DETERMINANTS OF CAPITAL STRUCTURE IN INDIA: A STUDY OF PHARMACEUTICAL AND CHEMICAL INDUSTRIES

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Abstract

The present paper examines the factors influencing capital structure of the companies belonging to two industries namely Pharmaceuticals and Chemical that are listed at Mumbai Stock Exchange Ltd. The secondary data has been used to achieve the objective of this study. The data period ranges from 1999 to 2015 (i.e. 17 years). The chosen period covers a complete business cycle i.e. both recessionary and booming phases of the industries. Here, the researcher has tested the null hypothesis: that there is no significant relationship between the financial leverage and various independent variables. The statistics like coefficient of determination (R^2), ANOVA (F), Durbin Watson, and regression coefficients resulting from the application of Multiple Regression model were applied for the analysis of data. The results indicated that cost of debt and cost of equity are found having negative values of regression coefficients and the same are significant at 2% and 1% level respectively in case of pharmaceuticals.. The relationship between liquidity and leverage is negative (-0.199), but statistically significant. It means that the leverage of the firm is affected by liquidity of the firm. In case of steel industry two variables namely size of the firm and operating leverage are having positive and significant regression coefficients indicating a positive relationship with the leverage ratio whereas cost of debt, cost of equity, and DPR are found having negative and insignificant coefficients during the years 2009 and 2015.

Key words: Capital structure, Financial leverage, Debt/Equity Ratio, Determinants of capital structure

Introduction

Capital structure decisions assume vital significance in corporate financial management because in today's global economic environment, the sustainability of a firm heavily depends on its

ability and success managing this function. Traditionally corporate finance involves three important decisions. These are investment decisions, financing decisions and dividend decisions. Among these three decisions, the capital structure decisions are considered highly important as they relate to long term financing of a firm. Capital structure refers to the different options used by a firm in financing its assets. The capital structure of a company is a combination of debt, equity and other sources of finance that it uses to fund its long term assets. The choices between debt and equity to finance a firm's assets involve a trade-off between risk and return. The excessive use of debt may endanger the survival of the firm, while a conservative use of debt may deprive the firm in leveraging return to equity owners. The firms' choice of a combination of debt and equity depends on the various factors. In recent years many theories have been proposed to explain the determinants of capital structure of the firms. These theories suggest that the firms select capital structures depending on the various costs and benefits associated with debt and equity financing.

Review of Literature

The review of literature in regard to determinants of capital structure is as given below:

Scott (1977) and Moore (1986) argue that along with ample non debt tax shield firms should also have considerable fixed assets, which they can use as mortgage to secure debt. It is also argued that unsecured loan is riskier than secured loan. So, one can envisage a positive relationship between non-debt tax shield and leverage. Past empirical studies also show mixed results about the relationship of non-debt tax shield and leverage.

DeAngelo, Harry and Masulis, M S (1988) argued that even if bankruptcy, agency and related costs are ignored, introduction of non-debt tax shields is enough for a firm to have an optimal capital structure. And even if these costs are taken into account, an optimal capital structure exists, irrespective of availability of non-debt tax shields.

Smith and Watts, (1992) found that firms with high growth options and high cash flow volatility have incentives to reduce debt in their capital structure over the range of progressivity This tax effect suggests a negative association between growth opportunities and debt. According to signaling theory high growth firms face greater information asymmetry and therefore are expected to have higher debt levels to signal higher quality. This signaling model predicts a positive association between growth opportunities and debt. According to agency theory firms

with more growth opportunities are less likely to issue debt for two reasons. First, the underinvestment problem suggests that firms generally issue only risky debt that can be supported by assets-in-place.

Galai, D., and Masulis R. (2002) present the argument that stockholders of levered firms are prone to overinvest that gives rise to the classical conflict between shareholders and bondholders. But if the debt is secured against the fixed assets, the firm is restricted to use the borrowed funds for the same project for which it has borrowed. By this fact, creditors get an improved guarantee of repayment, and thus the chances of recovery are higher. Since this does not happen without collateralization of the fixed assets, the proportion of debt increases with the availability of more fixed assets in the balance sheet of the firm. Hence, the trade-off theory predicts a positive relationship between the tangibility and leverage in any firm. In contrast, the agency cost model predicts a negative relationship of tangibility with leverage in any firm

Grossman, S., and Hart O. (2002) suggested that Tax and tax rate have important implications for business decisions and hence literature considers tax as one of the major determinants of capital structure. They use the absolute amount of the tax which the company pays in the particular financial year as a measure of tax.

