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Leverage Analysis of Tata Steel and Sail

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Abstract *The performance of leading companies in India plays key role in developing industrial sector of the country. The leverage has an important role in determining the financial strength that is essential for the development of corporate sector of the country. In the present study, operating leverage, financial leverage, and combined leverage have been analysed and it is concluded that the leverage of the companies under study is not proper, needs restructuring and differs from company to company significantly.*

Keywords *Analogous Device, Financial Leverage, Combined Leverage, Summed Up*

INTRODUCTION

The term leverage, in general, connotes efficiency and has been described as the power of lever and the mechanical advantage gained by it. As mentioned by Van Horne (2003), "Leverage may be defined as the employment of an asset or funds for which the firm pays a fixed cost or fixed return. The fixed cost or return may be thought of as the fulcrum of a lever." Companies and individuals have an analogous device called financial leverage, which can magnify the effect on the return to equity shareholders. Literally speaking, the financial leverage involves employment of that source of capital which carries fixed return as distinguished by the source of capital carrying variable return.

In financial management, the term leverage is used in the sense that a slight change in sales results in a relatively higher change in profits. It is possible only when fixed charge capital is employed along with variable charge capital (i.e., equity capital). Employment of an asset or sources of funds, which carries fixed cost or fixed return, affects the earnings available to the ordinary shareholders and also the risk. Higher risk and higher expected returns to the equity shareholders are the outcome of higher leverage.

Operating leverage is concerned with the operations of a firm. According to Brigham (2005), "A high degree of operating leverage, other things held constant, implies that a relatively small change in sales result in a large change in operating income." As mentioned by Walker & Pelty (2004), "Operating leverage is defined as the use of fixed operating costs to magnify a change in profits relative to a given change in sales." According to Soloman (1993), "The term operating leverage refers to the sensitivity of operating profits to sales." The cost structure of a firm gives rise to operating leverage because of the existence of fixed natural costs. This leverage relates to the sales and profits variation.

Leverage related with financing activities is called financial leverage. Financial leverage arises when a firm deploys debt funds with fixed charges. Combined leverage is joint effect of operating leverage and financial leverage on earning per share related with a given change in sales.

RESEARCH METHODOLOGY

The present paper is concerned with the study of the `Leverage Analysis of Tata Steel and SAIL'. The relevant data have been collected through the published annual reports and accounts of the companies under study. To supplement the data so collected from annual reports and accounts, other publications, newspapers, monthly journals and magazines etc. have also been included under this study.

Statistical techniques like percentage, average, standard deviation, coefficient of variation, regression analysis, chi-square analysis etc. have also been used.

HYPOTHESIS

H_{01}: There is a significant difference between actual and estimated degree of leverage of the companies.

H_{02}: There is a significant difference between degree of leverage of Tata Steel and SAIL.

RESULTS

For the present study, two leading companies in India have been selected which are as follows: (1) Tata Steel, and (2) Steel Authority of India Limited (SAIL). These are steel producing companies, one is from private sector and other is from public sector.

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Tata Steel Ltd

Analysis of Contribution

It is evident from Table 1 that the absolute figures of the contribution in Tata Steel indicated an increasing trend throughout the study period from 2004-05 to 2013-14 except in the year 2007-08 and 2013-14. It was Rs. 53129.13 crores in 2004-05 which increased to Rs. 59654.60 crores in 2005-06 and followed by Rs. 62292.47 crores in 2006-07 while it came down to Rs. 59271.65 crores in 2007-08 due to increase in variable operating expenses at a faster rate. In 2008-09, the figure of contribution increased to Rs. 64335.36 crores and further followed the increasing trend up to Rs. 109250.01 crores in the year 2012-13. In the year 2013-14, the amount of contribution steeped down to Rs. 103072.36 crores due to increase in operating expenses.

The proportion of contribution to sales registered a fluctuating trend during the period of study. The lowest percentage of contribution was recorded in the year 2013-14 at 36.12 percent due to loss of production. And highest percentage was 56.44 percent in 2004-05 constituting a range of 20.32 percent.

