

Nanavati (2013) concluded that company had negative Return on Equity in 2010-11 which resulted in reduction of equity but in subsequent year, Return on Equity became positive and seemed good enough looking to the type and nature of business as peer group (TCS, INFOSYS & WIPRO). Average Return on Equity was low compared to Satyam's Return on Equity. One could have considered Satyam Limited as an investment option as company had lowered financial leverage and efficient in making profitability with superior Return on Equity.

Botika (2012) has evaluated that before the beginning of financial crises in 2007, the strong dependence was found between CAR and profitability and Return on Assets. DuPont components represented an important and viable form of stock's abnormal return analysis which is helpful to investors in stock markets in their decision making.

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 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.

Rogova (2014) has divided all companies into the best ten and worst ten in order to understand the nature of difference between high and low ROE. It is worth mentioning that there were two Russian companies named Novatek and Gazprom Neft among the best ten while there was no one among worst ten. With the help of regression analysis, it was evident that four factors named NPM/OPM, IB, TB & ATR played major role in investigating efficiency deeper while EM/FL was inconsiderable because of all the companies in their low level of financial leverage. From this it can be concluded that management should improve and increase ATR & EBIT margin of ROE which makes company more efficient, reliable and attracts more number of investors.

The research scholar has detected a gap in the literature review in the sense that most of the studies in the nature of evaluating financial performance of a firm have used three step DuPont model or five step DuPont model but have not delved deeper into assets utilization and its impact on profitability.

This study addresses these lacunae in context of understanding the financial performance of Coal India Limited.

## OBJECTIVES

1. To study the financial performance of Coal India Ltd by applying DuPont model using three factor testing.
2. To study the financial performance of Coal India Ltd by applying DuPont model using five factor testing.
3. To study the impact of Equity Multiplier and Return on Assets on Return on Equity.
4. To study the impact of Net Profit Margin and Assets Turnover on Return on Equity.
5. To study the impact of Fixed Assets Turnover and Working capital on Return on Equity.
6. To test whether Coal India Ltd is able to generate positive ROE post disinvestment for the shareholders.

## AN INTRODUCTION TO CIL

A greater need for coal production was felt in the First Five Year Plan. In 1951 the Working Party for the coal Industry was set up which included representatives of coal industry, labor unions and government which suggested the amalgamation of small and fragmented producing units. Thus the idea for a nationalized unified coal sector was born. National Coal Development Corporation was formed with 11 collieries with the task of exploring new coalfields and expediting development of new coal mines.

The Coking Coal Mines (Emergency Provisions) Act, 1971 was promulgated by Government on 16<sup>th</sup> October, 1971 and took over the management of all 226 coking coal mines and nationalized them on 1<sup>st</sup> May, 1972. Bharat Coking Coal Limited was thus born. Further by promulgation of Coal Mines (Taking over of Management) Ordinance 1973 on 31<sup>st</sup> January, 1973 the Central Government took over the management of all 711 non-coking coal mines. On 1<sup>st</sup> May, 1973, a public sector company named Coal Mines Authority Limited (CMAL) was formed to manage these non coking mines which was renamed as 'Coal India Limited' in 1975-76. Overall production of coal by the company and its subsidiaries crossed 100 million tonnes in 1980-81.

Uptrend of profit started in 1991 and the company earned a profit of Rs. 1,670 million in Fiscal year 1992. Overall production crossed 200 million tones (1991-92) to 300 million tones in 2003-04. Fixing of coal prices once a year to compensate for increase in price of inputs on a normative cost basis, and adoption of the escalation formula prescribed by the Bureau of Industrial Cost and Prices ("BICP"). Rating of A+ (1996-96) has improved to AAA in 2005-06 indicating highest degree of safety with regard to timely payment of interest and principal, awarded by CRISIL.

The Department of Public Enterprises, GoI awarded 'Mini Ratna' status to the company in the year 2006-07 and in the year 2008-09, the 'Navratna' status was awarded for operational efficiency and financial strength, which affords greater operational freedom and autonomy in decision making. In the year 2009-10, company was converted into a public limited company. The government made an IPO which was oversubscribed and received highest bids and making it the second highest collection in any IPO of India. CIL became the fourth most valued company on the Indian stock Exchanges. Coal India Limited was granted the 'Maharatna' status on 11<sup>th</sup> April, 2011 by the Government of India thus becoming only the 5th PSU in the country, of a total of 215 Central Public Sector Enterprises (CPSEs), to have been conferred with this status. In 2015-16, Coal India continued to be one of the highest contributors to the government ex-chequer in the country- federal and state governments. In the year 2019-20, the company produced 602.13 Million Tonnes (MTs) of coal, breached the 600mt mark for the second year consecutively.

## RESEARCH METHODOLOGY

This paper attempts to study the financial performance of Coal India Ltd. 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: Coal India Limited 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	62,415.43	21,326.64	21,272.66	6484.45	14,788.20	98,924.37	40,440.76
2012-13	68,302.74	25,024.21	24,979.04	7,622.67	17,356.36	99,845.18	48,460.81
2013-14	68,810.02	22,937.54	22,879.54	7,767.9	15,111.67	90,344.01	42,391.86
2014-15	72,014.62	21,591.24	21,583.92	7,857.30	13,726.70	93,994.55	37,643.33
2015-16	75,641.78	21,824.82	21,438.66	7,171.87	14,266.79	1,12,828.20	34,833.16
2016-17	75,602.86	14,853.75	14,444.57	5,164.79	9,279.78	1,17,815.22	24,518.09
2017-18	81,111.26	11,200.85	10,770.75	3,732.31	7,038.44	1,25,470.67	20,178.74
2018-19	92,896.08	27,390.55	27,126.87	9,662.45	17,464.42	1,33,021.45	26,455.14
2019-20	89,373.34	24,574.24	24,071.32	7,370.98	16,700.34	1,50,021.51	32,156.92

