

Impact of Capital Structure in Indian Industries

Dr. Rohit R. Manjule

T&P officer and Assistant Professor,
DES's College of Engineering and Technology, Dhamangaon Rly(MS), India
rohitmanjule@gmail.com

1. ABSTRACT

This paper briefly tries to evaluate whether some a priori assumed macroeconomic determinants can be related to the leverage. For this purpose, an empirical study was undertaken on Indian industries covering 151 selected firms categorized 13 industrial sector. A major finding on the attribute of various explanatory variable used in the regression model is that the variables like liquidity and growth in terms of performance of the firm have significant influence on debt-equity ratio. In other words, sustainable growth along with credit worthiness of the firm influences debt-equity ratio i.e., degree of financial leverage. Further, the results from econometrical analysis reveal that determinants are industry specific, which implies that the weight of the explanatory variables varies from sector to sector.

Keywords:- Debt-equity ratio, Financial leverage, Econometrical, Capital structure,

2. Introduction

Capital structure, the mix of long term debts and equity securities, is generally used to finance long term assets of companies. It consists of permanent short-term debt, preferred stock, and common equity. The financial structure is sometimes used as synonymous with capital structure. However, financial structure is more comprehensive than that of capital structure in the sense that the former refers to aggregate amount of total current liabilities, long-term debt, preferred stock, and common equity i.e. total of liability side of the balance sheet (source of funds). Therefore, capital structure is only a part of financial structure and refers mainly to the permanent sources of the firm's financing. This necessitates firm's obligation for a well designed capital structure policies to lessen the hurdles of raising finance for its project.

3. Literature Review

Gorden (1962) observed that with the increase of size, return on investment was negatively related to debt ratio. He also confirmed the negative association between operating risk and debt ratio. Baxter (1967) articulated that the degree of degree of financial leverage would depend on the variance of net operating earnings, since; business with relatively stable income streams is comparatively least prone to bankruptcy. Hence, a negative association exists between variance of net operating earnings and degree of financial leverage. A cross sectional study Gupta (1969), on the financial structure of American Manufacturing Enterprises during 1961-62 confirmed^ that total debt ratios were positively related to growth and negatively related . ,to size. Toy et al (1974} found higher level of operating risk is associated with higher debt ratio and growth, typically measured in terms of sales, is negatively related to debt ratio while financial leverage is indirectly tied with return on investment (ROI). Ferri and Jones (1979) investigated the relationship between firm's financial

structure and its industrial class, size, variability of income and operating leverage. They found that the industry class was linked to the firm's leverage, but not in a direct manner as was suggested in other researches. Secondly, a firm's use of debt is related to its size. Finally, operating leverage does influence the percentage of debt in a firm's financial structure. In the same manner, Venkatesan (1983) analyzed the relationship between seven variables; industry categorization, size, operating leverage, debt coverage, cash flow coverage, business risk, growth ratio and financial structure of firms. It was observed that, only debt coverage ratio was found to be important variable significantly affecting the financial structure of the firm. Carelton and Siberman (1997) concluded that higher the variability in ROI lower will be the degree of financial leverage in firms. Bradley, Jarroll and Kim (2002) found that debt to asset ratio is negatively related to both volatility of annual operating earnings and advertising and Research and Development expenses. Mohanty found that financial leverage is negatively related to profitability and value of the firm within an industry in Indian context

4. Objectives of the Study

The major objective of the study is to examine the pattern {debt-equity mix} of asset financing by Indian companies and the influence of the various factor affecting there capital structure decisions. More specifically, the study focused on the following objectives.

1. To see the existence or lion existence of intra and inter sectoral differences in the debt structure of various industrial sectors in India represented by selected large representative companies.
2. To examine the influence of various factors affecting the capital structure decisions of Indian companies.
3. To examine whether or not determinants of capital structure of different industry in India are similar

5. Hypotheses

Hypothesis 1

H₀: Debt- equity ratios in various industrial sectors in India are similar.

H₁: Debt equity ratios among various industrial sectors in India defer significantly.

Hypothesis 2

H₀: Debt-equity ratios of firms in an industrial sector are similar.

H₁: Debt equity ratios in an industrial sector do defer significantly among firms.

Hypothesis 3

H₀: Debt- equity ratios of firms in an industrial sector are not influenced r_j by financial variables such as size, growth, liquidity, profitability, and -dividend. ^E

H₁: Debt equity ratios of firms in an industrial sector are influenced by the underlying financial variables.