Figures of Operating Revenue and Contribution of Tata Steel are shown in Table 2. The difference between actual and expected values of contribution was positive during 2006-07, 2009-10, 2010-11, 2011-12, and 2012-13, whereas the difference was negative in 2004-05, 2005-06, 2007-08, 2008-09, and 2013-14.

Estimated values of contribution are computed with the help of regression equation for Y on X. The same is depicted in Table 3 by the Chi-square test applied to know the significance of difference between Y and Y_c. The computed value of χ^2 was 278.51 which is much higher than the table value of χ^2 which is 16.9 for 9 degrees of freedom at 5 percent level of significance. Thus, it can be concluded that the difference between actual value and expected value of contribution was significant.

Analysis of EBIT

On comparing the absolute figures of EBIT, it can be noticed that it also varied in the same fashion as the absolute figures of contribution did. In 2004-05, it was Rs. 52727.81 crores which was minimum during the study period of ten years. In 2005-06 and 2006-07, it was increased to Rs. 59084.45 crores and Rs. 61802.95 crores respectively while it declined to Rs. 58772.49 crores in 2007-08. Thereafter, it followed an increasing trend and reached to Rs. 108391.42 crores in 2012-13 but it came down to Rs.102289.84 crores in 2013-14 due to increase in variable costs. On the whole, it can be said that the performance of the company improved during later years of the study due to renewed sense of commitment and dedication. The proportion of EBIT to sales also varied in a range of 20.16 percent from 56.01 percent, being the highest, in 2004-05 to 35.85 percent, being the lowest in 2013-14.

Figures of contribution and EBIT of Tata Steel are shown in Table 4. Expected values of EBIT are computed using regression equation for Y on X. As is evident from Table 4 that the difference between actual values and expected values of EBIT is very small which shows there was small variation in fixed cost during the study period.

The same is depicted in Table 5 by the chi-square test applied to know the significance of difference between Y and Y_c. On comparing calculated value of χ^2 i.e. 0.099 with the table value of χ^2 i.e., 16.9, it can be concluded that the difference between the actual value and expected values of EBIT was insignificant.

Analysis of EPS

The figures of EPS of the company ranged between Rs. 519.64 in 2008-09 to Rs. 869.88 in 2012-13 indicating a fluctuating trend. It was Rs.657.45 in 2004-05 which increased to Rs. 734.23 in 2005-06 followed by Rs. 751.84 in 2006-07 while it fell down to Rs. 715.46 in 2007-08 due to reduction in amount of Earnings After Tax (EAT). During 2008-09, 1168012200 equity shares were increased by issuing bonus shares but earning available to equity shareholders was as low as Rs. 519.64 as compared to that of previous years which resulted in lowest EPS for the year. In 2009-10, EPS increased significantly to Rs. 641.86 due to multidimensional efforts of the company. EPS further increased in next three years and reached at the maximum in 2012-13 at Rs. 869.88 during the period of study. It decreased to Rs. 813.16 in 2013-14. The study of index numbers varied in the same fashion as absolute figures of EPS did. It varied from 79.04 in 2008-09 to 132.31 in 2012-13 constituting a widest range of 53.27, however it decreased to 123.68 in 2013-14.

Steel Authority of India Limited (SAIL)

Analysis of Contribution

It is evident from Table 6 that the absolute figure of contribution in SAIL registered a rising trend for period of study except in years 2006-07 and 2008-09. It was Rs. 23068.76 crores in 2004-05 which increased to Rs. 28774.33 crores in 2005-06. The figure of contribution came down to Rs. 26965.64 crores in 2006-07. The company suffered on account of increase in various inputs cost. In 2007-08, the figure increased to Rs. 31010.53 crores and further came down to Rs. 26642.88 crores in 2008-09 due to fall in production and sales. Thereafter, the figure of contribution

continued to rise and reached to Rs. 61595.30 crores in 2013-14.