Dimitrios L. Papadopoulos et al. (2007) investigate the present status and determinants of capital structure of firms listed in Athens Stock exchange. The analysis is based the data covering the period from 1995-2002. The study finds that determinants of capital structure is subjected to minor changes through years; differences between capital structure practices of retail firms and that of industrial firms are minor; and profitability's the main determinant of capital structure.

Kapoor Sujata, Kanwal Anil (2008) attempt to identify the various factors that influence the capital structure decisions of IT firms in India. The multiple regression analysis is used for the analysis of pooled data for seven years i.e. 2000 to 2006. The study suggests that debt equity ratio payout ratio is positively related to profits, cash flows and it has inverse relationship with the sales growth and market to book value ratio. Husam-Aldin Nizar Al-Malkawai (2008) analyses the factors influencing corporate capital structure decisions of publicly quoted companies in Jordan. The analysis is based on 15-year unbalanced panel data covering the period between 1989 and 2003. The study finds that the factors affecting capital structure include size,

profitability, and age. The findings support for the agency costs hypothesis and are broadly consistent with the pecking order hypothesis.

Titman, S., and Wessel R. (2009) argue in their paper about the negative relationship between size and probability of bankruptcy. Accordingly, trade-off theory predicts an inverse relation between size and bankruptcy and hence positive relationship between size and leverage. On the other hand if we take size as a proxy for information asymmetry then large firms tend to disclose more information about their plans as they are closely watched by the capital market analysts. So the information asymmetry between the insiders and investors in the capital market is less for large firm. Accordingly, the pecking-order theory predicts a negative relationship between size and leverage.

Gupta Amitabh and Banga Charu (2010) bring out the determinants of corporate capital structure using factor analysis and the multiple regressions. Results of factor analysis indicate that leverage, liquidity, profitability, growth and ownership structure are the major factors. According to the regression analysis on these factors shows leverage and liquidity to be the determinants of the capital structure for Indian companies. Majumdar,R (2010) tested the determinants of debt maturity structure decisions and suggests that leverage is the important determinants of debt maturity choice. He finds no evidence to conclude about the impact of effective tax rate on debt maturity.

Abdul Rehman (2012) examines the factors affecting debt equity ratio of the companies listed at Karachi Stock Exchange (KSE) of Pakistan. One year of data i.e. 2009 is referred for the analysis by using regression analysis. The study found the positive relation of debt to total assets, profitability, current ratio with debt equity while cost of debt and capital intensity were found to be significant determinants of debt equity ratio in Pakistan.

Mehta Anupam (2012) investigates the determinants of capital structure for all firms in the areas of real estate, energy sector, construction sector, telecommunications sector, health care and industrial sectors for the period of 2005-2009. Two step analyses were done to analyze the effect of capital structure policy. At first stage correlation analysis and then backward multiple linear regression analysis was carried out at second stage. Profitability, Risk, Liquidity, Size and

Leverage of the firm are the determinants of capital structure policy. Size and the profitability were considered as the most important determinants of capital structure policy.

Ebenezer Agyemang Badu (2013) examines the factors influencing capital structure of listed financial institutions in Ghana using fixed and random effects. Panel data (regression analysis) covering 2005-2009 from the selected companies is used for the study. The results shows statistically significant and positive relationship between Age and liquidity but saw statistically insignificant relationship between profitability, collateral and dividend payout.

Boamah Kofi Baah, Richard Tawiah (2014) examines the determinants of capital structure and also its effect on value of firm for companies listed on the Ghana Stock Exchange. The reference period covers from 2006 to 2011. The ordinary least square (OLS) regression model is used in this study. The Price Volatility, Profit After-Tax, Earning per Share, Size, and Growth in Assets, Return on Equity, and Liquidity as explanatory variables and the Debt equity as the dependent variable uses these factors for the study. The study reveals that cost on equity, profit after tax and size of the company are the main determinants of capital structure of companies listed on the GSE. Profit After-Tax happens to be most important variable that is considered by most sectors in paying their dividend also.

