

Leverage, Risk & Choice of Capital Structure: An Empirical Case from India

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Abstract- The present empirical paper studies the leverage, risk and choice of capital structure in India through a case of MRF Ltd. from tyres & tubes industry of the Indian corporate sector which covers a time period of ten years (effective nine years) extending from the year 1982-83 to 1991-92 where the company is lying in the top of tyres & tubes industry of the Indian corporate sector on the basis of sales for the year 1991-92 for the purpose of our study. The study reveals that that debt-equity ratio₂ and leverage ratio₂ have been varying from 53.01 percent in the 1982-83 to 68.25 percent in the year 1985-86, each, with rising trend during the period under study, whereas, aggregate debt-equity ratio₂ and leverage ratio₂ of the company are worked out 63.71 percent, each, during the period under study. It is found that cost of debt on before and after tax basis ($K_{d_{bt}}$ & $K_{d_{at}}$) has been declining over the period under study, whereas, aggregate cost of debt on before and after tax basis ($K_{d_{bt}}$ & $K_{d_{at}}$) of the company is worked out 17.91 percent and 10.21 percent, respectively, during the period under study. It is observed that rate of return on net assets on before and after tax basis (ROI_{bt2} & ROI_{at2}) and rate of return on total networth on before and after tax basis (RON_{bt} & RON_{at}) have been rising during the period under study. On aggregate basis, aggregate rate of return on net assets on before and after tax basis (ROI_{bt2} & ROI_{at2}) is worked out 25.18 percent 14.35 percent, whereas, aggregate rate of return on total networth on before and after tax basis (RON_{bt} & RON_{at}) is worked out 38.42 percent and 21.90 percent, respectively, during the study period. Thus, it is concluded that the company is enjoying favourable leverage with regard to use of debt during seven out of nine years under study. Consequently, rate of return on total networth (RON_{bt} & RON_{at}) is higher than cost of debt ($K_{d_{bt}}$ & $K_{d_{at}}$) and rate of return on net assets (ROI_{bt2} & ROI_{at2}) on before and after tax basis in the above said seven years under study. It means that use of debt in the capital structure of the company has positive impact on the profitability of the company during seven out of nine years under study which consequently is contributing to the total networth of the company which ultimately is benefitting to the equity shareholders of the company. Leverage created through debt by the company is not generating risk for the company in the above said seven years under study because MRF Ltd. is able to cover the cost of debt ($K_{d_{bt}}$ & $K_{d_{at}}$) on before and after tax basis from the rate of return on net assets (ROI_{bt2} & ROI_{at2}) on before and after tax basis in the above said seven years under study. However, on aggregate basis, the company has also been experiencing favourable leverage with regard to use of debt on before and after tax basis during the period under study which further means that debt is behaving favourably during the period under study. It is also found that spread and net gain are positive when leverage impact is positive and vice-versa during the period under study. It is also found that effective tax rate born by the company is high, i.e. 43 percent, during the period under study.

Key Words- Return on Net Assets; Return on Total Networth; Cost of Debt

1. INTRODUCTION

Leverage is generally measured by the ratio called debt-equity ratio. This ratio indicates the relationship between the borrowed funds and owners' funds in the capital structure of a company. But actually the use of the fixed charges funds, such as debt and preference capital along with the owner's equity in the capital structure is described as financial leverage or trading on equity. The primary aim of corporate management is to maximize shareholders' value and the value of a firm in a legal and ethical manner. So, a financial manager would consider a number of factors to set an optimal capital structure for a firm giving considerable weight to earning rate, collateral value of

assets, age, cash flow coverage ratio, non debt tax shield, size (net sales), dividend payout ratio, debt service ratio, cost of borrowing, corporate tax rate, current ratio, growth rate, operating leverage and uniqueness (selling cost/sales) etc. "A company can finance its investments through debts/or equity. The company may also use preference capital. The rate of interest on debt is fixed irrespective of the company's rate of return on assets. The company has a legal binding to pay interest on debt. The rate of preference dividend is fixed, but preference dividends are paid when the company earns profits. The common shareholders are entitled to the residual income. That is, earnings after interest and taxes (less preference dividends) belong to