Hypothesis 4

H₀: Determinants of debt- equity ratio (capital structure) of different -industrial sector are similar :

H₁: Determinants of debt- equity ratio {capital structure} of different •• industrial sector are not similar

6. Research Methodology

To attain the aforesaid objective 151 companies were selected on the basis of rank of market capitalization as on March 2012. The analysis is based on data collected from secondary sources; Capitalline Database, Bombay Stock Exchange Directory and Financial Statement of Indian Companies, covering five years period from 2006-07 to 2011-12. Further variables considered in the analysis include; financial leverage, growth (percentage change of sales over previous year), size (capital employed), profitability (percentage change of RONW over the previous year), liquidity (current ratio) and finally dividend pay out ratio. Both financial and statistical tools- and techniques were used to evaluate the determinants of capital structure of Indian information technology sector. It includes; financial tools like ratio analysis and statistical tools such as correlation and regression analysis.

To analyze the data financial as well as statistical tools has been used. The financial tools like ratio analysis and statistical tools such as average, ANOVA, correlation coefficient and multiple regressions were used. The statistical results were verified by applying t-test, F-test, Z-test in appropriate cases.

7. Findings and Analysis

Nature of Capital Structure of Indian Companies: Table 1 exhibits that: the debt equity ratios of the industrial sectors covered in the study lie within the range of 0.295-4.079. The lowest ratio (0.295) observed in the case of IT industry and the highest in Finance & Investment (4.079) sector. However in the Finance & Investment industry, significant variations in debt-equity ratio were noticed among the firms. High debt ratios were seen in Shriram Transport Finance Company Limited and Shriram City Union Finano Limited. The Cement industry is also subject to large variations in the debt ratios. But it was found that much of this is attributed to JK Laxmi Cement Ltd having very high debt ratios.

Table 1: Nature of capital structure of sample Industries

D/E Ratio	Industry	Extent of leverage
Below 0.5	IT (0.295), Engineering (0.40), Personal Care (0.361)	Low
0.5 to 0.99	Energy (0.836), Pharmaceutical (0.671), Chemical (0.867)	Medium
1.0 to 1.49	Electricity (1.04), Autogroup (1.484), Diversified (1.08)	Average
1.5 & above	Construction (1.537), Cement (1.578), Steel (2.161), High Finance & Inv. (4.079)	High

Source: Self compiled; figures in parenthesis indicate debt to equity ratio.

The Personal Care industry is one with least borrowing; the mean ratios were 0.361. As related to individual classification a slightly high ratio was seen for Emami Ltd industries with 0.782. The IT industry is one of the cash rich industries with low borrowings. Most of the project in this industry is financed through equity which has resulted in low debt ratio. The Wipro Ltd, for example has comparatively low borrowings with average value of 0.018 indicating its rigidity in capital structure decision may be due to strong internal fund generating capacity that met the capital requirements of its needed expansion. The Electricity and Auto industries sectors witnessed uniform leverage across the firms. The firms in both the sectors are maintaining the standard norms of debt-equity ratio as the average value of sectors

are 1.040 and 1.484 respectively. It implies that the equity capital as well as debt capital in designing capital structure holds more or less equal importance throughout the period under study.

The average value of debt-equity ratio of Construction sector is 1.537 which signifies borrowed capital is 1.5 times of equity capital. The DLF Ltd., Jaiprakash Associates Ltd and Simples Ltd industries witnessed high debt ratios; where debts are double to the equity capital in the capital structure. The average value of debt-equity ratio of engineering industry is 0.40. Except Reliance Industrial Infrastructure Ltd and Sanghvi Movers Ltd, all other firms under this group have witnessed low debt equity ratio.

The average debt equity ratio in the Energy industry is 0.836 which is well below than 1.00. High leverage has been seen in Mangalore Refinery and Petrochemical Ltd, Chennai Petroleum Corporation Ltd and Gugrat Ltd. High debt ratios were seen in the Steel sectors. Essar Steel Ltd is the only company which is using high value of debt ratio of 13.712 indicating that the company is heavily relying on borrowed capital, although during study period there has been a declining trend of the ratio. In the diversified sector, the leverage ratios were found to be high and significant differences were noticed among the sample firms.

Pharmaceutical and chemical industries have witnessed a low debt ratio over the period Under study. Except a few firms, the companies under this industry are maintaining low debt ratios. The chemical sector in this respect is not an exception. The debt-equity ratio of the sample companies was classified and exhibited in Table 2.

