ELSEVIER

Scopus

doi

Journal of Vibration Engineering

ISSN:1004-4523

Registered

- SCOPUS
- GOOGLE SCHOLAR
- DIGITAL OBJECT IDENTIFIER (DOI)
- IMPACT FACTOR 6.1

Our Website
www.jove.science

ANANALYSISOFTHEPHARMACEUTICALA ND CHEMICAL INDUSTRIES IMPACT ONINDIA'SCAPITALSTRUCTURE

AUTHOR:Dr.S. CHANDBASHA

ASSOCIATEPROFESSOR

GLOBALINSTITUTEOFMANAGEMENT,HYDERABAD,TELANGANA,INDIA.

Abstract

The present paper examines the factors influencing capital structure of the companies belongingtotwoindustriesnamelyPharmaceuticalsandChemicalthatarelistedatMumbaiStockExcha nge Ltd. The secondary data has been used to achieve the objective of this study. The dataperiod ranges from 1999 to 2015 (i.e. 17 years).The chosen period covers a complete businesscycle i.e. both recessionary and booming phases of the industries. Here, the researcher has testedthe null hypothesis: that there is no significant relationship between the financial leverage andvarious independent variables. The statistics like coefficient of determination (R^2), ANOVA (F),Durbin Watson, and regression coefficients resulting from the application of Multiple Regressionmodel were applied for the analysis of data. The results indicated that cost of debt and cost ofequity are found having negative values of regression coefficients and the same are significant at2% and 1% level respectively in case of pharmaceuticals.. The relationship between liquidity andleverage is negative (-0.199), but statistically significant. It means that the leverage of the firm isaffected by liquidity of the firm. In case of steel industry two variables namely size of the firmand operating leverage are having positive and significant regression coefficients indicating apositive relationship with the leverage ratio whereas cost of debt, cost of equity, and DPR arefoundhavingnegativeandinsignificantcoefficientsduringtheyears2009and2015.

Keywords: Capitalstructure,Financialleverage, Debt/EquityRatio,Determinantsofcapitalstructure

Introduction

Capital structure decisions assume vital significance in corporate financial management becausein today's global economic environment,the sustainability of a firmheavily depends onitsabilityandsuccessmanagingthisfunction.Traditionallycorporatefinanceinvolvesthreeimportant decisions. These are investment decisions, financing decisions and dividend decisions.Among these three decisions, the capital structure decisions are considered highly important asthey relate to long term financing of a firm. Capital structure refers to the different options usedby 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 betweendebt and equity to finance a firm's assets involve a trade-off between risk and return.Theexcessiveuse of debt may endanger the survival of thefirm, whileaconservative use ofdebtmaydeprivethefirminleveragingreturntoequityowners.Thefirms'choiceofacombinationof debt and equity depends on the various factors.In recent years many theories have beenproposed to explain the determinants of capital structure of the firms. These theories suggest thatthefirmsselectcapitalstructuresdependingonthevariouscostsandbenefitsassociatedwithdebtand equityfinancing.

ReviewofLiterature

Thereviewofliteratureinregardtodeterminantsofcapitalstructureisasgivenbelow:

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

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

Smith and Watts, (1992) found that firms with high growth options and high cash flow volatilityhave incentives to reduce debt in their capital structure over the range of progressivityThis taxeffect suggests a negative association between growth opportunities and debt. According tosignalingtheoryhighgrowthfirmsfacegreaterinformationasymmetryandthereforeare

expected to have higher debt levels to signal higher quality. This signaling model predicts apositive association between growth opportunities and debt. According to agency theory firmswithmoregrowthopportunitiesarelesslikelytoissuedebtfortworeasons.First,theunderinvestme ntproblemsuggeststhatfirmsgenerallyissueonlyriskydebtthatcanbesupportedbyassets-in-place.

Galai, D., and Masulis R. (2002) present the argument that stockholders of levered firms arepronetooverinvest thatgivesrisetotheclassicalconflictbetweenshareholdersandbondholders.But if the debt is secured against the fixed assets, the firm is restricted to use the borrowed fundsfor the same project for which it has borrowed. By this fact, creditors get an improved guaranteeof repayment, and thus the chances of recovery are higher. Since this does not happen withoutcollateralization of the fixed assets, the proportion of debt increases with the availability of morefixed assets in the balance sheet of the firm. Hence, the trade-off theory predicts a positiverelationship between the tangibility and leverage in any firm. In contrast, the agency cost modelpredictsanegativerelationshipoftangibilitywithleverageinanyfirm

Grossman, S., and Hart O. (2002) suggested thatTax and tax rate have important implicationsfor business decisions and hence literature considers tax as one of the major determinants ofcapital structure.Theyuse the absolute amountof the tax which the companypaysin theparticularfinancialyearasameasureoftax.