them. The rate of equity is not fixed and depends on the dividend policy of the company.” (Pandey, I. M., 2010, p 317-18). The choice between debt and equity to finance a firm’s assets involves a trade-off between risk and return (Pandey, Chotigeat & Ranjit, 2000). The excessive use of debt may endanger the survival of a firm, while a conservative use of debt may deprive the firm in leveraging return to equity owners. Therefore, in order to increase the advantage of debt capital and at the same time to save the firm from the financial and other risks, it is desirable to have a reasonable debt equity mix in the total capital structure. Thus, the decision regarding debt equity mix in the capital structure of a firm is of critical importance and has to be approached with a great care. Every time when funds have to be procured, the financial manager weighs the pros and cons of various sources of finance and selects the most advantageous sources keeping in view the target capital structure. Thus, the capital structure decision is a continuous one and has to be taken whenever a firm needs additional finances. As the objective of a firm should be directed towards the maximization of the value of the firm, the capital structure, or leverage, decision should be examined from the point of view of its impact on the value of the firm. If the value of the firm can be effected by capital structure or financing decision, a firm would like to have a capital structure which maximizes the market value of the firm. So, the financial manager should plan an optimum capital structure for his company. The optimum capital structure is obtained when the market value per share is maximum. Capital structure is the mix of debt, equity and preference securities that are used to finance a company’s assets. However, the choice between debt and equity from the point of view of shareholders and lenders is an important one and it will be useful to list the special advantages of either form of capital relative to the other. The greater use of debt, where the interest rate is lower than the average rate of return on the investment, increases the net return to equity shareholders. Higher debt does not impair the control of shareholders over the enlarged operations of the firm. Debt is cheaper source of finance, cost of debt is lower than cost of preference share capital as well as equity share capital because debt holders’ first claim on the firm’s assets at time of its liquidation, payment of interest before any dividend is paid to preference and equity shareholders, and interest is an item chargeable to profits of a firm. Deductibility of the interest on debt before computing profits charge to tax, as against payment of dividends out of profits after tax, implies an effective lowering of the tax rate on a firm more or less in proportion to the extent to which debt is substituted for equity in the company’s financing pattern. But it is not desirable to resort to excessive debt financing because the excessive proportion of debt in the capital structure increases the financial risks of the firm. Financial risk arises when the firm is unable to cover its fixed financial costs. This is because debt being a contractual obligation.

The same along with interest must be paid out ultimately. Any failure in doing so shall result in technical insolvency if not a real one. Further, the use of debt capital will not automatically improve the overall return of the firm. It will increase the return if the firm’s rate of return on assets is higher than the cost of debt capital. Therefore, in order to increase the advantage of debt capital and at the same time to save the firm from the financial and other risks, it is desirable to have a reasonable debt equity mix in the total capital structure. Thus, the decision regarding debt equity mix in the capital structure of a firm is of critical one and has to be approached with a great care initially at the time of promotion and, subsequently, whenever funds have to be raised to finance investments by the firm. The paper is organized into five sections. Section I provides the introduction about leverage, debt capital and share capital. Section II shows the objectives of the present study. Section III deals with data source and sample size. Section IV deals with research methodology. Section V presents reports and analyses the empirical results of the study. Section VI summarizes and concludes the study.

2. OBJECTIVES OF THE STUDY

The present study has the following objectives in order to study the leverage, risk and choice of capital structure of MRF Ltd.

- To measure the extent of debt-equity ratio of MRF Ltd. from the tyres & tubes industry of the Indian corporate sector.
- To measure the extent of leverage ratio of MRF Ltd. from the tyres & tubes industry of the Indian corporate sector.
- To study the impact of leverage (through the use and cost of debt) on total networth of MRF Ltd. of tyres & tubes industry from the Indian corporate sector.

3. DATA SOURCE & SAMPLE SIZE

For studying the leverage, risk and choice of capital structure, MRF Ltd. from the tyres & tubes industry of the Indian corporate sector is selected. The study covers a time period of ten years (effective nine years) extending from the year 1982-83 to 1991-92 for the purpose of meeting the given objectives. The company is lying in the top of tyres & tubes industry of the Indian corporate sector on the basis of sales for the year 1991-92 for the purpose of this study. For the purpose of conducting the present study, data has been compiled from the different volumes of the Bombay Stock Exchange Official Directory.

4. RESEARCH METHODOLOGY

The present empirical paper studies the leverage, risk and choice of capital structure in India through a case of MRF Ltd. from tyres & tubes industry of the Indian corporate sector. To analyze the results, analysis of empirical section is organized into four parts. In the first part, analysis of debt-equity ratio & leverage ratio is done. The second part

explains the analysis of return on investment and cost of debt on before tax basis. The third part gives details of the analysis of return on investment and cost of debt on after tax basis. In the fourth part, impact of debt on return on total network is presented. The company does not have preference share capital during the study period. In this study, debt-equity ratio and leverage ratio will be same. Therefore, use of debt along with owner's equity will constitute leverage for our empirical work which further means that use of debt and leverage has same meaning over here. Return on net total assets which is calculated and is shown in the research methodology is supplementary information which further means that it is not a part for approaching and reaching to the conclusions of the main study. To analyse the data, the following ratios along with simple statistical tools like tables, percentages, etc. have been used for achieving the objectives of present study.