Thus, the available literature on the subject under consideration provides a conclusion that empirical research work in this area has lagged behind the theoretical work, particularly in developing countries. Further, there is hardly any study on the influence of capital structure in Pharmaceutical and Chemical industries in India. Also the time period under reference of the above mentioned studies is relatively short. The present study is aimed to conduct a study which is free from the above mentioned limitations.

Scope and Research Methodology of the Study

The scope of the study is limited to two industrial sectors of Indian economy which includes-Steel and Chemical. These sectors are chosen keeping into account the prominent role these sectors play in the economy as India is the world's third-largest producer of crude steel (up from eighth in 2003) and is expected to become the second-largest producer by 2016. The steel sector in India contributes nearly two per cent of the country's Gross Domestic Product (GDP) and employs over 600,000 people. The per capita consumption of total finished steel in the country has risen from 51 Kg in 2009-10 to about 61.9 Kg in 2015-16. Similarly, the Indian chemical

industry plays an important role in country's economic development. India's Chemical Industry is estimated at around 144 Billion USD at present. This sector forms a part of the basic goods industry and is a critical input for industrial and agricultural development. The chemical sector has witnessed growth of 13-14% in the last 5 years while petrochemicals have registered a growth of 8-9% over the same period. The industry has a 14% weight in the overall Index of Industrial Production (IIP) and it accounts for about 2.11% of the nation's GDP.

 The secondary data has been used to achieve the objective of this study. The data period ranges from 1999 to 2015 (i.e. 17 years) for the sample industries. The chosen period covers a complete business cycle i.e. both recessionary and booming phases of the industries. A sample of 120 companies (60 units from each of the two industries) listed at BSE was selected using simple random sampling technique for this study. The analysis regarding determinants of capital structure has been carried out by dividing the above mentioned period into two sub-groups: (i) between 1999 and 2008(before sub-prime crisis of US); and (ii) between 2009 and 2015(after sub-prime crisis). Here, the researcher has tested the null hypothesis: that there is no significant relationship between the financial leverage and various independent variables. 'Debt to equity ratio' is taken as a measure of financial leverage i.e. a dependent variable. The independent variable taken for the regression analysis are- DPR(dividend payout ratio), COD(cost of debt), SIZELOG10(log of size of firm), DSC(debt service capacity), LIQUIDITY(current ratio), COE(cost of equity), NDTS(non-debt tax shield), Operating leverage), Profitability and ASSETTANG(asset tangibility).

To begin with, step-wise correlation analysis was made so as to understand the problem of multi-co linearity in the data series. No problem of multi-co linearity was detected during the process. After this multiple regression analysis was carried out. The statistics like coefficient of determination (R^2), ANOVA (F), Durbin Watson, and regression coefficients resulting from the application of Multiple Regression model are presented in various tables.

 Results of the Study

Table-1 presents various statistics such as R, R^2, F-value and DW resulting from the regression analysis in case of Steel industry during the period 1999-2008.The value of R^2 is 0.176 which means 17.6 percent of the variation in the debt-equity ratio is caused by the various factors in the model. Durbin Watson test which is applied to check the presence of auto correlation obtains the

value 2.115.It means that data used does not show the problem of autocorrelation. This allows us to carry further analysis based on regression coefficients.

Table-1: Model Summary & ANOVA in case of Steel Industry (1999-2008)

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	F	Sig
.461	.212	0.174	0.442	2.113	6.261	0.000

Table-2 shows the regression coefficients, t values and level of significance obtained by various independent variables for the pre crisis period (1999-2008).It is evident from the table that only two factors out of the eleven have significant value of regression coefficient. These factors are: asset tangibility and liquidity position. Asset tangibility exerts positive influence whereas liquidity exerts negative influence on the leverage. The regression coefficients of other factors are not significant and hence these factors do not put significant impact on leverage.