Table 2: DE ratio: industry-wise and firm-wise distribution

Industry	1.5 and above	From 1 to 1.5	Below 1.0
Energy	1(8%)	2(17%)	9(75%)
IT	Nil	Nil	12(100%)
Construction	5(42%)	3(25%)	4(33%)
Pharmaceutical	1(6%)	4(25%)	11(69%)
Cement	2(20%)	4(40%)	4(40%)
Electricity	2(17%)	1(8%)	9(75%)
Engineering	Nil	2(20%)	8(80%)
Steel	8(53%)	3(20%)	4(27%)
Auto	1(8%)	2(15%)	10(77%)
Chemical	3(27%)	1(9%)	7(64%)
Personal Care	Nil	Nil	8(100%)
Finance & Investment	9(90%)	Nil	1(10%)
Diversified	2(20%)	3(30%)	5(50%)
Aggregate	34(23%)	25(17%)	92(60%)

It is manifested from the table that 60% of the sample companies accounted debt-equity ratio below one which means maximum numbers of companies of the sample are equity capital oriented. The companies under I T and Personal Care sector depend on internal source of funds. The industry like Energy, Pharmaceutical, Electricity, Engineering, Auto, and Chemical a mostly using equity capital and also depending on internal source of finance The companies under finance and investment sector are depending borrowed capital rather than issuing more equity capital. Reliance Capital Ltd. is the only financing company of the sample which accounted lower amount of borrowed capital in its capital structure. Thus, it is seen that debt-equity ratio of GO percent of sample companies across the industry fit bellow 1.0, 17 percent are within the range of 1-1.5 and rest are category; under the group of debt-equity ratio of 1.5 and above. This clearly she that, companies are mostly depending on their internal source of fu Further the industry emerged in the recent years; IT, and Personal Care equity oriented than that of the others. Besides, the market regulation SEBI & MOF have boosted the primary issue market by introducing host incentives and investors protection measures which ultimately lee increasing in the pace of growth of industrial finance in the country.' corporate sectors rushed to capital market and used IPO mode of rais finance.

Inter company variation of firm within different industrial sector: To study the inter companies variation in respect of debt-equity ratio within industry we used ANOVA technique. We considered the null hypothesis there is no significant difference between the leverages of companies within particular industry. The analyses were performed for each of industry separately and the results are demonstrated in Table 3.

Table 3: Result of ANOVA analysis

Industry	F value	F critical value	Df(k-1.N-k)	Sample size
Energy	6.012717*	1.994579	(11,48)	12
IT	40.87752*	2.053902	(11,48)	12
Construction	2.671943*	2.053902	(11,48)	12
Pharmaceutical	8.12077*	1.825587	(15,64)	16
Cement	20.91047*	2.124029	(09,40)	10
Electricity	1 .209985	1.994579	(11,48)	12
Engineering	15.59859*	2.124029	(09,40)	10
Steel	1.869915*	1.860244	(14,60)	15
Auto	1.050634	1.943619	(12,52)	13
Chemical	11.0565*	2.053902	(10,44)	11
Personal Care	2.941075*	2.312738	(07,32)	8
Finance & Inv.	22.43942*	2.124029	(09,40)	10'

Diversified 2.946772* 2. 124029 (09,40) 10

* Significant at 5% level, N - Number of years, k = Number of companies

It has been observed that the F-values for the selected industrial sectors except Electricity and Automobile were found to be greater than the table values. Therefore the null hypothesis that the debt equity ratios of firm in an industrial sector are similar was rejected. A significant variation was noticed among firms in case of Finance & Investment, Cement and I T industry as the calculated value of F-statistic is higher than the table value. In other words, capital structure of Indian industries is not similar. The firms within the Industry have employed capital of different magnitude based on their nature and growth over the years.

Inter industry variation in India: It is observed from Table4 that $F > F_0$ -which implies that the debt-equity ratios of different industry are not similar. Therefore the null hypothesis was rejected and it is concluded that debt ratios differ significantly across industrial sectors in India. The reasons for the differences may be attributed to the inherent characteristics of the firms particularly in the context of their financing pattern i.e, debt equity mix, Thus financing structure differs firm wise as well as industry wise. This implies that single jacket does not fit to all and capital structure differs in industry as well as companies wise due to host of several factors.