Dimitrios L. Papadopoulos et al. (2007) investigate the present status and determinants of capitalstructure of firms listed in Athens Stock exchange. The analysis is based the data covering theperiod from 1995-2002. The study finds that determinants of capital structure is subjected tominor changes through years; differences between capital structure practices of retail firms andthatofindustrialfirmsareminor;andprofitability'sthemaindeterminantofcapitalstructure.

Kapoor Sujata, Kanwal Anil (2008) attempt to identify the various factors that influence thecapital structure decisions of IT firms in India. The multiple regression analysis is used for theanalysisofpooleddataforsevenyearsi.e.2000to2006.Thestudysuggeststhatdebtequityratio payout ratio is positively related to profits, cash flows and it has inverse relationship withthesalesgrowthandmarkettobookvalueratio.Husam-AldinNizarAl-Malkawai(2008)analysesthefactorsinfluencingcorporatecapitalstructuredecisionsofpubliclyquote dcompanies inJordan.Theanalysis isbasedon15-yearunbalancedpanel datacoveringtheperiod

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 broadlyconsistentwiththepeckingorderhypothesis.

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

Gupta Amitabh and Banga Charu (2010) bring out the determinants of corporate capital structureusingfactoranalysisandthemultipleregressions.Resultsoffactoranalysisindicatethatleverage, liquidity, profitability, growth and ownership structure are the major factors. Accordingto the regression analysis on these factors shows leverage and liquidity to be the determinants ofthe capital structure for Indian companies. Majumdar,R (2010) tested the determinants of debtmaturity structure decisions and suggests that leverage is the important determinants of debtmaturity choice. He finds no evidence to conclude about the impact of effective tax rate on debtmaturity.

Abdul Rehman (2012) examines the factors affecting debt equity ratio of the companies listed atKarachi Stock Exchange (KSE) of Pakistan. One year of data i.e. 2009 is referred for the analysisbyusingregressionanalysis.Thestudyfoundthepositiverelationofdebttototalassets,profitability, current ratio with debt equitywhile cost of debt and capital intensity were found tobesignificantdeterminantsofdebtequityratioinPakistan.

Mehta Anupam (2012) investigates the determinants of capital structure for all firms in the areasof real estate, energy sector, construction sector, telecommunications sector, health care andindustrial sectors for the period of 2005-2009. Two step analyses were done to analyze the effectof capital structure policy. At first stage correlation analysis and then backward multiple linearregressionanalysiswas carriedoutatsecondstage.Profitability,Risk,Liquidity,Sizeand

Leverage of the firm are the determinants of capital structure policy. Size and the profitabilitywereconsideredasthemostimportantdeterminantsofcapitalstructurepolicy.

Ebenezer Agyemang Badu (2013) examines the factors influencing capital structure of listedfinancial institutions in Ghana using fixed and random effects. Panel data (regression analysis)covering2005-2009fromtheselectedcompaniesisusedforthestudy.Theresultsshowsstatistically significant and positive relationship between Age and liquidity but saw statisticallyinsignificantrelationshipbetweenprofitability,collateralanddividendpayout.

Boamah Kofi Baah, Richard Tawiah (2014) examines the determinants of capital structure andalso its effect on value of firm for companies listed on the Ghana Stock Exchange. The referenceperiod covers from 2006 to 2011. The ordinary least square (OLS) regression model is used inthis 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 dependentvariable uses these factors for the study. The study reveals that cost on equity, profit after tax andsize of the company are the main determinants of capital structure of companies listed on theGSE.ProfitAfter-Taxhappenstobemostimportantvariablethatisconsideredbymostsectorsinpayingtheirdividendalso.

Thus,theavailableliterature onthesubject underconsiderationprovidesa conclusionthatempirical research work in this area has lagged behind the theoretical work, particularly indeveloping countries. Further, there is hardly any study on the influence of capital structure inPharmaceutical and Chemical industries in India. Also the time period under reference of theabove mentioned studies is relatively short. The present study is aimed to conduct a study whichisfreefromtheabovementionedlimitations.

