A STUDY OF CAPITAL STRUCTURE & ITS COMPONENTS OF AUTOMOBILE INDUSTRY OF INDIA

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In the corporate financing decision, the capital structure decision is a crucial and important decision. The capital structure decision has a direct relationship with the firm performance; it is also associated with the value of firm, so, all the managers of firm tries to create its capital structure as an optimum capital structure. In the present paper an attempt has been made to study the components of capital structure of Automobile Industry of India with the data of seven years. The result of the study indicates that there are no any uniform trends found among the components of capital structure in automobile industry of India.

Key Words: Capital Structure, Components of Capital Structure, Automobile, India

Introduction

The companies finance their operations through internal and external sources. Management chooses one or a combination of these sources after considering all available alternatives and evaluating their relevant costs and terms.Traditional finance models suggest that companies select optimal structures by trading off various costs and benefits.There is also evidence that suggests that a company's history plays an important role in determining its capital structure.Highly profitable companies often use their earnings to pay down their liabilities to outside financing sources and as a result , they are usually less levered than their less profitable counterparts , Titman and Wessels(1988).Bowen,Daley and Huber (1982), introduced a methodology for analyzing the optimal capital structure.Their main hypothesis was that individual firm's debt structures tend to converge to the industry mean over time.The conclusion of their study was that firms exhibit a statistically significant tendency to move toward their industry mean over both five and ten year time periods.March (1982) concluded that the companies appear to make their choice of financing instrument as though they had target levels in mind for both long term ratios and the ratio of short term to total debt. Jalilvand and Harris (1984) concluded that the firms' targets are a driving force in the firms' financial behavior.

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Taggart (1986) used pecking order theory in his study and found that the pecking order hypothesis was more valid than the optimal capital structure hypothesis. Clagegett,Jr.(1992) tested both hypotheses and found that companies' long term debt to total assets ratio, for the most part, tended to move toward the most recent previous industry mean within one year. In general, in more companies with above industry average long term debt ratios are adjusted toward the mean than with below-average ratios. Also,companies normally behave in a manner consistent with the pecking order theory, however, some industries may not adjust during periods of severe turmoil. Claggett,Jr. concluded by stating that perhaps a hybrid theory between the optimal capital structure theory and the pecking order theory is the next step in the ongoing quest to explain how companies manage their capital structure.

Wald (1999) examined the factors correlated with capital structure in France, Germany, Japan, the UK, and the USA.He conducted a cross-country comparison of five countries to test alternative theories of capital structure within an international context.Wald verified many of the broad conclusions of similar leverage across countries given by Rajan and Zingales (1995), but also pointed out areas where differences may have existed.For although some variables, such as those associated with moral hazard, tax deductions, research and development, and profitability, had the expected signs and consistent across countries, other variables, such as those associated with risk, growth, firm size, and inventories showed different effects in different countries.The result of the study indicated that institutions could be significant determinants of capital structure, and that agency and monitoring problems,while existing in every country, could create different outcomes.

Objectives of the Study

In the present paper the researcher made an attempt to analyse the components of capital structure i.e. debt & equity, and also try to an attempt to analyse trends and patterns of the capitalization & capital structure of the sampled companies.

Methodology of the Study

Analyses in this study are based on data obtained from CMIE PROWESS database and the financial statements of the companies included in the sample. The sample includes top 9 automobile manufacturing companies registered in the Bombay Stock Exchange between the years 2001 and 2007. It is believed that these companies are fairly well representative of the automobile manufacturing industry in India. Their existence in the market continuously for 8 years can be taken as an indicator of their representativeness.

Analysis of Capital Structure

The magnitude of the debt finance in the capital structure could be combined by using three different ratios namely debt / equity ratio, debt to capital employed ratio and interest coverage ratio. But here the study is affected to the debt to capital employed ratio only.

