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# A Study on Leverage Analyses and its Impact on Profitability of Select Steel Companies Traded in Bse (From 2003 To 2012)

KEYWORDS: Leverage (Financial, operating and combined leverage), Earnings per share, Steel companies, ANOVA.

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**ABSTRACT** *The main objectives of this study are to analyse and understand the impact of leverage on profitability of the select firms. This paper analyses the relationship among (financial leverage, operating leverage and Composite leverage) with earning per share of the firms. In addition to this it investigates how the profitability is influenced by fixed financial charges and fixed operating cost. In this study, select steel companies which are traded in BSE are taken for analysis and the study is based on the secondary data collected from various websites. Hypotheses are examined with the help of correlation and test of significance and also analysis of variance (ANOVA).*

## INTRODUCTION

All financial decisions taken by the company have financial implications on the function of the organization and it will affect various departments of the organizations. . Financial management is making decision on the financial matters, implementation of the decisions and review of the implementation. It is the process of managing financial function. The foremost objective of financial management is to increase the shareholder's wealth; in other words it can be called as increasing the profitability of the share holders. The achievement of this objective is based on three major decisions. They are the Financing decision or Capital structure decision, the Investment decision or Capital expenditure decision and the Dividend decision. The investment decision relates to the selection of assets in which funds will be invested by a firm. The dividend decision is related to the distribution of surpluses. The dividend decision will be made based on the success of both investment and financial decision. Among the three decisions, the financing or the capital structure decision which is having an impact over the profitability of the firm is a very important decision as it influences the debt- equity mix (i.e., the proportion between the borrowed funds and the shareholders' funds) of the company, which ultimately affects the shareholders' return and risk. For instance, if the borrowed funds are more than the shareholders' fund, there will be increase in shareholders' earnings as well as in shareholders' risk. The risk of shareholders increases because the borrowed funds carry a fixed interest, which has to be paid whether the company earns profits or not. Thus, the earnings and the risk of the shareholders increase when there is a high proportion of borrowed funds as compared to owned funds in the capital structure of a company.

On the other hand, if the proportion of the shareholders' funds is more than the proportion of the borrowed funds in the capital structure of the company, the earnings as well the risk of the shareholders will be less. Thus, the debt-equity mix in the capital structure of a company has a significant effect on the shareholders' earnings and risk. So the management has to make an intelligent use of both operating leverage in profit planning and financial leverage in planning the capital structure.

The use of operating leverage helps the management to determine the profits at various levels of output and sales and plan for the proper operating level, having regard to market risks. The use of financial leverage helps the management to determine the proper and safe debt-equity mix in the capital structure, having regard to financial risks. That means, a company should make use of both the operating leverage and the financial leverage (i.e., should combine both the leverages), and should try to have a proper combination of both the leverages. A proper combination of both the leverages contributes to the growth of the company, while an improper combination of both the leverage restricts the growth of the company.

## LEVERAGE

Leverage means use of fund or employment of asset in the capital structure of the firm for which the firm has to pay fixed cost or fixed return. Employment of such fund will help the firm to increase its profitability. If the firm uses higher leverage it will be riskier for the firm if it's earning gets decreased gradually because it has to pay fixed interest for the amount borrowed. In other words the leverage effect will be favorable for the firm if it is able to earn more than the amount borrowed.

## FINANCIAL LEVERAGE

The employment of fixed source of funds such as debt and preference share in the capital structure of the firm along with owner's equity is called financial leverage or trading on equity. Financial leverage may be favorable or unfavorable. If a company is able to earn more return than the cost of borrowing, then the leverage is said to be favorable. On the other hand, if the company earns a return which is less than the cost of borrowing then the leverage is said to be unfavorable.

## OPERATING LEVERAGE

Operating leverage refers to the use of fixed cost in the operations of the firm. A firm has to bear the fixed cost expenses irrespective of output. Even if there is zero sales, the firm has to incur those expenses. The firm can use higher amount of operating leverage i.e. using of higher amount of fixed cost when compared to variable cost only when the sales are rising because even a small change in sales will bring a proportionate change in operating profit.