ScopeandResearchMethodologyoftheStudy

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 thesesectors play in the economy as India is the world's third-largest producer of crude steel (up fromeighth in 2003) and is expected to become the second-largest producer by 2016. The steel sectorin India contributes nearly two per cent of the country's Gross Domestic Product (GDP) andemploys over 600,000 people. The per capita consumption of total finished steel in the countryhasrisenfrom51Kgin2009-10toabout61.9Kgin2015-16.Similarly,theIndianchemical

industry plays an important role in country's economic development. India's Chemical Industryis estimated at around 144 Billion USD at present. This sector forms a part of the basic goodsindustry and is a critical input for industrial and agricultural development. The chemical sectorhas witnessed growth of 13-14% in the last 5 years while petrochemicals have registered agrowth of 8-9% over the same period. The industry has a 14% weight in the overall Index ofIndustrialProduction(IIP)anditaccountsforabout2.11%ofthenation'sGDP.

The secondary data has been used to achieve the objective of this study. The data period rangesfrom 1999 to 2015 (i.e. 17 years) for the sample industries. The chosen period covers a completebusiness cycle i.e. both recessionary and booming phases of the industries. A sample of 120companies (60 units from each of the two industries) listed at BSE was selected using simplerandomsamplingtechniqueforthisstudy.Theanalysisregardingdeterminantsofcapitalstructure 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(aftersub-prime crisis). Here, the researcher has tested the null hypothesis: that there is no significantrelationship between the financial leverage and various independent variables. 'Debt to equityratio' is taken as a measure of financial leverage i.e. a dependent variable. The independentvariable taken for the regression analysis are- DPR(dividend payout ratio), COD(cost of debt),SIZELOG10(logofsizeoffirm),DSC(debtservicecapacity),LIQUIDITY(currentratio),COE(costofequity),NDTS(non-debttaxshield),Operatingleverage),ProfitabilityandASSETTANG(assettangibility).

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.Afterthismultipleregressionanalysiswascarriedout.Thestatisticslikecoefficientofdetermination (R^2), ANOVA (F), Durbin Watson, and regression coefficients resulting from theapplicationofMultipleRegressionmodelarepresentedinvarioustables.

ResultsoftheStudy

Table-1 presents various statistics such as R, $R^{2,}$ F-value and DW resulting from the regressionanalysis in case of Steel industry during the period 1999-2008.The value of R^2 is 0.176 whichmeans 17.6 percent of the variation in the debt-equity ratio is caused by the various factors in themodel.DurbinWatsontestwhichisappliedtocheckthepresenceofautocorrelationobtainsthe

value 2.115.Itmeansthatdatauseddoesnotshowtheproblemof autocorrelation.Thisallows ustocarryfurtheranalysisbasedonregressioncoefficients.

Table-1:ModelSummary&ANOVAincaseof Steel Industry(1999-2008)

R	RSquare	Adjusted RSquare	Std.Erroroft heEstimate	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 byvarious independent variables for the pre crisis period (1999-2008).It is evident from thetable 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 positiveinfluencewhereasliquidityexertsnegativeinfluenceontheleverage.Theregressioncoefficients of other factors are not significant and hence these factors do not put significantimpactonleverage.

Table-2:RegressionCoefficientsoffinallyselectedmodelin caseofSteelIndustry(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 Modelsummary and ANOVA statistics resulting from the regression analyses in case of Steel industryduring the post-crisis phase. The value of R^2 is seen of moderate size 0.452.It means 45.2 percentvariation 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 importantrole in determining capital structure. Durbin Watson test obtains the value 1.893 which meansthatdatauseddoesnotshowtheproblemofautocorrelationasitisclosetotwo.Thisallowsustocarry furtheranalysisbasedonregressioncoefficients.

Table-3Summary&ANOVAoffinallyselected RegressionmodelincaseofSteelIndustry(2009-2015)

R	RSquare	Adjusted RSquare	Std.Erroroft heEstimate	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 capitalstructure during the post crisis period(2009-2015) in case of Steel Industry. It is clear from thetable that the regression coefficient for the relationship between profitability of the firm andleverage is negative (-0.104). The hypothesis that profitability does not influence debt-equityratioisacceptedbecausebetacoefficientisnotfoundsignificantat1%.Similarlytherelationship between growth of the firm and the leverage is positive and insignificant. However,sizeofthefirmandoperatingleveragearehavingpositiveandsignificantregressioncoefficients indicatingapositiverelationshipwiththeleverageratiowhereascostofdebt,costof equity, and DPR are found having negative and insignificant coefficients. The regressioncoefficientsconcerningliquidityfactorisfoundnegativeandsignificantat5%levelbecause P<0.05.

