

# Financial Performance of Cement Industry in India Using Extended Dupont Approach

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**Abstract** -The present study attempts to evaluate the financial performance of cement industry in India by choosing three leading cement companies like ACC, Gujarat Ambuja and UltraTech cement for the period 2006-2015 by using the extended DuPont approach. The extended DuPont approach has emphasized on analysis of Return on Equity (ROE) which disaggregates performance into five components: pre-interest/pretax margin, asset turnover, interest burden, tax efficiency and the equity multiplier. In the present study, we employed a two-step methodology: first, used extended DuPont approach to calculate return on equity of three companies and coefficient of correlation has been used to determine the relationship between the five components and return on equity. The results shows that return on equity of all three leading cement companies have declined drastically during 2006-2015. In the tough phase of cement industry all three leading companies have exhibited more or less similar financial performance during the study period. The contribution of five factors towards ROE is more or less similar among companies. The extended DuPont approach that we made for three leading cement companies in India emphasized on calculation of ROE is not relevant at all situations for taking rational economic decisions. In order to increase the rate of taking better economic decisions the results of extended DuPont approach can be compared across companies within an industry, between industries, or within a firm itself.

**Keywords:** DuPont, Equity Multiplier, Financial Performance, Return on Equity

## I. INTRODUCTION

Measuring the firm's financial performance using well framed ratios has been a conventional yet important tool for stakeholders including investors, creditors, bankers, analysts and financial managers for taking their economic decisions. The ratio analysis uses well established financial ratios to obtain meaningful results on the performance of the firm rather than using complete set of financial statements to evaluate financial performance of the firm. The various ratios will help stakeholders to analyze the financial performance and soundness of a firm.

Accounting and finance domain experts generally categorize financial ratios into liquidity, profitability, solvency, and turnover ratios. Liquidity ratios measure the ability of a firm to meet short-term debt, whereas a long-term solvency ratios measure how risky an investment for creditors in the firm. Profitability ratios evaluate the revenue-generating ability of a firm based on different variables including sales, equity, and assets. Turnover ratios measure

how best the firm uses its scarce resources to generate revenues.

The financial performance measured in terms of profitability of the firm is very prominent for rational investors to take their economic decisions. Investors use return on equity to measure the ability of the firm to generate earnings from its assets and economic efficiency of the management in using the resources of the firm. Return on equity measures the amount of profits available to shareholders against the investment that shareholders made into the firm. In other words, it measures how efficiently a company is able to generate profits using shareholder's equity, which includes stock offerings and retained earnings.

The three important drivers of return on equity are increase in sales or sales turnover, higher profit margins and higher debt proportions as compared to equity (highly levered), each of them can lead to a higher ROE. Although return on equity is a significant tool, it does not tell you the factors which are increasing or decreasing the firm's performance. The DuPont approach addresses this important issue by breaking down ROE and allowing rational investors to see what factors are primarily driving ROE. The systematic analysis of the DuPont approach allows you to determine whether management is generating value for shareholders and also comparisons can be made across companies within an industry, between industries, or within a firm itself.

The prime focus of financial statement analysis of any firm should be on the measuring financial performance from the viewpoint of owners' wealth maximization. Various measures of rates of return are used mainly for that purpose. In this article, we present Extended DuPont approach to measure financial performance of Indian cement Industry. The paper is organized as follows: Section I presents the introduction; Section II discusses the relevant review of literature; Section III presents objectives and methodology; Section IV data analysis and documents findings and the Section V concludes the paper.

## II. LITERATURE REVIEW

Using financial ratios to evaluate the firm performance is not new phenomena. A literature review can find literally good amount of publications work on this topic, but not much research work has been carried out on Extended

DuPont approach to measure the financial performance of firms. The available literature review on DuPont approach has been presented in this section.

Ly, Mart and Vello (2004) they used modified version of DuPont financial ratio analysis to measure Estonian Banking Sector Performance and results revealed in the increase of the rate of return indicators such as return on assets (ROA) and return on equity (ROE), was caused mainly by the changes in the proportions between output indicators (for example, the banks' burden has decreased substantially). The traditional output/input-type efficiency ratios (interest or income on assets or on equity ratios) however, decreased substantially during the analyzed period.

Thorpe and Holloway (2008) stated that economic returns to shareholders comprise dividends and capital gains on the market value of their shares and the shareholders were primarily concerned with financial measures like earnings, Return on assets and Return on equity.

Ross, Westerfield, Jaffe and Jordan (2008) stated that return on equity, return on sales and return on assets widest used financial ratios. These ratio were used to measure how efficiently the firm uses its assets and how efficiently the firm manages its operations.