Figures of Operating Revenue and Contribution of SAIL are shown in Table 7. Expected values of contribution are computed with the help of regression equation. An analysis of Table 7 reveals that the company generated more contribution than what was expected from it in years 2004-05, 2005-06, 2006-07, 2007-08 and 2012-13. During remaining five years of study period the company was unable to generate expected amount of contribution.

To test the significance of difference between the two, figure-test has been applied. Results of the same are depicted in Table 8. The calculated value of χ^2 comes to 208 whereas the table value of χ^2 at 5 percent significance level for 9 degrees of freedom is 16. Since calculated value is higher than the table value, the difference between expected and actual values of contribution was significant. Hence, it may be concluded that the performance of the company was outstanding as far as generation of contribution is concerned.

Analysis of EBIT

An analysis of EBIT that the absolute figure of EBIT registered an increasing trend for the period of study expect the year 2006-07 and 2008-09. It was Rs. 22725.11 crores in 2004-05 which increased to Rs. 28369.55 in 2005-06 but fell down to Rs. 26666.76 crores in 2006-07. Further it raised up to Rs. 30657.86 crores in 2007-08 but came down to Rs. 26241.42 crores being minimum during period of the study. Thereafter, the figures of EBIT followed an increasing trend for the rest of the period of study and reached to Rs. 60904.18 crores in 2013-14 which is the maximum for the period. The proportion of EBIT to sales registered a decreasing trend throughout the period of study. It was 66.12 percent in 2004-05 which came down to 49.62 percent till 2011-12 but however, it boosted up to 49.82 percent and 52.31 percent in 2012-13 and 2013-14 respectively due to increase in variable operating expenses.

Figures of contribution and EBIT of SAIL are shown in Table 9. Expected values of EBIT have been computed with the help of regression equation taking EBIT as dependent variable and contribution as independent variable. It is clear from Table 9 that the company's EBIT figure was higher than the expected figure of EBIT during the years 2004-05, 2005-06, 2006-07, 2007-08, 2009-10, and 2013-14 whereas it was lower in the years 2008-09, 2010-11, 2011-12, and 2012-13. The difference between both the figures was very small due to increase in fixed cost throughout the period of study.

The same is depicted in Table 10 by the Chi-square test applied to know the significance of difference between Y and Y_c. Since calculated value of χ^2 is lower than the table value of χ^2, it can be concluded that the difference between actual and expected amount of EBIT was not significant.

Analysis of EPS

The figure of EPS in SAIL registered a rising trend throughout the period of study except in the year 2006-07 and 2008-09. It was Rs. 658.90 in 2004-05 that increased to Rs. 817.79 in 2005-06 and further it decreased to Rs. 764.37 in 2006-07. In 2007-08, it again sharply increased to Rs. 873.20 but fell down to Rs. 739.97 in 2008-09 which was the minimum figure of EPS during the study period of all four companies and thereafter, it tended to rise ultimately reached to Rs. 261.85 in 2013-14. The index number of EPS varied in the same proportion as absolute figures of EPS. It was minimum as 112.30 in 2008-09 and maximum as 261.85 in 2013-14 constituting a widest range of 149.55.

Analysis of Degrees of Leverage of the Companies under Study

Tata Steel Limited

It is evident from Table 11, that the DOL in Tata Steel remained same i.e. 1.01 throughout the period of study which is not good for the company. It is clear from Table 1 that the company registered a progressive trend from sales point of view, thus it is advised that company should increase its DOL in order to magnify the effect on EBIT.

The degrees of financial leverage in Tata Steel also have slightly changed and remained same in some years. It was 1.02 in 2004-05 which increased to 1.03 in next two years and thereafter declined to 1.01 in 2007-08 and remained same till 2011-12. In 2012-13, it slightly increased to 1.02 and followed by 1.04 in 2013-14. This shows the improvement of the companies in later years.

The degrees of combined leverage also varied in the same proportion as DFL did. It was very less which is not a good sign from shareholder's view point. It was observed to be between 1.02 and 1.05 throughout the period of the study. It would cause the big financial loss to the company.