Debt to Capital Employed Ratio: This ratio represents the degree of relationship between debt and capital employed and is expressed in percentage as below:

$$\frac{\text{Debt}}{\text{Capital Employed}} \times 100$$

As the debt may be considered as long–term and short–term, either independently or in a combined manner, debt to capital employed ratio could be classified into three categories:

1. Short–term Debt to Capital Employed Ratio: Wherein capital employed is comprised of net worth and short – term debt only.

2. Long–term Debt to Capital Employed Ratio: Wherein capital employed comprised of net worth and long – term debt only.

3. Total Debt to Capital Employed Ratio: Wherein capital employed is comprised or net worth, short – term and long debt only.

Of the above three ratios, the second ratio namely, long - term debt to capital employed is used in macro analysis as the debt / equity norm, which is inspected to be used as a focal point for arriving at desired debt / equity ratio, is always fixed with respect to long – term debt equity ratio only. On the other hand, the third ratio of total debt to capital employed is used in micro study.

Equity to Capital Employed

There is yet another alternative way of expressing the basic relationship between debt and equity. If one wants to know how much funds are contributed together by the lenders and owners for each rupee of the owner's contribution, this can be found out by calculating the ratio of equity to capital employed or net worth to net assets. Here equity means shareholders funds or net worth is calculated as follows

Paid Up Share Capital + Share Premium + Reserves and Surplus – Accumulated Losses and Miscellaneous not Written off

In the light of above information, the researcher analyses the data of sample companies of Automobile industry in the following manners.

TABLE 1

TOTAL DEBT OF SAMPLE COMPANIES OF AUTOMOBILE INDUSTRY DURING THE STUDY PERIOD

(Rs. in Crore)

S.N.	Name of the company	Mar 07	Mar 06	Mar 05	Mar 04	Mar 03	Mar 02	Mar 01	Average
1	ASHOK LEYLAND LTD.	640.40	691.93	880.41	498.90	717.52	887.99	933.01	750.02
2	BAJAJ AUTO LTD.	1625.43	1467.15	1226.99	1005.72	840.22	626.10	513.71	1043.62
3	EICHER MOTORS LTD.	200.32	177.56	138.28	195.66	26.16	41.30	35.53	116.40
4	HERO HONDA LTD	165.17	185.78	201.76	174.70	134.28	116.44	66.48	149.23
5	HINDUSTAN MOTORS LTD	189.23	161.00	166.18	373.40	380.70	356.79	387.40	287.81
6	MAHINDRA & MAHINDRA LTD.	1636.00	883.38	1052.62	729.81	1139.85	1377.07	1133.91	1136.09
7	MARUTI UDYOG LTD.	630.80	71.70	307.60	311.90	456.00	656.00	1112.10	506.59
8	SWARAJ MAZDA LTD.	109.79	113.48	23.63	7.22	3.82	38.59	31.00	46.79
9	TATA MOTORS LTD.	4009.14	2936.84	2495.42	1259.77	1458.31	2304.96	2998.88	2494.76
	Average	1022.92	743.20	721.43	506.34	572.98	711.69	801.34	725.70

Sources : Capitaline Electronic Database

As per table 1 the average total debt of all sampled company for study period from 2001 to 2007 was Rs. 725.70 cr. Out of sampled company, the highest average debt borrowed by Tata Motors Ltd. i.e. Rs.2494.76 cr. Which are more by Rs.1769 cr. and approximately 243% more by overall average. Also on second position among the sampled company's, Mahindra & Mahindra Ltd. with average amount of debt Rs.1136.09 cr. and its more by Rs.411.9 cr. i.e. more by 56.8% to the overall average of sampled company's of an Automobile industry. While Swaraj Mazad ltd. stood on the last position among all sample companies with average debt of only Rs. 46.79 cr. It is less by Rs. 679 cr. and in percentage it is less by 93%. Remaining companies are generally below the average amount of debt of the sampled company of an Automobile industry.

Looking to the passage of time there was an up-ward trend. During 2001, the average debt increased.It decreased during 2002 to 2004 then again increased from 2005 to 2007 and highest average debt was in 2007. It was Rs. 1022.92 cr. which is more by Rs. 297 cr. comes at approximately 40%.In the year 2004; it was Rs. 506.34 cr., less by 30% to the average debt of sampled company of an Automobile industry.

