INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE, IT & MANAGEMENT

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5.   **KEYWORDS**: Abstract must be followed by a list of keywords, subject to the maximum of five. These should be arranged in alphabetic order separated by commas and full stops at the end.

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    INTRODUCTION

    REVIEW OF LITERATURE

    NEED/IMPORTANCE OF THE STUDY

    STATEMENT OF THE PROBLEM

    OBJECTIVES

    HYPOTHESES

    RESEARCH METHODOLOGY

    RESULTS & DISCUSSION

    FINDINGS

    RECOMMENDATIONS/SUGGESTIONS

    CONCLUSIONS

    SCOPE FOR FURTHER RESEARCH

    ACKNOWLEDGMENTS

    REFERENCES

    APPENDIX/ANNEXURE

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BOOKS

- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

UNPUBLISHED DISSERTATIONS AND THESES

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

ONLINE RESOURCES

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WEBSITES

- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

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CAPITAL STRUCTURE AND PROFITABILITY: A STUDY ON SELECTED CEMENT COMPANIES

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ABSTRACT

The major objective of this paper is to examine the impact of capital structure on profitability of the firm .This paper investigates the relationship between the Debt-Equity Ratio and the Earning Per Share and how effectively be able to debt financing. It attempts to describe how the earning capacity of the firm is influenced by the operating and the fixed financial charges. In this study, selected cement companies are taken for analysis and hypotheses are examined with the help of one way ANOVA. Apart from that, other tools like Central tendency, Standard deviation, Karl Pearson's co-efficient and multiple regressions are applied to examine that capital structure and profitability and growth are related and the capital structure is having an impact on profitability of the firm.

KEYWORDS
Capital structure, profitability.

INTRODUCTION

The capital structure decision is a very crucial factor for any business organization. Generally, when a firm expands, it requires capital, and that capital can be sourced from debt or equity. Debt instrument has two important advantages. First, interest paid is tax deductible, which lowers debt's effective cost. Second, debt holders get a fixed return, so stockholders do not have to share their profits if the business is extremely successful.

A firm should try to maintain an optimum capital structure with a view to maintain financial stability. The optimum capital structure is obtained when the market value per equity share is the maximum. It may, therefore, be defined as that relationship of debt and equity which maximizes the value of a company's share in the stock exchange. In practice, it is difficult to specify an optimal capital structure – indeed, managers even feel uncomfortable about specifying an optimal capital structure range. Thus, financial managers worry primarily about whether their firms are using too little or too much debt. Second, even if a firm's actual capital structure varies widely from the theoretical optimum, this might not have much effect on its stock price. Overall, financial managers believe that capital structure decisions are secondary in importance to operating decisions especially those relating to capital budgeting and the strategic direction of the firm.

Capital structure is one of the most important domains of financial decision making because of its interrelationship with other financial decision variables. Wrong capital structure decisions can result in a high cost of capital thereby lowering the net present values of proposals and making more of them non-profitable. Effective capital structure decisions can lower the cost of capital, resulting in higher NPVs and more acceptable projects and thereby increasing the value of the firm.

Capital structure is the mixture of debt and preferred and common stock on a company's balance sheet. In theory, one can speak of an optimum capital structure, but, in practice it is very difficult to design one. There are significant variations among industries as also among individual companies within the same industry in respect of capital structure. There are a number of factors, both quantitative and qualitative, including subjective judgment of financial managers which determine the capital structure. These factors are highly complex and cannot suit entirely into a theoretical framework. From the operational standpoint, therefore what should be attempted is an appropriate capital structure, given the facts of a particular case.

Keeping in mind the importance of capital structure decision and its bearing on the profitability of the company, the study examines the impact of capital structure on profitability. To be specific the study examines the impact of financial leverage, return on capital employed and asset leverage on return on equity of sample companies and Indian large cement industry as a whole.

OBJECTIVE OF THE STUDY

The main objective of the study is to show the impact of capital structure on profitability. Specific objectives are:
1.   To find out how the profitability of any cement company is related with its capital structure.
2.   To determine how a slight change in the ratio of debt and equity would affect the profitability of the company.
3.   To differentiate the profitability of a company with other company which is more levered i.e. which more include a greater percentage of debt capital in its total capital structure.

LITERATURE REVIEW

The most important financial decisions facing companies is the selection between debt and equity capital. This decision can effectively and efficiently be taken when managers are first of all aware of how capital structure influences firm profitability. In the corporate finance literature, it is believed that this decision differs from one economy to another depending on country level characteristics.