Table 4: Result of ANOVA analysis

Source of Variation	SS	df	MS	F	F ₀₅
Between Companies	61.1228	12	5.093567	7.809338	1.943619
Within years	33.91651	52	0.652241		
Total	95.03931	64			

8. Determinants of Capital Structure: To determine the factors influencing the leverage we conducted correlation matrix analysis to see the existence of interrelationship between leverage and the intervening variables. In this respect we have considered variables CR (Current Ratio), Sales volume, Capital employed, Ent. Value (Enterprises Value), Book value of share, growth in PAT (growth in profit after tax), growth in Mcap (growth in market capitalization) EPS (earning per share), RONW (return on net worth), ROC (return on capital! DPR (dividend payout ratio). Further, multiple regression analysis was used to assess the determinants of companies' performance on the capital structure of companies. But because of collinearly problem we used leverage (debt-equity,) as dependent variable and the variables like size (capital employed), growth (profit after tax), and liquidity (CR), profitability (RONW], dividend (DPR), as independent variable. The correlation results are displayed in Table 5.

Table 5: Correlation coefficient: DE ratio vs. other variable

Variables	Value of r	P value
CR	.295**	.001
Sales Volume	-.070	.393
Capital employed	-.012	.888
Book value per share	-.126	.122
Enterprises, value	-.106	.195
EPS	-.173*	.034
ROC	-.311**	.000
RONW	-.142	.082
DPR	-.170*	.037
Grw. Mcap.	.151	.065
Grw. PAT	.197*	.016

Source: Self compiled, ** Significant at 1% , *Significant at 5%

It is found that variables like liquidity ratio (CR), Earning per Share (EPS) ROC, DPR and Growth of PAT have emerged as significant variables affecting debt-equity ratio of the firm. It implies that leverage of the firm is affected by companies' solvency, profitability and size. The following paragraphs are devoted to analyze how far these findings pertaining to selected variable are similar to the findings of the previous studies.

Size: We defined size of the firm by capital employed. The controversy in capital structure as to the relationship of size to leverage was confirmed. The correlation value between capital employed and debt-equity ratio was found to be -0.012 and not statistically significant. This refutes the earlier assumptions that size has a positive correlation with the debt ratio. However the findings of Fisher, Heinkel and Zechner (1989) and Kim and Sorenson (1986) suggest that firm's size is significant predictor of leverage. However the size of the firm has no significant impact on the financial leverage of firms as per the sample is concerned.

Growth; Growth defined in terms of change of profit after tax over the years. It was found the 'r' is positive and statistically significant. This implies that growing firm with proven profitability, rely more on debt than that of less growing firms which have better access to equity sources. Titman Wessels (1988) argued that equity-controlled firms have a tendency to invest sub optimally to expropriate wealth from a firm's bondholders. The cost associated with this agency relationship is likely to be higher for firms in growing industries which have more flexibility in their choice of new investments. Expected future growth should thus be negatively related to long term debt levels. Myers (1977) suggested that the agency problem could be tackled if the firm issued short term debts rather than long term debts. Jensen and Meckling (1976) and several others also established that agency cost be reduced if firm adopt the issue convertible debts.

Profitability: We measure profitability by RONW defined earlier. The correlation value for RONW and debt-equity is -0.142 and is not statistically significant either at 1% or 5% level. It suggests that there is no relationship between

degree of leverage and financial profitability of the firm. Similar findings were obtained in the Packing order hypothesis of Myers and Majluf (1984).

Liquidity: The correlation coefficient between liquidity (CR) and DE ratio is found to be 0.295 and statistically significant at 1% level. This indicates a positive impact of the leverage on liquidity of sample companies. The existence of relationship implies less risky firms having high liquidity ratio always prefer long-term debt rather than financing from equity sources.

Dividend: The correlation coefficient between DPR (dividend) and debt-equity ratio is -0.170 and statistically significant. This indicates that the dividend is an influential factor for designing capital structure of a firm. It suggests the companies with maximum long term debt capital are distributing more amount of dividend among the shareholders as compared to companies emphasizing internal source of funds.

To identify the influence of each or such intervening variables relating to the performance of the firm regression line has been fitted considering debt-equity ratio as dependent variable while others (only those are significantly correlated to debt-equity ratio) i.e, liquidity (CR), dividend (DPR), and growth (PAT) as independent variable. The following model has been fitted for the analysis.

$$Y_i = \beta_0 + \beta_1 x_1 + u_i \quad \text{Here,} \quad H_0: \beta_i = 0 \text{ and } H_1: \beta_i \neq 0$$

Table 6: Regression summary: Leverage (D/E ratio) as dependent variable

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	B	P value
1 (Constant)	.378	.293		1.292	.198
CR	.366	.108	.265	3.398	.001
DPR	-.007	.005	-.105	-1.323	.188
PAT	.004	.001	.196	2.480	.014

$R^2 = 0.245$, $F = 6.996^{**}$, (.000), $**$ Significant at 1%, $*$ Significant at 5%

