LEVERAGE BAMBOOZLING: AN EMPIRICAL STUDY OF FERTILISER INDUSTRY OF INDIA

Dr. Gurnam Singh Rasoolpur

Principal

Guru Nanak Khalsa College, Droli Kalan, Jalandhar, India

gsrasoolpur@gmail.com

ABSTRACT

The present empirical paper studies the leverage bamboozling in fertilizer industry of the Indian corporate sector which covers a time period of ten years extending from the year 1982-83 to 1991-92, by selecting top eight companies from the list published by Business Standard Research Bureau, Calcutta of the Indian corporate sector by dropping diversified companies and companies for which data is not available, on the basis of sales for the year 1991-92 for the purpose of our study. The study reveals that that debt-equity ratio$_2$ has been varying from 49.15 percent in the 1984-85 to 70.31 percent in the year 1987-88 while leverage ratio$_2$ has been varying from 49.75 percent in the 1984-85 to 70.62 percent in the year 1987-88 during the period under study, whereas, aggregate debt-equity ratio$_2$ and aggregate leverage ratio$_2$ of this industry are worked out 61.66 percent and 62.29 percent respectively during the period under study. It is found that aggregate cost of debt (Kd_{bt} & Kd_{at}) on before and after tax basis of the industry is worked out 10.33 percent and 8.37 percent, respectively, during the period under study. It is observed that rate of return on net assets (ROI_{bt2} & ROI_{at2}) and rate of return on total networth (RON_{bt} & RON_{at}) on before and after tax basis have been declining during the period under study. On aggregate basis, aggregate rate of return on net assets (ROI_{bt2} & ROI_{at2}) on before and after tax basis is worked out 11.44 percent and 9.27 percent, whereas, aggregate rate of return on total networth (RON_{bt} & RON_{at}) on before and after tax basis is worked out 13.07 percent and 10.59 percent, respectively, during the study period. Thus, it is concluded that the industry is enjoying favourable leverage with regard to use of debt during seven out of ten years under study. Consequently, rate of return on total networth (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 companies has positive impact on the profitability of the company during seven out of ten years under study which consequently is contributing to the total networth of the companies which ultimately is benefitting to the equity shareholders of the companies under this industry. Leverage created through debt is not generating risk for the companies in the above said seven years under study because the companies under this industry are 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 industry 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 this industry is not high, i.e. 19 percent, during the period under study.

Section I – Introduction:
Behaviour of different sources of debt capital is governed by the legal framework provided by government of the concerned country. Their costs also depend upon the legal system available to them. However, cost of debt is lower than cost of preference share capital as well as equity share capital because the debt holders are the first claimants on the firm's assets at time of its liquidation. Similarly, they are the first to be paid their interest before any dividend is paid to preference and equity shareholders. However, preference share capital is a distinctive type of long term source of financing which bears some of the features of equity as well as debentures. Cost of preference share capital is lower than the cost of equity share capital because preference share holders are having two preferences (i.e. payment of dividend and repayment of principal amount at the time of liquidation) over the equity share holders. Interest paid to the debt holders is an item chargeable to profits of a firm. But, the interest and principal repayment on debt are definite obligations that are payable irrespective of the financial situation of a firm. So debt is riskier. It enhances the financial risk. Also, if interest and principal payments on debt are not promptly met when due, bankruptcy, loss of control for the owners may occur. It will turn out that use of some debt by the firm is desirable and a strong case can be made for the existence of an optimal capital structure, or debt/equity mix. A firm should make a judicious mix of both debt and equity to achieve a capital structure, which may be the optimal capital structure. Modigiliani and Miller (1959) gave logically consistent behavioural justification for this relationship and denied the existence of an optimum capital structure. Barges (1963) tested the M-M hypothesis and found that the cost of capital comes down with leverage. Singh (1998) observed that cost of capital is a significant factor in case of large-size companies, while it is not a significant factor affecting capital structure of companies in case of medium and small-size companies. 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 should 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, cost of borrowing, 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. 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, for taking more benefits of debt capital also by keeping away firms from risks, a desirable debt equity combination must be used 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 six sections. Section I provides the introduction regarding preference share capital, equity share capital and debt 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.

Section II - Objectives of the Study:
The present study has been undertaken to examine the leverage bamboozling in fertiliser industry with the following objectives.
(i) To measure the extent of debt-equity ratio and leverage ratio of individual concerns and the fertiliser industry on average and aggregate basis from the Indian corporate sector.
(ii) To examine the impact of use and cost of debt on profitability of individual concerns and the fertiliser industry on average and aggregate basis from the Indian corporate sector.

Section III - Data Source & Sample Size:
The present study is confined to top eight companies of the fertiliser industry from the Indian corporate sector. The companies are selected on the basis of sales for the year 1991-92 for the purpose of this study. For selecting top eight companies in fertiliser industry from the Indian corporate sector, industry wise list of companies published by Business Standard Research Bureau, Calcutta is used. The study covers a time period of ten years extending from the year 1982-83 to 1991-92. For selecting top eight companies in fertiliser industry from the Indian corporate sector, diversified companies and companies for which data is not available are dropped. Southern Pertochemical Ind. Corp., Ltd., Gujarat State Fertilisers Co., Ltd., Gujarat Narmada Valley Fertiliser, Ltd., Zuari Agro Chemicals, Ltd., Mangalore Chemical & Fertilisers, Ltd., Coromandel Fertilisers, Ltd., Dharamsi Morarji Chemicals Co., Ltd., and Nagarjuna Fertilisers & Chemicals, Ltd. are the name of companies which are selected for the purpose of study under this industry. For the purpose of conducting the present study, data has been compiled from the different volumes of the Bombay Stock Exchange Official Directory.