Fulbag and Monika (2010) they observed 55% of the companies reported a decline in profitability and 29% of the companies reported improvement in profitability after acquisition. Applying DuPont, the study reported assets turnover declined significantly, whereas operating profit margin improved significantly following the merger. Henry, Carl and Junaina (2010) stated that DuPont system of financial analysis helped to assess the impact of the Asian financial crisis and the restructuring of the banking industry in Malaysia on the financial performance of AFFIN Bank.

Mihaela, Claudia and Lucian (2011) stated that Du Pont analysis were made (by calculating ROS, ROA and ROE) for the top 20 most profitable companies in the world emphasize that absolute measurements were not relevant every time. In order to get better results from DuPont analysis comparison between several companies are necessary.

Ahmed (2012) observed that net profit margin and total asset turnover exhibited relative stability for the period from 2001 to 2009. He also observed that equity multiplier almost stable indicator for the period from 2001-2005 and the ratios declined between 2006-2009 which indicates that the Arab bank had less financial leverage in the recent years, which means the bank was relying less on debt to finance its assets. Christina and Karthikeyan (2012) found that the Cipla pharmaceutical financial performance is high followed by Dr.Reddy's Laboratories and then Ranbaxy Pharmaceutical by using DuPont analysis. They also stated that ROE & ROI is the most comprehensive measure of profitability of a firm. It considers the operating and

investing decisions made as well as the financing and tax-related decisions.

Joe (2012) found that through the use of DuPont analysis, investors were able to determine the actual drivers behind a company's ROE. The DuPont helps to find out whether company has been able to effectively use debt to drive stronger profits as well as how margins and asset turnover are trending over time. He also suggests that compare ROE and its drivers to other companies in the same industry rather than against all companies. Gopi (2015) used two-step methodology: first, using DuPont approach to calculate return on equity of three companies and coefficient of correlation has been used to determine the relationship between companies and return on equity. He found that return on equity of all three leading cement companies have declined drastically during 2006-2015. In the hard phase of cement industry ACC shows better financial performance with minimal volatility as compared to other two companies. The result also indicated that there is more similarity of return on equity between Gujarat Ambuja and UltraTech Cement. Vaishali and Rashmi (2015) they studied performance of the banks using DuPont approach and they stated that as DuPont analysis provides much deeper understanding on the efficiency of the bank.

From the above available literature it is noticed that DuPont approach is very useful tool in evaluating the financial performance of any firm from the perspective of investors. It is clear from the review of previous research studies that most of them pertain to banking industry and other than cement industry. Moreover, the aforesaid research works belong to foreign countries. The fact is that no significant research work has so far been conducted to evaluate the financial performance of Indian companies by using Extended DuPont approach. Hence, with this background, the study attempts to measure the "Financial Performance of Cement Industry in India using Extended DuPont Approach".

### III. OBJECTIVES AND METHODOLOGY

#### A. Objectives

Following are the main objectives set for the present research study.

1. To measure financial performance of cement industry in India using Extended DuPont approach.
2. To determine the relationship between the factors of Extended DuPont with return on equity.

#### B. Methodology

In order to achieve the objectives of this study we have used Extended DuPont approach and core of this approach is calculation ROE. The Extended DuPont approach breaks down ROE into five elements such as pre-interest pretax margin, assets turnover, interest burden, tax efficiency and equity multiplier. The present study has used the Extended DuPont approach as given by DuPont Corporation for

analyzing ROE. The ROE is calculated by using the following formula:

$$\text{ROE} = \text{Pre-Interest Pretax Profit Margin} \times \text{Asset Turnover} \times \text{Interest Burden} \times \text{Tax efficiency} \times \text{Equity Multiplier.}$$

Where:

Pre-interest Pretax Profit Margin= Earnings before interest and taxes (EBIT)/ Sales;

Asset Turnover = Sales ÷ Average Total Assets;

Interest Burden= (EBIT- Interest Expenses)/ EBIT

Tax Efficiency= [1-(Tax Expenses/ (EBIT- Interest expenses))] and

Equity Multiplier = Average Total Assets ÷ Average Shareholders' equity

In addition to the Extended DuPont approach the present study has calculated correlation coefficient to determine the relationship between Extended DuPont and ROE.

#### IV. DATA AND RESULTS

We used the data from the cement companies income statements and balance sheets for the period 2006 to 2015 in this study. The sample includes three leading companies like ACC, Gujarat Ambuja and UltraTech cement operating in India during this period.