As such in order to ensure whether there would be any significant difference about average total amount of debt within the Automobile industry or not, the researcher tried to test through **ANOVA** technique at 5% level of significance.

Statistical hypothesis are:

$H_0 : \mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 = \mu_6 = \mu_7 = \mu_8 = \mu_9$

The average amount of debt of the sampled companies of an Automobile industry is equal.

$H_1 : \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \mu_5 \neq \mu_6 \neq \mu_7 \neq \mu_8 \neq \mu_9$

The above average is not equal.

The results of the ANOVA were as under:

TABLE 2

ANALYSIS OF VARIANCE TABLE FOR DEBT OF AUTOMOBILE INDUSTRY

Sources of Variance	Sum of Squares	DOF	Mean Square	F - value
SSC (Between Samples)	1494189.63	6	249031.60	2.87
SSE (Within Samples	40062301.91	56	715398.25	
SST (Total)	41556491.54	62		

Computed F value : 2.87
Critical value of F at á = 5% : 2.25
Result : H_0 is rejected.

Since the computed value of F is greater then the critical value, the null hypothesis is rejected against alternative hypotheses and it may be concluded that there was significant difference between the sampled companies of an Automobile industry regarding average total amount of debt is concern.

Trends and Patterns of Capitalization in Automobile Industry:

By looking into the figures of total capital employed of the sample companies individually as well as year wise (as per the table referred earlier), the researcher did not notice wide variations in the amount of total capitalization. Within the light of this fact, the researcher tried to examine whether there is a variation about average capital employed among the sampled companies of an Automobile industry. The researcher tries to use ANOVA technique. To test average capital employed of automobile industries, the researcher uses t test.

TABLE 3

TOTAL CAPITAL EMPLOYED OF SAMPLE COMPANIES OF AUTOMOBILE INDUSTRY DURING THE STUDY PERIOD

(Rs. in Crore)

Sr.No.	Name of the company	Mar 07	Mar 06	Mar 05	Mar 04	Mar 03	Mar 02	Mar 01	Average
1	ASHOK LEYLAND LTD.	2534.97	2104.38	2048.28	1550.70	1677.01	1924.94	2111.77	1993.15
2	BAJAJ AUTO LTD.	7159.75	6237.88	5361.34	4699.34	4080.82	3491.87	3150.24	4883.03
3	EICHER MOTORS LTD.	613.69	622.57	379.23	382.49	127.04	112.62	118.30	336.56
4	HERO HONDA LTD	2635.23	2195.11	1695.14	1313.51	995.31	802.20	695.67	1476.02
5	HINDUSTAN MOTORS LTD.	292.62	252.24	301.20	447.26	535.51	538.39	614.62	425.98
6	MAHINDRA & MAHINDRA LTD.	5188.91	3792.25	3039.15	2504.84	2709.68	2881.09	3202.73	3331.24
7	MARUTI UDYOG LTD.	7484.70	5524.30	4686.40	3903.10	3554.00	3363.30	3754.60	4610.06
8	SWARAJ MAZDA LTD.	185.45	179.80	79.73	48.06	31.94	57.42	48.43	90.12
9	TATA MOTORS LTD.	10878.89	8473.91	6606.81	4849.54	4055.47	4770.02	6252.66	6555.33
	Average	4108.25	3264.72	2688.59	2188.76	1974.09	1993.54	2216.56	2633.50

Sources : Capitaline Electronic Database

As per table 3, the overall average amount of total capitalization of the sampled companies of an Automobile industry during the relevant period was Rs. 2633.50 cr. Among all

sample companies, Tata motors Ltd. is having highest total capital employed of Rs. 6555.33 cr. This is almost 2.5 times of the average. Bajaj Auto and Maruti udyog Ltd. is having total capitalization of Rs 4883.03cr. and 4610.06 cr., which is almost double to the total average capital. While Swaraj Mazda Ltd. is having only Rs 90.12 cr. It was very much less than the average. It was just 3.4 % of the average capital employed.