Section IV - Research Methodology:
The present empirical paper studies the leverage bamboozling in fertiliser industry of the Indian corporate sector which covers a time period of ten years extending from the year 1982-83 to 1991-92, by selecting top eight companies from the list of companies published by Business Standard Research Bureau, Calcutta from fertiliser industry of the Indian corporate sector by dropping diversified companies and companies for which data is not available, on the basis of sales for the year 1991-92 for the purpose of our study. To analyze the results, analysis of empirical section is organized into four parts. In the first part, analysis of debt-equity ratio and 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 networth is presented. ***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. While computing the defined ratios, simple average of the components (denominators and enumerators) is considered and undertaken.*** 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

$$\text{Debt-Equity Raio}_1 = \frac{\text{Average Term Debt} + \text{Average Short Term Loans \& } Advances}{\text{Average Total Networth}}$$

$$\text{Debt-Equity Raio}_2 = \frac{\text{Average Term Debt} + \text{Average Short Term Loans \& } Advances}{\text{Average Term Debt} + \text{Average Short Loans \& } Advances + Avg.Total\ Networth} \times 100$$

Leverage Ratio: It can be calculated in the following manner

$$\text{Leverage Raio}_1 =$$

$$\frac{\text{Average Term Debt} + \text{Average Short Term Loans \& } Advances + Average\ Pref.\ \text{Share } Capital}{\text{Average } Equity\ Networth}$$

$$\text{Leverage Raio}_2 =$$

$$\frac{\text{Avg.Term Debt} + \text{Avg.Short Term Loans \& } Advances + Avg.Pref.\text{Share } Capital}{\text{Avg.Term Debt} + \text{Avg.Short Loans \& } Adv. + Avg.Pref.\text{Share } Capital + Avg.Equity\ Networth} \times 100$$

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

Return on Total Networth on Before Tax Basis (RON_{bt}) =
$$\frac{\text{Average Pre Tax Profits}}{\text{Average Total Networth}} \times 100$$

Return on Total Networth on After Tax Basis (RON_{at}) =
$$\frac{\text{Avg. Profits after Interest \& Taxes}}{\text{Average Total Networth}} \times 100$$

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

Return on Net Total Assets on Before Tax Basis (ROI_{bt1}) =
$$\frac{\text{Avg.Earnings Before Intt.\& Taxes}}{\text{Average Net Total Assets}} \times 100$$

Return on Net Total Assets on After Tax Basis (ROI_{at1}) = $\text{ROI}_{bt1}(1\text{-}t)$

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

Return on Net Assets on Before Tax Basis (ROI_{bt2}) =
$$\frac{\text{Avg. Earnings Before Interest \& Taxes}}{\text{Average Net Assets}} \times 100$$

Return on Net Assets on After Tax Basis (ROI_{at2}) = $ROI_{bt2}(1\text{-}t)$

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

Cost Debt on Before Tax Basis (Kd_{bt}) =
$$\frac{\text{Average Total Interest Charges}}{\text{Avg.Total Intt.Bearing Debt Both L.Term \& Short Term}} \times 100$$

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

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

Net Gain on Before Tax Basis = Return on Total Networth (RON_{bt}) - Return on Net Assets (ROI_{bt})

Net Gain on After Tax Basis = Return on Total Networth (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

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

Avg. = Average

Here Term Debt plus Short Term Loans & Advances comprise of debentures, long term loans and short term loans & advances. Total Networth 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 networth 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 networth 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.

Section V– Empirical Results:

(1) Analysis of Debt-Equity Ratio and Leverage Ratio:

As revealed by tables 1, 2, 3 and 4 debt-equity ratio$_2$ has been varying from 49.15 percent in the 1984-85 to 70.31 percent in the year 1987-88 while leverage ratio$_2$ has been varying from 49.75 percent in the 1984-85 to 70.62 percent in the year 1987-88 during the period under study. For seven out of ten years under study, debt-equity ratio$_2$ is below 63 percent while leverage ratio$_2$ is below 64 percent respectively. Beginning from the year 1982-83, debt-equity ratio$_2$ and leverage ratio$_2$ are declining upto the year 1986-87 from 60.46 percent to 49.15 percent and from 61.53 percent to 49.75 percent respectively. Subsequently, these ratios start rising and touch the level of 70.31 percent 70.62 percent, respectively, in the year 1987-88 during the period under study. These ratios are highest i.e. 70.31 percent and 70.62 percent respectively in the year 1987-88 due to the higher amount of interest bearing debt and lower amount of total networth and lower profits earned by this industry. Overall, these has a rising trend over the period under study. These ratios are lowest, i.e. 49.15 percent and 49.75 percent respectively in the year 1984-85 due to the higher amount of total networth and higher profits earned by this industry. On aggregate basis, the debt-equity ratio$_2$ and leverage ratio$_2$ of the industry are worked out 61.66 percent and 62.29 percent respectively during the period under study.