Table-4RegressionCoefficientsoffinallyselectedmodelincaseofSteelIndustry(2009-

2015)

Model	UnstandardizedCoefficients		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-5presentsModel summary, F-Value andDW statistics resulting from thefinallyselected regression model in case of Steel industry for the overall period (1999-2015).Thevalue of R^2 is 0.290.It means 29 percent of the variation in the debt-equity ratio is explainedby the model. The above is supported by ANOVA model which indicates that F-value issignificant at.01 level of significance. It means the explanatory variables play an importantroleindeterminingcapitalstructure.DurbinWatsontestvalueis1.896whichmeansthatdata used do not show the problem of autocorrelation. The above analysis allows us to carryfurtheranalysisbasedonregressioncoefficients.

Table-5 ModelSummary&ANOVAincaseofSteelIndustry(1999-2015)

R	RSquare	Adjusted RSquare	Std.Erroroft heEstimate	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 overallperiod of the study from 1999-2015. It is clear from the table that the values of regressioncoefficientsoffivevariablesnamelyassettangibility,size,liquidity,CODandoperatinglever age are significant at 5 percent level. While there is negative relationship of liquidity andCOD with the other three variables namely asset tangibility, size of the firm and operatingleverage have positive coefficients meaning thereby these have positive influence on debt-equityratio.

Table-6RegressionCoefficientsof finallyselectedmodelincaseofSteelIndustry(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 industryduring the pre crisis phase from 1999-2008. It is clear from the table that the value of R^2 is0.409.It means 41 percent variation in the debt-equity ratio is caused by the model. The sameis obvious from the F-value which is significant at 0.00 level. Durbin Watson test is alsoappliedtocheckthe problemofautocorrelation.Thetestobtainsthevalue1.938whichis

indicatingthatthereisconclusiveevidenceregardingtheabsenceofautocorrelationandhencetheresultsarelikelytobereliable.

Table-7:Summary&ANOVAoffinallyselectedmodelincaseofChemicalIndustry(1999-2008)

R	RSquare	Adjusted R Square	Std. Error oftheEstimate	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, costof debt is having negative value of coefficient and it is statistically significant at 2 percent levelof significance. Further the regression coefficient for the relationship between profitability andleverage is negative but it is statistically insignificant. The table also indicates that the variablescost of equity, liquidity and debt service capacity are having negative regression coefficientswhicharesignificantat5percentlevelofsignificance.

Table-8:RegressionCoefficientsoffinallyselectedmodelincaseofChemicalIndustry(1999-2008)

Model	UnstandardizedCoefficients		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 industryduring the post crisis phase from 2009-2015 .The value of R^2 is 0.425.It means 42.5 percentvariation 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 isindicatingtheabsenceofautocorrelation.Theaboveresultsindicatethatthemodelisreliable.

Table-9:ModelSummary&ANOVAincaseofChemicalIndustry2009-2015)

Model	R	R Square	Adjusted RSquare	Std.Erroroft heEstimate	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 operatingleverage and size are positive and significant at 5 percent level of significance. It implies highertheoperatingleverage,higherwillbethedebt-equityratio.Similarly,largerthesize,higheristhe D/E ratio.The variables growth, DSC, DPR and liquidity are having negative values ofcoefficient, but none of these are significant except liquidity. So these factors have no impact ontheleverageofthefirmexceptliquidity.

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

Industry(2009-2015)

Model	UnstandardizedCoefficients		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 percentvariationinthedebt-equityratioiscausedbythemodel.FurtherthecalculatedvalueofAnova(6.574) is significant at 1% level. It means that there is significant variance in capitalstructureratio.DurbinWatsonwasusedtocheckthe problemofautocorrelationwhichobtains 2.010valuesmeaningtherebythatthereisnoproblemofautocorrelationinvariousseries.

Table-11:ModelSummary&ANOVAincaseofChemicalIndustry(1999-2015)

Model	R	RSquare	Adjusted R Square	Std.Errorof theEstimate	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 structuremodel for the overall period (i.e1999-2015) in case of Chemical Industry. It may be seen in thetablethattherelationshipbetweenprofitabilityofthefirmandleverageispositivebutinsignificant. The table also indicates that the relationship between growth of the firm and theleverage is negative but insignificant. Further COD, COE are found having negative values ofregressioncoefficientsandthesamearesignificantat2%and1%levelrespectively.Therelationship between liquidity and leverage is negative (-0.199), but statistically significant. Itmeans that the leverage of the firm is affected by liquidity of the firm. The regression coefficientof debt service capacity and operating leverage is negative and significant. The former indicatesthe negative relation with the leverage and the latter indicates a positive relation. It means thatincrease in the values of DSC, decreases the value of leverage. So the hypothesis of no impact ofDSCondebt-equityratioisrejected.Operatingleveragehasturnedouttobesignificantdeterminant 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 independentvariablesunderthemodelexertmoderatelevelofinfluenceondebt-equityratio.NDTS,operatingleverage,costofdebtandcostofequity,DSC,liquidityhaveturnedtobethe significantfactorsincaseofChemicalindustry,attheoverallevel.