Steel Authority of India Limited (SAIL)

Degrees of operating leverage of SAIL remained almost same throughout the period of study. It was 1.02 in 2004-05, 2008-09, 2010-11 and 2011-12 while decreased to 1.01 in rest of the years of the study. This means 1 percent change in sales revenue would result in almost the same percentage change in EBIT.

The degrees of financial leverage (DFL) marked a minor variation throughout the period of study. It was 1.02 in

Table 1: Tata Steel: Common Size Income Statement (2004-05 to 2013-14)

(2004-05 to 2013-14) **(Rs. in Crores)**

Particulars	2004-05	%	2005-06	%	2006-07	%	2007-08	%	2008-09	%
Operating Revenue	94140.55	*100.00*	113496.47	*100.00*	114863.95	*100.00*	119848.23	*100.00*	130202.95	*100.00*
Less : Various operating expenses	41011.42	*43.56*	53841.87	*47.44*	52571.48	*45.77*	60576.58	*50.54*	65867.59	*50.59*
Contribution (C)	53129.13	*56.44*	59654.60	*52.56*	62292.47	*54.23*	59271.65	*49.46*	64335.36	*49.41*
Less : Fixed operating expenses	401.32	*0.43*	570.15	*0.50*	489.52	*0.43*	499.16	*0.42*	512.93	*0.39*
Earning Before Interest and Tax [EBIT]	52727.81	*56.01*	59084.45	*52.06*	61802.95	*53.80*	58772.49	*49.02*	63822.43	*49.02*
Less : Interest	1006.01	*1.07*	1669.58	*1.47*	1544.42	*1.34*	762.47	*0.64*	442.28	*0.34*
Earning Before Tax [EBT]	51721.80	*54.94*	57414.87	*50.59*	60258.53	*52.46*	58010.02	*48.38*	63380.15	*48.68*
Less : Taxes	527.20	*0.56*	242.28	*0.21*	1714.74	*1.49*	2299.11	*1.92*	2686.02	*2.06*
Earning After Tax [EAT] i.e. Earning Available to Equity Shareholders	51194.60	*54.38*	57172.59	*50.38*	58543.79	*50.97*	55710.91	*46.46*	60694.13	*46.62*
No. of Equity Shares (N)	77,86,74,800		77,86,74,800		77,86,74,800		77,86,74,800		1168012200	
EPS = $\frac{EAT}{N}$ (in Rs.)	657.45		734.23		751.84		715.46		519.64	
Indices of EPS (2002-03 = 100)	100.00		111.68		114.36		108.82		79.04	

Particulars	2009-10	%	2010-11	%	2011-12	%	2012-13	%	2013-14	%
Operating Revenue	150677.07	*100.00*	183204.40	*100.00*	220779.36	*100.00*	247479.39	*100.00*	285337.31	*100.00*
Less : Various operating expenses	73295.04	*48.64*	94974.46	*51.84*	123931.44	*56.13*	138229.38	*55.85*	182264.95	*63.88*
Contribution (C)	77382.03	*51.36*	88229.94	*48.16*	96847.92	*43.87*	109250.01	*44.15*	103072.36	*36.12*
Less : Fixed operating expenses	765.38	*0.51*	654.69	*0.36*	685.38	*0.31*	858.59	*0.35*	782.52	*0.27*
Earning Before Interest and Tax [EBIT]	76616.65	*50.85*	87575.25	*47.80*	96162.54	*43.56*	108391.42	*43.80*	102289.84	*35.85*
Less : Interest	582.96	*0.39*	1022.19	*0.56*	1505.45	*0.68*	1551.24	*0.63*	3952.14	*1.39*
Earning Before Tax [EBT]	76033.69	*50.46*	86553.06	*47.24*	94657.09	*42.88*	106840.18	*43.17*	98337.70	*34.46*
Less : Taxes	1063.80	*0.71*	1790.87	*0.98*	2985.53	*1.35*	3117.82	*1.26*	1379.04	*0.48*
Earning After Tax [EAT] i.e. Earning Available to Equity Shareholders	74969.89	*49.75*	84762.19	*46.26*	91671.56	*41.53*	103722.36	*41.91*	96958.66	*33.98*
No. of Equity Shares (N)	1168012200		1168012200		1168012200		1192374306		1192374306	
EPS = $\frac{EAT}{N}$ (in Rs.)	641.86		725.70		784.85		869.88		813.16	
Indices of EPS (2002-03 = 100)	97.63		110.38		119.38		132.31		123.68	

Source : Annual Reports and Accounts of Tata Steel Limited from 2004-05 to 2013-14.