TABLE 1: DEBT-EQUITY RATIO OF FERTILISER INDUSTRY
(Figures on Average Basis)

Year	Debt-Equity Ratio$_1$ = $\dfrac{\text{Avg. Term Debt} + \text{Avg. Short Term Loans and Advances}}{\text{Avg. Total Networth}}$ (In Times)	Debt-Equity Ratio$_2$ = $\dfrac{\text{Avg. Term Debt} + \text{Avg. Short Term Loans and Advances}}{\text{Avg. Term Debt} + \text{Avg. Short Term Loans and Advances} + \text{Avg. Total Networth}} \times 100$ (Percentage)
1982-83	1.5291	60.46
1983-84	1.2384	55.33
1984-85	0.9665	49.15
1985-86	1.1614	53.73
1986-87	1.1528	53.55
1987-88	2.3682	70.31
1988-89	1.9740	66.37
1989-90	1.6898	62.82
1990-91	1.6790	62.76
1991-92	2.0686	67.41
Fertiliser	**1.6079** (Aggregate Basis)	**61.66** (Aggregate Basis)

Industry	

Source: Compiled from the Bombay Stock Exchange Official Directory.   **Avg. = Average**

TABLE 2: DEBT-EQUITY RATIO OF FRETILISER INDUSTRY
(COMPANY-WISE) (Figures on Aggregate Basis)

Name of the Companies	Debt-Equity Ratio₁ = $\dfrac{\text{Agg. Term Debt} + \text{Agg. Short Loans and Advances}}{\text{Agg. Total Networth}}$ (In Times)	Debt-Equity Ratio₂ = $\dfrac{\text{Agg. Term Debt} + \text{Agg. Short Term Loans and Advances}}{\text{Agg. Term Debt} + \text{Agg. Short Term Loans and Advances} + \text{Agg. Total Networth}} \times 100$ (Percentage)
Southern Petroch. Ind. Corp, Ltd.	1.2312	55.18
Gujarat State Fertilisers Co., Ltd.	0.9536	48.81
Gujarat Narmada Valley Fert., Ltd.	2.2808	69.52
Zuari Agro Chemicals, Ltd.	0.8762	46.70
Mangalore Ch. & Fertilisers, Ltd.	9.5891	90.56
Coromandel Fertilisers, Ltd.	1.1609	53.72
Dharamsi Morarji Ch. Co., Ltd.	1.5178	60.28
Nagarjuna Fertilisers & Ch., Ltd.	3.2866	76.67
Fertiliser Industry	**1.6079** (Aggregate Basis)	**61.66** (Aggregate Basis)

Source: Compiled from the Bombay Stock Exchange Official Directory.   **Agg.= Aggregate**

TABLE 3: LEVERAGE RATIO OF FERTILISER INDUSTRY
(Figures on Average Basis)

Year	Leverage Ratio1 = $\dfrac{\text{Avg. Term Debt} + \text{Avg. Short Term Loans and Advances} + \text{Avg. Pref. Share Capital}}{\text{Avg. Equity Networth}}$ (In Times)	Leverage Ratio2 = $\dfrac{\text{Avg. Term Debt} + \text{Avg. Short Term Loans and Adv.} + \text{Avg. Pref. Share Capital}}{\text{Avg. Term Debt} + \text{Avg. Short Term Loans and Adv} + \text{Avg. Pref. Share Capital} + \text{Avg. Equity Networth}} \times 100$ (Percentage)
1982-83	1.5994	61.53

1983-84	1.2859	56.25
1984-85	0.9902	49.75
1985-86	1.1835	54.20
1986-87	1.1640	53.79
1987-88	2.4032	70.62
1988-89	1.9999	66.67
1989-90	1.7460	63.58
1990-91	1.7388	63.49
1991-92	2.1460	68.22
Fertiliser Industry	**1.6516** (Aggregate Basis)	**62.29** (Aggregate Basis)

Source: Compiled from the Bombay Stock Exchange Official Directory.   Avg.= Average

TABLE 4: LEVERAGE RATIO OF FERTILISER INDUSTRY
(COMPANY-WISE) (Figures on Aggregate Basis)

Name of Companies	Leverage Ratio1 = $\dfrac{\text{Agg. Term Debt} + \text{Agg. Short Term Loans and Advances} + \text{Agg. Pref. Share Capital}}{\text{Agg. Equity Networth}}$ (In Times)	Leverage Ratio2 = $\dfrac{\text{Agg. Term Debt+Agg. Short Term Loans } and Adv.+ \text{Agg. Pref. Share Capital}}{\text{Agg. Term Debt+Agg. Short Term Loans } and Adv+ \text{Agg. Pref. Share Capital+Agg. Equity Networth}} \times 100$ (Percentage)
Southern Petroch. Ind. Corp, Ltd.	1.2670	55.89
Gujarat State Fertilisers Co., Ltd.	0.9559	48.87
Gujarat Narmada Valley Fert., Ltd.	2.2808	69.52
Zuari Agro Chemicals, Ltd.	1.0003	50.01
Mangalore Ch. & Fertilisers, Ltd.	12.1739	92.41
Coromandel Fertilisers, Ltd.	1.1609	53.72
Dharamsi Morarji Ch. Co., Ltd.	1.5178	60.28

Nagarjuna Fertilisers & Ch., Ltd.	3.6656	78.57
Fertiliser Industry	**1.6516** (Aggregate Basis)	**62.29** (Aggregate Basis)

Source: Compiled from the Bombay Stock Exchange Official Directory.   Agg.=Aggregate Avg.=Average