Debt-Equity Ratio: It can be calculated in the following manner

Debt-Equity Ratio₁ =

$$\frac{\text{Term Debt + Short Term Loans \& Advances}}{\text{Total Network}} \times 100$$

Debt-Equity Ratio₂ =

$$\frac{\text{Term Debt + Short Term Loans \& Advances}}{\text{Term Debt + Short Loans Advances + Total Network}} \times 100$$

Leverage Ratio: It can be calculated in the following manner

Leverage Ratio₁ =

$$\frac{\text{Term Debt + Short Term Loans Advances + Pref Share Capital}}{\text{Equity Network}} \times 100$$

Leverage Ratio₂ =

$$\frac{\text{Term Debt + Short Term Loans Advances + Pref Share Capital}}{\text{Term Debt + Short Term Loans Advances + Pref Share Capital + Equity Network}} \times 100$$

Return on Total Network: It is calculated in the following manner

Return on Total Network on Before Tax Basis (RON_{bt}) =

$$\frac{\text{Pre Tax Profits}}{\text{Total Network}} \times 100$$

Return on Total Network on After Tax Basis (RON_{at}) =

$$\frac{\text{Profits after Interest \& Taxes}}{\text{Total Network}} \times 100$$

Return on Net Total Assets: It is calculated in the following manner

Return on Net Total Assets on Before Tax Basis (ROI_{bt1}) =

$$\frac{\text{Earnings Before Intt. \& Taxes}}{\text{Net Total Assets}} \times 100$$

Return on Net Total Assets on After Tax Basis (ROI_{at1}) =

ROI_{bt1}(1-t)

Return on Net Assets: It is calculated in the following manner

Return on Net Assets on Before Tax Basis (ROI_{bt2}) =

$$\frac{\text{Earnings Before Interest \& Taxes}}{\text{Net Assets}} \times 100$$

Return on Net Assets on After Tax Basis (ROI_{at2}) =

ROI_{bt2}(1-t)

Cost of Debt: The following formula is used to calculate the cost of debt

Cost Debt on Before Tax Basis (Kd_{bt}) =

$$\frac{\text{Total Interest Charges}}{\text{Total Intt. Bearing Debt Both Long Term \& Short Term}} \times 100$$

Cost of Debt on After Tax Basis (Kd_{at}) = Kd_{bt}(1-t)

Net Gain: The following is the formula for calculating the Net Gain

Net Gain on Before Tax Basis =

Return on Total Network (RON_{bt}) - Return on Net Assets (ROI_{bt})

Net Gain on After Tax Basis =

Return on Total Network (RON_{at}) - Return on Net Assets (ROI_{at})

Spread: The following is the formula for calculating the Spread

Spread on Before Tax Basis =

Return on Net Assets (ROI_{bt}) - Cost of Debt (Kd_{bt})

Spread on After Tax Basis =

Return on Net Assets (ROI_{at}) - Cost of Debt (Kd_{at})

Effective Tax Rate (t): It is calculated in the following manner

$$\text{Effective Tax Rate (t)} = \frac{\text{Provision for Taxes}}{\text{Pre-Tax Profits}} \times 100$$

Here Term Debt plus Short Term Loans & Advances comprise of debentures, long term loans and short term loans & advances. Total Network includes equity share capital, preference share capital, capital reserves including share premium and other reserves & surplus less intangible assets. Intangible Assets include preliminary expenses, expenses on issue of shares and debentures, goodwill, technical know-how charges, drawings & designs, patents, trade-marks and copyright. While computing total network usually accumulated losses are deducted from the aggregate of paid up share capital plus reserves & surplus. But in the present study in addition to accumulated losses, goodwill, trade-mark, patents, & copyright have also been deducted. It is so because separate amount of accumulated losses is not available in the Bombay Stock Exchange

Official Directory. Total network has been also adjusted for the accounting year 1988-89 due to the change in the length of accounting year from 1st of April to 31st of March in the next year. Depreciation, interest charges and profits and/or losses have been changed proportionately.

5. EMPIRICAL RESULTS

5.1 Analysis of Debt-Equity Ratio & Leverage Ratio:

As revealed by [Table 1](#), debt-equity ratio₂ has been varying from 53.01 percent in the 1982-83 to 68.25 percent in the year 1985-86 during the period under study. For six out of nine years under study, it has been below 60 percent. Overall, it has rising trend over the period under study. It is highest, i.e. 68.25 percent, in the year 1985-86 due to the higher interest bearing debt raised by the company. It is lowest, i.e. 53.01 percent, in the year 1982-83 due to the existence of lower amount of interest bearing debt in the company. On aggregate basis, the debt-equity ratio₂ of the company is worked out 63.71 percent during the period under study. Preference share capital does not exist for the company during the study period. Therefore, debt-equity ratio and leverage ratio are same during the period under study. Thus, the company is having same debt-equity ratio and leverage ratio experience over the period under study [Table 2](#).