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**COMBINED LEVERAGE**
Composite leverage is a use of operating leverage and financial leverage in an appropriate proportion in the business. Operating leverage affects the firm's operating profit and financial leverage affects the earnings of the shareholder or EPS. Firm has to use a correct mixture of both the leverages to take the fullest possible advantage of growing business opportunities.'

**EARNING PER SHARE (EPS)**
The portion of a company's profit is allocated to each outstanding share of common stock. Earnings per share serve as an indicator of a company's profitability.

**LEVERAGE AND EARNING PER SHARE**
There is a close relationship between the financial leverage and earnings per share of the company. If degree of financial leverage is high and the return on investment is greater than the cost of debt capital, then the impact of leverage on EPS will be favorable. The impact of financial leverage is unfavorable when the earning capacity of the firm is less than what is expected by the lender (i.e.) the cost of debt.

**LITERATURE REVIEW**
The empirical studies conducted in India as well as abroad are presented to discern the impact of Leverage on profitability of the firms. Govindasamy p and Chandrakumarmangalam s (2010) "leverage an analysis and its impact on profitability with reference to selected cement companies in india". Mukesh C Ajmera(2012)"leverage analysis and its impact on share price and earning of the selected steel companies of India". Taiwo Asalu and Olayinka Akinlo(2012)" profitability and leverage: evidence from ingrain firms". Khan Huma(2012)" Analysis of liquidity, profitability and working capital management – an empirical study of BSE listed companies". Wessels and Titman (1988)"The determinants of capital structure choice". Ali Liqat" The determination of leverage of the listed- textile companies in India". Amsaveni,R(2009)"impact of leverage on profitability of primary aluminum industry in India". Rafique Mahira(2011)" Effect of profitability and financial leverage on the capital structure: A case of pakistan's automobile industry". Hovry Martin (2007)"Leverage and the ownership structure of the listen firms in china". Yasin Bin Tariq and syed tahir Hijazi(2006)" Determination of capital structure:a case for the Pakistani cement industry".

**OBJECTIVES OF THE STUDY: GENERAL OBJECTIVES:**
The main objective of this study is to find out the leverage of select steel companies traded in BSE.

**SPECIFIC OBJECTIVES:**
1. To understand and analyze the leverage effects of the select steel companies traded in BSE,

2. To find out the leverages namely a) operating leverage b) financial leverage c) composite leverage,

3. To study the impact of leverage on Earning per share (EPS),

**HYPOTHESES:**
1. There is no significant relationship between Degree of financial leverage and Earning per share.

2. There is no significant relationship between Degree of operating leverage and Earning per share.

3. There is no significant relationship between Degree of combined leverage and Earning per share.

**AREA OF THE STUDY:**
The present study aims at the leverage impact on profitability of TATA STEEL, JSW STEEL LIMITED, STEEL AUTHORITY OF INDIA, covering a period of ten years from (2003 to 2012).

**PERIOD OF THE STUDY:**
This study covers a period of ten financial years from 2003 to 2012.

**RESEARCH METHODOLOGY:**
The present study adopts an analytical and descriptive research design. The data of the select companies has been collected from the annual report and the balance sheet published by the companies in money control.com

A sample size of three companies listed on the Bombay stock exchange has been selected for the purpose of the study. They are TATA steel, JSW steel limited, and Steel authority of India.

**SAMPLE DESIGN SAMPLING TECHNIQUE:**
The selection of the companies is made on the basis of market capitalization.

**SAMPLE SIZE**
Three public limited companies are chosen as sample size for the study on account of their having the highest market capitalization.

**DATA COLLECTION:**
This study is based on secondary data collected from various websites like, money control.com, steel.nic.in.etc.

**TOOLS USED FOR ANALYSIS:**
Tools used for the analysis are mean, standard deviation, correlation and test of significance and analysis of variance (ANOVA)

**LIMITATIONS OF THE STUDY:**
• The project is confined to the annual report of the companies.

• Owing to the shortage of time, only secondary data analysis is done.