- Revenue includes only operational sales while other income is excluded.
- EBIT = EBT + Finance Cost
- Total assets = Net fixed assets + current assets (for 2011-12 to 2014-15)
- Shareholder's equity = ESC + Reserves (General & Statutory) + Accumulated profit / loss + Reserves and surplus of Joint Ventures – Misc. Expenditure (for 2011-12 to 2014-15)
- Shareholder fund excludes Non Controlling Interest (NCI) from 2015-16 to 2019-20.
- Return on assets includes Net Profit Margin and Asset Turnover.
- Net profit margin includes Tax Burden, Interest Burden and Operating Margin.

**DuPont Testing Using 3 Factor Analysis for Coal India Limited**

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	23.69%	0.63	2.44	35.870
2012-13	25.41%	0.68	2.06	35.050

2013-14	21.96%	0.76	2.13	35.253
2014-15	19.06%	0.76	2.49	35.385
2015-16	18.86%	0.67	3.23	40.382
2016-17	12.27%	0.64	4.80	37.455
2017-18	8.67%	0.64	6.21	34.224
2018-19	18.80%	0.69	5.02	64.698
2019-20	18.68%	0.59	4.66	50.586

**DuPont Testing Using 5 Factor Analysis for Coal India Limited**

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	0.69	0.99	34.16%	0.63	2.44	35.870
2012-13	0.69	0.99	36.63%	0.68	2.06	35.050
2013-14	0.66	0.99	33.33%	0.76	2.13	35.253
2014-15	0.63	0.99	29.98%	0.76	2.49	35.385
2015-16	0.66	0.98	28.85%	0.67	3.23	40.382
2016-17	0.64	0.97	19.64%	0.64	4.80	37.455
2017-18	0.65	0.96	13.80%	0.64	6.21	34.224
2018-19	0.64	0.99	29.48%	0.69	5.02	64.698
2019-20	0.69	0.97	27.49%	0.59	4.66	50.586

**Table 2: Coal India Limited Datasheet for Assets Utilization (Numbers are in crores)**

Years	Revenue/Sales	Total Fixed Assets	Closing stock	Trade Payables / Creditors	Trade Receivables / Debtors	Total purchases
2011-12	62,415.43	13,440.29	4,801.14	829.02	5662.84	5,123.03
2012-13	68,302.74	13,465.76	4,301.16	837.17	10480.21	6,556.03
2013-14	68,810.02	14,784.39	4,154.61	805.08	8241.03	7,114.7
2014-15	72,014.62	16,115.04	4,712.16	920.76	8521.88	6,725.96
2015-16	75,641.78	20,662.55	6,162.54	3,297.15	11,447.61	5,595.54
2016-17	75,602.86	22,035.99	7,412.79	3,884.31	12,476.27	5,730.14
2017-18	81,111.26	24,059.98	4,979.09	6,974.40	6,257.80	8,492.79
2018-19	92,896.08	28,546.43	4,138.24	9,417.97	5,498.55	8,187.67
2019-20	89,373.34	32,302.35	5,200.47	10,107.55	14,408.22	6,083.64

- Revenue includes only operational sales while other income is excluded.
- Total fixed assets are considered as Net Plant, Property & Equipment from 2015-16 to 2019-20.
- Total Purchases = Cost of material consumed (+) Change in inventories in FG/WIP & stock in trade
- Bills Payables and Bills Receivables is not given in the Balance Sheet or Notes.
- In the year 2015-16, the company had convergent from Indian GAAP to Ind AS resulting in reclassification of other current liabilities into other current financial liabilities and trade payables which will impact Creditors Turnover Ratio from this year onwards.
- Working capital includes Stock Turnover Ratio, Debtors ratio and Creditors ratio.

**Assets Utilization Testing for Coal India Limited**

Years	Fixed Turnover Ratio (times)	Stock Turnover Ratio (times)	Creditors Ratio (times)	Debtors Ratio (times)
2011-12	4.64	13.00	6.18	11.02
2012-13	5.07	15.88	7.83	6.52
2013-14	4.65	16.56	8.84	8.35
2014-15	4.47	15.28	7.30	8.45
2015-16	3.66	12.27	1.70	6.61
2016-17	3.43	10.20	1.48	6.06
2017-18	3.37	16.29	1.22	12.96
2018-19	3.25	22.45	0.87	16.89
2019-20	2.77	17.19	0.60	6.20

## CONCLUSION

- ✓ Assets turnover ratio should be in increasing trend in general but in our case it is showing decreasing trend (0.63 to 0.59). This is due to decrease in fixed turnover ratio from (4.64 to 2.77) while stock turnover ratio has improved slightly but against that debtors turnover ratio has decreased drastically.
- ✓ Decreasing turnover ratio indicates that fixed assets were not utilized efficiently.
- ✓ Management of debtors was inefficient which can be improved by stock management.
- ✓ ROE improved continuously due to equity multiplier while equity multiplier was increasing because of increase in total assets & total assets shot up because of rise in other financial assets recognized under Ind AS, revisions under current tax assets and trade receivables.
- ✓ Among all the five factors of DuPont model, Equity Multiplier was the only one which showed upward trend from 2.44 to 4.66 resulting in positive ROE.

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