International Journal of Management and Economics
www.managementjournals.net
Online ISSN: 2664-7079; Print ISSN: 2664-7060; Impact Factor: RJIF 5.22
Received: 05-01-2021; Accepted: 25-01-2021; Published: 20-02-2021
Volume 3; Issue 1; 2021; Page No. 16-24

Impact of capital structure on profitability: Evidence from various sectors in the nifty 100 index

Eireen Bharucha, Nisha Prasad, Omkar Pawar, Pratik Jaju, Prithika Kharwar, Vidhi Goradia
Department of Finance, M.Sc Finance, NMIMS University, Mumbai, Maharashtra, India

Abstract
This study examines the capital structure management of various sectors and various companies from India during the 10 years study period from year 2010 to 2020.
One of the most perplexing issues faced by finance managers is to know about the effect of capital structure on the profitability of firm. We investigate the various relationships possible between capital structure and profitability between various sectors, and different companies within that particular sector. Thus, the present study has been undertaken to evaluate the effect of capital structure on the profitability of Nifty 100 companies listed on the National Stock Exchange of India from 2010-2020. Parameters such as financial and operating leverage have been analysed across sectors and companies and other factors affecting profitability like sales growth, firm size, current ratio, GDP growth rate have also been taken into consideration as control variables. The data has been analyzed by using descriptive statistics and multiple panel data regression models. Four different regression models have been used to study the relationship between capital structure and profitability. In these models, we study the individual effect of Degree of Financial Leverage and Degree of Operating Leverage on profitability, that is, ROA and NPR.

Keywords: capital structure, profitability, various sectors, nifty 100 Index

Introduction

In the wake of liberalization and globalization of economic policies across the world, investment opportunities have expanded, financing options have widened, and above all, dependence on capital markets has increased. A new business requires capital and still more capital is required if the firm is to expand. The required funds can come from many different sources and in different forms. Firms can use either debt or equity capital to finance their assets. The best choice is a mix of debt and equity. One of the most perplexing issues faced by financial managers is the relationship between capital structure, which is the mix of debt and equity financing, and stock prices. It is very commonly known that the value of a firm can be maximized by minimizing its cost of capital. Therefore, one of the major goals in current strategic management is to identify the optimal capital structure. The optimal capital structure exists only when the debt and equity combine to reduce the cost of capital and enhance the firms' profitability. The management of the firm itself has to set their capital structure in a way to maximize their firm value, and this decision is really important. The ultimate aim of most companies would be to sustainably increase shareholder value. By sustainably, we hint that the growth must not only come from high leverage. Decisions related to an optimal capital structure have troubled theoreticians for many years. The early work made quite a few assumptions in an effort to simplify the problem and assumed that both the cost of debt and equity were separate from the capital structure, and that the appropriate figure for consideration was the net income of the firm. Using these suppositions, the average cost of capital reduced by using leverage, and the value of the firm (the value of the debt and equity combined) improved, whereas the value of the equity remained the same. Trade-off theory mainly refers to two concepts: cost of financial distress and agency costs. Kraus and Litzenberger provided a statement of the trade-off theory, "optimal leverage provides a trade-off between the tax benefits of debt and the deadweight costs of bankruptcy." This theory assumes that one could achieve benefits of leverage within a capital structure until the optimum capital structure is achieved. The theory acknowledges the tax advantages from the interest payments which reduce the bottom line A major objective of the trade-off theory is to explain the fact that businesses are generally funded partially with debt and partially with equity.

Research gap addressed

Although many research studies have been undertaken in the field of capital structure and profitability, few studies explain the effect of capital structure on profitability in true sense. Therefore, to fill this gap in the literature, the present study attempts to analyze the effect of capital structure on profitability with special reference to the selected firms in India.

1. Time period of 2010 to 2020 for capital budgeting practices and debt equity trade had not been analysed qualitatively or quantitatively
2. Extensive Research analysis on all fifteen sectors (with exception of Banking and Finance Companies- as the equity and debt restrictions differ from other industries) of the NIFTY 100 Index is not present currently.

