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A Study of Capital Structure of Selected Power Companies of India Using ANOVA Test

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Abstract:

As capital structure is a part of financial structure, a firm should get the knowledge of it before financing itself. The main purpose of the study is to evaluate the capital structure of selected power companies of India using ANOVA test. It contains big power organizations of India including Adani Power Ltd, Reliance Power Ltd and Tata Power Ltd during 2013 to 2018 five year data. The study contains ratio namely as return on Assets (ROA),Return on Equity (ROE) and Debt to Equity (DE) ratio to analyze the capital structure. At the end of the study find-out that the selected firms has upward flow in DE ratio but study also suggested that the ROE of Adani Power Ltd during the financial year 2017 and is highly negative which can lead to negative impact on firm. So the firm suggested that to increase ROE. And also Tata power and Reliance Power has inward flow of ROA and ROE.

Key Words: Capital Structure, ROA, ROE, DE, Adani Power Ltd, Reliance Power Ltd, Tata Power Ltd.

1. Introduction of Capital Structure:

The word “Capital" in the business world, simply means money. Therefore, capital structure is the way that a business finances its operations. Some people can be confused the term capital structure with financial structure or Assets structure; as financial structure consists of short-term debt, long-term debt and share holders’ fund or can say that the entire left hand side of the company’s Balance Sheet. But capital structure consists of long-term debt and shareholders’ fund. It may be also concluded that the capital structure of a company is a part of its financial structure. Some experts of financial management include short-term debt in the composition of capital structure. In that case, there is no difference between the two terms—capital structure and financial structure.

According to Gerstenberg-“Capital structure of a company refers to the make-up of its capitalization and it includes all long-term capital resources viz., loans, reserves, shares and bonds.”[1]

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Saarth
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Any type of debt or equity is accounted for the capital structure. But the costs of capital have to be balanced with a capital structure which fits the business model. The capital with the lowest costs should make up the largest proportion of a business's capital structure. The both debt holders and shareholders want to be remunerated for the money they invested into the company. It is then possible to determine the cost of capital as the average of the net cost of debt and equity (WACC). To calculate the average, the impact of debts and equity on the total capital structure has to be taken into account.

2. Literature Review:

According to Stewart C. Myers (2001)the trade-off theory says that firms seek debt levels that balance the tax advantages of additional debt against the costs of possible financial distress. The trade-off theory predicts moderate borrowing by tax-paying firms. The pecking order theory says that the firm will borrow, rather than issuing equity, when internal cash flow is not sufficient to fund capital expenditures. Thus the amount of debt will reflect the firm's cumulative need for external funds. The free cash flow theory says that dangerously high debt levels will increase value, despite the threat of financial distress, when a firm's operating cash flow significantly exceeds its profitable investment opportunities. A static trade-off theory, in which the firm is viewed as setting a target debt—to—value ratio and gradually moving towards it, in much the same way that a firm adjusts dividends to move towards a target pay-out ratio. The pecking order theory, in which the firm prefers internal to external financing and debt to equity if it issues securities. In the pure pecking order theory, the firm has no well—defined target debt—to—value ratio.(Myers, 1984) The dominance of pecking order theory in explaining capital structure of firms theoretically as well as statistically according to Kumar, Colombage and Rao(2017). According to Titman and Wessel's (1988)firms with unique or specialized products have relatively low debt ratios. Uniqueness is categorized by the firms' expenditures on research and development, selling expenses, and the rate at which employees voluntarily leave their job. A larger debt level improves the liquidation decision because it makes default more likely. In the absence of default, incumbent management is assumed not to liquidate the firm even if the assets are worth more in their next best alternative use. Since investors choose an optimal liquidation decision based on their information, default improves this decision. More frequent default, however, is more costly as resources are expended investigating the firm when it is in default.(Harris and Raviv, 1991)

3. Objectives:

The main purpose of the paper is to evaluate the capital structure of selected power companies of India during 2013-2018 using ANOVA test.

- To get knowledge about optimum capital structure.
- To analyze the what kind of trend in capital structure of selected power companies
- To evaluate Return on Equity of selected power companies.

Saarth
E-Journal of Research
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- To evaluate Return on Assets of selected power companies.
- To evaluate Debt to Equity Ratio of selected power companies.
- To evaluate capital structure of selected Indian power companies by using F-test.

4. Research Methodology

The paper contains the analysis of capital structure of selected power organizations of India including Adani Power Ltd, Reliance Power Ltd and Tata Power Ltd during 2013 to 2018 five year data. For analyzing the capital structure the study contains the ratio namely Return on Assets (ROA), Return on Equity (ROE) and Debt to Equity Ratio (DE) which is evaluated by using ANOVA test and hypothesis will be evaluated at 5% significance level; following is the hypothesis which is going to be evaluated.

Hypothesis:
H01: there is no difference between in ROA of selected power organizations.
H11: there is difference between in ROA of selected power organizations.
H02: there is no difference between in ROE of selected power organizations.
H12: there is difference between in ROE of selected power organizations.
H03: there is no difference between in DE of selected power organizations.
H13: there is difference between in DE of selected power organizations.

5. Findings and Analysis

5.1 Financial Ratios

1) Return on Assets
2) Return on Equity
3) Debt to Equity Ratio

5.2 Return on Assets

TABLE 1: ROA of Adani Power Ltd, Reliance Power Ltd and Tata Power Ltd during 2013 to 2018.

YEAR	Adani Power Ltd	Reliance Power Ltd	Tata Power Ltd
2013-14	-0.49	0.27	3.12
2014-15	-1.39	0.11	3.01
2015-16	0.72	5.88	3.91
2016-17	-8.63	0.26	0.97
2017-18	-3.02	0	-8.63
Average	-2.562	1.304	0.476

Sources: ROA data collected from the website www.moneycontrol.com.