With passage of time, average capitalization increase by Rs. 1474.75 Cr. from year 2001 to 2007. This increment was on an average 66% to the total capitalization. By looking at the figures, the researcher notices that there was a downward trend from year 2001 to 2004. Then from 2005 to 2007 it was an upward linear trend so far as total capitalization of an Automobile industry is concerned.

The researcher performs same exercises and setup the following statistical hypothesis.

$H_0 : \mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 = \mu_6 = \mu_7 = \mu_8 = \mu_9$

No significant difference among sample units about capital employed.

$H_1 : \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \mu_5 \neq \mu_6 \neq \mu_7 \neq \mu_8 \neq \mu_9$

The above difference is significant.

TABLE 4

ANALYSIS OF VARIANCE TABLE FOR CAPITAL EMPLOYED OF AUTOMOBILE INDUSTRY

Sources of Variance	Sum of Squares	DOF	Mean Square	F - value
SSC (Between Samples)	34131174.52	6	5688529.09	1.06
SSE (Within Samples)	338313617.47	56	6041314.60	
SST (Total)	372444791.99	62		

The result of the F test was as under:

Computed value : F value : 1.06

Critical value of F at á = 5% : 2.25

Result : H_0 is accepted.

Since the computed value of F(1.06) is less than the critical value of F(2.25), the null hypothesis is accepted. It may be concluded that there is no significant difference among different sampled companies of an Automobile industry regarding average capital employed is concerned.

Trends and Patterns of Debt to Capital Employed (%) in Automobile Industry

Here researcher has tried to analyse the proportion of debt to capital employed among the sample companies, and for testing the hypothesis, F test is used.

TABLE 5

TOTAL DEBT TO CAPITAL EMPLOYED (%) OF SAMPLE COMPANIES OF AUTOMOBILE INDUSTRY DURING THE STUDY PERIOD

Sr.No.	Name of the company	Mar 07	Mar 06	Mar 05	Mar 04	Mar 03	Mar 02	Mar 01	Average
1	ASHOK LEYLAND LTD.	25.26	32.88	42.98	32.17	42.79	46.13	44.18	38.06
2	BAJAJ AUTO LTD.	22.70	23.52	22.89	21.40	20.59	17.93	16.31	20.76
3	EICHER MOTORS LTD.	32.64	28.52	36.46	51.15	20.59	36.67	30.03	33.73
4	HERO HONDA LTD	6.27	8.46	11.90	13.30	13.49	14.52	9.56	11.07
5	HINDUSTAN MOTORS LTD.	64.67	63.83	55.17	83.49	71.09	66.27	63.03	66.79
6	MAHINDRA & MAHINDRA LTD	31.53	23.29	34.64	29.14	42.07	47.80	35.40	34.84
7	MARUTI UDYOG LTD.	8.43	1.30	6.56	7.99	12.83	19.50	29.62	12.32
8	SWARAJ MAZDA LTD.	59.20	63.11	29.64	15.02	11.96	67.21	64.01	44.31
9	TATA MOTORS LTD.	36.85	34.66	37.77	25.98	35.96	48.32	47.96	38.21
	Average	31.95	31.06	30.89	31.07	30.15	40.48	37.79	33.34

The table 5 shows the general pattern of total debt to total CE in percentage of sampled companies of an Automobile industry during the period of study. It can be seen from the table, that on an average debt proportion was 33.34 % and highest average of this ratio is 66.79% for Hindustan motor which is almost more by 33.45 i.e. double then the general average ratio. While lowest ratio is 11.07 % for Hero Honda motors Ltd. which is less by 22.27 i.e. 1/2 to the average ratio.

Looking at the passage of time from 2001 to 2002, it was more than the average but from 2003 onwards it was below the average. There is no sizeable difference

during the year 2003 to 2007. It was almost near to the average in debt proportion.