(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 5, rate of return on net total assets on before tax basis (ROI_{bt1}) has been varying from 14.52 percent in year 1983-84 to 7.51 percent in the year 1988-89 during the period under study. During six out of ten years under study, the rate of return on net total assets on before tax basis (ROI_{bt1}) has been below 9 percent. Overall, it has been declining over the period under study excepting for the year 1983-84 when it is 14.52 percent. It is highest, i.e. 14.52 percent, in the year 1983-84 due to higher rate of return on net total assets on before tax basis (ROI_{bt1}) of individual companies in this industry on account of higher production, sales, exports and capacity utilisation. It is lowest, i.e. 7.51 percent, in the year 1988-89 due to the losses suffered by Mangalore Chemicals & Fertilisers, Ltd. and lower rate of return on net total assets on before tax basis (ROI_{bt1}) of the remaining companies in this industry on account of under utilisation of plant capacity, lower production, non availability of imported phosphoric acid for producing DAP etc. On aggregate basis, the rate of return on net total assets on before tax basis (ROI_{bt1}) of this industry is worked out 9.28 percent during the study period.

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

As revealed by table 5, rate of return on net assets on before tax basis (ROI_{bt2}) has been varying from 19.03 percent in year 1983-84 to 9.06 percent in the year 1988-89 during the period under study. During six out of ten years under study, rate of return on net assets on before tax basis (ROI_{bt2}) has been below 11 percent. Overall, it has been declining over the period under study excepting for the year 1983-84 when it is 19.03 percent. It is highest, i.e. 19.03 percent, in the year 1983-84 due to the highest rate of return on net total assets on before tax basis (ROI_{bt1}) of this industry and higher rate of return on net assets on before tax basis (ROI_{bt2}) of individual companies in this industry on account of higher production, sales, exports and capacity utilisation. It is lowest, i.e. 9.06 percent, in the year 1988-89 due to the lowest rate of return on net total assets on before tax basis (ROI_{bt1}) of this industry and lower rate of return on net assets on before tax basis (ROI_{bt2}) of individual companies in this industry on account of under utilisation of plant capacity, lower production, non availability of imported phosphoric acid for producing DAP etc. On aggregate basis, the rate of return on net assets on before tax basis (ROI_{bt2}) of the industry is worked out 11.44 percent during the study period.

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

As revealed by table 5, cost of debt on before tax basis (Kd_{bt}) has been varying from 16.52 percent in year 1982-83 to 8.48 percent in the year 1991-92 during the period under study. During nine out of ten years under study, cost of debt on before tax basis (Kd_{bt}) has been below 12 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 industry is worked out 10.33 percent during the period under study.

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

As revealed by table 5, rate of return total networth on before tax basis ($RONbt$) has been varying from 28.63 percent in the year 1983-84 to 5.56 percent in the year 1988-89 during the period under study. During six out of ten years under study, rate of return on total networth on before tax basis ($RONbt$) has been below 13.13 percent. Overall, it has been declining over the period under study excepting for the years 1983-84 and 1984-85 when it was 28.63 percent and 18.61 percent respectively. It is highest, i.e. 28.63 percent, in the year 1983-84 due to the highest rate of return on net total assets ($ROIbt1$) as well as net assets ($ROIbt2$) on before tax basis and highest excess gap of rate of return on net assets ($ROIbt2$) over cost of debt ($Kdbt$) on before tax basis. It is lowest, i.e. 5.56 percent, in the year 1988-89 due to the lowest rate of return on net total assets ($ROIbt1$) as well as net assets ($ROIbt2$) on before tax basis and highest excess gap of cost of debt ($Kdbt$) over rate of return on net assets ($ROIbt2$) on before tax basis. On aggregate basis, the rate of return on total networth on before tax basis (RON_{bt}) of the industry is worked out 13.07 percent during the study period.

(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 7, effective tax rate has been below 22 percent during the period under study excepting for the year 1988-89 when it is 40 percent. The rate of return on net total assets on before tax basis (ROI_{bt1}) has been varying from 14.52 percent in the year 1983-84 to 7.51 percent in the year 1988-89 while the rate of return on net total assets on after tax basis (ROI_{at1}) has been varying from 12.02 percent in the year 1982-83 to 4.51 percent in the year1988-89 during the period under study. During six out of ten years under study, rate of

TABLE 5: IMPACT OF DEBT ON RETURN ON TOTAL NETWORTH IN FERTILISER INDUSTRY. (Before Tax Basis & Figures on Average Basis)

Year	Return on Total Assets (ROI_{bt1})= Avg. EBIT / Avg. Total Asset (Percentage)	Return on Net Assets (ROI_{bt2})= Avg. EBIT / Avg. Net Asse (Percentage)	Cost of Debt (Kd_{bt})= Avg. Total Intere / Avg. Total Debt (Percentage)	Return on Total Networth (RON_{bt})= Avg. Pre Tax Pro / Avg. Total Networ (Percentage)
1982-83	13.21	16.73	16.52	17.06
1983-84	14.52	19.03	11.27	28.63
1984-85	11.94	15.22	11.69	18.61

1985-86	11.47	13.86	11.64	16.44
1986-87	8.44	10.19	10.57	9.03
1987-88	8.62	10.44	11.08	7.31
1988-89	7.51	9.06	11.12	5.56
1989-90	7.86	9.60	9.58	9.62
1990-91	8.66	10.40	9.05	12.66
1991-92	7.91	9.99	8.48	13.13
Fertiliser Industry	9.28 Aggregate Basis	11.44 Aggregate Basis	10.33 Aggregate Basis	13.07 Aggregate Basis