Capital Structure		Investment Dynamics			
		Risk	Return	Ownership	Perfomance
	D				
A	E	Low risk	Low return	No ownerrship	Temporary
S	B				
S	T				
E	E				
T	Q				
S	U	High risk	High Return Dividend capital	Voting rights	Premanent
	I				
	T				
	y				

Fig 1

Literature Review

1. (Modigliani & Miller, 1958) [4] This paper explained the relationship between capital structure of the organisation with the profitability factors of the company. In the research paper it demonstrates that how in a frictionless world like ours, financial leverage is unrelated to firm value, but in a world where tax plays an important role– deductible interest payments from the debt taken by the company, firm value and capital structure are positively related.
2. (Modigliani & Miller, 1963) [3] This paper used a regression model to explain how profitability reacts to the changes in the capital structure of the organisation. This research has been extensive and added personal taxes to the analysis and concluded that optimal debt usage occurs on a macroeconomic level, but it merely has any effect, more like it does not exist at the firm level. Interest expense being deducted at the firm level is like an compensation at the investor level.
3. (Myers, 1984): motivated by the adverse selection model of Myers and Majluf propounded pecking order theory. The theory states that companies show a distinct preference for utilizing internal finance (as retained earnings or excess liquid assets) over external finance. If internal funds are insufficient to finance investment opportunities, a company might obtain external finance, but it will choose among various external finance sources so as to minimize additional costs.
4. (Mirigianakis, Asteriou and Voulgaris, 2002): This study explains the capital structure of the company is significantly influenced by utilization of assets, gross and net profitability and total assets. In their further research in the year 2004, they also found that profitability is the main factor which influences the capital structure of the company.
5. (Lara and Mesquita, 2003): This study reveals a fact that the best and exemplary ratio of equity capital and debt capital will boost the net worth of a company (profitability) equally with return rates.
6. (Baral, 2004) has made an attempt to determine the factors determining the capital structure of companies listed in the Nepal Stock Exchange. A cross-sectional analysis was done taking into consideration industries from different sectors such as trading, commercial banks, hotels, etc. It was found from the result that size, growth rate and earning rate have statistically significant influence on capital structure decisions.
7. (Amidu, 2007) has examined the determinants of the capital structure of banks in Ghana. The research concludes that some of the factors that determine the capital structure of the banks in Ghana are profitability, growth rate, corporate tax, asset structure and bank size. A multi regression model has been used so as to understand the significance of different factors influencing the capital structure decisions of the banks of Ghana.
8. (Deari and Deari, 2009) have tried to investigate the factors determining the capital structure. The study concludes that profitability, tangibility, size and growth affect capital structure decisions while non-debt tax shields do not affect capital structure decisions.
9. (Onaolapo and Kajola, 2010) have concluded from their study that the debt ratio has a significantly negative impact on the firm's financial measures. They have employed ordinary least squares as a measure of estimation. The variables used for financial measures in the paper were ROA and return on equity.
10. (Sheikh and Wang, 2011) have investigated into the factors determining the capital structure of 160 firms listed in the Karachi Stock Exchange during 2003–2007. The multi-regression model was run and it was concluded from the study that profitability, tangibility, earning volatility and liquidity are negatively related to leverage, while the firm size is positively related to leverage. It is also observed that the non-debt tax shield and growth opportunity have no significant influence on the capital structure.
11. (Addae *et al*., 2013,) [1] The research paper analysed the relationship between capital structure and profitability of listed firms in Ghana during the five year period from 2005 to 2009. Literature review on the relationship between the firms' profitability and capital structure was not so conclusive about its evidence of what should be the optimal capital. Regression analysis was used to demonstrate the

relationship between capital structure and profitability. Also, average profitability and debt ratios were used to determine whether Ghanaian listed firms depended on debt or not.

12. (Takeh & Navaprabha, 2015) did a study on Capital structure and its impact on financial performance of selected Indian Steel Industry during 2007 to 2012. The result showed that there was a negative relationship between capital structure and financial performance of Indian Steel Industry. The multiple regression and ANOVA indicated that there is a significant impact of capital structure on OPM, ROCE, ROE and there is no significant impact of capital structure on ROA.
13. (Singh & Singh, 2016) The paper focused on listed Cement Companies in India for the period 2009 to 2014. Based on correlation coefficient, it was found that there was a negative relationship between debt and profitability i.e. companies with higher proportion of debt tend to have low profitability. Also, it was found that the firms under consideration did not have sound debt-equity composition in their capital structure and hence failed to enjoy benefits of leverage properly.
14. (Kalyani & Mathur, 2017) [2] "What will be an optimum capital structure for a firm?" has been one of the most difficult questions to answer as well as the most crucial decision for every firm. This research paper has explained the relationship between capital structure and profitability. They have used Profit ratio as their dependent variables such as ROA (Return on Assets) and Net Profit Ratio, is taken into consideration and the effect of independent variables which are Sales of a firm, Total Assets of a firm, Debt Service Capacity, Dividend Pay-Outs, Degree of Financial Leverage, Degree of Operating Leverage of the firms belonging to various sectors in NIFTY 100 of India were chosen for study. The paper concluded that various independent factors did have a significant relationship with Net profit ratio and ROA.
15. (Singh & Bagga, 2019) [5] One of the major concerns faced by finance managers is to know about the effect of capital structure on the profitability of a firm. This paper studies the effect of capital structure on the profitability of Nifty 50 companies listed on NSE of India from 2008 – 2017. The data has been analyzed by using descriptive statistics, correlation and multiple panel data regression models. They have done detailed analysis about the effect of total debt and total equity ratios on profitability, that is, ROA and ROE. They concluded that there is a significant positive impact of capital structure on firm's profitability.