To achieve the objective of the research study we calculated pre-interest pretax margin, assets turnover, interest burden, tax efficiency and equity multiplier for three cement companies. The results are presented below:

TABLE I DESCRIPTIVE STATISTICS AND ROE FOR ACC LIMITED

Year	Pre-Interest Pretax Margin	Asset Turnover	Interest Burden	Tax Efficiency	Equity Multiplier	Return on Equity
2006	28.80	1.08	96.92	76.05	2.04	46.68
2007	27.89	1.08	98.76	74.56	1.77	39.45
2008	24.39	0.94	97.77	69.83	1.71	26.72
2009	29.63	0.86	96.44	70.05	1.70	29.37
2010	19.04	0.75	96.23	76.66	1.70	17.94
2011	16.95	0.84	94.06	86.04	1.69	19.40
2012	13.79	0.95	92.65	73.12	1.64	14.56
2013	11.45	0.93	95.96	89.32	1.58	14.41
2014	10.38	0.95	93.19	102.91	1.54	14.54
2015	7.22	0.92	92.10	75.51	1.53	7.10
Mean	18.95	0.93	95.41	79.41	1.69	23.02
Std. Dev	8.29	0.10	2.27	10.39	0.14	12.44
Correlation	0.91	0.60	0.77	-0.37	0.91	-

Source: Company Annual Reports

From table I it can be seen that the pre-interest pretax margin, assets turnover, interest burden, tax efficiency, equity multiplier and ROE for ACC has dropped drastically during the study period of 2006-2015. The highest pre-interest pretax margin of 29.63% reported in the year 2009 with a mean value of 18.95% and standard deviation of 8.29%; the highest assets turnover of 1.08 observed during the year 2006 and 2007 with a mean value of 0.93 and standard deviation of 0.10; the highest interest burden of 98.76% reported during the year 2007 with a mean value of 95.41% and standard deviation of 2.27%; the highest tax efficiency of 102.91% is observed during the year 2014 with a mean value of 79.41% and standard deviation of 10.39%; the highest equity multiplier of 2.04 observed during the year 2006 with a mean value of 1.69 and standard deviation of 0.14 and the highest ROE of 46.68% reported during the year 2006 with a mean value of 23.02% and standard deviation of 12.44%. The results shows that the company financial performance is not consistently over period of time and it reflect on the inefficiency of the

management in using scarce economic resources. The correlation coefficient signifies that the ROE to larger extent is influenced by pre interest pretax margin and equity multiplier followed by interest burden, assets turnover and tax efficiency.

From table II it is evident that pre-interest pretax margin, assets turnover, interest burden, tax efficiency, equity multiplier and ROE for Ambuja Cements has dropped drastically during the study period of 2006-2015. The highest pre-interest pretax margin of 48.87% reported in the year 2009 with a mean value of 25.12% and standard deviation of 10.23%; the highest assets turnover of 1.32 observed during the year 2006 with a mean value of 0.85 and standard deviation of 0.18; the highest interest burden of 98.77% reported during the year 2009 with a mean value of 96.41% and standard deviation of 1.82%; the highest tax efficiency of 85.50% is observed during the year 2013 with a mean value of 74.03% and standard deviation of 7.32%; the highest equity multiplier of 1.68 observed during the

year 2006 with a mean value of 1.42 and standard deviation of 0.95 and the highest ROE of 53.02% reported during the year 2006 with a mean value of 23.06% and standard deviation of 14.29%. The results shows that the company performance is very volatile and it reflect on inefficiency of

the management in generating returns. The correlation coefficient brings out the fact that the ROE depends to larger extent on assets turnover followed by equity multiplier, pre interest pretax margin, interest burden and tax efficiency.

TABLE II DESCRIPTIVE STATISTICS AND ROE FOR AMBUJA CEMENTS LIMITED

Year	Pre-Interest Pretax Margin	Asset Turnover	Interest Burden	Tax Efficiency	Equity Multiplier	Return on Equity
2006	31.16	1.32	94.21	81.63	1.68	53.02
2007	48.87	0.95	97.28	65.22	1.47	43.40
2008	32.18	0.87	98.40	71.19	1.39	27.14
2009	25.80	0.85	98.77	67.56	1.37	20.07
2010	23.14	0.77	97.16	76.04	1.39	18.31
2011	20.63	0.78	96.96	72.16	1.41	15.96
2012	20.32	0.82	96.17	68.20	1.41	15.37
2013	17.24	0.72	95.88	85.50	1.38	14.16
2014	18.52	0.74	96.51	83.90	1.37	15.28
2015	13.36	0.67	92.74	68.89	1.37	7.91
Mean	25.12	0.85	96.41	74.03	1.42	23.06
Std. Dev	10.23	0.18	1.82	7.32	0.09	14.29
Correlation	0.81	0.93	0.03	0.00	0.87	