Table-2: Regression Coefficients of finally selected model in case of Steel Industry (1999-2008)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.079	2.132		.037	.971
PROFITABILITY	.089	.485	.026	.184	.855
GROWTH	.004	.007	.072	.561	.577
ASSETTANG	1.023	1.060	.140	2.966	0.001
SIZELOG10	.311	.633	.060	.492	.625
COD	-.002	.027	-.011	-.081	.936
COE	-.007	.005	-.192	-1.486	.142
LIQUIDITY	-.213	.074	-.357	-2.868	.006
DSC	.008	.183	.005	.041	.967
OPERATINGLEV	-.012	.150	-.011	-.080	.937

NDTS	6.326	11.590	.077	.546	.587
DPR	.272	.676	.050	.402	.689

Let us now analyze the factors affecting leverage during 2009-2015.Table 3 exhibits the Model summary and ANOVA statistics resulting from the regression analyses in case of Steel industry during the post-crisis phase. The value of R^2 is seen of moderate size 0.452.It means 45.2 percent variation in the debt-equity ratio is caused by the model. It is obvious from the model that F-value is significant at.01 level of significance. It means explanatory variables play an important role in determining capital structure. Durbin Watson test obtains the value 1.893 which means that data used does not show the problem of autocorrelation as it is close to two. This allows us to carry further analysis based on regression coefficients.

**Table-3 Summary & ANOVA of finally selected Regression model
in case of Steel Industry (2009-2015)**

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	F	Sig.
.673	.452	.337	1.732	1.893	3.906	.000

Table-4 shows the results of regression analysis run to identify the determinants of capital structure during the post crisis period (2009-2015) in case of Steel Industry. It is clear from the table that the regression coefficient for the relationship between profitability of the firm and leverage is negative (-0.104). The hypothesis that profitability does not influence debt-equity ratio is accepted because beta coefficient is not found significant at 1%.Similarly the relationship between growth of the firm and the leverage is positive and insignificant. However, size of the firm and operating leverage are having positive and significant regression coefficients indicating a positive relationship with the leverage ratio whereas cost of debt, cost of equity, and DPR are found having negative and insignificant coefficients. The regression coefficients concerning liquidity factor is found negative and significant at 5% level because P <0.05.

 Table-4 Regression Coefficients of finally selected model in case of Steel Industry (2009-

2015)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	**Std. Error**	**Beta**		
(Constant)	-8.242	2.411		-3.419	.001
PROFITABILITY	-.610	.673	-.104	-.906	.369
GROWTH	.001	.006	.011	.099	.921
ASSETTANG	1.088	.713	.167	2.825	.024
SIZELOG10	3.620	.728	.562	4.970	.000
COD	-.002	.020	-.011	-.088	.931
COE	-.023	.028	-.093	-.806	.424
LIQUIDITY	-.250	.152	-.206	-2.638	.017
DSC	-.250	.208	-.156	-1.205	.234
OPERATINGLEV	.412	.139	.384	2.970	.005
NDTS	.028	.062	.058	.455	.651
DPR	-.490	.988	-.058	-.497	.622

Table-5 presents Model summary, F-Value and DW statistics resulting from the finally selected regression model in case of Steel industry for the overall period (1999-2015).The value of R^2 is 0.290.It means 29 percent of the variation in the debt-equity ratio is explained by the model. The above is supported by ANOVA model which indicates that F-value is significant at.01 level of significance. It means the explanatory variables play an important role in determining capital structure. Durbin Watson test value is 1.896 which means that data used do not show the problem of autocorrelation. The above analysis allows us to carry further analysis based on regression coefficients.

Table-5 Model Summary & ANOVA in case of Steel Industry (1999-2015)

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	F	Sig.
.538	.290	.227	1.645	1.896	4.600	.000

Table-6 shows the values of regression coefficients related to the Steel industry for the overall period of the study from 1999-2015. It is clear from the table that the values of regression coefficients of five variables namely asset tangibility, size, liquidity, COD and operating leverage are significant at 5 percent level. While there is negative relationship of liquidity and COD with the other three variables namely asset tangibility, size of the firm and operating leverage have positive coefficients meaning thereby these have positive influence on debt-equity ratio.