• Some of the external factors affecting the leverage are not taken into account.

**DEGREE OF OPERATING LEVERAGE**
**TABLE1: DEGREE OF OPERATING LEVERAGE**

| YEAR | TATA STEEL | SAIL | JSW |
|---|---|---|---|
| 2003 | 1.64 | 1.28 | 1.6 |
| 2004 | 1.16 | 1.14 | 0.79 |
| 2005 | 1.06 | 0.98 | 1.14 |
| 2006 | 1.08 | 0.83 | 0.96 |
| 2007 | 1.05 | 0.91 | 1.22 |
| 2008 | 1.05 | 0.88 | 1.05 |
| 2009 | 1.04 | 0.71 | 1.54 |
| 2010 | 1.03 | 1.05 | 1.07 |
| 2011 | 1.02 | 0.83 | 1.02 |
| 2012 | 1.18 | 0.91 | 1.33 |
| TOTAL | 11.31 | 9.52 | 11.72 |
| MEAN | 1.131 | 0.952 | 1.172 |
| S.D | 0.186753 | 0.166787 | 0.255204 |

(Compiled From Financial Statement)

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The above table shows that the mean DOL of JSW was high as 1.17 which is followed by TATA steel with mean DOL of 1.13. The SD value of JSW was comparatively high which indicates that it has high variation in its fixed cost expenditure where as SD value of SAIL was lower with 0.16 and it is followed by TATA steel with the standard deviation of 0.18 respectively.

**ANOVA**
**HYPOTHESIS TESTING:**
Ho: The DOL position of the steel companies does not differ significantly.

Ha: The DOL position of the steel companies differs significantly.

**TABLE 2:F TESTS FOR DEGREE OF OPERATING LEVERAGE**

| | Sum of squares | df | Mean square | F ratio | F critical |
|---|---|---|---|---|---|
| Between Sample | 0.27374 | 2 | 0.13687 | 3.212324 | 3.35 |
| within Sample | 1.15041 | 27 | 0.042608 | | |
| Total | 1.42415 | 29 | | | |

The above Table shows that since the critical value at 5% significant level is 3.35, which is greater than F, calculated 3.21, the null hypothesis is accepted. Hence, it is concluded that the DOL position of TATA steel, SAIL, and JSW does not differ significantly.

DEGREE OF OPERATING LEVERAGE

**TABLE 3: DEGREE OF FINANCIAL LEVERAGE**

| YEAR | TATA STEEL | SAIL | JSW |
|---|---|---|---|
| 2003 | 1.19 | 2.22 | -8.5 |
| 2004 | 1.07 | 1.24 | 1.39 |
| 2005 | 1.04 | 1.06 | 1.25 |
| 2006 | 1.03 | 1.07 | 1.22 |
| 2007 | 1.04 | 1.03 | 1.16 |
| 2008 | 1.12 | 1.02 | 1.16 |
| 2009 | 1.18 | 1.02 | 1.59 |
| 2010 | 1.22 | 1.04 | 1.23 |
| 2011 | 1.15 | 1.06 | 1.21 |
| 2012 | 1.17 | 1.1 | 1.31 |
| TOTAL | 11.21 | 11.86 | 3.02 |
| AVERAGE | 1.121 | 1.186 | 0.302 |
| S.D | 0.070938 | 0.368999 | 3.095397 |

(Compiled From Financial Statement)

The above table shows that the calculated mean value of SAIL was higher as 1.19. The standard deviation value of JSW was maximum when compared to other companies which are due to the inability of the firm to make profit during the year 2003. The standard deviation of TATA steel is comparatively low which indicates that the company is less risky in terms of the financial risk.

**ANOVA**
**HYPOTHESIS TESTING:**
Ho: The DFL position of the steel companies does not differ significantly.

Ha: The DFL position of the steel companies differs significantly.