Table 2: Tata Steel: Regression Analysis of Contribution (2004-05 to 2013-14)

(Rs. in ten crores)

Years	Operating Revenue (X)*	Contribution (Y)*	Expected Contribution (Y_c)
2004-05	9414	5313	5578.72
2005-06	11350	5965	6159.52
2006-07	11486	6229	6200.32
2007-08	11985	5927	6350.02
2008-09	13020	6434	6660.52
2009-10	15068	7738	7274.92
2010-11	18320	8823	8250.52
2011-12	22078	9685	9377.92
2012-13	24748	10925	10178.92
2013-14	28534	10307	11314.71
	$\sum X = 166003$	$\sum Y = 77346$	$\sum Y_c = 77346$

* Values from Table I are converted in ten crores and rounded off.

Table 3: Tata Steel: Chi-Square Analysis of Contribution (2004-05 to 2013-14)

(Rs. in ten crores)

Years	Contribution (Y)	Expected Contribution (Y_c)	$(Y - Y_c)^2$	$\frac{(Y - Y_c)^2}{Y_c}$
2004-05	5313	5578.72	70607.12	12.66
2005-06	5965	6159.52	37838.03	6.14
2006-07	6229	6200.32	822.54	0.13
2007-08	5927	6350.02	178945.92	28.18
2008-09	6434	6660.52	51311.31	7.70
2009-10	7738	7274.92	214443.09	29.48
2010-11	8823	8250.52	327733.35	39.72
2011-12	9685	9377.92	94298.13	10.06
2012-13	10925	10178.92	556635.37	54.69
2013-14	10307	11314.71	1015479.44	89.75
	$\sum Y = 77346$	$\sum Y_c = 77346$	$\sum (Y - Y_c)^2 = 2548114.30$	$\sum \frac{(Y - Y_c)^2}{Y_c} = 278.51$

Table 4: Tata Steel: Regression Analysis of EBIT (2004-05 to 2013-14)

(Rs. in ten crores)

Years	Contribution (X)	EBIT (Y)	Expected EBIT (Y_c)
2004-05	5313	5273	5275.01
2005-06	5965	5908	5920.50
2006-07	6229	6180	6181.86
2007-08	5927	5877	5882.88
2008-09	6434	6382	6384.80
2009-10	7738	7662	7675.77
2010-11	8823	8758	8749.90
2011-12	9685	9616	9603.30
2012-13	10925	10839	10830.90
2013-14	10307	10229	10219.08
	$\sum X = 77346$	$\sum Y = 76724$	$\sum Y_c = 76724$

Table 5: Tata Steel: Chi-Square Analysis of EBIT (2004-05 to 2013-14)

(Rs. in ten crores)

Years	EBIT (Y)	Expected EBIT (Y_c)	$(Y - Y_c)^2$	$\frac{(Y - Y_c)^2}{Y_c}$
2004-05	5273	5275.01	4.04	0.001
2005-06	5908	5920.50	156.25	0.026
2006-07	6180	6181.86	3.46	0.001
2007-08	5877	5882.88	34.57	0.006
2008-09	6382	6384.80	7.84	0.001
2009-10	7662	7675.77	189.61	0.025
2010-11	8758	8749.90	65.61	0.007
2011-12	9616	9603.30	161.29	0.017
2012-13	10839	10830.90	65.61	0.006
2013-14	10229	10219.08	98.41	0.009
	$\sum Y = 76724$	$\sum Y_c = 76724$	$\sum (Y - Y_c)^2 = 786.69$	$\sum \frac{(Y - Y_c)^2}{Y_c} = 0.099$