Hoje and Yong (2008) examined the financial structure of Japanese companies in order to determine the compatibility with agency predictions and identified that debt equity ratio could get influenced by the growth rate, the size of the firm and agency costs of the firm.

Sanjay .J. Bhayani (2009) identified that there is no relationship between financial leverage and cost of capital while there was positive correlation between degree of leverage and cost of capital. This study revealed that financial leverage does not influence price earnings ratio and total value of the firm.

Ali .K Ozdagli (2009) presented a dynamic model to test the relationship between financial leverage, corporate performance and stock returns of various companies. The study reveals significantly financial leverage affects investments and business risk in turn.

According to Monica and Abir (2010) there was an inverse relationship between financial leverage and growth prospects of companies whereas their existed positive correlation between debt ratio and size of the company.

Slim and Fathi (2010) found that operating leverage and business risk could explain the variations in the return and the value of the firm. The degree of financial leverage was found to be having greater impact on the value of the firm.

Investigating the relationship between corporate governance and leverage decisions, Christopher (2010) etal found out that the firms were more inclined to use debt component in the capital structure when corporate governance weakens.

Wenjuan Ruan etal (2011) found out that capital structure of the companies gets affected by managerial ownership and the firm's value thereby.

Studying the triangle relationship among firm size, capital structure and financial performance of Turkey based companies, Erol Muzir (2011) found that the impact of firm size on performance and sustainability would vary in line with the expansion is financed. The study revealed that debt financing increases the risk exposure of the firm.

RESEARCH METHODOLOGY
SAMPLE COMPANIES
The scope of the study is confined to Indian large scale cement sector. The rationale behind choosing this industry is that, as in case of any other manufacturing industry, cement industry is largely capital intensive, perhaps apart from being labor intensive, requiring the corporate to be exploring appropriate sources of funds to meet with growing needs of capital expenditure. Unlike service sectors, manufacturing sectors warrant for huge capital expenditure both in the initial period and in the times of growth. The need for such capital expenditure is also long term in nature requiring funds to be blocked in fixed assets almost permanently. Therefore decision with respect to choosing of appropriate mix of funds in case of capital intensive industries like cement sector is very crucial as it would affect the liquidity and profitability position of the company. Though Indian large cement sector constitutes twenty four companies according to Centre for Monitoring Indian Economy (CMIE), but I have taken the first three companies according to their sales volume as the sample size and eliminated other companies due to insufficiency and inadequacy.
- ➢ ULTRATECH CEMENT
- ➢ ACC CEMENT
- ➢ AMBUJA CEMENT

STUDY PERIOD
The study period is selected from year ended 31st March, 2002to the year ended 31st March 2011 i.e., a time span of 10 years. This period is considered in the study so as to grab the impact of most recent changes surrounding the Indian economy in general and Indian corporate sector in particular.

DATA SOURCES
For this study most of the data have been collected from the financial data base package "www.Capitaline .com", manufactured, maintained and marketed by Capital Market Publishers Pvt. Ltd., Mumbai and other company website.

TOOLS USED FOR ANALYSIS PURPOSE
MAIN TOOLS
- ➢ Debt Ratio = Total debt / (Total Capital Employed)
- ➢ Debt Equity Ratio = Total Debt / Shareholders' Net worth
- ➢ Coverage Ratio = PBIT / Interest
- ➢ Return on Capital Employed = PBIT / Capital Employed
- ➢ Financial Leverage = PAT/ PBIT
- ➢ Assets Leverage = Capital Employed / Shareholders' Net worth
- ➢ Return on Equity = PAT / Shareholders' Net worth

Apart from analyzing the above stated metrics, the study runs the following multiple regressions model and analyses the results thereof for every sample company and the industry

$ROE = α + β1ROCE + β2FL + β3AL$

Where:

ROE = Return On Equity

α = Intercept

β1 = Coefficient of Return on Capital Employed

β2 = Coefficient of Financial Leverage

β3 = Coefficient of Assets Leverage

The above model is partially in line with popularly known DuPont model of ROE decomposition. As a part of the study I have chosen the variable pertaining to capital structure and leverage analysis in DuPont model.

OTHER TOOLS
- ❖ Central tendency.
- ❖ Risk measures.
- ❖ Karl Pearson's co-efficient of correlation.
- ❖ Multiple regression analysis.
- ❖ ANOVA.

ANALYSIS OF THE STUDY
For the analysis and interpretation purpose I have used firstly the capital structure position of sample companies and the industry in terms of Debt ratio and Debt- Equity ratio. Secondly I used the profitability position in terms of Return on capital employed and Return on Equity. It may be noted that while analyzing the performance of the sample companies from the view point of shareholders, it is essential to know the impact of Financial and Asset Leverage on the return on equity.

