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Influence of Capital structure on Firm Performance: Empirical Evidence from Indian Manufacturing Industry

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ABSTRACT: *The study is an attempt to examine empirically the impact of capital structure on firm performance using a data sample of 56 Indian manufacturing firms listed on Bombay Stock Exchange, National Stock Exchange or both during 2010-2022. The study uses three financial performance measures namely return on assets, return on capital employed and earnings per share as dependent variables. The eight capital structure measures such as long-term debt, short-term debt, interest coverage ratio, current ratio, growth, tangibility, non debt tax shield and size are used as independent variables. The data are divided into three sectors including steel, cement and automobile. The correlation analysis and multiple regression analysis are used in the study to estimate the impact of capital structure on firm performance. The empirical result shows that firm performance has a negative relationship with short and long term debt in most of the studied sectors. In the automotive sector, long-term debt is positively related to return on capital employed. Liquidity is negatively related to firm performance in the cement and automotive industries. Non-debt tax shield is positively related to firm performance as measured by return on capital employed and earnings per share in the cement and automotive industries, respectively, while interest coverage ratio is positively correlated with firm performance in the cement industry.*

Key words: *Automobile, Capital structure, Cement, Firm performance, Leverage, Manufacturing industry, Multiple regression analysis, Relation, Steel.*
JEL Classification: *C30; G30.*

1. Introduction

Capital structure decision is one of the very crucial decisions for the management of the company. The corporate entities raise their fund from diverse sources like issue of equity and preference shares, long term and short term loans, ploughing back, etc. Initially, issue of common stock dominates the field. At the later stage of corporate development, the firm may arrange capital through borrowings and ploughing back. Procurement of capital from diverse sources is invested in various assets. The main aim of the firm is to maintain a desired capital structure where minimization of cost of capital and maximization of value of shares is achievable. The capital structure decisions may affect many aspects of the firms including productivity, efficiency and decision makings. Although there are many theories to explain the capital structure of the firms and many of the researchers advised to optimize the debt-equity ratio of the capital structure but no any specific manner has been described to attain the optimal capital structure. Some of the previous studies (Ghosh & Jain, 2000; Hadlock & James, 2002) report positive influence of corporate capital structure on its financial performance negative impact of corporate structure on its financial performance is also described by certain researches (Fama & French, 1998; Simerly & Li, 2000). The financial decision in very vital to determine the capital structure. However, the management tries to achieve optimal capital structure with

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different level of leverage. It has been argued that profitable firm has less debt content in their capital structure compared to less profitable firms.

Modigliani and Miller (1958) argues that under certain assumptions such as a perfect capital market, homogeneous expectations of investors, a tax-free economy and no transaction costs, capital structure is irrelevant in determining the firm value. Investors are likely to buy the shares of an undervalued firm and sell the shares of an overvalued firm to earn return. But later Modigliani and Miller (1963) suggests that firm value can be increased by changing capital structure due to tax advantages of debt capital. However, these assumptions are not at par. There is no specific method to achieve optimal capital structure.

According to static trade-off theory the firm trades-off between interest tax shield and cost of debt and equity financing to attain optimal capital structure. The theory suggests inverse relation between profitability and financial leverage. The value of the firm depends on the tax savings on interest payment inducing the firm to borrow up to a margin where the present value of interest tax shield offset the cost of debt financing and financial distress, bankruptcy and agency cost. In contrast to trade-off theory pecking order theory has be introduced by Myers and Majluf (1984) where no optimal capital structure is suggested because the firm prefer internal financing over external financing. The managers follow a hierarchy while considering source of financing. Internal resources are used first, and then when they are exhausted debts are issued. When it is not advisable to incur more debt, equity is issued.

The aim of the present study to examine the relation between financial performance like return on assets (ROA), return on capital employed (ROCE) and Earning per share (EPS) and capital structure choices: including short term debt, long term debt, growth, size, tangibility, current ratio, interest coverage ratio, non-debt tax shield over the period 2009-10 to 2021-22 in Indian manufacturing firms with special reference to steel, cement and automobile sector. Most of the studies in this field belong to developed economies like Europe, America, Australia, etc. A vast amount of studies were carried out to find out the relation between corporate capital structure and financial performance of the firms (Barton & Gordon, 1988; Bradley, Jarrell, & Kim, 1984; Titman & Wessels, 1988) in the western countries. There is lack of empirical evidence regarding the influence of capital structure on firm's performance in developing countries. Extensive empirical researches have been performed to investigate the relationship between choice of capital structure and firm's performance with a very little contribution of India.