Table 6: SAIL: Common Size Income Statement (2004-05 to 2013-14)

(2004-05 to 2013-14) (Rs. in Crores)

Particulars	2004-05	%	2005-06	%	2006-07	%	2007-08	%	2008-09	%
Operating Revenue	34368.03	*100.00*	47179.93	*100.00*	45309.67	*100.00*	52605.14	*100.00*	50339.10	*100.00*
Less : Various operating expenses	11299.27	*32.88*	18405.60	*39.01*	18344.03	*40.49*	21594.61	*41.05*	23696.22	*47.07*
Contribution (C)	23068.76	*67.12*	28774.33	*60.99*	26965.64	*59.51*	31010.53	*58.95*	26642.88	*52.93*
Less : Fixed operating expenses	343.65	*1.00*	404.78	*0.86*	298.88	*0.66*	352.67	*0.67*	401.46	*0.80*
Earning Before Interest and Tax [EBIT]	22725.11	*66.12*	28369.55	*60.13*	26666.76	*58.85*	30657.86	*58.28*	26241.42	*52.13*
Less : Interest	150.40	*0.44*	387.33	*0.82*	294.74	*0.65*	153.02	*0.29*	55.65	*0.11*
Earning Before Tax [EBT]	22574.71	*65.68*	27982.22	*59.31*	26372.02	*58.20*	30504.84	*57.99*	26185.77	*52.02*
Less : Taxes	216.16	*0.63*	232.19	*0.49*	434.50	*0.96*	874.43	*1.66*	1076.49	*2.14*
Earning After Tax [EAT] i.e. Earning Available to Equity Shareholders	22358.55	*65.05*	27750.03	*58.82*	25937.52	*57.24*	29630.41	*56.33*	25109.28	*49.88*
No. of Equity Shares (N)	339330000		339330000		339330000		339330000		339330000	
EPS = $\frac{EAT}{N}$ (in Rs.)	658.90		817.79		764.37		873.20		739.97	
Indices of EPS (2002-03 = 100)	100.00		124.11		116.01		132.52		112.30	

Particulars	2009-10	%	2010-11	%	2011-12	%	2012-13	%	2013-14	%
Operating Revenue	59264.55	*100.00*	68161.77	*100.00*	83571.14	*100.00*	96442.92	*100.00*	116427.83	*100.00*
Less : Various operating expenses	29310.64	*49.46*	33769.17	*49.54*	47202.96	*56.48*	47947.71	*49.72*	54832.53	*47.10*
Contribution (C)	29953.91	*50.54*	34392.60	*50.46*	36368.18	*43.52*	48495.21	*50.28*	61595.30	*52.90*
Less : Fixed operating expenses	404.42	*0.68*	506.35	*0.74*	588.23	*0.70*	635.13	*0.66*	691.12	*0.59*
Earning Before Interest and Tax [EBIT]	29549.49	*49.86*	33886.25	*49.72*	35779.95	*42.82*	47860.08	*49.62*	60904.18	*52.31*
Less : Interest	81.64	*0.14*	158.74	*0.23*	422.98	*0.51*	792.48	*0.82*	2082.84	*1.79*
Earning Before Tax [EBT]	29467.85	*49.72*	33727.51	*49.49*	35356.97	*42.31*	47067.60	*48.80*	58821.34	*50.52*
Less : Taxes	510.38	*0.86*	99.52	*0.15*	698.97	*0.84*	382.40	*0.40*	275.92	*0.24*
Earning After Tax [EAT] i.e. Earning Available to Equity Shareholders	28957.47	*48.86*	33627.99	*49.34*	34658.00	*41.47*	46685.20	*48.40*	58545.42	*50.28*
No. of Equity Shares (N)	339330000		339330000		339330000		339330000		339330000	
EPS = $\frac{EAT}{N}$ (in Rs.)	853.37		991.01		1021.37		1375.81		1725.32	
Indices of EPS (2002-03 = 100)	129.51		150.40		155.01		208.80		261.85	

Source : Annual Reports and Accounts of Steel Authority of India Limited from 2004-05 to 2013-14.