1) CALCULATION OF DEBT RATIO OF SAMPLE COMPANIES (in percentage)

COMPANY	ULTRATECH CEMENT	ACC CEMENT	AMBUJA CEMENT	AVERAGE
YEAR				
2002	N/A	60.9	52.64	56.77
2003	N/A	58.15	52	55.08
2004	60.33	51.6	38.57	50.17
2005	58.93	48.58	34.1	47.20
2006	58.3	22.57	19.87	33.58
2007	47.23	6.87	6.62	20.24
2008	39.23	8.91	4.84	17.66
2009	37.3	8.61	2.5	16.14
2010	25.82	7.49	0.879	11.40
2011	27.98	6.63	0.607	11.74
AVERAGE	35.51	28.03	21.26	32
S.D	22.39	23.72	21.28	18.68
C.V	0.63	0.85	1	0.58

As it is depicted from the above table that Debt ratio of Indian large cement sector was highest of 56.77% in the year 2002 and lowest in the year 2010 0f 11.40%. When we look in to the Debt ratio of individual selected companies ACC cement has employed highest debt component in the year 2002 to the extent of 60.9%, while Ambuja cement employed lowest debt component of 0.607% in the year 2011. while there is no company which maintained consistency in employing the debt capital, Ultratech cement relied more on debt component, ACC cement and Ambuja cement have significantly reduced the debt component in the same period except the last year. The ten year average value of the debt ratio of all the sample companies reveal that Ultratech and ACC cement could be categorized as highly levered companies which employed the debt component of 35.51% and 28.03% while Ambuja cement seen to be low levered company as the debt component below the industry average . Standard deviation and co-efficient of variation reveal that, in the case of ACC cement , the volatility in the debt component was highest and lowest in the case Ultratech cement as compared to industry.

The debt ratio of sample companies has been compared using one-way ANOVA and is tested by the following hypothesis. The result shown in the following table:

H_{o1}: The debt ratio of the sample companies does not vary significantly.

ANALYSIS OF ANOVA TABLE				
Source.of variation	**Sum..of squares(ss)**	**Degree.of freedom(d.f)**	**Mean square(MS)**	**Test statistic**
Between sample	1016.73	2	508.037	
				F=508.04/505.57=1.005
Within sample	13,650.35	25	505.569	
Total	14,666.423	27=N-1		

From the table given at the end of the book, the value of F for $v_1=2$ and $v_2=25$ at 5% level is 3.39. We see that calculated value 1.005 is lower than the tabulated value 3.39. Hence, we accept the null hypothesis at 5% level and conclude that the debt ratio of the sample companies does not vary significantly.

2) CALCULATION OF DEBT-EQUITY RATIO OF THE SAMPLE COMPANIES (in percentage)

COMPANY	ULTRATECH CEMENT	ACC CEMENT	AMBUJA CEMENT	AVERAGE
YEAR				
2002	N/A	1.52	1.1	1.31
2003	N/A	1.47	1.1	1.29
2004	1.52	1.21	0.83	1.19
2005	1.48	1	0.57	1.02
2006	1.42	0.4	0.35	0.72
2007	1.08	0.17	0.15	0.47
2008	0.74	0.09	0.06	0.30
2009	0.62	0.1	0.04	0.25
2010	0.46	0.09	0.02	0.19
2011	0.38	0.08	0.01	0.16
AVERAGE	0.96	0.61	0.42	0.69
S.D	0.47	0.61	0.45	0.47
C.V	0.45	1	1.07	0.68

Table 2 reveals that debt to equity of the cement sector industry was highest in the year 2002 of 1.31 times and lowest in the year 2011 of 0.16 times, whereas amongst the sample companies Ultratech cement and ACC cement stands first with debt to equity of 1.52 times in the year2004 and 2002 when compared to other sample companies. Ten years average value of the debt equity ratio of the sample companies reveal that Ultratech cement is highly levered while other two companies employed below the industry average of 0.74. Standard deviation is high in case of ACC cement of 0.61which mean that ACC cement involve more risk than other two companies and co-efficient of variation reveal that in the case Ambuja cement the volatility in the leverage was highest and lowest in the case of Ultratech cement.

The debt equity ratio of sample companies has been compared using one-way ANOVA and is tested by the following hypothesis. The results are shown in the following table.

H_{o2}: The debt equity ratio of the sample companies does not vary significantly.