5.2 Analysis of Return on Investment and Cost of Debt on Before Tax Basis:

Return on Net Total Assets on Before Tax Basis (ROI_{bt1})

As revealed by [Table 3](#), rate of return on net total assets on before tax basis (ROI_{bt1}) has been varying from 8 percent in years 1982-83 and 1983-84 to 19 percent in the year 1987-89 during the period under study. During five out of nine years under study, the rate of return on net total assets on before tax basis (ROI_{bt1}) has been below 14 percent. Overall, it has been rising over the period under study. It is highest, i.e. 19 percent, in the year 1987-89 due to the increased turnover to Rs. 742.47 crores which reflected an improvement in 60.86 percent on an annualised basis over the preceding year and sharp rise in export turnover on an annualised basis by 117.61 percent to Rs. 64.30 crores. It is lowest, i.e. 8 percent, in the years 1982-83 and 1983-84, each, respectively, caused by severe power cuts and recessionary conditions. Further steeply escalation prices of raw materials such as natural rubber, nylon, chemicals etc., adversely affected price realisation, and the company was forced to peg its selling price at 1980-81 level in the years 1982-83 and 1983-84. On aggregate basis, the rate of return on net total assets on before tax basis (ROI_{bt1}) is worked out 15.77 percent during the study period.

Return on Net Assets on Before Tax Basis (ROI_{bt2})

As revealed by [Table 3](#), rate of return on net assets on before tax basis (ROI_{bt2}) has been varying from 18 percent in year 1983-84 to 30 percent in the year 1987-89 during the period under study. During seven out of nine years

under study, rate of return on net assets on before tax basis (ROI_{bt2}) has been below 26 percent. Overall, it has been rising over the period under study excepting for the year 1983-84 when it is 18 percent. It is highest, i.e. 30 percent, in the year 1987-89 due to the highest rate of return on net total assets on before tax basis (ROI_{bt1}) caused by reasons mentioned earlier such as increased turnover and exports. It is lowest, i.e. 18 percent, in the year 1983-84 due to the lowest rate of return on net total assets on before tax basis (ROI_{bt1}) caused by reasons mentioned earlier such as sluggish market conditions and stiff completion. On aggregate basis, the rate of return on net assets on before tax basis (ROI_{bt2}) is worked out 25.18 percent during the study period.

Cost of Debt on Before Tax Basis (Kd_{bt})

As revealed by [Table 3](#), cost of debt on before tax basis (Kd_{bt}) has been varying from 29 percent in year 1982-83 to 15 percent in the years 1986-87 and 1987-89 during the period under study. During seven out of nine years under study, cost of debt on before tax basis (Kd_{bt}) has been below 20 percent. Overall, it has been declining over the period under study. On aggregate basis, aggregate cost of debt on before tax basis (Kd_{bt}) of the company is worked out 17.91 percent during the period under study.

Return on Total Network on Before Tax Basis (RON_{bt})

As revealed by [Table 3](#), rate of return on total network on before tax basis (RON_{bt}) has been varying from 13 percent in the year 1982-83 to 64 percent in the year 1987-89 during the period under study. During six out of nine years under study, rate of return on total network on before tax basis (RON_{bt}) has been below 35 percent. Overall, it has been rising over the period under study and witnesses a high rise in the years 1986-87 and 1987-89 when it is 58 percent and 64 percent respectively. It is highest, i.e. 64 percent, in the year 1987-89 due to the highest rate of return on net total assets (ROI_{bt1}) as well as net assets (ROI_{bt2}) on before tax basis and highest excess gap of rate of return on net assets (ROI_{bt2}) over cost of debt (Kd_{bt}) on before tax basis. It is lowest, i.e. 13 percent, in the year 1982-83 caused by lower rate of return on net total assets (ROI_{bt1}) as well as net assets (ROI_{bt2}) on before tax basis, highest cost of debt (Kd_{bt}) on before tax basis and highest excess gap of cost of debt (Kd_{bt}) over rate of return on net assets (ROI_{bt2}) on before tax basis. On aggregate basis, the rate of return on total network on before tax basis (RON_{bt}) is worked out 38.42 percent during the study period.

5.3 Analysis of Return on Investment and Cost of Debt on After Tax Basis:

Return on Net Total Assets on After Tax Basis (ROI_{at1})

As revealed by [Table 4](#) effective tax rate has been below 52 percent during the period under study. The rate of return on net total assets on before tax basis (ROI_{bt1}) has been varying from 8 percent in the years 1982-83 and 1983-84 to 19 percent in the year 1987-89 while the rate of return on net total assets on after tax basis (ROI_{at1}) has been varying from 4 percent in the year 1982-83 to 12

percent in the year 1987-89 during the period under study. During six out of nine years under study, rate of return on net total assets on after tax basis (ROI_{at1}) has been below 9 percent. Overall, it has been rising over the period under study. It is highest, i.e. 12 percent, in the year 1987-89 due to the highest rate of return on net total assets on before tax basis (ROI_{bt1}) caused by the reasons mentioned earlier such as increased turnover and exports. It is lowest, i.e. 4 percent, in the year 1982-83 due to the lowest rate of return on net total assets on before tax basis (ROI_{bt1}) caused by reasons mentioned earlier such as severe power cuts and recessionary conditions, steeply escalation prices of raw materials and adversely affected price realisation. On aggregate basis, the rate of return on net total assets on after tax basis (ROI_{at1}) is worked out 9 percent during the study period.