Source: Compiled from the Bombay Stock Exchange Official Directory.   Avg. = Average

TABLE 6: IMPACT OF DEBT ON RETURN ON TOTAL NETWORTH IN FERTILISER INDUSTRY (COMPANY-WISE) (Before Tax Basis & Figures on Aggregate Basis)

Name of the Companies	Return on Total Assets $(ROI_{bt1})=$ $\dfrac{Agg.\ EBIT}{Agg.\ Total\ Assets}$ (Percentage)	Return on Net Assets $(ROI_{bt2})=$ $\dfrac{Agg.\ EBIT}{Agg.\ Net\ Assets}$ (Percentage)	Cost of Debt $(Kd_{bt})=$ $\dfrac{Agg.\ Total\ Interest}{Agg.\ Total\ Debt}$ (Percentage)	Return on Total Networth $(RON_{bt})=$ $\dfrac{Agg.\ Pre\ Tax\ Profit}{Agg.\ Total\ Networth}$ (Percentage)
Southern Petrochemical Ind. Corp, Ltd.	8.78	10.63	11.85	8.64
Gujarat State Fertilisers Co., Ltd.	10.21	13.63	8.45	18.62
Gujarat Narmada Valley Fertiliser, Ltd.	11.37	12.94	11.91	15.29
Zuari Agro Chemicals, Ltd.	2.79	19.77	13.72	25.78
Mangalore Chemi & Fertilisers, Ltd.	4.14	5.69	11.09	-44.46
Coromandel Fertilisers, Ltd.	10.37	11.94	13.10	10.48
Dharamsi Morarji Chemicals Co., Ltd.	11.64	18.99	19.13	18.79
Nagarjuna Fertilisers & Chemicals, Ltd.	.85	1	.81	1.64
Fertiliser Industry	9.28 (Aggregate Basis)	11.44 (Aggregate Basis)	10.33 (Aggregate Basis)	13.07 (Aggregate Basis)

Source: Compiled from the Bombay Stock Exchange Official Directory.   Agg. = Aggregate

TABLE 7: IMPACT OF DEBT ON RETURN ON TOTAL NETWORTH IN FERTILISER INDUSTRY (After Tax Basis & Figures on Average Basis)

Year	Return on Total Assets $ROI_{at1}=ROI_{bt1}(1-t)$ (Percentage)	Return on Net Assets $ROI_{at2}=ROI_{bt2}(1-t)$ (Percentage)	Cost of Debt $Kd_{at}=Kd_{bt}(1-t)$ (Percentage)	Return on Total Networth $RON_{at}=$ $\dfrac{Avg.\ Profits\ after\ Intt\ \&\ T_a}{Avg.\ Total\ Networth}$ (Percentage)
1982-83	13.21(1-.09)=12.02	16(1-.09)=15.22	16.52(1-.09)=15.03	17.06(1-.09)=15.52
1983-84	14.52(1-.22)=11.33	19.03(1-.22)=14.84	11.27(1-.22)=8.79	28.63(1-.22)=22.33
1984-85	11.94(1-.24)=9.07	15.22(1-.24)=11.57	11.69(1-.24)=8.88	18.61(1-.24)=14.14
1985-86	11.47(1-.09)=10.44	13.86(1-.09)=12.61	11.64(1-.09)=10.59	16.44(1-.09)=14.96
1986-87	8.44(1-.20)=6.75	10.19(1-.20)=8.15	10.57(1-.20)=8.46	9.03(1-.20)=7.22
1987-88	8.62(1-.22)=6.72	10.44(1-.22)=8.14	11.08(1-.22)=8.64	7.31(1-.22)=5.70
1988-89	7.51(1-.40)=4.51	9.06(1-.40)=5.44	11.12(1-.40)=6.67	5.56(1-.40)=3.34
1989-90	7.86(1-.22)=6.13	9.60(1-.22)=7.49	9.58(1-.22)=7.47	9.62(1-.22)=7.50
1990-91	8.66(1-.15)=7.36	10.40(1-.15)=8.84	9.05(1-.15)=7.69	12.66(1-.15)=10.76
1991-92	7.91(1-.20)=6.33	9.99(1-.20)=8	8.48(1-.20)=6.78	13.13(1-.20)=10.50
Fertiliser Industry	**9.28(1-.19)=7.52 Aggregate Basis**	**11.44(1-.19)=9.27 Aggregate Basis**	**10.33(1-.19)=8.37 Aggregate Basis**	**13.07(1-.19)=10.59 Aggregate Basis**

Source: Compiled from the Bombay Stock Exchange Official Directory.