Data and Research Methodology

Sampling and Design

The study consists of a sample of companies from 15 different sectors all part of the Nifty 100 Index which comprises Nifty 50 & Nifty Next 50 Index. The Financial Services sector was excluded since the ratios for this sector are different from other sectors and hence it won't be a like to like comparison. Top 5 firms as per market capitalisation are selected from each of these 15 sectors for the purpose of this study the study comprises a period of 10 years, from 2010 to 2020. The sample data of selected firms was taken from the financial statements of the respective firms and from moneycontrol. Data thus obtained was a panel data set having 750 data points. The Judgement Sampling which is a non-random sampling technique is chosen for sample selection. Descriptive statistics, Correlation and Multiple-regression analysis techniques were used to study the influence of independent variable which are Debt-Equity Ratio, GDP Growth, Log Sales, Growth of assets, Current Ratio, Degree of financial leverage and Operating leverage on dependent variables representing the financial performance which are by ROA (Return on Assets) and Net Profit Ratio.

Table 1: Description of how sample sectors were selected.

Number of sectors listed in NSE - NIFTY 50 and NIFTY next 50	17
(-) Financial services sectors	-2
Remaining non-financial sectors	15

The 15 sectors are as follows

Table 2: Classification of firms

List of sectors from NIFTY 50 and NIFTY next 50	
1. Automobile	9. Industrial Manufacturing
2. Cement	10. Metals
3. Chemicals	11. Fertilizers & Pesticides
4. Engineering Construction	12. Pharma
5. Consumer Goods	13. Media & Entertainment
6. Energy - Oil & Gas	14. Telecommunication
7. Energy - Power	15. Textile
8. IT	

Research Hypothesis

1. Ho: There is no significant positive relationship between the degree of financial leverage and ROA
2. Ho: There is no significant positive relationship between the degree of financial leverage and Net profit ratio
3. Ho: There is no significant positive relationship between degree of operating leverage and ROA
4. Ho: There is no significant positive relationship between the degree of operating leverage and Net profit ratio.

Explanatory and Control Variables

The Statistical Techniques used for analysis are Pearson's Coefficient of Correlation and Regression Analysis Model to analyse the unique impact of Capital Structure on Profitability. In addition to above tools, descriptive statistics such as Mean, Mode, Standard Deviation, etc. are also used. The various variables taken for this research study are discussed as follows:

Dependent Variable

- Return on Assets (ROA) is measured as the ratio between Earnings before Interest and Taxes (EBIT) and Total Assets. Profitability is a very vital variable for a firm. A firm having a high profitability and sales turnover would not rely on Debt Capital, but if it goes for external financing, it would face no difficulty in bearing the fixed charges associated with it. Corporate Financial Performance (Profitability) or ROA = Avg. EBIT/Avg. Total Assets
- Net Profit Ratio (NP Ratio) expresses the relationship between Net Profit after Taxes and Sales. This ratio is a measure of the overall profitability of the organisation. Net profit is arrived at after considering both the operating and non-operating items of incomes and expenses. The ratio indicates what portion of the net sales is left for the owners

after all expenses have been met. Higher the net profit ratio, higher is the profitability of the business.

Net profit ratio = (Net profit after tax / Net sales) × 100

Independent Variables

- **Size of the Firm:** It is the most important variable for every firm because a firm's sustainability mostly depends on its size and also the income part which is directly proportional to its sales turnover. It can also be said that if a firm's sales turnover increases, then there is a probability that its profit will increase which would result in an increase in debt service capacity (interest). As a result, the firm would become capable of affording more debt. The financial institutions and banks would easily provide loan if a firm's sales turnover is sound and the amount of fixed charges can be predicted to be serviced effectively.