ANALYSIS OF ANOVA TABLE				
Source.of variation	**Sum.of squares(ss)**	**Degree.of freedom(d.f)**	**Mean square(MS)**	**Test statistic**
Between sample	1.310	2	0.655	
				F=0.655/0.27 = 2.43
Within sample	6.755	25	0.270	
Total	8.064	27=N-1		

From the table given at the end of the book, the value of F for $v_1=2$ and $v_2=25$ at 5% level is 3.39. We see that calculated value 2.43 is lower than the tabulated value 3.39. Hence, we accept the null hypothesis at 5% level and conclude that the debt equity ratio of the sample companies does not vary significantly.

3) CALCULATION OF COVERAGE RATIO OF THE SAMPLE COMPANIES IN TIMES

COMPANY	ULTRATECH CEMENT	ACC CEMENT	AMBUJA CEMENT	AVERAGE
YEAR				
2002	N/A	2.12	2.97	2.55
2003	N/A	1.88	3	2.44
2004	1.43	3.26	4.38	3.02
2005	0.69	5.61	6.65	4.32
2006	4.19	22.54	17.26	14.66
2007	14.43	27.13	36.76	26.11
2008	19.31	44.46	62.44	42.07
2009	11.84	28.22	81.40	40.49
2010	14.51	26.74	35.13	25.46
2011	7.44	16.90	33.36	19.23
AVERAGE	9.23	17.89	28.34	18.04
S.D	6.82	14.41	27.03	15.32
C.V	0.74	0.81	0.95	0.85

From the above table it is seen that Ambuja cement maintained highest coverage ratio in the year2009 of 81.40 times. A closer look into the table reveal that Ultratech cement and ACC cement also maintained a reasonably high coverage ratio maintaining its position to be able to take care of interest obligation. Comparing the coverage ratio of sample companies with that of the industry, we understand that ACC cement and Ambuja cement were able to take care of interest obligation during the review period. On an average it is found that all the sample companies were able to maintain sufficient coverage ratio to meet interest obligation. However the standard deviation and co-efficient of variation reveal that coverage ratio of ACC cement and Ambuja cement varied more than Ultratech cement.

The coverage ratio of the sample companies has been tested using one-way ANOVA and is tested by the following hypothesis. The results are shown below.

H_{o3}: The coverage ratio of the sample companies does not vary significantly.

ANALYSIS OF ANOVA TABLE				
Source.of variation	Sum.of squares(ss)	Degree.of freedom(d.f)	Mean square(MS)	Test statistic
Between sample	1646.870	2	823.435	
				F=823.435/350.72 =2.35
Within sample	8767.970	25	350.719	
Total	10,414.839	27=N-1		

The table value of F for $v_1 = 2$ and $v_2 = 25$ at 5% level is 3.39. We see that calculated value 2.35 is lower than the tabulated value 3.39. Hence, we accept the null hypothesis at 5% level and conclude that the coverage ratio of the sample companies does not vary significantly.

4) CALCULATION OF RETURN ON CAPITAL EMPLOYED OF THE SAMPLE COMPANIES (in percentage)

COMPANY	ULTRATECH CEMENT	ACC CEMENT	AMBUJA CEMENT	AVERAGE
YEAR				
2002	N/A	11.93	10.30	11.115
2003	N/A	9.81	11.29	10.55
2004	6.06	13.09	15.12	11.42
2005	2.82	17.4	18.46	12.89
2006	15.07	41.76	44.88	33.90
2007	37.49	44.95	55.86	46.1
2008	35.81	32.84	33.58	34.08
2009	25.89	36.13	27.51	29.84
2010	27.44	21.71	23.13	24.09
2011	13.92	21.26	21.62	18.93
AVERAGE	20.56	25.09	26.18	23.29
S.D	13.06	12.87	14.81	12.34
C.V	0.64	0.51	0.57	0.53

The performance in terms of ROCE, of sample companies and the industry has been analyzed with the help of the information captured in the above table 4. Among all the companies during the study period, ACC cement and Ambuja cement registered the highest ROCE of 44.95% and 55.86% in the year 2007. In the case of Ultratech cement it is high of 37.49% and lowest of 2.82%. Though the average of ACC and Ambuja cement were higher than Ultratech cement and the industry, it is found that ROCE of these two companies started declining in the later years. Co-efficient of variation reveal that the rate of volatility in ROCE of Ultratech cement and Ambuja cement were higher than of the ACC cement and the industry, thus it is found that only these companies carries higher risk. Whereas ACC cement make an average return of 25.09% on its total capital with the lowest co-efficient of variation of 0.51.