Return on Net Assets on After Tax Basis (ROI_{at2})

As revealed by [Table 4](#), rate of return on net assets on before tax basis (ROI_{bt2}) has been varying from 18 percent in the year 1983-84 to 30 percent in the year 1987-89 while the rate of return on net assets on after tax basis (ROI_{at2}) has been varying from 12 percent in the year 1982-83 to 19 percent in the year 1987-89 during the period under study. During seven out of nine years under study, rate of return on net assets on after tax basis (ROI_{at2}) has been below 15 percent. Overall, it has been rising over the period under study. It is highest, i.e. 19 percent, in the year 1987-89 due to the highest rate of return on net assets on before tax basis (ROI_{bt2}) caused by reasons mentioned earlier such as increase turnover and exports. It is lowest, i.e. 12 percent, in the years 1982-83, 1983-84, 1985-86 and 1991-92 caused by lower rate of return on net assets on before tax basis (ROI_{bt2}) due to the reasons mentioned earlier such as severe power cuts and recessionary conditions, steeply escalation prices of raw materials and adversely affected price realisation in the years 1982-83 and 1983-84 and higher effective tax rate in the years 1985-86 and 1991-92. On aggregate basis, the rate of return on net assets on after tax basis (ROI_{at2}) is worked out 14.35 percent during the study period.

Cost of Debt on After Tax Basis (K_{d_{at}})

As revealed by [Table 4](#) cost of debt on before tax basis (K_{d_{bt}}) has been varying from 29 percent in year 1982-83 to 15 percent in the years 1986-87 and 1987-89 while cost of debt on after tax basis (K_{d_{at}}) has been varying from 16 percent in year 1982-83 to 9 percent in the years 1987-89, 1990-91 and 1991-92 over the period under study. During six out of nine years under study, cost of debt on after tax basis (K_{d_{at}}) has been below 11 percent. Overall, it has been declining over the period under study. On aggregate basis, aggregate cost of debt on after tax basis (K_{d_{at}}) of the company is worked out 10.21 percent during the period under study.

Return on Total Networkth on After Tax Basis (RON_{at})

As revealed by [Table 4](#), rate of return on total networkth on before tax basis (RON_{bt}) has been varying from 13 percent

in the year 1982-83 to 64 percent in the year 1987-89 while rate of return on total networkth on after tax basis (RON_{at}) has been varying from 7 percent in the year 1982-83 to 40 percent in the year 1987-89 during the period under study. During five out of nine years under study, rate of return on total networkth on after tax basis (RON_{at}) has been below 17 percent. Overall, it has been rising over the period under study. It is highest, i.e. 40 percent, in the year 1987-89 due to the highest rate of return on net total assets (ROI_{at1}) as well as net assets (ROI_{at2}) on after tax basis, lowest cost of debt (K_{d_{at}}) on after tax basis and highest excess gap of rate of return on net assets (ROI_{at2}) over cost of debt (K_{d_{at}}) on after tax basis. It is lowest, i.e. 7 percent, in the year 1982-83 due to the lowest rate of return on net total assets (ROI_{at1}) as well as net assets (ROI_{at2}) on after tax basis, highest cost of debt (K_{d_{at}}) on after tax basis and highest excess gap of cost of debt (K_{d_{at}}) over rate of return on net assets (ROI_{at2}) on after tax basis. On aggregate basis, the rate of return on total networkth on after tax basis (RON_{at}) is worked out 21.90 percent during the study period

5.4 Impact of Debt on Return on Total Networkth:

[Table 3](#) [Table 4](#) [Table 5](#) also show the effect of use and cost of debt (K_{d_{bt}} & K_{d_{at}}) on rate of return on total networkth (RON_{bt} & RON_{at}) on before and after tax basis for a period of nine year from the year 1982-83 to 1991-92. Comparison of cost of debt (K_{d_{bt}} & K_{d_{at}}) with rate of return on net assets (ROI_{bt2} & ROI_{at2}) on before and after tax basis shows that latter has been higher than former for all the years under study excepting for the years 1982-83 and 1983-84. This leads to conclude that the company has been enjoying favourable leverage with regard to use of debt during seven out of nine years under study. Consequently, rate of return on total networkth (RON_{bt} & RON_{at}) has been higher than cost of debt (K_{d_{bt}} & K_{d_{at}}) and rate of return on net assets (ROI_{bt2} & ROI_{at2}) on before and after tax basis in the above said seven years under study. It means that use of debt in the capital structure of the company has positive impact on the profitability of the company during seven out of nine years under study which consequently is contributing to the total networkth of the company which ultimately is benefitting to the equity shareholders of the company. Leverage created through debt by the company is not generating financial risk for the company in the above said seven years under study because MRF Ltd. is able to cover the cost of debt (K_{d_{bt}} & K_{d_{at}}) on before and after tax basis from the rate of return on net assets (ROI_{bt2} & ROI_{at2}) on before and after tax basis in the above said seven years under study. For the years 1982-83 and 1983-84 where MRF Ltd. is not able to cover the cost of debt (K_{d_{bt}} & K_{d_{at}}) on before and after tax basis from the rate of return on net assets (ROI_{bt2} & ROI_{at2}) on before and after tax basis, the leverage is generating financial for the company. On aggregate basis, the company has also been experiencing favourable leverage with regard to use of debt on before and after tax basis during the period under study. Further details