Source: Company Annual Reports

TABLE III DESCRIPTIVE STATISTICS AND ROE FOR AMBUJA CEMENTS LIMITED

Year	Pre-Interest Pretax Margin	Asset Turnover	Interest Burden	Tax Efficiency	Equity Multiplier	Return on Equity
2006	25.51	1.19	93.06	67.07	2.96	55.82
2007	28.86	1.01	94.84	66.91	2.45	45.24
2008	23.3	0.91	91.53	71.71	2.22	30.99
2009	24.2	0.88	93.08	68.83	1.96	26.62
2010	15.57	0.93	86.72	78.74	1.86	18.38
2011	19.91	0.85	93.81	72.08	1.83	20.79
2012	20.16	0.8	94.8	69.42	1.79	18.91
2013	15.41	0.7	89.69	77.27	1.77	13.27
2014	15.16	0.7	84.07	69.79	1.81	11.2
2015	14.94	0.65	85.82	71.15	1.85	10.99
Mean	20.30	0.86	90.74	71.30	2.05	25.22
Std. Dev	5.01	0.16	3.95	3.96	0.39	14.98
Correlation	0.88	0.94	0.61	-0.58	0.96	

Source: Company Annual Reports

From table III it is evident that the pre-interest pretax margin, assets turnover, interest burden, tax efficiency, equity multiplier and ROE for Ultratech cements has declined drastically during the study period of 2006-2015. The highest pre-interest pretax margin of 28.86% reported in the year 2007 with a mean value of 20.30% and standard deviation of 5.01%; the highest assets turnover of 1.19 observed during the year 2006 with a mean value of 0.86 and standard deviation of 0.16; the highest interest burden of 94.84% reported during the year 2007 with a mean value

of 90.74% and standard deviation of 3.95%; the highest tax efficiency of 78.74% is observed during the year 2010 with a mean value of 71.30% and standard deviation of 3.96%; the highest equity multiplier of 2.96 observed during the year 2006 with a mean value of 2.05 and standard deviation of 0.39 and the highest ROE of 55.82% reported during the year 2006 with a mean value of 25.22% and standard deviation of 14.98%. The results shows that the company financial performance is not stable during the study period and it reflect on inefficiency of the management in

generating returns. The calculated correlation coefficient states that the ROE depends to greater extent on equity multiplier followed by assets turnover, pre interest pretax margin, interest burden and tax efficiency.

From the above results of Extended DuPont approach it can be inferred that the financial performance of all three leading cement companies seems to be similar as measured by ROE with minimal deviation among companies. It reflects that the financial performance of the cement

companies in India is influenced by similar factors. The quiet interesting fact is that pre interest pretax margin and equity multiplier contributes to great extent for ROE of ACC; assets turnover contributes to large extent for ROE of Gujarat Ambuja Cements and equity multiplier contributes significantly for ROE of Ultratech Cement.

In order to determine the relationship between companies and their ROE the correlation coefficients has been calculated and the results are presented below:

TABLE IV RELATIONSHIP BETWEEN COMPANIES AND RETURN ON EQUITY (CORRELATION MATRIX)

	ACC	Ambuja Cements	Ultratech Cement
ACC	-	0.961	0.975
Ambuja Cements	0.961	-	0.979
Ultratech Cement	0.975	0.979	-

From table IV it can be noticed that between Ambuja and Ultratech cement there is strongest correlation (0.979) as to compare to other combination of companies. It indicates that there is more similarity in financial performance (ROE) between Gujarat Ambuja and Ultratech cement as compare to other combinations of cement companies.

## V. CONCLUSION

In this research study we used Extended DuPont approach to measure the financial performance of leading cement companies in India. The companies ROE is decomposed into pre-interest pretax margin, assets turnover, interest burden, tax efficiency, equity multiplier is comprehensively tested. The Extended DuPont approach has shown the decline in the profitability (ROE) of leading cement companies during 2006-2015.

From the above results of Extended DuPont approach it can be inferred that the financial performance of all three leading cement companies seems to be similar as measured by ROE with minimal deviation among companies. It reflects that the financial performance of the cement companies in India is influenced by similar factors. The quiet interesting fact is that pre interest pretax margin and equity multiplier contributes to great extent for ROE of ACC; assets turnover contributes to large extent for ROE of Gujarat Ambuja Cements and equity multiplier contributes significantly for ROE of Ultratech Cement.

The DuPont approach that we made for three leading cement companies in India emphasized on calculation of ROE are not relevant at all point of time for taking rational economic decisions. In order to increase the rate of taking better economic decisions using DuPont approach comparisons can be made across companies within an industry, between industries, or within a firm itself. As future research direction, we suggest to expand the scope of research by increasing the sample of companies to evaluate factors influencing the financial performance of the cement industry in India.

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