Table 7: SAIL: Regression Analysis of Contribution (2004-05 to 2013-14)

(Rs. in ten crore)

Years	Operating Revenue (X)*	Contribution (Y)*	Expected Contribution (Y_c)
2004-05	3437	2307	2108.83
2005-06	4718	2877	2672.47
2006-07	4531	2697	2590.19
2007-08	5261	3101	2911.39
2008-09	5034	2664	2811.52
2009-10	5926	2995	3203.99
2010-11	6816	3439	3595.59
2011-12	8357	3637	4273.63
2012-13	9644	4850	4839.92
2013-14	11643	6160	5719.47
	$\sum X = 65367$	$\sum Y = 34727$	$\sum Y_c = 34727$

* Values from Table 6 are converted in ten crores and rounded off.

Table 8: SAIL: Chi-Square Analysis of Contribution (2004-05 to 2013-14)

(Rs. in ten crores)

Years	Contribution (Y)*	Expected Contribution (Y_c)	$(Y - Y_c)^2$	$\frac{(Y - Y_c)^2}{Y_c}$
2004-05	2307	2108.83	39271.35	18.62
2005-06	2877	2672.47	41832.52	15.65
2006-07	2697	2590.19	11408.38	4.40
2007-08	3101	2911.39	35951.95	12.35
2008-09	2664	2811.52	21762.15	7.74
2009-10	2995	3203.99	43676.82	13.63
2010-11	3439	3595.59	24520.43	6.82
2011-12	3637	4273.63	405297.76	94.84
2012-13	4850	4839.92	101.61	0.02
2013-14	6160	5719.47	194066.68	33.93
	$\sum Y = 34727$	$\sum Y_c = 34727$	$\sum (Y - Y_c)^2 = 817889.65$	$\sum \frac{(Y - Y_c)^2}{Y_c} = 208$

Table 9: SAIL: Regression Analysis of EBIT (2004-05 to 2013-14)

(Rs. in ten crores)

Years	Contribution (X)	EBIT (Y)	Expected EBIT (Y_c)
2004-05	2307	2273	2272.46
2005-06	2877	2837	2836.76
2006-07	2697	2667	2658.56
2007-08	3101	3066	3058.52
2008-09	2664	2624	2625.89
2009-10	2995	2955	2953.58
2010-11	3439	3389	3393.14
2011-12	3637	3578	3589.16
2012-13	4850	4786	4790.00
2013-14	6160	6090	6086.93
	$\sum Y = 34727$	$\sum Y = 34265$	$\sum Y_c = 34265$

Table 10: SAIL: Chi-Square Analysis of EBIT (2004-05 to 2013-14)

(Rs. in ten crores)

Years	EBIT (Y)	Expected EBIT (Y_c)	$(Y - Y_c)^2$	$\frac{(Y - Y_c)^2}{Y_c}$
2004-05	2273	2272.46	0.29	0.0001
2005-06	2837	2836.76	0.06	–
2006-07	2667	2658.56	71.23	0.0268
2007-08	3066	3058.52	55.95	0.0183
2008-09	2624	2625.89	3.57	0.0014
2009-10	2955	2953.58	2.02	0.0007
2010-11	3389	3393.14	17.14	0.0051
2011-12	3578	3589.16	124.55	0.0347
2012-13	4786	4790.00	16.00	0.0033
2013-14	6090	6086.93	9.42	0.0015
	$\sum Y = 34265$	$\sum Y_c = 34265$	$\sum (Y - Y_c)^2 = 300.23$	$\sum \frac{(Y - Y_c)^2}{Y_c} = 0.0919$

Table 11: Degree of Operating Leverage (2004-05 to 2013-14)

Year	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Tata Steel	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
SAIL	1.02	1.01	1.01	1.01	1.02	1.01	1.02	1.02	1.01	1.01