TABLE 8: IMPACT OF DEBT ON RETURN ON TOTAL NETWORTH IN FERTILISER INDUSTRY (COMPANY-WISE) (After Tax Basis & Figures on Aggregate Basis)

Name of Companies	Return on Total Assets $ROI_{at1}=ROI_{bt1}(1-t)$ (Percentage)	Return on Net Assets $ROI_{at2}=ROI_{bt2}(1-t)$ (Percentage)	Cost of Debt $Kd_{at}=Kd_{bt}(1-t)$ (Percentage)	Return on Total Networth $RON_{at}=$ $\dfrac{Agg.\ Profits\ after\ Intt\ \&\ T_a}{Agg.\ Total\ Networth}$ (Percentage)
Southern Petrochemical Ind. Corp, Ltd.	8.78(1-.11)=7.81	10.63(1-.11)=9.46	11.85(1-.11)=10.55	8.64(1-.11)=7.69
Gujarat State Fertilisers Co., Ltd.	10(1-.20)=8.17	13.63(1-.20)=10.69	8.45(1-.20)=6.76	18.62(1-.20)=14.9

Gujarat Narmada Valley Fertilisers, Ltd.	11.37(1-.05)=10.80	12.94(1-.05)=12.29	11.91(1-.05)=11.31	15.29(1-.05)=14.53
Zuari Agro Chemicals, Ltd.	2.79(1-.42)=1.62	19.77(1-.42)=11.47	13.72(1-.42)=7.96	25.78(1-.42)=14.95
Mangalore Chemi & Fertilisers, Ltd.	4.14=4.14	5.69=5.69	11.09=11.09	44.46=44.46
Coromandel Fertilisers, Ltd.	10.37(1-.25)=7.78	11.94(1-.25)=8.95	13.10(1-.25)=9.83	10.48(1-.25)=7.86
Dharamsi Morarji Chemicals Co., Ltd.	11.64(1-.11)=10.36	18.99(1-.11)=16.90	19.13(1-.11)=17.03	18.79(1-.11)=16.72
Nagarjuna Fertilisers & Chemicals, Ltd.	.85(1-.09)=.77	1(1-.09)=.91	.81(1-.09)=.73	1.64(1-.09)=1.49
Fertiliser Industry	**9.28(1-.19)=7.52 (Aggregate Basis)**	**11.44(1-.19)=9.27 (Aggregate Basis)**	**10.33(1-.19)=8.37 (Aggregate Basis)**	**13.07(1-.19)=10.59 (Aggregate Basis)**

Source: Compiled from the Bombay Stock Exchange Official Directory.   Agg. = Aggregate

TABLE 9: ANALYSIS OF SPREAD AND GAIN IN FERTILISER INDUSTRY

(1)	Before Tax Basis & Figures on Average Basis			(5)	After Tax Basis & Figures on Average Basis		
	(2)	(3)	(4)		(6)	(7)	(8)
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	.21(-3.31)	Favourable	.33(3.85)	60.46	.19(-3.01)	Favourable	.30(3.50)
1983-84	7.76(3.25)	Favourable	9.60(14.11)	55.33	6.05(2.54)	Favourable	7.49(11)
1984-85	3.53(.25)	Favourable	3.39(6.67)	49.15	2.69(.19)	Favourable	2.57(5.07)
1985-86	2.22(-.17)	Favourable	2.58(4.97)	53.73	2.02(-.15)	Favourable	2.35(4.52)
1986-87	-.38(-2.13)	Unfavourable	-1.16(.59)	53.55	-.31(-1.71)	Unfavourable	-.93(.47)

1987-88	-.64(-2.46)	Unfavourable	-3.13(-1.31)	70.31	-.50(-1.92)	Unfavourable	-2.44(-1.02)
1988-89	-2.06(-3.61)	Unfavourable	-3.50(-1.95)	66.37	-1.23(-2.16)	Unfavourable	-2.10(-1.17)
1989-90	.02(-1.72)	Favourable	.02(1.76)	62.82	.02(-1.34)	Favourable	.01(1.37)
1990-91	1.35(-.39)	Favourable	2.26(4)	62.76	1.15(-.33)	Favourable	1.92(3.40)
1991-92	1.52(-.57)	Favourable	3.13(5.22)	67.41	1.22(-.45)	Favourable	2.50(4.17)
Fertiliser Industry	**1.11(-1.05) Aggregate Basis**	**Favourable**	**1.63(3.79) Aggregate Basis**	**61.66 Aggregate Basis**	**0.90(-.85) Aggregate Basis**	**Favourable**	**1.32(3.07) Aggregate Basis**

**Source: Compiled from the Bombay Stock Exchange Official Directory.
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.**

TABLE 10: ANALYSIS OF SPREAD AND GAIN IN FERTILISER INDUSTRY (COMPANY-WISE)

(1)	Before Tax Basis & Figures on Aggregate Basis			(5)	After Tax Basis & Figures on Aggregate Basis		
	(2)	(3)	(4)		(6)	(7) (8)	
Name of the companies	**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)**
Southern Petrochemical Ind. Corp., Ltd.	-1.22(3.07)	Unfav	-2(-.14)	55.18	-1.09(-2.74)	Unfav	-1.77(-.12)
Gujarat State Fertilisers Co., Ltd.	5.18(1.76)	Fav	5(8.41)	48.81	3.93(1.41)	Fav	4.21(6.73)
Gujarat Narmada Valley Fertilisers, Ltd.	1.03(-.54)	Fav	2.35(3.92)	69.52	.98(-.51)	Fav	2.24(3.73)
Zuari Agro Chemicals, Ltd.	6.05(-10..93)	Fav	6.01(23)	46.70	3.51(-6.34)	Fav	3.48(13.33)
Mangalore Chemicals & Fertiliser, Ltd.	-5.40(-6.95)	Unfav	-50.15(-48.6)	90.56	-5.40(-6.95)	Unfav	-50.15(-.48.6)
Coromandel Fertilisers, Ltd.	-1.16(-2.73)	Unfav	-1.46(.11)	53.72	-.87(-2.04)	Unfav	-1.09(.08)