Saarth
E-Journal of Research
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5.3 ANOVA Table(ROA)

TABLE 2: Analysis of 'F' Test in selected Power Companies
Under the study Return on Assets (ROA) Ratio

Source of Variation	**Sums of Squares SS**	**Degrees of freedom DF**	**Mean Squares MS**	**F**	***p*-value**
Between rows	*SSR*=103.096	*r*-1=4	*MSR*=103.0964=25.774	25.77410.6206=2.4268	0.133
Between columns	*SSC*=41.435	*c*-1=2	*MSC*=41.4352=20.7175	20.717510.6206=1.9507	0.1954
Error (residual)	*SSE*=84.9652	(*r*-1)(*c*-1)=8	*MSE*=84.96528=10.6206		
Total	*SST*=229.4961	*rc*-1=14			

Sources:Results obtained by the author usingwww.atozmath.com

5.4Analysis of ROA

1. F for between columns

F(4, 8) at 0.05 level of Significance =3.8379
As calculated FR = 2.4268<3.8379
So, H01 is accepted, Hence there is no significant differentiating between Rows.

2. F for between columns

F (2, 8) at 0.05 level of significance =4.459
As calculated FC = 1.9507<4.459
So, H01 is accepted, Hence there is no significant differentiating between columns.

5.5 Return on Equity

TABLE 3: ROE of Adani Power Ltd, Reliance Power Ltd and
Tata Power Ltd during 2013 to 2018.

YEAR	**Adani Power Ltd**	**Reliance Power Ltd**	**Tata Power Ltd**
2013-14	-4.44	0.33	7.26
2014-15	-14.24	0.14	6.42
2015-16	7.37	7.69	8.82
2016-17	-205.83	0.38	2.39
2017-18	-236.46	0.01	-24.25
Average	-90.72	1.71	0.128

Saarth
E-Journal of Research
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Sources: ROA data collected from the website www.moneycontrol.com.

5.6 ANOVA Table(ROE)

TABLE 4: Analysis of 'F' Test in selected Power Companies Under the study Return on Equity (ROE) Ratio

Source of Variation	**Sums of Squares SS**	**Degrees of freedom DF**	**Mean Squares MS**	**F**	***p*-value**
Between rows	*SSR*=23445.6544	*r*-1=4	*MSR*=23445.65444 =5861.4136	5861.41364346.26 =1.3486	0.3322
Between columns	*SSC*=27998.6112	*c*-1=2	*MSC*=27998.6112 2=13999.3056	13999.30564346.2 6=3.221	0.0747
Error (residual)	*SSE*=34770.0799	(*r*-1)(*c*-1)=8	*MSE*=34770.07998 =4346.26		
Total	*SST*=86214.3455	*rc*-1=14			

Sources:Results obtained by the author usingwww.atozmath.com

5.7Analysis of ROE

1. F for between columns

F(4, 8) at 0.05 level of Significance =3.8379
As calculated FR = 1.3486<3.8379
So, H02 is accepted, Hence there is no significant differentiating between Rows.

2. F for between columns

F (2, 8) at 0.05 level of significance =4.459
As calculated FC = 3.221<4.459
So, H02 is accepted, Hence there is no significant differentiating between columns.

5.8 Debt to Equity

TABLE 5: DE of Adani Power Ltd, Reliance Power Ltd and Tata Power Ltd during 2013 to 2018.

YEAR	**Adani Power Ltd**	**Reliance Power Ltd**	**Tata Power Ltd**
2013-14	6.08	0.15	0.67
2014-15	7.23	0.26	0.67
2015-16	6.54	0.29	0.68
2016-17	16.41	0.4	0.68

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2017-18	55.23	0.41	0.96
Average	18.298	0.302	0.732

Sources: ROA data collected from the website www.moneycontrol.com.

5.9 ANOVA Table(DE)

TABLE 6: Analysis of 'F' Test in selected Power Companies
Under the study Debt to Equity (DE) Ratio

Source of Variation	**Sums of Squares SS**	**Degrees of freedom DF**	**Mean Squares MS**	**F**	***p*-value**
Between rows	*SSR*=603.8082	*r*-1=4	*MSR*=603.80824=150.9521	150.9521146.7339=1.0287	0.4485
Between columns	*SSC*=1054.3421	*c*-1=2	*MSC*=1054.34212=527.1711	527.1711146.7339=3.5927	0.0584
Error (residual)	*SSE*=1173.871	(*r*-1)(*c*-1)=8	*MSE*=1173.8718=146.7339		
Total	*SST*=2832.0214	*rc*-1=14			

Sources:Results obtained by the author usingwww.atozmath.com

5.10Analysis of ROE

1. F for between columns

F(4, 8) at 0.05 level of Significance =3.8379

As calculated FR = 1.0287<3.8379

So, H03 is accepted, Hence there is no significant differentiating between Rows.

2. F for between columns

F (2, 8) at 0.05 level of significance =4.459

As calculated FC = 3.5927<4.459

So, H03 is accepted, Hence there is no significant differentiating between columns.

6. Conclusion:

The target of the study is to get knowledge about optimum capital structure in selected power companies of India during 2013-2018 based on ROA, ROE and DE ratio by using ANOVA Test.The ANOVA test result indicates that the null hypothesis is accepted which shows that there is no difference between ROA, ROE and DE of selected companies. But study suggested that the ROE of Adani Power Ltd during the financial year 2017 and 2018 as -205.83 and -236.46 accordingly, is highly negative which can lead to negative impact on firm. So the firm suggested that to increase ROE. And also Tata power and Reliance Power has inward flow of ROA and ROE.

Saarth
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