The present paper provides the evidence of positive and negative relation between firm's performance and capital structure. Data for the study are accumulated from published audited financial statements and balance sheets of the sample companies under the study. Multiple regression technique is applied to explore the relationship. The paper is organized as follow. In the next segment, some theoretical and empirical evidence on firm performance and capital structure have been reviewed, the following segment describes research methodology and the last segment indicates empirical results of the data analysis followed by detailed discussion and conclusion that can be derived from the result.

2. Review of Literature

Capital structure is one of the significant factors that can influence the firm performance in a significant way. A number of empirical and theoretical studies have been conducted to explore the impact (positive, negative or no relation) of capital structure on firm performance. Some of the studies show the mixed results. According to irrelevance theory of Modigliani and Miller (1958) in perfect capital market situation the firm value is independent to capital structure and there is no option for optimal capital structure choice. However, in Proposition-II, Modigliani and Miller (1963) suggests that the expected rate of return generated by debt financing is exactly offset by the risk incurred, regardless of the financing mix chosen considering the tax as well. Bankruptcy costs also affect the capital structure decision significantly (Harris & Raviv, 1991).

The trade-off theory argues that the optimal capital structure is a trade-off between interest tax shield and cost of financial distress. In other words, corporate leverage is determined by balancing tax savings benefits of debt against deadweight cost of bankruptcy. In contrast to trade-off theory (Jensen & Meckling, 1976) introduced the agency cost theory which explains the conflicts among shareholders, debt-holders and management. The conflict gives rise to agency problem involving agency cost. Agency costs have immense influence on firm's capital structure. On the other hand, Pecking-order theory (Myers & Majluf, 1984) suggested a preferential order for raising funds for new projects. In this theory, a hierarchy of financial arrangements was developed, starting with retained earnings followed by debt, and then new shares were

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issued. All capital structure theories are developed to understand the impact of capital structure on firm performance.

A large number of empirical studies have been conducted to estimate the relationship between firm performance and capital structure and majority of studies conclude that capital structure has negative impact on profitability of firms. A negative relation between capital structure and firm performance of US firms has been reported by the study of Titman and Wessels (1988). The study argues that due to low risk tolerance the small firms retain a distinct connection to financial institutions, resulting higher interest rates, compared to large ones. The findings of the study is similar to the outcomes of the other empirical researches conducted by Kester (1986) on firms of US and Japan, Friend and Lang (1988) on US firms, Rajan and Zingales (1995) in G-7 countries and Wald (1999) in developed countries.

Rajan and Zingales (1995) carried on a research on 48 US firms to investigate the relationship status between capital structure and firm performance reports a negative correlation among profitability and level of debt financing and the association becomes more visible with large firms. Another study by (Omondi & Muturi, 2013) reveals a significant negative influence of leverage on profitability (ROA) of Kenyan firms. Nguyen and Nguyen (2015) also points out the negative association among capital structure and ROA, ROCE and Tobin's Q of Vietnamese firms. The result is consistent with the findings of empirical studies conducted by Wiwattanakantang (1999) on 270 Thai firms and Huang and Song (2006) on Chinese firms. Abeywardhana and Krishanthi (2016) investigates the link between capital structure and firm performance of SMEs(Small and medium-sized enterprises) in UK, concentrating on manufacturing sector for a period of 11 years since 1998 to 2008 showing negative impact of leverage on ROA and ROCE of the sample firms. Chakraborty (2010) applies two leverage indicators including total liabilities over assets and liabilities over equity to explore the influence of debt on firm performance presented by EBIT over total assets and cash flows over total assets. The result of the study confirms negative relation between these variables. Mohamad and Abdullah (2012) also found negative impact of debt and equity financing on the performance of the firms using a sample of 130 Malaysian firms listed on Bursa, Malaysia. Similar result also found by the other researchers (Arowoshegbe & Idialu, 2013; Harris & Raviv, 1991; Manawaduge, Zoysa, Chowdhury, & Chandarakumara, 2011; Olokoyo, 2013; Pouraghajan, Malekian, Emamgholipour, Lotfollahpour, & Bagheri, 2012) in their studies where the firm performance has been negatively affected by using of short term as well as long term debt. Quang and Xin (2014) also reports significant negative impact of capital structure on firm performance. Balakrishnan and Fox (1993) found that high level of debt level leads to financial risk and consequently reduce the firms' willingness to invest in risky profitable projects. Majumdar and Chhibber (1999)observe that debt-equity ratio negatively affect the corporate performance. Furthermore, they found that firm size, liquidity, diversity and advertising are positively while the other variables like age, time, excise duty and industrial grouping are negatively related to firm performance. Alternatively, Gleason, Mathur, and Mathur (2000) using the data of retailers from 14 European countries found that capital structure negatively affect firm performance.