regarding spread and net gain on before and after basis have been in Table 5. Due to favourable impact of leverage by using debt in the capital structure of the company, spread between rate of return on net assets (ROI_{bt2} & ROI_{at2}) and cost of debt ($K_{d_{bt}}$ & $K_{d_{at}}$) on before and after tax basis, and net gain calculated by deducting rate of return on net assets (ROI_{bt2} & ROI_{at2}) from rate of return on total networkth (RON_{bt} & RON_{at}) on before and after basis have been positive in the above said seven years under study. Spread and net gain are negative when leverage impact is negative during the remaining two years under study. On aggregate basis, spread on before and after tax basis is worked out 7.27 percent and 4.14 percent, respectively, while net gain on before and after tax basis is worked out 13.24 percent and 7.55 percent, respectively, during the period under study.

6. CONCLUSIONS

The present empirical paper studies the leverage, risk and choice of capital structure in India through a case of MRF Ltd. from tyres & tubes industry of the Indian corporate sector which covers a time period of ten years (effective nine years) extending from the year 1982-83 to 1991-92 where the company is lying in the top of tyres & tubes industry of the Indian corporate sector on the basis of sales for the year 1991-92 for the purpose of our study. The following are the conclusions and findings of the present study.

- 1 It is observed that debt-equity ratio₂ has been varying from 53.01 percent in the 1982-83 to 68.25 percent in the year 1985-86 with rising trend during the period under study, whereas, aggregate debt-equity ratio₂ of the company is worked out 63.71 percent during the period under study. The company does not have preference share capital during the study period. Therefore, the company is having same debt-equity and leverage experience over the period under study.
- 2 It is found that cost of debt on before tax basis ($K_{d_{bt}}$) has been varying from 29 percent in year 1982-83 to 15 percent in the years 1986-87 and 1987-89 with declining trend while cost of debt on after tax basis ($K_{d_{at}}$) has been varying from 16 percent in year 1982-83 to 9 percent in the years 1987-89, 1990-91 and 1991-92 also with declining trend over the period under study, whereas, aggregate cost of debt on before and after tax basis ($K_{d_{bt}}$ & $K_{d_{at}}$) of the company is worked out 17.91 percent and 10.21 percent, respectively, during the period under study.
- 3 It is observed that the rate of return on net total assets on before tax basis (ROI_{bt1}) has been varying from 8 percent in the years 1982-83 and 1983-84 to 19 percent in the year 1987-89 with rising trend while the rate of return on net total assets on after tax basis (ROI_{at1}) has been varying from 4 percent in the year 1982-83 to 12 percent in the year 1987-

89 also with rising trend during the period under study. On aggregate basis, the rate of return on net total assets on before and after tax basis (ROI_{bt1} & ROI_{at1}) is worked out 15.77 percent and 9 percent, respectively, during the study period.

- 4 It is found that rate of return on net assets on before tax basis (ROI_{bt2}) has been varying from 18 percent in the year 1983-84 to 30 percent in the year 1987-89 with rising trend while the rate of return on net assets on after tax basis (ROI_{at2}) has been varying from 12 percent in the year 1982-83 to 19 percent in the year 1987-89 also with rising trend during the period under study. On aggregate basis, the rate of return on net assets on before and after tax basis (ROI_{bt2} & ROI_{at2}) is worked out 25.18 percent 14.35 percent, respectively, during the study period.
- 5 It is observed that rate of return total networkth on before tax basis (RON_{bt}) has been varying from 13 percent in the year 1982-83 to 64 percent in the year 1987-89 with rising trend while rate of return total networkth on after tax basis (RON_{at}) has been varying from 7 percent in the year 1982-83 to 40 percent in the year 1987-89 also with rising trend during the period under study. On aggregate basis, the rate of return on total networkth on before and after tax basis (RON_{bt} & RON_{at}) is worked out 38.42 percent and 21.90 percent, respectively, during the study period.
- 6 It is observed that the company is enjoying favourable leverage with regard to use of debt during seven out of nine years under study. Consequently, rate of return on total networkth (RON_{bt} & RON_{at}) is higher than cost of debt ($K_{d_{bt}}$ & $K_{d_{at}}$) and rate of return on net assets (ROI_{bt2} & ROI_{at2}) on before and after tax basis in the above said seven years under study.
- 7 It is also found that spread and net gain are positive when leverage impact is positive and, spread and net gain are negative when leverage impact is negative during the period under study. On aggregate basis, spread on before and after tax basis is worked out 7.27 percent and 4.14 percent, respectively, while net gain on before and after tax basis is worked out 13.24 percent and 7.55 percent, respectively, during the period under study.
- 8 It is found that leverage created through debt by the company is not generating risk for the company in the above said seven years under study because MRF Ltd. is able to cover the cost of debt ($K_{d_{bt}}$ & $K_{d_{at}}$) on before and after tax basis from the rate of return on net assets (ROI_{bt2} & ROI_{at2}) on before and after tax basis in the above said seven years under study.
- 9 It is also found that effective tax rate born by the company is high during the period under study. On aggregate basis, effective tax rate born by the company is 43 percent during the study period.