**TABLE 4: F TESTS FOR DEGREE OF FINANCIAL LEVERAGE**

| | Sum of squares | df | Mean square | F ratio | F critical |
|---|---|---|---|---|---|
| Between Sample | 4.854807 | 2 | 2.427403 | 0.748992 | 3.35 |
| within Sample | 87.50409 | 27 | 3.240892 | | |
| Total | 92.3589 | 29 | | | |

The above Table shows that since the critical value at 5% significant level is 3.35, which is greater than F, calculated 0.749, the null hypothesis is accepted. Hence, it is concluded that the DFL position of TATA steel, SAIL, and JSW does not differ significantly.

**DEGREE OF COMBINE LEVERAGE**
**TABLE 5: DEGREE OF COMBINE LEVERAGE**

| YEAR | TATA STEEL | SAIL | JSW |
|---|---|---|---|
| 2003 | 1.95 | 2.84 | -1.36 |
| 2004 | 1.24 | 1.41 | 1.1 |
| 2005 | 1.1 | 1.04 | 1.43 |
| 2006 | 1.11 | 0.89 | 1.17 |
| 2007 | 1.09 | 0.94 | 1.42 |
| 2008 | 1.18 | 0.9 | 1.22 |
| 2009 | 1.23 | 0.72 | 2.45 |
| 2010 | 1.26 | 1.09 | 1.32 |
| 2011 | 1.17 | 0.88 | 1.23 |
| 2012 | 1.38 | 1 | 1.74 |
| TOTAL | 12.71 | 11.71 | 11.72 |
| AVERAGE | 1.271 | 1.171 | 1.172 |
| S.D | 0.254316 | 0.613686 | 0.973411 |

**(Compiled From Financial Statement)**
The above table indicates that the mean DCL of TATA steel, SAIL, JSW were 1.27, 1.17 and 1.17 respectively. The standard deviation shows that TATA steel, SAIL, JSW have lesser risk with the standard deviation value of 0.25, 0.61, and 0.97 respectively.

**ANOVA**
**HYPOTHESIS TESTING:**
Ho: The DCL position of the steel companies does not differ significantly.

Ha: The DCL position of the steel companies differs significantly.

**TABLE 6 F TESTS FOR DEGREE OF COMBINED LEVERAGE**

| | Sum of squares | df | Mean square | F ratio | F critical |
|---|---|---|---|---|---|
| Between Sample | 10.85353 | 2 | 5.426763 | 0.699998 | 3.35 |
| within Sample | 209.3185 | 27 | 7.752539 | | |
| Total | 220.17 | 29 | | | |

The above table shows that since the critical value at 5% significant level is 3.35, which is greater than F, calculated 0.699, the null hypothesis is accepted. Hence, it is concluded that the DCL position of TATA steel, SAIL, and JSW does not differ significantly.

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**EARNING PER SHARE (EPS)**

**TABLE 7 EARNING PER SHARE**

| YEAR | TATA STEEL | SAIL | JSW |
|---|---|---|---|
| 2003 | 27.53 | -0.74 | -0.86 |
| 2004 | 47.48 | 6.08 | 4.1 |
| 2005 | 62.77 | 16.5 | 65.27 |
| 2006 | 63.35 | 9.72 | 53.28 |
| 2007 | 72.74 | 15.02 | 77.09 |
| 2008 | 63.85 | 18.25 | 90.84 |
| 2009 | 69.7 | 14.95 | 22.96 |
| 2010 | 56.37 | 16.35 | 106.59 |
| 2011 | 71.58 | 11.87 | 88.87 |
| 2012 | 68.95 | 8.58 | 71.62 |
| TOTAL | 604.32 | 116.58 | 579.76 |
| AVERAGE | 60.432 | 11.658 | 57.976 |
| S.D | 13.8511 | 5.860925 | 37.43881 |

(Compiled From Financial Statement)

The above table indicates that the EPS of TATA steel is higher than that of JSW and SAIL. TATA steel has generated the EPS of Rs.60.43, which is the highest among all, followed by JSW (57.97), SAIL (11.66). From the study it is found that TATA steel is the most efficient company in terms of generating earning per share. Standard deviation value of JSW is higher(37.44) which indicates a higher variation in earning per share during the study period and also during the year 2003 it has incurred loss while other companies have low standard deviation values such as TATA steel (13.85) and SAIL (5.86) respectively.