Dharamsi Morarji Chemicals Co., Ltd.	-.14(-7.49)	Unfav	-.20(7.15)	60.28	-.13(-6.67)	Unfav	-.18(6.36)
Nagarjuna Fertilisers & Chemicals, Ltd.	.19(.04)	Fav	.64(.79)	76.67	.18(.04)	Fav	.58(.72)
Fertiliser Industry	1.11(-1.05) (Aggregate Basis)	Fav	1.63(3.79) (Aggregate Basis)	61.66 (Aggregate Basis)	.90(-.85) (Aggregate Basis)	Fav	1.32(3.07) (Aggregate Basis)

**Source: Compiled from the Bombay Stock Exchange Official Directory.
*Since ROI$_{bt}$ could not be computed. Therefore, net gain could not be computed in Narmada Cement Co., Ltd. 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.**

return on net total assets on after tax basis (ROI$_{at1}$) has been below 7.36 percent. Overall, it has been declining over the period under study. It is highest, i.e. 12.02 percent, in the year 1982-83 due to the lowest effective tax rate i.e. 9 percent and the higher rate of return on net total assets on before tax basis (ROI$_{bt1}$) of this industry on account of higher rate of return on net total assets on before tax basis (ROI$_{bt1}$) of individual companies in this industry due to satisfactory performance, capacity utilisation and better production, even though power supply, water scarcity and some mechanical breakdown problems incurred in this year. It is lowest, i.e. 4.51 percent, in the 1988-89 due to the highest effective tax rate i.e. 40 percent and lowest rate of return on net total assets on before tax basis (ROI$_{bt1}$) caused by reasons mentioned earlier such as the losses suffered by Mangalore Chemicals & Fertilisers, Ltd. and lower rate of return on net total assets on before tax basis (ROIbt1) of the remaining companies in this industry on account of under utilisation of plant capacity, lower production, non availability of imported phosphoric acid for producing DAP etc. On aggregate basis, the rate of return on net total assets on after tax basis (ROI$_{at1}$) of the industry is worked out 7.52 percent during the study period.

Return on Net Assets on After Tax Basis (ROI$_{at2}$):
As revealed by table 7, rate of return on net assets on before tax basis (ROIbt2) has been varying from 19.03 percent in the year 1983-84 to 9.06 percent in the year 1988-89 while the rate of return on net assets on after tax basis (ROIat2) has been varying from 15.22 percent in the year 1982-83 to 5.44 percent in the year 1988-89 during the period under study. During six out of ten years under study, rate of return on net assets on after tax basis (ROIat2) has been below 9 percent. Overall, it has been declining over the period under study. It is highest, i.e. 15.22 percent, in the year 1982-83 due to the lowest effective tax rate i.e. 9 percent, highest rate of return on net total assets on after tax basis (ROIbt1) and higher rate of return on net assets on before tax basis (ROIbt2) of this industry on account of reasons mentioned

earlier such as satisfactory performance, capacity utilisation and better production, even though power supply, water scarcity and some mechanical breakdown problems incurred in this year. It is lowest, i.e. 5.44 percent, in the year 1988-89 due to the highest effective tax rate and lowest rate of return on net assets on before tax basis (ROI_{bt2}) of this industry caused by reasons mentioned earlier such as under utilisation of plant capacity, lower production, non availability of imported phosphoric acid for producing DAP etc. On aggregate basis, the rate of return on net assets on after tax basis (ROI_{at2}) of the industry is worked out 9.27 percent during the study period.

Cost of Debt on After Tax Basis (Kd_{at}):

As revealed by table 7, cost of debt on before tax basis (Kd_{bt}) has been varying from 16.52 percent in year 1982-83 to 8.48 percent in the year 1991-92 while cost of debt on after tax basis (Kd_{at}) has been varying from 15.03 percent in year 1982-83 to 6.67 percent in the year 1988-89 over the period under study. During eight out of ten years under study, cost of debt on after tax basis (Kd_{at}) has been below 9 percent. Overall, it has been declining over the period under study. On aggregate basis, aggregate cost of debt on after tax basis (Kd_{at}) of the industry is worked out 8.37 percent during the period under study.

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

As revealed by table 7, rate of return total networth on before tax basis (RONbt) has been varying from 28.63 percent in the year 1983-84 to 5.56 percent in the year 1988-89 while rate of return total networth on after tax basis (RONat) has been varying from 22.33 percent in the year 1983-84 to 3.34 percent in the year 1988-89 during the period under study. During six out of ten years under study, rate of return on total networth on after tax basis (RONat) has been below 11 percent. Overall, it has been declining over the period under study excepting for the year 1983-84 when it is 22.33 percent. It is highest, i.e. 22.33 percent, in the year 1983-84 due to the higher rate of return on net total assets (ROIat1) as well as net assets (ROIat2) on after tax basis and highest excess gap of rate of return on net assets (ROIat2) over cost of debt (Kdat) on after tax basis. It is lowest, i.e. 3.34 percent, in the year 1988-89 due to the lowest rate of return on net total assets (ROIat1) as well as net assets (ROIat2) on after tax basis and highest excess gap of cost of debt (Kdat) over rate of return on net assets (ROIat2) on after tax basis. On aggregate basis, the rate of return on total networth on after tax basis (RON_{at}) of the industry is worked out 10.59 percent during the study period.