Conversely, some of the previous researches (Fama & French, 2002; Gill, Biger, & Mathur, 2011; Goyal, 2013; Roden & Lewellen, 1995) report the positive relation amid capital structure and firm performance in their studies. Highly profitable firms employ high level of debt in their capital structure which leads to positive relation among profitability and capital structure (Champion, 1999; Ghosh, Nag, & Sirmans, 2000; Hadlock & James, 2002). Abor (2005) found a positive relation between capital structure measure by STD and Total Debt and firm performance in Ghanian firms. Analogous result also observed by Margaritis and Psillaki (2010) in their research where significant positive relation has been revealed among leverage and firm performance using a sample of low and high growth French firms. Similarly, Fosu (2013); Aliakbar, Seyed, and Pejman (2013) and Wang (2003) also found a significant positive association between capital structure and firm performance.

However, some of the researchers (King & Santor, 2008; Krishnan & Moyer, 1997; Mesquita & Lara, 2003) reports mixed result where impact of capital structure is positive or negative or no-impact on firm performance. Kinsman and Newman (1998) observed a diverse result where earnings are negatively correlated with short term debt while hold positive association with long term debt. Toraman, Kılıç, and Reis (2013) analyzed the relation between leverage (short term and long term debt and total debt) and firm performance as measured by ROA by applying multiple regression technique in manufacturing firms of Istanbul. The study reveals a negative relation between ROA and short-term, long term liabilities while no relation found among

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debt-equity and ROA. Saeedi and Mahmoodi (2011) carried on a study on 320 Tehran firms to find out the association between corporate performance and capital structure. The outcome of the study shows positive relation amid capital structure and firm performance as measured by EPS and Tobin's Q whereas report a significant negative relation between ROA and capital structure and no significant relation between ROE and leverage of the firm. Tianyu (2013) conducted a study on firms of developed and developing countries to explore the influence of capital structure on corporate performance and found significant negative relation in Chinese firms and positive relation for German and Swedish firms prior to financial disaster in 2008.

Another study Salim and Yadav (2012) discover negative relation between capital structure and firm performance as measured by ROA, ROCE and EPS but reports positive relation growth and performance of all sectors under the study. The finding is consistent with the result of research done by Zeitun and Tian (2007). However, positive relation between ROA and capital structure and negative relation among firm performance (EPS and Tobin's Q) and leverage have been revealed by the studies of Saeedi and Mahmoodi (2011) and Ebrati, Farzad, Reza, and Ghorban (2013). Some of the research papers (Ebaid, 2009; Khalaf, 2013; Phillips & Sipahioglu, 2004) have reported no impact or insignificant influence of capital structure on corporate performance. The study of Hasan (2014) on 36 Bangladeshi firms has observed significant negative relation among ROA and capital structure while no evidence of statistical significant relation among capital structure and ROE and Tobin's Q.

To sum up, the previous discussion some of the studies show positive association whereas some shows negative relation among firm performance and capital structure. As should be realized, the findings of previous empirical studies have demonstrated that the influence of capital structure on firm performance is questionable. Hence, the present studies are fascinated in this matter. The current study strengthens the literature by testing the impact of capital structure on firm performance in the Indian manufacturing sector.

3. Objective of the study

The man aim of the study is to explore the influence of capital structure on the financial performance of the firms which are selected from three Indian manufacturing sectors like steel, cement and automobile. The study is an attempt to unfold the relation between capital structures and firm's performance.