**ANOVA**

**HYPOTHESES TESTING:**

Ho: The EPS position of the steel companies does not differ significantly.

Ha: The EPS position of the steel companies differs significantly.

**TABLE 8 F TESTS FOR DEGREE EARNING PER SHARE**

| | Sum of squares | df | Mean square | F ratio | F critical |
|---|---|---|---|---|---|
| Between Sample | 15100.97 | 2 | 7550.487 | 13.9148 | 3.35 |
| within Sample | 14650.81 | 27 | 542.6226 | | |
| Total | 29751.78 | 29 | | | |

The above table shows that since the critical value at 5% significant level is 3.35, which is lesser than F, calculated 13.91, the null hypothesis is rejected. Hence, it is concluded that the EPS position of TATA steel, SAIL, and JSW differs significantly.

**TEST OF CORRELATION ANALYSIS**

Correlation is a statistical measurement of the relationship between two variables. Positive correlation ranges from +1 to -1. A zero correlation indicates that there is no relationship between the variables. A correlation of -1 indicates a perfect negative correlation, meaning that as one variable goes up, the other goes down. A correlation of +1 indicates a perfect correlation, meaning that both variables move in the same direction together.

Table value of (n-1) i.e. 10 degree of freedom at 5% level of significance is 1.812 for two tailed test

**OPERATING LEVERAGE AND EPS**

**Hypothesis 1 (HO): There is no significant relationship between operating leverage and EPS**

**TABLE 9 CORRELATIONS AND T-TEST FOR OPERATING LEVERAGE**

| Companies | Correlation | Result | T-test (value) | Hypothesis result |
|---|---|---|---|---|
| TATA STEEL | -0.24648 | Negative | -13.5408 | Rejected |
| SAIL | -0.86084 | Negative | -5.63903 | Rejected |
| JSW | 0.525677 | Positive | -4.85488 | Rejected |

The above table shows that the correlation between the operating leverage and EPS is negative for TATA steels and SAIL. It is positive for JSW. As per the t-test result, all companies have strong correlation between DOL and EPS. Hence the hypothesis is rejected; there exists a strong relationship between DOL and EPS.

**FINANCIAL LEVERAGE AND EPS**

**Hypothesis 2(HO): there is no significant relationship between financial leverage and EPS**

**TABLE 10 CORRELATIONS AND T-TEST FOR FINANCIAL LEVERAGE**

| Companies | Correlation | Result | T-test(value) | Hypothesis result |
|---|---|---|---|---|
| TATA STEEL | -0.85756 | Negative | -11.6523 | Rejected |
| SAIL | -0.63567 | Negative | -5.76285 | Rejected |
| JSW | -0.31766 | Negative | -4.79785 | Rejected |

The above table shows that the correlation between the operating leverage and EPS is negative for all the companies. As per the t-test result all companies have strong correlation between DOL and EPS. Hence the hypothesis is rejected; there exists a strong relationship between DOL and EPS.

**COMBINE LEVERAGE AND EPS**

**Hypothesis 2(HO): there is no significant relationship between combine leverage and EPS**

**TABLE 10 CORRELATIONS AND T-TEST FOR COMBINE LEVERAGE**

| Companies | Correlation | Result | T-test (value) | Hypothesis result |
|---|---|---|---|---|
| TATA STEEL | -0.85756 | Negative | -11.6523 | Rejected |
| SAIL | -0.63567 | Negative | -5.76285 | Rejected |
| JSW | -0.31766 | Negative | -4.79785 | Rejected |

The above table shows that the correlation between the combine leverage and EPS is negative for TATA steels and SAIL. It is positive for JSW. As per the t-test result all companies have strong correlation between DOL and EPS. Hence the hypothesis is rejected; there exists a strong relationship between DOL and EPS.