Table-12:RegressionCoefficientsoffinallyselectedmodelincaseofChemicalIndustry(1999-2015)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
	(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
OPERATINGLEV	.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 ofComputer industry.Table-5.13 exhibits the Model summary and ANOVA results in case ofthisindustryforthepre-crisisphase(1999-2008).ThevalueofR^{2}isfoundsmall(i.e0.238).This indicates that 23.81 percent variation in the debt-equity ratio is explained by themodel. It is alsosupported by F-value which is significant at.01 level of significance.Itmeans explanatory variables play an important role in determining capital structure. DurbinWatson test which is applied to check the problem of auto correlation. This test obtains avalue 2.148 which means that data used do not show the problem of autocorrelation. Thisallowsustocarryfurther analysesbasedonregressioncoefficients.

Conclusion

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

regressioncoefficientsandthesamearesignificantat2%and1%levelrespectively.Therelationship between liquidity and leverage is negative (-0.199), but statistically significant. Itmeans that the leverage of the firm is affected by liquidity of the firm. In case of steel industrytwo variables namely size of the firm and operating leverage are having positive and significantregression coefficients indicating a positive relationship with the leverage ratio whereas cost ofdebt, cost of equity, and DPR are found having negative and insignificant coefficients during theyears2009and2015.Thevaluesofregressioncoefficientsoffivevariablesnamelyassettangibility, size, liquidity, COD and operating leverage are significant at 5 percent level in thisindustry during 1999-2015. While there is negative relationship of liquidity and COD with theother three variables namely asset tangibility, size of the firm andoperating leveragehavepositive coefficients meaning therebythesehavepositive influence on debt-equity ratio. Thus,theaboveresultsneedtobekeptinmindwhiledecidingthecapitalstructureofafirm.

References

- Baah,Boamah Kofi, Tawiah Richard and Eric Opoku Febiri (2014), "Industry SectorDeterminants of capital structure and Its Effect on Share Prices in Ghana", *InternationalJournalofEconomics,BusinessandFinance*,Vol.2,No.5,pp.1-19,ISSN:2327-8188.
- DeAngelo, Harry and Masulis, M S (1988). "Optimal Capital Structure under Corporate andPersonalTaxation,"*JournalofFinancial Economics,8,*pp 3-29.
- DimitriosL.Papadopoulosetal.(2007),"CorporateTaxesandImpliedCostofEquityCapital",*JournalofAccountingResearch*,Vol.43,No.5,pp.675-707.
- EbenezerAgyemangBadu(2013)"FactorsinfluencingcapitaldecisionsofCorporateIndia",ICFAIJournalofAppliedFinance,Vol.10,No.2,pp5-16.
- Galai,D.,andMasulisR.(2002),TheOptionPricingModelandtheRiskFactorofStock, *JournalofFinancialEconomics,*3,631-644.
- Grossman,S.,andHartO.(2002):CorporateFinancialStructureandManagerialIncentives,in:McCall,J.(ed.),*TheEconomicsofInformationandUncertainty*,UniversityofChicagoPress.
- Gupta, Amitabh andBangaCharu (2010),"TheDeterminants of capitalstructure Policy". *Decision*,Vol.37,No.2,pp.63-77.

- Husam-AldinNizarAl-Malkawai(2008),"FactorsInfluencingCorporatecapitalstructureEvidencefromJodanianPanelData",InternationalJournalofBusiness,13(2),ISSN:1083-4336
- Kanwal Anil, Kapoor Sujata (2008), "Determinants debt equity Ratios- A Study of IndianInformationTechnologySector",InternationalResearchJournalofFinanceandEconomicsISSN1450-2887Issue15.
- Mehta Anupam (2012),"An Empirical of Determinats of Capital structure-EvidencefromtheUAECompanies",*GlobalReviewofAccountingandFinance*,Vol.3,No.1,pp.18-31.
- Scott, J. (1977): Bankruptcy, Secured Debt and Optimal Capital Structure, *Journal ofFinance*32,1-19.
- Smith, C. W. Jr., Wattsm R. L., 1992. "The investment opportunity set and corporatefinancing, dividend and compensation policies" *Journal Financial Economics 32, 263-292.*