Size of the Firm = Log (Average Sales)

- **Debt to Equity:** The ratio is used to evaluate a company's financial leverage. The D/E ratio is an important metric used in corporate finance. It is a measure of the degree to which a company is financing its operations through debt versus wholly-owned funds. More specifically, it reflects the ability of shareholder equity to cover all outstanding debts in the event of a business downturn
- **Asset Growth Rate (AGR):** Capital growth, or capital appreciation, is an increase in the value of an asset or investment over time. Capital growth is measured by the difference between the current value, or market value, of an asset or investment and its purchase price, or the value of the asset or investment at the time it was acquired.
- **GDP Growth Rate (GGR):** An economic growth rate is the percentage change in the value of all of the goods and services produced in a nation during a specific period of time, as compared to an earlier period.
- **Current Ratio (CR):** The current ratio is a liquidity ratio that measures a company's ability to pay short-term obligations or those due within one year. It tells investors and analysts how a company can maximize the current assets on its balance sheet to satisfy its current debt and other payables. CR: Current Asset/Current Liability
- **Degree of Financial Leverage:** Financial leverage is measured as the ratio between total debt and total asset. The total debt includes current liabilities, provisions and borrowings. Borrowings consist of both the short-term and long-term borrowings. It is given by:
  DFL= EBIT/EBIT-Interest, where DFL is the Degree of Financial Leverage.
- **Degree of Operating Leverage:** is a multiple that measures how much the operating income of a company will change in response to a change in sales. Companies with a large proportion of fixed costs (or costs that don't change with production) to variable costs (costs that change with production volume) have higher levels of operating leverage. DOL= %Change in sales/ %Change in EBIT

We studied the relationship between Return on Total Assets (ROA) with Capital Structure Management of firms through two models as below:

ROA = b0 + b1*DOL + b2*SIZE + b3*GGRt + b4*AGR + b5*D/E + b6*CR + Error
ROA = b0 + b1*DFL + b2*SIZE + b3*GGRt + b4*AGR + b5*D/E + b6*CR + Error

We also studied the relationship between Net Profit Ratio (NPR) with Capital Structure Management of firms through two models as below:

NPR = b0 + b1*DOL + b2*SIZE + b3*GGRt + b4*AGR + b5*D/E + b6*CR + Error
NPR = b0 + b1*DFL + b2*SIZE + b3*GGRt + b4*AGR + b5*D/E + b6*CR + Error

The models above are created after considering the fact that profitability will not only be affected by working capital management. There will be several other things that will affect a company's profit. Some of these things are:

1. The size of the company which is Natural log of the annual sales (Size)
2. The YoY Asset Growth Rate (AGR)
3. The YoY GDP Growth Rate (GGR)
4. The Degree of Financial Leverage (DFL)
5. The Debt to Equity Ratio (D/E)
6. The Degree of Operating Leverage (DOL)
7. Current Ratio (CR)

All these factors are included in the regression model as control variables. Hence these factors will be constant throughout all the models. The only difference in these models will be that each one of them will have a different capital structure ratio like DOL or DFL. So since all the other things are kept constant the output of the regression will tell us the relationship between the individual capital structure ratios and profitability.

For analysing the relationship between capital structure and profitability for companies within a single sector, one company with the highest market capitalisation will be considered as the base company and other companies will be assigned dummy variables to run panel regression between different companies within the same sector and across a period of ten years. The results of the four models mentioned above will be analysed individually to determine how the capital structure is affecting profitability of these companies and to determine which company is earning better profits because of better capital structure management. Similarly while analysing the relationship between capital structure management and profitability for all the fifteen sectors. One sector will be considered as the base sector, rest fourteen sectors will be assigned dummy variables to run Panel regression between sectors across a period of ten years. The results of all the four models will again be analysed individually to determine whether capital structure management is affecting profitability of all the sectors and which sector is getting a competitive advantage owing to better capital structure management.

Problems encountered during data cleansing and their solutions

Heteroskedasticity: One of the assumptions of regression is that the variance of the error term should be constant. If it is changing, then we call it heteroskedasticity. These are of two types: conditional and unconditional heteroskedasticity. There are two methods to detect and correct this issue. We can either draw a visual plot or perform Breusch-Pagan Test.

Serial Correlation: One of the assumptions of regression is that the error terms should be independent of each other. If error terms are correlated, then we have the issue of serial correlation. To detect and correct this we can use Durbin-Watson Test.

Multicollinearity: Multicollinearity refers to when two or more independent variables (or combinations of independent variables) are highly (but not perfectly) correlated with each other. With multicollinearity, the regression coefficients may not be individually statistically significant even when the overall regression is significant as shown by the F-statistic.