**MAJOR FINDINGS OPERATING LEVERAGE**

- Mean and standard deviation of DOL of JSW are the highest among the other Companies and they are exposed with more risk of paying operating expenses.

- One way ANOVA is adopted to find out the variability of data among the sample companies and it is found that the DOL position of TATA STEEL, SAIL, and JSW does not differ significantly.

- Correlation test is used to find out the relationship between two variables called DOL and EPS where as strong correlation is found in all companies during the study period.

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**FINANCIAL LEVERAGE**

➢ Standard deviation of DFL of JSW is the highest among the sample companies. It reveals that JSW is exposed with more risk of paying interest but at the same time the return of the owners can be maximized. JSW during the year 2003 did not have sufficient profit even to meet the interest expenses.

➢ One way ANOVA is adopted to find out the variability of data among the sample companies and it is found that the DFL position of TATA STEEL, JSW, SAIL does not differ significantly.

➢ Correlation test is used to find out the relationship between two variables called DFL and EPS where as strong correlation is found in all companies during the study period.

**COMBINE LEVERAGE**

➢ The mean value of DCL of TATA STEEL is higher as it was 1.27. It was exposed with high risk of paying fixed operating expenses and financial risk.

➢ One way ANOVA is adopted to find out the variability of data among the sample companies and it is found that the DCL position of TATA STEEL, SAIL and JSW does not differ significantly.

➢ Correlation t- test is used to find out the relationship between two variables called DCL and EPS as strong correlations are found in all companies during the study period.

**EARNING PER SHARE**

➢ It is found that the mean value of EPS of TATA STEEL and JSW are higher as they are Rs.60.43 and Rs.57.98 respectively. It is an indication of higher EPS of the company. Standard deviation of EPS of JSW and TATA STEEL are higher and there is a high variation in its EPS during the study period.

➢ One way ANOVA is adopted to find out the variability of data among the sample companies and it is found out that the EPS position of TATA STEED, SAIL AND JSW differs significantly.

**SUGGESTIONS OPERATING LEVERAGE**

➢ In case of JSW it was found that exposed with the risk of high operating risk in order to reduce the risk it is suggested that JSW employs greater amount of variable cost and smaller amount of fixed cost because low operating leverage will give cushion to the management by providing high margin of safety against fluctuations in sales.

➢ Since there is negative correlation between the DOL and EPS for TATA STEEL and SAIL, it is suggested that the firms use low operating leverage in order to increase the EPS of the firms.

**FINANCIAL LEVERAGE**

➢ In case of DFL the JSW is exposed with high risk; so proper planning of capital structure is needed. Hence in order to reduce the risk, it is suggested that JSW increases the equity capital and reduces the long term borrowing in capital structure of the firm.

➢ Since there is negative correlation between DFL and EPS for all the firms, in order to increase EPS, the firm should employ low financial leverage.

**COMBINE LEVERAGE**

➢ In case of DCL it is suggested that proper balance between the operating and financial leverage of the selected firms is made.

➢ Since it was found with negative correlation it is suggested that the degree of combined leverage may be reduced in order to increase the EPS of the selected firms.

**CONCLUSIONS**

This paper analyses the impact of leverage on profitability i.e. EPS of select steel companies traded in BSE. Leverage is an important factor which is having an impact on profitability of the firm which in turn affects the wealth of the shareholders. From this study it is found out that there is a negative correlation between DOL and EPS, DFL and EPS, and DCL and EPS. The result shows that the use of debt and fixed cost expenses would reduce the profitability of the firms. It implies that in order to increase the earnings the firms need to reduce the use of debt in capital structure and fixed cost in operation of the firm. In short firms can use higher amount of the source of debt and fixed cost in capital structure and operations of the firm. Only then they can increase the size and sales irrespective of various factors affecting the firms.

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