The R squared for the equation was found to be 0.245 that is explanatory variables explain hardly 25% of variation in dependent variable. This indicates a very weak prediction for the variables. Prima facie the result of the regression analysis on various determinants of the coefficient of capital structure, in majority, was found to be consistent with the various research findings. However, there were certain exceptions, which need to be explored further. A major finding on the

attribute of various explanatory variable used in the regression model is that the variables like liquidity and growth in terms of performance of the firm have significant influence on debt-equity ratio. In other words, sustainable growth along with credit worthiness of the firm influences debt-equity ratio i.e., degree of financial leverage. The firms generally look forward for more debts in its capital structure when it has been attaining a sustainable growth with higher degree of liquidity and proven profitability. It could contain risks of debts in the capital structure.

9. Determinants of Capital Structure of Different Industry: To-see that does the findings of aggregate analysis tally with the result of different individual industry, it is necessary to identify the impact of all aforesaid variables on the leverage of individual industry. We in this respect fitted regression line among the variables states above. The industry wise regression result is exhibited in Table 7. D/E ratio taken as dependent variable and others variable are taken as independent variable.

The regression coefficient of size expressed in terms of capital employed is found to be negative in case of engineering (-.557) and in chemical (-.592) sectors. The negative relationship is statistically significant at 5% level, It implies comparative larger companies fall in the industry of engineering and chemical are using less amount of borrowed capital. Whereas, a positive relationship found in the sector of steel (.633) and personal care (.493) and statistically significant, signifying that comparatively larger companies of those sector are using more borrowed capital. A statistically significant; positive relationship between Profitability (RONW) and financial leverage, found in the sector of finance and investment industries implying that comparatively more profitable companies are dependent on borrowed capital.

In case of personal care sector and automobile sector liquidity is positively related with leverage and in case of energy and pharmaceuticals sector liquidity is negatively related with leverage and also statistically significant which suggest that liquidity is determinant for leverage for those sectors. The positive relationship explains that having high liquidity i.e less risky ; companies are using more debt capital in their capital structure. On the other hand, negative relationship implies comparatively risky companies are using internal source of funds.

DPR has negative impact on leverage in construction sector and also statistically significant which signifies that paying high dividend companies are using internal source of funds rather to use of debt capital. In case of other sectors, DPR is not an influential factor of capital structure.

The regression coefficient of growth of profit after tax is positively related with leverage only in steel sector which suggest that growing companies are relying on external source of funds rather to internal source of funds. However, in case of other industries growth have no impact on their capital structure,

Table 7: Regression result: leverage (D/E Ratio) as dependent variable

Industry	Size	Growth	Liquidity	Profitability	Dividend	R ²	F
Energy	-.167 (.612) [.56]	-.236 (-.821) [.443]	-.665* (-2.366) [.048]	-.157 (-.534) [.612]	.011 (.036) [.972]	.634	2.081* [.046]
IT	-.073 (-.212) [.839]	-.293 (-.813) [.448]	-.187 (-.500) [1-635]	-.543 (-1.510) [.182]	.058 (.510) [.886]	.262	.682 [.654]
Construction	-.334 (-.975) [.367]	-.338 (-1.040) [.338]	-.406 (-1.344) [.228]	.686 (1.885) [.108]	-.783* (-2.403) [.043]	.571	1.981* [.049]
Pharmaceutical	.214 (.584) [.572]	.096 (.275) [.789]	-.791* (-2.464) [.033]	.427 (1.177) [.266]	-.271 (-.825) [.428]	.483	1.871* [.047]
Cement	.180 (.356) [.740]	.422 (.904) [.417]	-.228 (-.474) [.660]	.280 (.525) [.627]	.317 (.491) [.649]	.460	.682 [.463]
Electricity	.533 (1.015) 1.349]	-.031 (-.048) [.863]	-.077 (-.162) [.877]	.119 (.318) [.761]	.095 (.158) [.880]	.302	.519 [.656]
Engineering	-.557* (-1.64) 0.46]	.495 (.976) [.384]	.253 (.579) [.593]	-.095 (-.251) [.814]	-.331 (-.829) [.454]	.659	1.548* [.046]

10. Conclusion

It is argued that the financial manager must consider the factors and carefully analyze sector specific attributes before attempting to achieve the so-called optimal capital structure, as they are vital in the Indian context. It has been found in the case of some Indian firms that the capital structure is too rigid to offer any scope for adjustment. A capital structure of course is based on multiple considerations, which have to be undertaken before trying to achieve an optimal capital structure.

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