Data Interpretation and Analysis

The method of Ordinary Least Squares (OLS) regression was employed to study the relationship between profitability and capital structure. The net profit ratio and return on asset were taken as the dependent variable. The independent variables were – size of the company, asset growth rate, GDP growth rate, leverage ratio, current ratio, degree of operating leverage and degree of financial leverage were taken in all the regressions. To incorporate for the effect of industries, some industry dummy variables were also taken. The sample has been divided into fifteen categories –IT, Metals, Chemicals, Pesticides, Engineering construction, Industrial manufacturing, Consumer goods, Energy- Oil and gas, Power, Pharmaceutical, Telecom, Cement, Automobile, Textile and Media. The Information Technology (IT) industry was taken as the comparison industry and all other industries were assigned a dummy variable- IT, Metals, Chemicals, Pesticides, Engineering construction, Industrial manufacturing, Consumer goods, Energy- Oil and gas, Power, Pharma, Telecom, Cement, Automobile, Textile and Media for the order specified above. The regression analysis has been done to study the collective impact of all the industries as well as to analyze any differences between different types of industries identical in all other respects. The regression models including the dummy variable have been presented alongside. The test for the significance of the included dummy variable has also been presented in each case.

Regression results with Net Profit Ratio (NPR)

A. Effect of degree of financial leverage on net profit ratio (NPR)

The results, tabulated suggest that there is a significant negative relationship between the degree of financial leverage and net profit ratio of the firm.There is a positive but insignificant relationship between the IT sector and other sectors like Metal, Chemicals, Pesticides, Engineering Construction, Power, Pharma and Telecom, while the correlation with other industries is negative. Also Industrial Manufacturing has a positive and significant relationship with the IT sector. This suggests that if everything else remains constant then for a given level of financial leverage the Industrial Manufacturing sector has higher NPR as compared other industries.

Table 3: Effect of degree of financial leverage on net profit ratio (NPR)

Regression Statistics	
Multiple R	0.959587
R Square	0.876972
Adjusted R Square	0.701432
Standard Error	0.088619
Observations	150

	Coefficients	Standard Error	t Stat	P-value
Intercept	-0.450580	0.469946	-0.958791	0.034042
SIZE	0.264394	0.111193	2.377798	0.019687
CR	0.007845	0.021959	0.357279	0.007218
GGR	0.207866	0.689428	0.301505	0.007638
D/E	0.301894	0.121682	2.481010	0.015096
AGR	-0.181608	0.098128	-1.850732	0.067723
DFL	-0.349660	0.103387	-3.382051	0.001094
Metals	0.016686	0.098427	0.169524	0.865792
Chemicals	0.088139	0.114859	0.767367	0.445015
Pesticides	0.053690	0.104616	0.513210	0.609152
Engineering Construction	0.074066	0.080408	0.921136	0.359617
Industrial Manufacturing	0.223193	0.084397	2.644568	0.009760
Consumer goods	-0.060103	0.058638	-1.024976	0.308317
Energy - Oil & Gas	-0.467229	0.098907	-4.723924	0.000009
Power	0.004998	0.210112	0.023785	0.981080
Pharma	0.179549	0.096074	1.868858	0.065128
Telecom	0.032645	0.276631	0.118008	0.906553
Cement	-0.035045	0.173642	-0.201823	0.840908
Automobile	-0.119342	0.161411	-0.739366	0.463285
Textile	-0.483870	0.299323	-1.616549	0.112530
Media	0.107691	0.444818	0.242100	0.809734

B. Effect of degree of operating leverage on net profit ratio

The results, tabulated in table 4 suggest that there is a negative correlation between the degree of operating leverage and net profit ratio.The firm size, current ratio, GDP growth and debt- to equity ratios are positively correlated while the asset growth rate is negatively correlated. The relationship between metal, chemical, pesticides, engineering construction, industrial manufacturing, power, pharma, telecom, cement and media with respect to Information Technology is positive, while the correlation of other industries are negative. This suggests that for a given degree of operating leverage, keeping the control variables as constant the power sector earns the highest net operating profit.

Table 4: Effect of degree of operating leverage on net profit ratio

Regression Statistics	
Multiple R	0.927662
R Square	0.829492
Adjusted R Square	0.745473
Standard Error	0.09346
Observations	150