4. Research Methodology

4.1. Data and Collection of Data

The sample of the study consists of 56 Indian manufacturing companies listed on BSE or NSE or both on the basis of their market capitalization for a period of 13 years since 2009-10 to 2021-22. The sample of the present study contains three sector steel, cement and automobile. The present study is empirical in nature and mainly conducted on secondary data. The data set contains detailed financial as well as capital structure information for every year of study. The items of interest were: audited balance sheet and income statement, interest paid, depreciation, earnings before interest and tax which are available from concerned company's website.

4.2. Variables

The concept of performance is a controversial issue in finance largely due to its multidimensional meanings. The performance of the firm basically originated from organization theory and strategic management (Murphy, Trailer, & Hill, 1996). Hence, the performance of the firm can be either financial or organizational. Financial performance measures are mainly profit maximization, shareholders' return maximization and profit on assets maximization (Chakravarthy, 1986). The most commonly used financial performance measures are return on assets (ROA), and return on equity (ROE) or return on investment (ROI). The ratios are derived from balance sheet and income statements and used by many of the researchers in their studies (Ang, Cole, & Lin, 2000; Demsetz & Lehn, 1985; Gorton & Rosen, 1995; Mehran, 1995). The financial performance measure ROA is a very useful proxy measure for denoting corporate performance (Abdel, 2003; Long & Ravenscraft, 1984; Reese & Cool, 1978).

In the present study return on assets (ROA), return on capital employed (ROCE) and earnings per share (EPS) are used as proxy variable for firm performance and they are denoting as the dependent variables. Eight explanatory variables related to capital structure decision namely long term debt (LTDTA), short term debt (STDTA), Growth (assets), Size (logarithm of assets), interest coverage ratio (ICR), current ratio (CR),

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tangibility (TANG) and non-debt tax shield (NDTS) are taken into consideration for the present study. These variables are derived from previous literature studies. Table 1 presents the definition of explanatory variable used in the present study.

Table 1. Definition of variables under the study.

Variables	***Definition***
Dependent Variables	
ROA	Ratio of net profit (EBIT) to total assets
ROCE	Ratio of earnings before interest and tax (EBIT) to capital employed
EPS	Ratio of net profit to number of shares outstanding
Key Explanatory Variables	
LTDTA	Ratio of Long term debt to total assets
STDTA	Ratio of short term debt to total assets
Growth	Growth in total assets
Size	Natural Logarithm of total assets
ICR	Ratio of EBIT to interest expenses
CR	Ratio of current assets to current liabilities
TANG	Ratio of fixed assets to total assets
NDTS	Ratio of depreciation to total assets

4.3. Methodology

Descriptive statistics and correlation analysis are employed in the present study. Correlation analysis is used in the study to show the relation between the independent variables. To examine the influence of capital structure on firm's performance multiple regression analysis is applied in the present study. In the present paper regression equations are set to test how the firm's capital structure influences firm's performance. The empirical models are estimated as below:

$$ROA_{I,t}(Performance) = \beta_0 + \beta_1\ LTDTA_{I,t} + \beta_2 STDTA_{I,t} + \beta_3\ Growth_{I,t} + \beta_4\ Size_{I,t} + \beta_5 ICR_{I,t} + \beta_6 CR_{I,t} + \beta_7 Tang_{I,t} + \beta_8 NDTS_{I,t} + \in_{l,t} \quad (1)$$

$$ROCE_{I,t}(Performance) = \beta_0 + \beta_1\ LTDTA_{I,t} + \beta_2 STDTA_{I,t} + \beta_3\ Growth_{I,t} + \beta_4\ Size_{I,t} + \beta_5 ICR_{I,t} + \beta_6 CR_{I,t} + \beta_7 Tang_{I,t} + \beta_8 NDTS_{I,t} + \in_{l,t} \quad (2)$$

$$EPS_{I,t}(Performance) = \beta_0 + \beta_1\ LTDTA_{I,t} + \beta_2 STDTA_{I,t} + \beta_3\ Growth_{I,t} + \beta_4\ Size_{I,t} + \beta_5 ICR_{I,t} + \beta_6 CR_{I,t} + \beta_7 Tang_{I,t} + \beta_8 NDTS_{I,t} + \in_{l,t} \quad (3)$$