The return on capital employed of the sample companies has been tested using one-way ANOVA and is tested by the following hypothesis. The results are shown below:

H_{o4}: The return on capital employed ratio of the sample companies does not vary significantly

ANALYSIS OF ANOVA TABLE				
Source.of variation	Sum.of squares(ss)	Degree.of freedom(d.f)	Mean square(MS)	Test statistic
Between sample	152.735	2	76.368	
				F=76.368/186.29 =0.41
Within sample	4657.290	25	186.29	
Total	4810.025	27=N-1		

The table value of F for $v_1 = 2$ and $v_2 = 25$ at 5% level is 3.39. We see that calculated value 0.41 is lower than the tabulated value 3.39. Hence, we accept the null hypothesis at 5% level and conclude that the return on capital employed of the sample companies does not vary significantly.

5) CALCULATION OF FINANCIAL LEVERAGE OF THE SAMPLE COMPANIES IN TIMES

COMPANY	ULTRATECH CEMENT	ACC CEMENT	AMBUJA CEMENT	AVERAGE
YEAR				
2002	N/A	0.42	0.53	0.475
2003	N/A	0.41	0.58	0.495
2004	0.24	0.55	0.68	0.49
2005	0.04	0.7	0.77	0.50
2006	0.61	0.73	0.77	0.70
2007	0.62	0.72	0.63	0.66
2008	0.63	0.68	0.70	0.67
2009	0.66	0.68	0.68	0.67
2010	0.64	0.74	0.74	0.71
2011	0.68	0.81	0.70	0.73
AVERAGE	0.52	0.64	0.68	0.61
S.D	0.24	0.14	0.08	0.11
C.V	0.46	0.22	0.12	0.18

From the above table it is found that financial leverage of ACC cement and Ambuja cement has been exceptionally high when compared to the rest of the years. In the case of Ultratech cement it was almost in line with the rest of the year. A closer look into the data would reveal that all sample companies and the

industry could make profit after tax less than one time during the year 2004 through 2011. The volatility of financial leverage was low in the case of Ambuja cement while that of industry and highest in the case of Ultratech cement**.**

The financial leverage of the sample companies has been tested using one-way ANOVA and is tested by the following hypothesis. The results are shown below:

H_{05}: The financial leverage of the sample companies does not vary significantly**.**

ANALYSIS OF ANOVA TABLE				
Source.of variation	Sum.of squares(ss)	Degree.of freedom(d.f)	Mean square(MS)	Test statistic
Between sample	0.128	2	0.064	
				F=0.064/0.25 = 2.56
Within sample	0.623	25	0.025	
Total	0.751	27=N-1		

The table value of F for $v_1=2$ and $v_2=25$ at 5% level is 3.39. We see that calculated value 2.56 is lower than the tabulated value 3.39. Hence, we accept the null hypothesis at 5% level and conclude that the financial leverage of the sample companies does not vary significantly.

6) CALCULATION OF ASSET LEVERAGE OF THE SAMPLE COMPANIES IN TIMES

COMPANY	ULTRATECH CEMENT	ACC CEMENT	AMBUJA CEMENT	AVERAGE
YEAR				
2002	1	2.56	2.11	0.19
2003	1	2.40	2.08	1.83
2004	2.52	2.07	1.63	2.07
2005	2.44	1.94	1.52	1.97
2006	2.40	1.29	1.23	1.64
2007	1.90	1.07	1.07	1.35
2008	1.65	1.1	1.05	1.23
2009	1.59	1.09	1.03	1.24
2010	1.35	1.08	1.01	1.15
2011	1.39	1.07	1.01	1.16
AVERAGE	1.72	1.57	1.37	1.38
S.D	0.57	0.61	0.47	0.54
C.V	0.33	0.39	0.34	0.39

Asset leverage positions of the sample companies and the industry has been captured in the above table. Among all the companies ACC cement employed the least amount of shareholder's funds to fund the total assets which in turn implies that it employed more debt. Ultratech cement and Ambuja cement maintain consistency in equity proportion in the total capital though it was slightly higher in the later year. On an overall basis, the average asset leverage of Ultratech cement is the highest at 1.72.

The asset leverage of the sample companies has been tested using one-way ANOVA and is tested by the following hypothesis. The results are shown below:
H_{06}: The asset leverage ratio of the sample companies does not vary significantly.