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-0.838850	0.481857	-1.740869	0.008537
SIZE	0.419741	0.106057	3.957690	0.000158
CR	0.017613	0.022956	0.767262	0.044508
GGR	0.377782	0.731450	0.516484	0.006069
D/E	0.091303	0.110867	0.823532	0.041254
AGR	-0.335488	0.090754	-3.696659	0.000388
DOL	-0.000810	0.000602	-1.344368	0.018245
Metals	0.130810	0.097259	1.344967	0.182256
Chemicals	0.095999	0.121617	0.789354	0.432128
Pesticides	0.050913	0.110332	0.461455	0.645665
Engineering Construction	0.088556	0.084657	1.046052	0.298538
Industrial Manufacturing	0.317689	0.084657	3.752670	0.000321
Consumer goods	-0.071052	0.061728	-1.151049	0.252978
Energy - Oil & Gas	-0.487924	0.104068	-4.688507	0.000011
Power	0.329069	0.196652	1.673356	0.097977
Pharma	0.237946	0.099532	2.390645	0.019054
Telecom	0.233942	0.298984	0.782456	0.437790
Cement	0.030372	0.196863	0.154280	0.878035
Automobile	-0.113884	0.178720	-0.637221	0.527009
Textile	-0.246570	0.321008	-0.768112	0.446183
Media	0.153240	0.490934	0.312139	0.756287

Regression results with Return on Assets (ROA)

A. Effect of degree of financial leverage on return on assets

The table presents the regression results when the return on assets is regressed on degree of financial leverage and the control variables. The results are tabulated in table 5. The t-test shows that the results are significant at the 5% level and that financial leverage and ROA are negatively correlated. As seen in the results, when the company's financial leverage increases by one, the ROA decreases. This is as expected in reality because when debt is pumped in, the cash balance goes up ultimately the asset value goes up and ROA goes down (keeping other factors constant). The relationship between chemicals, pesticides, engineering construction, industrial manufacturing and pharma are positive with respect to information technology while it is negative for the rest of the industries. The results suggest that for a given inventory and control variables, the Industrial Manufacturing industry earns a higher return on assets than all the given industries

Table 5: Effect of degree of financial leverage on return on assets

Regression Statistics	
Multiple R	0.92341
R Square	0.878005
Adjusted R Square	0.720506
Standard Error	0.064082
Observations	150

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-0.324921	0.339829	-0.956131	0.034175
SIZE	0.283063	0.080406	3.520413	0.000699
CR	-0.000817	0.015879	-0.051425	0.009591
GGR	0.152474	0.498542	0.305841	0.007605
D/E	0.230472	0.087991	2.619269	0.010454
AGR	-0.218866	0.070958	-3.084431	0.002760
DFL	-0.236858	0.074762	-3.168180	0.002140
Metals	-0.022325	0.071175	-0.313666	0.754552
Chemicals	0.047699	0.083057	0.574292	0.567305
Pesticides	0.006207	0.075650	0.082046	0.934805
Engineering Construction	0.021671	0.058145	0.372704	0.710308
Industrial Manufacturing	0.142330	0.061029	2.332157	0.022086

Consumer goods	-0.030757	0.042403	-0.725347	0.470255
Energy - Oil & Gas	-0.418959	0.071522	-5.857763	0.000000
Power	-0.039330	0.151937	-0.258857	0.796379
Pharma	0.110408	0.069474	1.589207	0.115771
Telecom	-0.181564	0.101111	-1.795689	0.078840
Cement	-0.140187	0.063468	-2.208795	0.031996
Automobile	-0.079987	0.058997	-1.355778	0.181514
Textile	-0.397869	0.109405	-3.636662	0.000673
Media	-0.159310	0.162585	-0.979861	0.332068

B. Effect of degree of operating leverage on return on assets

Table 6 represents the regression results when the return on assets is regressed on degree of operating leverage and the control variables. As seen in the results, return on assets is negatively correlated with degree of operating leverage and the coefficient is significant at the 5% level. There is a positive relationship between metal, chemical, pesticides, engineering construction, industrial manufacturing, power and pharma with respect to Information Technology, the rest of the industries have a negative relationship. It is inferred that for a given degree of operating leverage and control variables, the Industrial manufacturing industry generates higher return on assets than all the given industries

Table 6: Effect of degree of operating leverage on return on assets

Regression Statistics	
Multiple R	0.904365
R Square	0.847003
Adjusted R Square	0.783968
Standard Error	0.067097
Observations	150