Where,

$LTDTA_{I,t}$ = Long term debt to total assets for period I in year t
$STDTA_{I,t}$ = Short term debt to total assets for period I in year t
$Growth_{I,t}$= Change in total assets for period I in year t
$Size_{I,t}$ = Logarithm of total assets for period I in year t
$ICR_{I,t}$ = EBIT to Interest Expenses for period I in year t
$CR_{I,t}$ = Current Assets to Current Liabilities for period I in year t
$Tang_{I,t}$ = Fixed Assets to Total Assets for period I in year t
$NDTS_{I,t}$ = Non-Debt Tax Shield for period I in year t
$\in_{l,t}$ =Error terms for period I in year t

5. Empirical Analysis Result and Discussion

Table 2 reports summary statistics of variables used in the present study in order to explore data variation in the firms. The mean of return on assets of whole sample is showing 5.44 indicating firms ability to generate income by using assets poor financial performance during the study period, while the mean of return on capital employed and earnings per share are showing 10.84 and 38.86 respectively during the study period showing that manufacturing companies under the study have satisfactory accounting performance. However, the proxies for capital structure (STDTA and LTDTA) have positive mean of 0.11 and 0.19 indicating that Indian manufacturing firms under the study do not employ high level of debt to raise fund. Moreover, the firms under the study use more long term debt compared to short term debt. The other variables like Growth, CR, TANG, and NDTS have very low average. The lower growth and liquidity may affect the firm's

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performance in adverse way. Meanwhile, there is a big gap between minimum and maximum value of ROA, ROCE, EPS and ICR revealing the large divergence in financial performance among firms. The values of skewness and kurtosis demonstrate that the data is normal as calculated value leads to reference value because skewness value near to '0' and kurtosis value near to '3'. The Shapiro-Wilk test also confirms the normality of the data.

Table 2. Summary statistics of explanatory variables during 2009-2022.

Variables	Mean	Median	Std.Dev	Kurtosis	Skewness	Min	Max	Shapiro-Wilk	Sig.
ROA	5.44	4.73	1.93	2.94	1.63	3.73	10.46	0.898	0.126
ROCE	10.84	11.63	3.47	-1.27	-0.06	5.97	15.87	0.937	0.417
EPS	38.86	40.52	11.28	-0.64	0.46	24.90	61.59	0.908	0.171
Growth	0.10	0.08	0.07	2.61	1.21	0.00	0.28	0.902	0.143
Size	3.55	3.55	0.11	-1.37	-0.05	3.37	3.72	0.949	0.588
ICR	90.24	68.86	62.50	-0.10	0.96	29.22	220.74	0.879	0.069
CR	1.36	1.37	0.16	-0.78	-0.16	1.09	1.60	0.962	0.777
TANG	0.52	0.52	0.02	-0.66	-0.40	0.48	0.55	0.957	0.702
STDTA	0.11	0.11	0.02	4.10	-1.94	0.07	0.12	0.718	0.001
LTDTA	0.19	0.20	0.03	1.99	0.25	0.13	0.26	0.915	0.215
NDTS	0.04	0.04	0.00	-0.53	0.48	0.03	0.04	0.946	0.542

Table 3. Correlation matrix of explanatory variables during 2009-2022.

Variables	Growth	Size	ICR	CR	TANG	STDTA	LTDTA	NDTS
Growth	1							
Size	-0.566	1						
ICR	-0.286	-0.242	1					
CR	0.509	-0.391	-0.363	1				
TANG	-0.484	-0.098	0.559	-0.566	1			
STDTA	0.027	-0.264	0.419	-0.195	0.109	1		
LTDTA	0.372	-0.859	0.221	0.154	0.448	0.117	1	
NDTS	-0.674	0.436	0.324	-0.739	0.672	0.157	-0.208	1

Table 3 exhibits the correlation of explanatory variables. The result shows that the variable Growth shares the negative relation with Size, ICR, Tang and NDTS. The variable size has negative relation with all other variables except NDTS. There is a positive correlation between ICR and STDTA, LTDTA, NDTS and TANG while the variable CR is sharing negative relation with Tang, STDTA and NDTS but positive relation with LTDTA.