Table 12: Analysis of Variance of DOL

Sources of Variation	Sum of Squares	Degrees of Freedom	Mean Square of Variance	'F' Ratio
Between Companies	49.74	1	49.74	$F = \frac{49.74}{2.70} = 18.42$
Within Companies	48.63	18	2.70	

Table 13: Degree of Financial Leverage (2004-05 to 2013-14)

Year	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Tata Steel	1.02	1.03	1.03	1.01	1.01	1.01	1.01	1.02	1.02	1.04
SAIL	1.02	1.02	1.01	1.01	1.00	1.00	1.01	1.01	1.02	1.04

Table 14: Analysis of Variance of DFL

Sources of Variation	Sum of Squares	Degrees of Freedom	Mean Square of Variance	'F' Ratio
Between Companies	59.97	1	59.97	$F = \frac{59.97}{3.11} = 19.28$
Within Companies	55.96	18	3.11	

Table 15: degree of Combined Leverage (2004-05 to 2013-2014)

Year	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Tata Steel	1.03	1.04	1.04	1.02	1.02	1.02	1.02	1.03	1.03	1.05
SAIL	1.04	1.03	1.02	1.02	1.02	1.01	1.03	1.03	1.03	1.05

Table 16: Analysis of Variance of DCL

Sources of Variation	Sum of Squares	Degrees of Freedom	Mean Square of Variance	'F' Ratio
Between Companies	0.887	1	0.887	$F = \frac{0.887}{0.03} = 29.56$
Within Companies	0.580	18	0.03	

2004-05 and 2005-06 which decreased to 1.01 in next two years and further declined to 1.00 in next two years. In 2010-11 and 2011-12 it slightly boosted up to 1.01 and further 1.02 and 1.04 in 2012-13 and 2013-14 respectively. The performance of the company was constant. Hence, it is advised that the company should keep its DFL high in future also. This would be in company's interest.

Degrees of combined leverage in SAIL marked a decreasing trend in starting years and increasing trend in later years. It was 1.04 in 2004-05 which decreased to 1.03 in 2005-06 and followed by 1.02 in next three years while came down to 1.01 in 2009-10. But in 2010-11, it slightly increased to 1.03 and followed by next two years and thereafter reached to 1.05 in 2013-14. This shows that the performance of the company was improved in later years and it was satisfactory.

For arriving at objective conclusions and with a view to test the significance of variation in the degrees of leverage between the companies under study and between different years within the companies, `F' test has been applied. Table 11 shows degrees of operating leverage (DOL) of the companies under study.

Analysis of variance of degrees of operating leverage in the companies under study is shown in Table 12. It can be seen from Table 12 that the calculated value of `F' ratio was 18.42 which is higher than the table value of `F' at 5 percent level of significance.

Degrees of financial leverage of the companies under study have been summed up in Table 13. Table 14 shows analysis of variance of DFL of these companies.

The calculated value of `F' ratio comes to 19.28 whereas table value of `F' ratio is very low at 5 percent significance level of significance. Since calculated value is higher than the table value, it can be concluded that the difference between DFL of Tata Steel and SAIL was significant.

Table 15 depicts degrees of combined leverage of the companies under study. Table 16 shows analysis of variance of DCL of the companies under study. As it can be seen from Table 16 that the calculated value of `F' ratio is 29.56 which is much higher than the table value of `F' ratio at 5 percent level of significance. This shows the difference between DCL of the companies Tata Steel and SAIL was significant at the given level of significance.

CONCLUSION

The difference between degrees of operating leverage in Tata Steel and SAIL was significant. The performance of these companies was not satisfactory from DOL point of view. The difference between degree of financial leverage in Tata Steel and SAIL was significant. Similarly, the difference between degree of combined leverage of the companies Tata Steel and SAIL was significant. Hence, it can be concluded from this study that there was a significant difference between actual and estimated degree of leverage of the companies. Also, there was a significant difference between degree of leverage of Tata Steel and SAIL.

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