Source.of variation	Sum.of squares(ss)	Degree.of freedom(d.f)	Mean square(MS)	Test statistic
Between sample	0.615	2	0.307	
				F=0.307/0.297 = 1.03
Within sample	8.011	27	0.297	
Total	8.626	29=N-1		

The table value of F for $v_1=2$ and $v_2=25$ at 5% level is 3.35. We see that calculated value 1.03 is lower than the tabulated value 3.35. Hence, we accept the null hypothesis at 5% level and conclude that the asset leverage of the sample companies does not vary significantly.

7) CALCULATION OF RETURN ON EQUITY OF THE SAMPLE COMPANIES IN PERCENTAGE

COMPANY	ULTRATECH CEMENT	ACC CEMENT	AMBUJA CEMENT	AVERAGE
YEAR				
2002	N/A	12.79	15.23	14.01
2003	N/A	9.65	17.24	13.44
2004	3.61	14.8	18.83	12.41
2005	0.27	23.69	24.72	16.23
2006	22.13	39.2	37.97	33.10
2007	44.35	34.64	43.07	40.69
2008	37.37	24.61	21.50	27.83
2009	27.14	26.71	15.66	23.50
2010	23.72	17.31	13.74	18.26
2011	13.17	18.43	11.62	14.41
AVERAGE	21.47	22.18	21.96	21.39
S.D	*15.36*	*9.49*	*10.55*	9.66
C.V	*0.72*	*0.43*	*0.48*	0.45

A closer look into table reveals that from the year 2002 to 2011, ROE of all sample companies and industry was appreciably positive. Return on equity of all the sample companies are high in the year 2007 of 44.35%, 34.64% and43.07% but among themselves Ultratech and Ambuja stand first position. In the case of Ultratech cement it is extremely low in the year 2005. Higher ROE reveals that firm has the capability to meet the demand of equity shareholder. The volatility in ROE was also higher in case of Ultratech cement and Ambuja cement of 15.36% and 10.55%. Co-efficient of variation of ACC cement (0.43) indicates per unit volatility in their ROE was lower when compared to that of Ultratech cement and Ambuja cement.

H_{07}: The return on equity ratio of the sample companies does not vary significantly.

Source.of variation	Sum.of squares (ss)	Degree.of freedom (d.f)	Mean square(MS)	Test statistic
Between sample	2.314	2	1.157	
				F=1.157/138.546 = 0.008
Within sample	3463.639	27	138.546	
Total	3465.953	29=N-1		

The table value of F for $v_1 = 2$ and $v_2 = 25$ at 5% level is 3.35. We see that calculated value 0.008 is lower than the tabulated value 3.35. Hence, we accept the null hypothesis at 5% level and conclude that the return on equity of the sample companies does not vary significantly.

Multi-Regression Model Between Return on equity, Return on capital employed, Financial leverage and Asset leverage.

Apart from the above equations, I have also use the concept of Multi-Regression and correlation to understand the relationship between Return on equity, Return on capital employed, financial leverage and Asset leverage and also find out how ROE are affected by ROCE , FL & AL.

In the Multi –Regression model I have taken the Return on equity as dependent variable and the Return on capital employed, financial leverage and Asset leverage as an independent variable.

$y = a + b_1 X_1 + b_2 X_2 + b_3 X_3$

Where,

Y = Return on equity.

a = intercept.

b_1 = Coefficient of Return on capital employed.

X_1 = Return on capital employed.

b_2 = Coefficient of financial leverage.

X_2 = Financial leverage.

b_3 = Coefficient of Asset leverage.

X_3 = Asset leverage.

ULTRATECH CEMENT

MODEL SUMMARY

Model	R	R Square	Adjusted R^2	Std. Error of the Estimate
1.	0.993	0.986	0.976	2.37646

COEFFICIENT

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1.	(Constant)	-30.009	7.871		-3.812	.019
	ROCE	1.135	0.102	0.965	11.131	.000
	FL	17.510	6.650	0.272	2.633	.058
	AL	10.038	2.821	0.317	3.559	.024

Therefore,

Y = -30.009 + 1.135 X1 + 17.510 X2 + 10.038 X3

ROE = -30.009 + 1.135 ROCE + 17.510 FL + 10.038 AL

ACC CEMENT

MODEL SUMMARY

Model	R	R Square	Adjusted R square	Std. Error of the Estimate
2.	0.993	0.987	0.980	1.34435

COEFFICIENT

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
2.	(Constant)	-56.070	8.350		-6.715	.001
	ROCE	0.902	0.057	1.223	15.919	.000
	FL	49.984	7.393	0.722	6.761	.001
	AL	14.953	2.066	0.957	7.237	.000

Therefore,

Y = -56.70 + 0.902 X1 + 49.984 X2 + 14.953X3

ROE= -56.70 + 0.902ROCE + 49.984 FL + 14.953 AL.