Thus, it is concluded that the company is enjoying favourable leverage with regard to use of debt during seven out of nine years under study. Consequently, rate of return on total networkth (RON_{bt} & RON_{at}) is higher than cost of debt (Kd_{bt} & Kd_{at}) and rate of return on net assets (ROI_{bt2} & ROI_{at2}) on before and after tax basis in the above said seven years under study. It means that use of debt in the capital structure of the company has positive impact on the profitability of the company during seven out of nine years under study which consequently is contributing to the total networkth of the company which ultimately is benefitting to the equity shareholders of the company. Leverage created through debt by the company is not generating risk for the company in the above said seven years under study because MRF Ltd. is able to cover the cost of debt (Kd_{bt} & Kd_{at}) on before and after tax basis from the rate of return on net assets (ROI_{bt2} & ROI_{at2}) on before and after tax basis in the above said seven years under study. However, on aggregate basis, the company has also been experiencing favourable leverage with regard to use of debt on before and after tax basis during the period under study which further means that debt is behaving favourably during the period under study. Due to favourable impact of leverage by using debt in the capital structure of the company, spread between rate of return on net assets (ROI_{bt2} & ROI_{at2}) and cost of debt (Kd_{bt} & Kd_{at}) on before and after tax basis, and net gain calculated by deducting rate of return on net assets (ROI_{bt2} & ROI_{at2}) from rate of return on total networkth (RON_{bt} & RON_{at}) on before and after basis have been positive in the above said seven years under study. Spread and net gain are negative when leverage impact is negative during the remaining two years under study.

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Appendix

Table 1: DEBT-EQUITY RATIO OF MRF LTD

Year	Debt – Equity Ratio1 $= \frac{\text{Term Debt} + \text{Short Term Loans and Advances}}{\text{Total Networkth}}$	Debt – Equity Ratio2 $= \frac{\text{Term Debt} + \text{Short Term Loans and Advances}}{\text{Term Debt} + \text{Short Term Loans and Advances} + \text{Total Networkth}} \times 100$
1982-83	1.1283	53.01
1983-84	2.0362	67.06
1984-85	1.5930	61.43
1985-86	2.1493	68.25
1986-87	2.0362	67.06
1987-89	1.8797	65.27
1989-90	1.6762	62.63
1990-91	1.8933	65.44
1991-92	1.5751	61.17
MRF Ltd.	1.7554 (Aggregate Basis)	63.71 (Aggregate Basis)

Source: Compiled from the Bombay Stock Exchange Official Directory, Vol. 36(iii), p. 63366.

Table 2: LEVERAGE RATIO OF MRF LTD.

Year	Leverage Ratio1 $= \frac{\text{Term Debt} + \text{Short Term Loans and Advances} + \text{Pref Share Capital}}{\text{Equity Networkth}}$	Leverage Ratio2 = $\frac{\text{Term Debt} + \text{Short Term Loans and Advances} + \text{Pref Share Capital}}{\text{Term Debt} + \text{Short Term Loans and Advances} + \text{Pref Share Capital} + \text{Equity Networkth}} \times 100$
1982-83	1.1283	53.01
1983-84	2.0362	67.06
1984-85	1.5930	61.43

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1985-86	2.1493	68.25
1986-87	2.0362	67.06
1987-89	1.8797	65.27
1989-90	1.6762	62.63
1990-91	1.8933	65.44
1991-92	1.5751	61.17
MRF Ltd.	1.7554 (Aggregate Basis)	63.71 (Aggregate Basis)

Source: Compiled from the Bombay Stock Exchange Official Directory, Vol. 36(iii), p. 63366.