In the light of this fact, to ensure whether there was any significant variation in the debt to total capitalization among the various companies of an Automobile industry, one way analysis of variance technique was applied. In this connection the following was the hypothesis.

$H_0 : \mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 = \mu_6 = \mu_7 = \mu_8 = \mu_9$

The average debt to CE ratio of the sampled companies of an Automobile industry is equal.

$H_1 : \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \mu_5 \neq \mu_6 \neq \mu_7 \neq \mu_8 \neq \mu_9$

The above average is not equal.

The results of the ANOVA were as under.

TABLE 6

Analysis of Variance Table for Proportion of Debt to Capital Employed of Automobile Industry

Sources of Variance	Sum of Squares	DOF	Mean Square	F - value
SSC (Between Samples)	893.21	6	148.87	2.66
SSE (Within Samples)	22172.13	56	395.93	
SST (Total)	23065.33	62		

Computed value : F value : 2.66

Critical value of F at á = 5% : 2.25

Result : Ho is rejected.

Since the computed value of F is more than the critical value of F, the null hypothesis is rejected. It may be concluded that there was significant difference between different sampled companies of an Automobile industry as far as proportion of debt to total capitalization is concerned.

Total Capitalization vis-à-vis Debt to Total Capitalization

After having studied the trends and pattern with regard to total debt, total capitalization and the proportion of debt to total capitalization separately an effort has been made to study the same together in the sampled companies. A similar exercise is also done to know whether there were distinct pattern available between size of the capitalization and the relative proportion of debt to capitalization. In this context, the researcher tries to use t-test of correlation coefficient at 5% level of significance for two tail.

TABLE 7

THE DETAILS OF DEBT TO AVERAGE CAPITAL EMPLOYED AND AVERAGE CAPITAL EMPLOYED IN THE SAMPLE COMPANIES OF AUTOMOBILE INDUSTRY

Name of the company	Average proportion of debt to capital Employed	Average Capital Employed Rs. in Crore.
ASHOK LEYLAND LTD.	38.06	1993.15
BAJAJ AUTO LTD.	20.76	4883.03
EICHER MOTORS LTD.	33.73	336.56
HERO HONDA LTD	11.07	1476.02
HINDUSTAN MOTORS LTD.	66.79	425.98
MAHINDRA & MAHINDRA LTD.	34.84	3331.24
MARUTI UDYOG LTD.	12.32	4610.06
SWARAJ MAZDA LTD.	44.31	90.12
TATA MOTORS LTD.	38.21	6555.33
Average	33.34	2633.00

Sources : Capitaline Electronic Database

Statistically, the hypothesis is as follows:

$H_0 : r = 0$

$H_1 : r \neq 0$

The null hypothesis was that there was no correlation between the two phenomena, while the alternative hypothesis was that there was some significant correlation between these two phenomena.

TABLE 8

ANALYSIS OF COEFFICIENT CORRELATION AND T-TEST OF THE SAMPLE COMPANIES OF AUTOMOBILE INDUSTRY

Details	Coefficient Correlation	DOF	t-test		Result
			Computed value	Table value	
All sampled companies	-0.4037	7	1.167	2.37	insignificant

From the above result it is clear that the computed value is less than the critical value of t, hence it may be concluded that there was no correlation between these two phenomena as a whole of an Automobile industry.

Trends and Patterns of Equity to CE (%) in Automobile Industry

After analysing the proportion of debt to capital employed, the researcher tries to analyse the proportion of equity to capital employed of sample companies and the relationship between total equity and capital employed.