**Table-6 Regression Coefficients of finally selected model in case of
Steel Industry (1999-2015)**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-3.491	1.493		-2.338	.021
PROFITABILITY	-.249	.385	-.053	-.646	.519
GROWTH	-.001	.005	-.010	-.118	.906
ASSETTANG	1.239	.553	.177	2.242	.027
SIZE	1.909	.463	.336	4.125	.000
COD	-.619	.015	-.190	-2.279	.025
COE	-.008	.005	-.133	-1.679	.096
LIQUIDITY	-.166	.068	-.191	-2.437	.016
DSC	-.119	.127	-.075	-.943	.347
OPERATINGLEV	.213	.080	.211	2.683	.008
NDTS	.036	.048	.063	.744	.459
DPR	-.150	.564	-.021	-.265	.791

Table-7 shows the Model summary and ANOVA with reference to the Chemical industry during the pre crisis phase from 1999-2008. It is clear from the table that the value of R^2 is 0.409.It means 41 percent variation in the debt-equity ratio is caused by the model. The same is obvious from the F-value which is significant at 0.00 level. Durbin Watson test is also applied to check the problem of auto correlation. The test obtains the value 1.938 which is

indicating that there is conclusive evidence regarding the absence of autocorrelation and hence the results are likely to be reliable.

Table-7: Summary & ANOVA of finally selected model in case of Chemical Industry (1999-2008)

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	F	Sig.
.640	0.409	.401	1.289	1.938	7.375	.000

Table-8 shows regression coefficients in case of Chemical industry for the data during the period (1999-2008). Looking at the regression coefficients we find that during the pre crisis phase, cost of debt is having negative value of coefficient and it is statistically significant at 2 percent level of significance. Further the regression coefficient for the relationship between profitability and leverage is negative but it is statistically insignificant. The table also indicates that the variables cost of equity, liquidity and debt service capacity are having negative regression coefficients which are significant at 5 percent level of significance.

Table-8 : Regression Coefficients of finally selected model in case of Chemical Industry (1999-2008)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.378	.712		1.936	.054
PROFITABILITY	-.051	.179	-.014	-.283	.777
GROWTH	-.003	.002	-.060	-1.173	.242

ASSETTANG	.286	.270	.054	1.060	.290
SIZELOG	.203	.250	.045	.811	.418
COD	-.019	.008	-.116	-2.363	.019
COE	-.027	.006	-.250	-4.700	.000
LIQUIDITY	-.238	.040	-.304	-6.016	.000
DSC	-.094	.047	-.109	-1.996	.047
OPERATINGLEV	-.095	.056	-.095	-1.692	.091
NDTS	-.058	.184	-.015	-.313	.754
DPR	.396	.300	.069	1.323	.187

Table-.9 presents the regression Model summary and ANOVA related to the Chemical industry during the post crisis phase from 2009-2015 .The value of R^2 is 0.425.It means 42.5 percent variation in the debt-equity ratio is caused by the model. It is also obvious from the model that F-change is significant at 1 percent level. Durbin Watson test obtains a value 2.197 which is indicating the absence of autocorrelation. The above results indicate that the model is reliable.

Table-9: Model Summary & ANOVA in case of Chemical Industry 2009-2015)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	F	Sig.
1	.652[a]	.425	0.404	1.737	2.197	2.989	.000

Table-10 depicts the values of regression coefficients of independent variables during the phase-II (2009-2015).It is evident from this table that the regression coefficient related to operating leverage and size are positive and significant at 5 percent level of significance. It implies higher the operating leverage, higher will be the debt-equity ratio. Similarly, larger the size, higher is the D/E ratio. The variables growth, DSC, DPR and liquidity are having negative values of coefficient, but none of these are significant except liquidity. So these factors have no impact on the leverage of the firm except liquidity.

Table-5.10: Regression Coefficients of finally selected model in case of Chemical

Industry(2009-2015)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.092	1.106		.987	.324
PROFITABILITY	.077	.198	.022	.390	.697
GROWTH	-.001	.002	-.026	-.443	.658
ASSETTANG	-.558	.378	-.086	-1.475	.141
SIZELOG	.536	.389	.079	1.377	.170
COD	.009	.009	.060	.986	.325
COE	.002	.010	.011	.180	.857
LIQUIDITY	-.150	.064	-.137	-2.347	.020
DSC	-.159	.080	-.118	-1.984	.048
OPERATINGLEV	.029	.011	.145	2.561	.011
NDTS	.010	.038	.016	.270	.788
DPR	-.739	.449	-.094	-1.645	.101

Table-5.11 shows the model summary and ANOVA(F) values for the overall period (1999-2015) in case of Chemical industry. The value of R^2 is moderate (i.e 0.403).It means 40.3 percent variation in the debt-equity ratio is caused by the model. Further the calculated value of Anova(6.574) is significant at 1% level. It means that there is significant variance in capital structure ratio. Durbin Watson was used to check the problem of auto correlation which obtains 2.010 values meaning thereby that there is no problem of auto correlation in various series.