AMBUJA CEMENT

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
3.	0.987	0.974	0.961	2.07205

COEFFICIENT

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
3.	(Constant)	-62.744	11.335		-5.536	.001
	ROCE	0.921	0.063	1.292	14.713	.000
	FL	47.083	11.781	0.351	3.996	.007
	AL	20.876	2.642	0.867	7.901	.000

Therefore,

Y = -62.744 + 0.921 X1 + 47.083 X2 + 20.876 X3

ROE = -62.744 + 0.921 ROCE + 47.083 FL + 20.876 AL

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MULTI – REGRESSION OF ALL THE SAMPLE COMPANIES

COMPANY	Multiple regression equation	Multiple 'R'	R^2	Adjusted R^2	Std Error
Ultratech cement	ROE = -30.009 + 1.135 ROCE + 17.510 FL + 10.038 AL	0.993	0.986	0.976	2.37646
ACC cement	ROE= -56.70 + 0.902 ROCE + 49.984 FL + 14.953 AL.	0.993	0.987	0.980	1.34435
Ambuja cement	ROE = -62.744 + 0.921 ROCE + 47.083 FL + 20.876 AL	0.987	0.974	0.961	2.07205

As stated earlier multiple regression models has been applied to test and analyze how ROE of each sample company has been affected by ROCE, Financial leverage and Asset leverage. We have seen from the above table that ROE of the Ultratech cement highly depend on the financial leverage than asset leverage and ROCE. The beta –coefficient of financial leverage is higher as compared to the asset leverage and ROCE. The intercept in multi-regression of Ultratech cement is -30.009 which indicate that when all the three independent variable are zero then return on equity works out to be negative. In the case of ACC cement and Ambuja cement, ROE is highly depended on the financial leverage and asset leverage but the beta-coefficient of financial leverage is more than the asset leverage in both the cases. The intercept of both ACC cement and Ambuja cement seem to negative (-56.70 & -62.744) which mean that when all the three independent factors are zero then return on equity must be zero.

Therefore, finally we can say that the financial leverage and the asset leverage are the major determinant which affects the return on equity. A closer look into the co-efficient of ROCE proves the technical inference that ROCE will always positively impact on return on equity. The value of 'R' and 'R^2' implies that the relationship between dependent variable (ROE) and independent variable (ROCE, FL, AL) is very high. The value of standard error in case of Ultratech cement (2.37646) is very high which stands for high volatility of sampling fluctuation than the other two companies.

PEARSON'S CORRELATION (BETEEN ROE & ROCE)

ULTRATECH CEMENT

		ROE	ROCE
ROE	Pearson Correlation	1	0.978(**)
	Sig. (2-tailed)		.000
	N	10	10
ROCE	Pearson Correlation	0.978(**)	1
	Sig. (2-tailed)	.000	
	N	10	10

** Correlation is significant at the 0.01 level (2-tailed).

From the above table we can say that the relationship between return on equity and return on capital employed is highly significant because the correlation value(0.978) is much more higher than the significant value(0.01) and also there is a positive correlation which implies when return on capital employed increase then return on equity also increase or vice versa.

ACC CEMENT

		ROE	ROCE
ROE	Pearson Correlation	1	0.930(**)
	Sig. (2-tailed)		0.000
	N	10	10
ROCE	Pearson Correlation	0.930(**)	1
	Sig. (2-tailed)	0.000	
	N	10	10

** Correlation is significant at the 0.01 level (2-tailed)

From the above information we can say that the relationship between return on equity and return on capital employed is highly significant because the correlation value(0.930) is much more higher than the significant value(0.01) and also there is a positive correlation which implies when return on capital employed increase then return on equity also increase or vice versa.

AMBUJA CEMENT

		ROE	ROCE
ROE	Pearson Correlation	1	0.837(**)
	Sig. (2-tailed)		0.003
	N	10	10
ROCE	Pearson Correlation	0.837(**)	1
	Sig. (2-tailed)	0.003	
	N	10	10

** Correlation is significant at the 0.01 level (2-tailed).

In the case of Ambuja cement we can say that the relationship between return on equity and return on capital employed is highly significant because the correlation value (0.837) is much more higher than the significant value (0.01) and also there is a positive correlation which implies when return on capital employed increase then return on equity also increase or vice versa.