Table 3: IMPACT OF DEBT ON RETURN ON TOTAL NETWORTH IN MRF LTD. (Before Tax Basis)

Year	Return on Total Assets (ROI _{bt1}) = $\frac{\text{EBIT}}{\text{Total Assets}} \times 100$ (Percentage)	Return on Net Assets (ROI _{bt2}) = $\frac{\text{EBIT}}{\text{Net Assets}} \times 100$ (Percentage)	Cost of Debt (Kd _{bt}) = $\frac{\text{Total Interest}}{\text{Total Debt}} \times 100$ (Percentage)	Return on Total Network (RON _{bt}) = $\frac{\text{Pre Tax Profits}}{\text{Total Network}} \times 100$ (Percentage)
1982-83	8	21	29	13
1983-84	8	18	20	14
1984-85	10.94	24.14	23.69	24.86
1985-86	13	24	20	32
1986-87	17	29	15	58
1987-89	19	30	15	64
1989-90	14	23	17	32
1990-91	18	26	17	41

1991-92	18	25	19	35
MRF Ltd.	15.77 Aggregate Basis	25.18 Aggregate Basis	17.91 Aggregate Basis	38.42 Aggregate Basis

Source: Compiled from the Bombay Stock Exchange Official Directory, Vol. 36(iii), p. 63366.

Table 4: IMPACT OF DEBT ON RETURN ON TOTAL NETWORTH IN MRF LTD. (After Tax Basis)

Year	Return on Total Assets $ROI_{at1}=ROI_{bt1}(1-t)$ (%)	Return on Net Assets $ROI_{at2}=ROI_{bt2}(1-t)$ (%)	Cost of Debt $Kd_{at}=Kd_{bt}(1-t)$ (%)	Return on Total Networkth $RON_{at}=\frac{\text{Profits after Intt \& Taxes}}{\text{Total Networkth}} \times 100$ (%)
1982-83	$8(1-.45)=4$	$21(1-.45)=12$	$29(1-.45)=16$	7
1983-84	$8(1-.31)=6$	$18(1-.31)=12$	$20(1-.31)=14$	10
1984-85	$10.94(1-.40)=6.56$	$24.14(1-.40)=14.48$	$23.69(1-.40)=14.21$	14.92
1985-86	$13(1-.52)=6$	$24(1-.52)=12$	$20(1-.52)=10$	15
1986-87	$17(1-.36)=11$	$29(1-.36)=18$	$15(1-.36)=10$	37
1987-89	$19(1-.37)=12$	$30(1-.37)=19$	$15(1-.37)=9$	40
1989-90	$14(1-.34)=9$	$23(1-.34)=15$	$17(1-.34)=11$	21
1990-91	$18(1-.45)=10$	$26(1-.45)=14$	$17(1-.45)=9$	23
1991-92	$18(1-.51)=9$	$25(1-.51)=12$	$19(1-.51)=9$	17
MRF Ltd.	15.77(1-.43)=9 Aggregate Basis	25.18(1-.43)=14.35 Aggregate Basis	17.91(1-.43)=10.21 Aggregate Basis	38.42(1-.43)=21.90 Aggregate Basis

Source: Compiled from the Bombay Stock Exchange Official Directory, Vol. 36(iii), p. 63366.

Table 5 ANALYSIS OF SPREAD AND GAIN IN MRF LTD.

	Before Tax Basis				After Tax Basis		
Year	Spread between ROI _{bt2} & Kd _{bt} (ROI _{bt2} -Kd _{bt}) (%age)	Debt Impact	Net Gain (RON _{bt} -ROI _{bt2}) (%age)	Debt-Equity Ratio ₂ (%age)	Spread between ROI _{at2} & Kd _{at} (ROI _{at2} -Kd _{at}) (%age)	Debt Impact	Net Gain (RON _{at} -ROI _{at2}) (%age)
1982-83	-8(-21)	Unfavourable	-8(5)	53.01	-4(-12)	Unfavourable	-5(3)
1983-84	-2(-12)	Unfavourable	-4(6)	67.06	-2(-8)	Unfavourable	-2(4)
1984-85	.45(-12.75)	Favourable	.72(13.92)	61.43	.27(-7.65)	Favourable	.44(8.36)
1985-86	4(-7)	Favourable	8(19)	68.25	2(-4)	Favourable	3(9)
1986-87	14(2)	Favourable	29(41)	67.06	8(1)	Favourable	19(26)
1987-89	15(4)	Favourable	34(45)	65.27	10(3)	Favourable	21(28)
1989-90	6(-3)	Favourable	9(18)	62.63	4(-2)	Favourable	6(12)
1990-91	6(1)	Favourable	15(23)	65.44	5(1)	Favourable	9(13)
1991-92	6(-1)	Favourable	10(17)	61.17	3(0)	Favourable	5(8)
MRF Ltd.	7.27(-2.14) Aggregate Basis	Favourable	13.24(22.65) Aggregate Basis	63.71 Aggregate Basis	4.14(-1.21) Aggregate Basis	Favourable	7.55(12.90) Aggregate Basis

Source: Compiled from the Bombay Stock Exchange Official Directory, Vol. 36(iii), p. 63366.

Supplementary Information: Figures in brackets in columns 2 & 6 indicate Spread between Rate of Return on Net Total Assets & Cost of Debt on before & after tax basis and figures in brackets in columns 4 & 8 indicate Net Gain on before & after tax basis on Net Total Assets respectively.