	Coefficients	***Standard Error***	***t Stat***	***P-value***
Intercept	-0.588445	0.345933	-1.701035	0.009264
SIZE	0.388097	0.076140	5.097136	0.000002
CR	0.005799	0.016480	0.351886	0.007258
GGR	0.271406	0.525121	0.516845	0.006066
D/E	0.087708	0.079594	1.101943	0.002736
AGR	-0.322884	0.065154	-4.955698	0.000004
DOL	-0.000577	0.000432	-1.333646	0.018593
Metals	0.054901	0.069824	0.786278	0.433917
Chemicals	0.053540	0.087311	0.613216	0.541391
Pesticides	0.004401	0.079209	0.055562	0.955823
Engineering Construction	0.031415	0.060777	0.516889	0.606592
Industrial Manufacturing	0.206530	0.060777	3.398176	0.001039
Consumer goods	-0.038077	0.044315	-0.859221	0.392664
Energy - Oil & Gas	-0.432841	0.074712	-5.793438	0.000000
Power	0.180071	0.141180	1.275471	0.205659
Pharma	0.149869	0.071456	2.097367	0.038967
Telecom	-0.086714	0.116013	-0.747449	0.458439
Cement	-0.111275	0.076388	-1.456713	0.151706
Automobile	-0.078008	0.069348	-1.124875	0.266235
Textile	-0.285365	0.124559	-2.290998	0.026396
Media	-0.137765	0.190495	-0.723194	0.473070

Regression results across companies

In order to gauge the impact of capital structure on profitability across companies, two different sets of regression were performed with ROA and NPR as the dependent variables, considering one independent variable out of - DOL and DFL at a time with companies in that industry as dummy variable keeping one company as the base and by keeping the control variables constant throughout. Out of the two sets of regressions if a company is seen to have the highest beta in at least 3 out of the 4 results then it was ranked 1 and based on the same logic other companies were also ranked. The results in the table demonstrate the extent of impact of each parameter on a company's profitability. The table can be interpreted as follows: The first 5 rows imply that for the textile industry if all the control variables are kept constant then for the same level of DFL or DOL page industries would earn the highest NPR & ROA. The risk rank tells us which company is more risky as compared to others by comparing their DOL and DFL with the industry average. For example the risk ranks of the cement sector tell us that Shree cement is a more risky company as compared to the other cement companies shown in the table whereas ACC cement is the least risky company.

Table 7: Extend of impact of capital structure on profitability of companies.

		Rank				
Sector	**Company**	**NPR - DFL**	**ROA - DFL**	**NPR - DOL**	**ROA - DOL**	**Risk Rank**
Textile	Page Industries	1	1	1	1	3
Textile	Alok Industries	5	5	5	5	2
Textile	Welspun India	3	3	3	4	5
Textile	Garware Technic	2	2	2	2	1
Textile	Swan Energy	4	4	4	3	4
Cement	Grasim Ind	5	4	4	3	4
Cement	Shree Cements	2	2	5	4	1
Cement	UltraTech Cement	1	1	1	1	3
Cement	ACC	3	5	3	5	5
Cement	Ambuja Cements	4	3	2	2	2
Auto	Maruti Suzuki	4	5	4	5	1
Auto	Bajaj Auto	2	2	2	2	2
Auto	Mahindra & Mahindra	5	4	5	4	4
Auto	Eicher Motors	1	1	1	1	3
Auto	Hero MotoCorp	3	3	3	3	5
Pharma	Sun Pharma	1	1	1	1	5
Pharma	Dr. Reddy's Lab	2	3	2	3	2
Pharma	Divi's Lab	3	2	3	2	3
Pharma	Cipla	5	5	5	5	1
Pharma	Aurobindo	4	4	4	4	4
Communication	Vodafone-Idea	2	2	2	2	2
Communication	Tata Communications	3	3	3	3	4
Communication	Suyog Telematics	5	5	5	5	3
Communication	Bharti Airtel	1	1	1	1	5
Communication	MTNL	4	4	4	4	1
Media	Sun TV	4	1	4	1	2
Media	Zee Entertainment	5	2	5	2	3
Media	TV 18	2	5	2	4	4
Media	Network 18	3	4	3	5	5
Media	TV Today Network	1	3	1	3	1
Engineering and construction	L&T	1	1	1	1	5
Engineering and construction	GMR	5	5	5	4	1
Engineering and construction	IFRB	3	2	3	2	4
Engineering and construction	Ircon Developers	2	3	2	3	3
Engineering and construction	NCC	4	5	4	5	2
Industrial Manufacturing	Siemens	5	5	5	5	5
Industrial Manufacturing	ABB India	3	3	3	3	1
Industrial Manufacturing	BHEL	4	4	4	4	3
Industrial Manufacturing	Thermax	2	2	2	2	4
Industrial Manufacturing	BEML	1	1	1	1	2
IT	TCS	1	1	1	1	4
IT	Infy	3	3	3	3	5
IT	HCL Tech	2	2	2	2	2
IT	Wipro	4	4	4	4	3
IT	Tech M	5	5	5	5	1
Chemicals	Pidilite	4	4	4	4	1
Chemicals	Aarti	1	1	3	3	3
Chemicals	Atul	5	5	5	5	5
Chemicals	Vinati Organics	3	3	2	1	2
Chemicals	Navin Fluorine	2	2	1	2	4
Pesticides	UPL	2	1	2	1	2
Pesticides	PI Industries	1	2	1	2	5
Pesticides	Bayer Cropscience	5	4	5	4	4
Pesticides	Rallis India	3	3	3	3	3
Pesticides	BASF	4	5	4	5	1
Metals	Hindalco	5	5	5	5	3
Metals	JSW Steel	2	3	2	3	1
Metals	Tata Steel	4	2	3	2	5
Metals	Hindustan Zinc	1	1	1	1	4
Metals	NALCO	3	4	4	4	2