PEARSON'S CORRELATION (BETWEEN ROE & FL)

ULTRATECH CEMENT

		ROE	FL
ROE	Pearson Correlation	1	0.828(**)
	Sig. (2-tailed)		0.003
	N	10	10
FL	Pearson Correlation	0.828(**)	1
	Sig. (2-tailed)	0.003	
	N	10	10

** Correlation is significant at the 0.01 level (2-tailed).

In the case of Ultratech cement ,we can say that the relationship between return on equity and the financial leverage is highly significant because the correlation value(0.828) is much more higher than the significant value(0.01) and also there is a positive correlation which implies when financial leverage increase then return on equity also increase or vice versa.

ACC CEMENT

		ROE	FL
ROE	Pearson Correlation	1	0.630
	Sig. (2-tailed)		0.051
	N	10	10
FL	Pearson Correlation	0.630	1
	Sig. (2-tailed)	0.051	
	N	10	10

** Correlation is significant at the 0.01 level (2-tailed).

In the case of ACC cement we can say that the relationship between return on equity and the financial leverage is highly significant because the correlation value(0.630) is much more higher than the significant value(0.01) and also there is a positive correlation which implies when financial leverage increase then return on equity also increase or vice versa.

AMBUJA CEMENT

		ROE	FL
ROE	Pearson Correlation	1	0.189
	Sig. (2-tailed)		0.602
	N	10	10
FL	Pearson Correlation	0.189	1
	Sig. (2-tailed)	0.602	
	N	10	10

** Correlation is significant at the 0.01 level (2-tailed).

In the case of Ambuja cement we can say that the relationship between return on equity and the financial leverage is highly significant because the correlation value(0.189) is much more higher than the significant value(0.01) and also there is a positive correlation which implies when financial leverage increase then return on equity also increase or vice versa.

PEARSON'S CORRELATION (BETWEEN ROE & AL)

ULTRATECH CEMENT

		ROE	AL
ROE	Pearson Correlation	1	0.073
	Sig. (2-tailed)		0.841
	N	10	10
AL	Pearson Correlation	0.073	1
	Sig. (2-tailed)	0.841	
	N	10	10

* Correlation is significant at the 0.05 level (2-tailed)

From the given data we can say that the relationship between return on equity and the asset leverage is significant but not to that extent because the correlation value(0.073) is small higher than the significant value(0.05) and also there is a positive correlation which implies when asset leverage increase then return on equity also increase or vice versa.

ACC CEMENT

		ROE	AL
ROE	Pearson Correlation	1	-0.633(*)
	Sig. (2-tailed)		0.049
	N	10	10
AL	Pearson Correlation	-0.633(*)	1
	Sig. (2-tailed)	0.049	
	N	10	10

* Correlation is significant at the 0.05 level (2-tailed).

From the given information we can conclude that the relationship between return on equity and the asset leverage is not significant because the correlation value(-0.633) is small than the significant value(0.05) and also there is a negative correlation between them which implies when asset leverage increase then return on equity also decrease or vice versa.

AMBUJA CEMENT

		ROE	AL
ROE	Pearson Correlation	1	-0.200
	Sig. (2-tailed)		0.579
	N	10	10
AL	Pearson Correlation	-0.200	1
	Sig. (2-tailed)	0.579	
	N	10	10

* Correlation is significant at the 0.05 level (2-tailed).

From the given information we can conclude that the relationship between return on equity and the asset leverage is not significant because the correlation value (-0.200) is small than the significant value (0.05) and also there is a negative correlation between them which implies when asset leverage increase then return on equity also decrease or vice versa.

CONCLUSION

From the above analysis we can conclude that the capital structure decision is a very crucial factor for any business organization. The study primarily attempted to show as to how return on equity of sample companies and the industry got affected by independent variables like return on capital employed, financial leverage and assets leverage. The study disclosed very interesting outcomes, some of which are in line with theoretical propositions. The study revealed that debt ratio, coverage ratio, return on capital employed, financial leverage, assets leverage and return on equity of the sample companies does not vary significantly. Multiple regression analysis revealed that ROE was very much significantly dependent on independent variables (i.e., ROCE, FL and AL) in case of all sample companies and the industry. But the financial leverage and assets leverage are the major determinant which affects the return on equity. A closer look into the coefficient of ROCE proved the technical inference that ROCE will always positively impact on return on equity. The value of 'R' and 'R^2' implied that the relationship between dependent variable and independent variables is very significant. Karl Pearson's coefficient revealed that ROCE and FL had significant

impact on ROE, but AL had negative impact on ROE. This study thus established statistically tested relationship between capital structure decisions and profitability of sample companies and the industry in Indian cement sector.

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