TABLE 9

TOTAL EQUITY TO CAPITAL EMPLOYED (%) OF SAMPLE COMPANIES OF AUTOMOBILE INDUSTRY DURING THE STUDY PERIOD

Sr.No.	Name of the company	Mar 07	Mar 06	Mar 05	Mar 04	Mar 03	Mar 02	Mar 01	Average
1	ASHOK LEYLAND LTD.	5.22	5.81	5.81	7.67	7.09	6.18	5.63	6.20
2	BAJAJ AUTO LTD.	1.41	1.62	1.89	2.15	2.48	2.90	3.21	2.24
3	EICHER MOTORS LTD.	4.58	4.51	7.41	5.23	15.74	17.76	16.91	10.30
4	HERO HONDA LTD	1.52	1.82	2.36	3.04	4.01	4.98	5.74	3.35
5	HINDUSTAN MOTORS LTD.	55.11	63.93	53.54	36.06	30.11	29.95	26.24	42.13
6	MAHINDRA & MAHINDRA LTD.	4.59	6.15	3.67	4.63	4.28	4.03	3.45	4.40
7	MARUTI UDYOG LTD.	1.93	2.62	3.08	3.70	4.07	3.93	3.52	3.27
8	SWARAJ MAZDA LTD.	5.66	5.83	13.16	21.83	32.84	18.27	21.66	17.04
9	TATA MOTORS LTD.	3.54	4.52	5.48	7.28	7.89	6.70	4.09	5.64
	Average	9.28	10.76	10.71	10.18	12.06	10.52	10.05	10.51

Sources : Capitaline Electronic Database

The equity to CE of Sample Company of an Automobile industry is presented in Table no. 9. It can be seen from the table that average equity to CE is 10.51%. The researcher found that highest this ratio is 42.13 for Hindustan Motors which is more than that of average by 300% and it comes out 31.62 while Bajaj Auto having only 2.24 which is lowest among the sampled company and it is on an average 78% (8.27) less than the general average. So far as time passage is concerned there is no considerable variation during the year 2001 to 2007.

To test the significance of the variable of Equity to CE among the industry, the researcher uses one way analysis technique.

Statistical hypothesis are:

$H_0 : \mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 = \mu_6 = \mu_7 = \mu_8 = \mu_9$

The average Equity to CE ratio of the sampled companies of an Automobile industry is equal.

$H_1 : \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \mu_5 \neq \mu_6 \neq \mu_7 \neq \mu_8 \neq \mu_9$

The above average is not equal.

The results of the ANOVA were as under:

TABLE 10

ANALYSIS OF VARIANCE TABLE FOR PROPORTION OF EQUITY TO CAPITAL EMPLOYED OF AUTOMOBILE INDUSTRY

Sources of Variance	Sum of Squares	DOF	Mean Square	F - value
SSC (Between Samples)	38.89	6	6.48	30.91
SSE (Within Samples)	11221.24	56	200.38	
SST (Total)	11260.13	62		

Computed F value : 30.91

Critical value of F at $\alpha = 5\%$: 2.25

Result : H_0 is rejected.

Since the computed value of F is much more then the critical value, the null hypothesis is rejected and it may be concluded that there was significant difference between sampled companies of an Automobile industry regarding proportion of equity to total capital employed. Whatever the variation found is not due to sampling error but some other reasons.

Conclusions

The foregoing analysis on Capital Structure and its constituents leads to the following conclusions:

It is found that the Tata Motors having the maximum Debt as well as Capital Employed while the Swaraj Mazda having the minimum Debt as well as Capital Employed. The Debt to Capital Employed and Equity to Capital Employed both are highest for Hindustan Motors Ltd. The Hero Honda has the lowest debt to capital employed while the Bajaj Auto has the lowest equity to capital employed.

There was upward linear trend regarding average amount of debt during the period of study, while down-up trend for Automobile industry regarding capital employed. As far as proportion of debt to capital employed is concerned; there was no considerable change for an Automobile industry. There was stable linear trend of equity to capital employed for Automobile industry.

The total amount of Debt within the Automobile Industry is significantly varying.

The average amount of Capital Employed is same within and between the Automobile industry.

The proportion of debt to total capitalisation was significant within an Automobile Industry.

The relationship among the average capital employed and the ratio of debt to capital employed between the Automobile Industry was found to be very much insignificant.

There was significant difference within the sampled companies of Automobile industry.

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