(4) Impact of Debt on Return on Total Networth:

Tables 5, 6, 7, 8, 9 and 10 also show the effect of use and cost of debt (Kd_{bt} and Kd_{at}) on before and after tax basis for a period of ten years from the year 1982-83 to 1991-92. Comparison of cost of debt (Kd_{bt} and Kd_{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 excepting for the years 1986-87, 1987-88 and 1988-89. This leads us to conclude that Cement Industry has been enjoying favourable leverage with regard to use of debt during seven out of ten years under study. Consequently, rate of return on total networth (RONbt and RONat) has been higher that than cost of debt (Kdbt

and Kd_{at}) and rate of return on net assets (ROI_{bt} and ROI_{at}) 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 industry has positive impact on the profitability of the companies during seven out of ten years under study which consequently is contributing to the total networth of the companies which ultimately is benefitting to the equity shareholders of the companies lying in this industry. Leverage created through debt by this industry is not generating financial risk for the companies in the above said seven years under study because the industry 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. For the years 1986-87, 1987-88 and 1988-89 where industry is not 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, the leverage is generating financial risk for the industry. On aggregate basis, the industry 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 has been shown in tables 9 & 10. Due to favourable impact of leverage by using debt in the capital structure of the companies in this industry, 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 networth (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 three years under study. On aggregate basis, spread on before and after tax basis is worked out 1.11 percent and 0.90 percent, respectively, while net gain on before and after tax basis is worked out 1.63 percent and 1.32 percent, respectively, during the period under study.

Section VI – Summary and Conclusions:
The present empirical paper studies the leverage bamboozling in Fertiliser Industry of the Indian corporate sector which covers a time period of ten years extending from the year 1982-83 to 1991-92, by selecting top eight companies from the list published by Business Standard Research Bureau, Calcutta from Fertiliser Industry of the Indian corporate sector by dropping diversified companies and companies for which data is not available, 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 ratio$_2$ has been varying from 49.15 percent in the 1984-85 to 70.31 percent in the year 1987-88 while leverage ratio$_2$ has been varying from 49.75 percent in the 1984-85 to 70.62 percent in the year 1987-88 during the period under study. Beginning from the year 1982-83, debt-equity ratio$_2$ and leverage ratio$_2$ are declining upto the year 1986-87 from 60.46 percent to 49.15 percent and from 61.53 percent to 49.75 percent respectively. Subsequently, these ratios start rising and touch the level of 70.31 percent 70.62 percent, respectively in the year 1987-88 during the period under study. Aggregate debt-equity

ratio$_2$ and aggregate leverage ratio$_2$ of this industry are worked out 61.66 percent and 62.29 percent respectively during the period under study.

2   It is found that cost of debt on before tax basis (Kd$_{bt}$) has been varying from 16.52 percent in year 1982-83 to 8.48 percent in the year 1991-92 while cost of debt on after tax basis (Kd$_{at}$) has been varying from 15.03 percent in year 1982-83 to 6.67 percent in the year 1988-89 with a declining trend during the period under study, whereas, aggregate cost of debt on before and after tax basis (Kd$_{bt}$ & Kd$_{at}$) of this industry is worked out 10.33 percent and 8.37 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 14.52 percent in the year 1983-84 to 7.51 percent in the year 1988-89 while the rate of return on net total assets on after tax basis (ROI$_{at1}$) has been varying from 12.02 percent in the year 1982-83 to 4.51 percent in the year 1988-89 with a declining 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$_{at1}$) of this industry is worked out 9.28 percent and 7.52 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 19.03 percent in the year 1983-84 to 9.06 percent in the year 1988-89 while the rate of return on net assets on after tax basis (ROI$_{at2}$) has been varying from 15.22 percent in the year 1988-89 to 5.44 percent in the year 1988-89 with a declining 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$_{at2}$) of this industry is worked out 11.44 percent 9.27 percent, respectively, during the study period.

5   It is observed that rate of return on total networth on before tax basis (RON$_{bt}$) has been varying from 28.63 percent in the year 1983-84 to 5.56 percent in the year 1988-89 while rate of return on total networth on after tax basis (RON$_{at}$) has been varying from 22.33 percent in the year 1983-84 to 3.34 percent in the year 1988-89 with a declining during the period under study. On aggregate basis, the rate of return on total networth on before and after tax basis (RON$_{bt}$ & RON$_{at}$) of this industry is worked out 13.07 percent and 10.59 percent, respectively, during the study period.

6   It is observed that the industry is enjoying favourable leverage with regard to use of debt during seven out of ten years under study. Consequently, rate of return on total networth (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.

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 1.11 percent and .90 percent, respectively, while net gain on before and after tax basis is worked out 1.63 percent and 1.32 percent, respectively, during the period under study under this industry.

8   It is found that leverage created through debt by this industry is not generating risk for the companies in the above said seven years under study because industry is able to cover the cost of debt (Kd_{bt} & Kd_{at}) 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 when leverage impact is positive.

9   It is also found that effective tax rate born by this industry is not high during the period under study. On aggregate basis, effective tax rate born by this industry is 19 percent during the study period.

Thus, it is concluded that the industry is enjoying favourable leverage with regard to use of debt during seven out of ten years under study. Consequently, rate of return on total networth (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 fertiliser industry has positive impact on the profitability of the companies during seven out of ten years under study which consequently is contributing to the total networth of the industry which ultimately is benefitting to the equity shareholders of the companies lying in this industry. Leverage created through debt by this industry is not generating risk for the companies in the above said seven years under study because the companies under this industry are 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 industry 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 companies under this industry, 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 networth (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 seven years under study.

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