Energy Power	NTPC	5	3	3	3	3
Energy Power	Power Grid Corporation	2	1	2	1	2
Energy Power	NHPC	1	2	1	2	5
Energy Power	Torrent Power	4	5	5	5	4
Energy Power	Tata Power	3	4	4	4	1
Energy - Oil & Gas	Bharat Petroleum	5	4	5	4	5
Energy - Oil & Gas	GAIL	1	2	2	2	4
Energy - Oil & Gas	IOCL	2	5	3	5	3
Energy - Oil & Gas	ONGC	3	1	1	1	1
Energy - Oil & Gas	Hindustan Petroleum	4	3	4	3	2
Consumer Goods	Britannia	4	4	4	4	3
Consumer Goods	ITC	1	1	1	2	2
Consumer Goods	Asian Paints	2	3	3	3	1
Consumer Goods	HUL	5	5	5	5	5
Consumer Goods	Nestle India	3	2	2	1	4

Table 8: Relationship between profitability and capital Structure

Industry	**NPR-DFL**	**ROA-DFL**	**NPR-DOL**	**ROA-DOL**
Metals	*Y*	*Y*	*Y*	*Y*
Chemical	*N*	*N*	*Y*	*Y*
Pesticides	*Y*	*Y*	*N*	*Y*
Pharma	*N*	*Y*	*Y*	*Y*
Communication	*Y*	*N*	*Y*	*Y*
Media	*Y*	*Y*	*Y*	*N*
Engineering Construction	*Y*	*Y*	*Y*	*Y*
Industrial Manufacturing	*Y*	*Y*	*Y*	*Y*
IT	*N*	*N*	*Y*	*Y*
Energy - Oil & Gas	*Y*	*N*	*Y*	*Y*
Energy - Power	*Y*	*Y*	*Y*	*Y*
Consumer Goods	*N*	*N*	*Y*	*Y*
Textile	*Y*	*Y*	*Y*	*Y*
Automobile	*Y*	*Y*	*Y*	*Y*
Cement	*N*	*Y*	*Y*	*Y*

Conclusions

Capital Structure is an important aspect of financial decision making. The companies need to raise an appropriate amount from debt and from equity sources. It can help them to enhance their profitability. The analysis done on company level shows that for some companies and sectors the relationship between profitability and capital structure isn't significant but that doesn't imply that the profitability of these companies isn't affected by capital structure it may be just that the effect isn't that significant and hence it wasn't identified by the statistical measures. The same is justified by the analysis done on sector level which suggests that overall capital structure affects the profitability of the companies in the Indian Market.

The analyses presented above can help the companies identify the areas where there is a scope of improvement for better performance. From our analysis on the panel data of 75 companies listed on NIFTY 100 we conclude that when financial leverage is increased by a unit, the ROA will decrease, as the asset side becomes more cash heavy. Hence the relationship is inversely proportional.As seen in the results, return on assets is negatively correlated with degree of operating leverage and the coefficient is significant. We suggest that there is a negative correlation between the degree of operating leverage and net profit ratio. The results, tabulated suggest that there is a significant negative relationship between the degree of financial leverage and net profit ratio of the firm.

References

1. Addae AA, Baasi MN, Hughes D. The Effects of Capital Structure on Profitability of Listed Firms in Ghana. European Journal of Business and Management. 2013; 5(31):215-229.
2. Kalyani DS, Mathur DN. Impact of capital structure on profitability: with reference to select companies from oil and natural gas industry of India. Journal of Modern Management & Entrepreneurship. 2017; 07:129-137.
3. Modigliani, Miller. Corporate income taxes and the cost of capital: A correction. The American Economic Review. 1963; 53(3):433-443.
4. Modigliani F, Miller MH. The cost of capital, corporate finance and the theory of investment. American Economic Review. 1958; 48(3):261-297.
5. Singh NP, Bagga M. The Effect of Capital Structure on Profitability: An Empirical Panel Data Study. Jindal Journal of Business Research. 2019; 8(1):65-77.