Table-11: Model Summary & ANOVA in case of Chemical Industry (1999-2015)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	F	Sig.

1	0.635	0.403	0.395	1.542	2.010	6.574	.000

Table-12 shows the regression coefficients resulting from the finally selected capital structure model for the overall period (i.e1999-2015) in case of Chemical Industry. It may be seen in the table that the relationship between profitability of the firm and leverage is positive but insignificant. The table also indicates that the relationship between growth of the firm and the leverage is negative but insignificant. Further COD, COE are found having negative values of regression coefficients and the same are significant at 2% and 1% level respectively. The relationship between liquidity and leverage is negative (-0.199), but statistically significant. It means that the leverage of the firm is affected by liquidity of the firm. The regression coefficient of debt service capacity and operating leverage is negative and significant. The former indicates the negative relation with the leverage and the latter indicates a positive relation. It means that increase in the values of DSC, decreases the value of leverage. So the hypothesis of no impact of DSC on debt-equity ratio is rejected. Operating leverage has turned out to be significant determinant of leverage .Further, NDTS has turned as significantly related with the leverage. So, the results yielded by multivariate regression model, have brought clearly that the independent variables under the model exert moderate level of influence on debt-equity ratio. NDTS, operating leverage, cost of debt and cost of equity, DSC, liquidity have turned to be the significant factors in case of Chemical industry, at the overall level.

Table-12:Regression Coefficients of finally selected model in case of Chemical Industry(1999- 2015)

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	1.606	.623		2.578	.010
PROFITABILITY	.052	.134	.015	.387	.699
GROWTH	-.001	.001	-.033	-.868	.386
ASSETTANG	-.108	.227	-.018	-.476	.634

SIZELOG	.192	.217	.034	.886	.376
COD	-.015	.006	.093	-2.467	.014
COE	-.020	.005	-.148	-3.796	.000
LIQUIDITY	-.187	.036	-.199	-5.268	.000
DSC	-.146	.042	-.136	-3.491	.001
OPERATINGL EV	.029	.009	.122	3.276	.001
NDTS	.055	.028	.074	1.98	.054
DPR	-.073	.260	-.011	-.279	.781

After the Chemical industry we investigated the factors affecting debt-equity ratio in case of Computer industry.Table-5.13 exhibits the Model summary and ANOVA results in case of this industry for the pre-crisis phase(1999-2008).The value of R^2 is found small (i.e 0.238).This indicates that 23.81 percent variation in the debt-equity ratio is explained by the model. It is also supported by F-value which is significant at.01 level of significance. It means explanatory variables play an important role in determining capital structure. Durbin Watson test which is applied to check the problem of auto correlation. This test obtains a value 2.148 which means that data used do not show the problem of autocorrelation. This allows us to carry further analyses based on regression coefficients.

Conclusion

The analysis of data, about the influence of various independent factors on leverage, has brought out some interesting findings. The values of R square work out between 0.21 and 0.45 which refers that the influence of various explanatory factors under reference is from lower to moderate on capital structure. In chemical industry the variables cost of debt, cost of equity, liquidity and debt service capacity are having negative regression coefficients during 1999-2008 which are significant at 5 percent level of significance. During 2009-2015, the variables growth, DSC, DPR and liquidity are having negative values of coefficient, but none of these are significant except liquidity. At the overall level, cost of debt and cost of equity are found having negative values of

regression coefficients and the same are significant at 2% and 1% level respectively. The relationship between liquidity and leverage is negative (-0.199), but statistically significant. It means that the leverage of the firm is affected by liquidity of the firm. In case of steel industry two variables namely size of the firm and operating leverage are having positive and significant regression coefficients indicating a positive relationship with the leverage ratio whereas cost of debt, cost of equity, and DPR are found having negative and insignificant coefficients during the years 2009 and 2015. The values of regression coefficients of five variables namely asset tangibility, size, liquidity, COD and operating leverage are significant at 5 percent level in this industry during 1999-2015. While there is negative relationship of liquidity and COD with the other three variables namely asset tangibility, size of the firm and operating leverage have positive coefficients meaning thereby these have positive influence on debt-equity ratio. Thus, the above results need to be kept in mind while deciding the capital structure of a firm.

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