6. Regression Result

In the present paper three core manufacturing industry data are taken into account. The data are from steel, cement and automobile industry.

Table 4. Performance measured by return on assets (ROA).

Industry	Var	Beta	T-Test	Sig	R-Square	F-Test	Sig	DW
STEEL	STDTA	-0.653	-3.948	0.003	0.727	13.307	0.002	2.371
	Growth	0.531	3.211	0.009				
CEMENT	ICR	1.086	8.399	0.000	0.880	36.792	000	2.702
	NDTS	0.389	3.007	0.013				
Automobile	CR	-0.583	-2.380	0.037	0.340	5.663	0.037	2.725

Note: Significant at 5% level.

Table 4 is showing relation between firm's performance measured by ROA and capital structure variables (LTDTA, STDTA, Growth, Size, ICR, CR, Tang, and NDTS). Stepwise multiple regression analysis is

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applied to analyze the data. In case of steel industry, we have independent variables which are significantly influencing the ROA. The variable STDTA has significant negative relation (t-value= -3.948; sig= 003) to firm's performance measure indicating high amount of short term debt is confronting with the default risk of having debt burden on firm's profitability. On the other hand, Growth has significant positive relation with ROA. It implies that an increase in Growth will result in an enhancement in ROA. The value of R-square of the model is 0.727 specifies that 72.7 percent variation in ROA can be explained by these two independent variables. The model shows DW test value is 2.371 that imply no autocorrelation in the model.

For cement sector, ICR and NDTS have statistically significant positive impact on ROA. The main reason of having positive relation among NDTS and ROA is that lower debt content in capital structure which minimizes the potential business risk and hence increases the firm's profitability. The positive relation between ICR and firm's performance indicates due to low debt burden the firm is able to reduce the interest payment out of its income which provides the positive impact on firm's performance. The R-square value of the model is 0.880 means 88 percent variation can be explained by the independent variables at confidence level of 95 percent. The F-statistic and DW test value are 36.792 and 2.702 respectively.

It has been observed that CR has statistically significant negative relation with the firm's performance (ROA) in case of automobile industry. It implies that holding of too much liquid assets without investing them in the business affect the firm's income in adverse way. The R-square value of the model is slightly low (0.340) but it is significant as given by p-value (0.037) corresponding to F-statistic (5.663). The DW shows a value of 2.725 indicates absence of autocorrelation among the residuals.

Table 5. Performance measured by return on capital employed (ROCE).

Industry	Var	Beta	T-Test	Sig	R-Square	F-Test	Sig	DW
Steel	LTDTA	-0.438	-4.438	0.002				
	STDTA	-0.613	-7.015	0.000				
	ICR	-0.383	-3.908	0.004	0.932	41.401	0.000	1.819
Cement	ICR	0.711	7.710	0.000				
	Size	0.490	5.305	0.000	0.920	57.662	0.000	3.047
Automobile	LTDTA	0.618	2.605	0.024	0.381	6.784	0.024	2.007

Note: Significant at 5% level.

Table 5 is presenting the result of testing relationship between capital structure variables and firm's performance measured by return on capital employed (ROCE). It has been observed that LTDTA, STDTA and ICR have significant negative relation with ROCE. It points out too much external long term and short term debt raises the business risk of the industry and consequently high interest payment lower down the profitability of the firm. The result of cement industry shows that ROCE has significant positive relation with ICR and Size at 95% confidence level. It suggests that increase in ICR and Size is associated with increase in ROCE. For automobile industry, LTDTA shares significant positive relation with firm's ROCE indicating increase in long term debt in capital structure will result in an increase in ROCE. All the regression models except automobile sector have high R-square value of 0.932 and 0.920 respectively indicating ability of the independent variables explaining the variation of ROCE. The automobile sector model shows the R-square value of 0.381 signifies 38.1 percent variation in ROCE can be explained alone by LTDTA. The DW statistic of all models reveals that there is no autocorrelation in the models.

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Table 6. Performance measured by earning per share (EPS).

Industry	Var	Beta	T-Test	Sig	R-Square	F-Test	Sig	DW
Steel	Tang	-0.860	-5.598	0.000	0.740	31.338	0.000	1.374
Cement	LTDTA	-0.443	-3.570	0.006	0.908	29.714	0.000	2.871
	ICR	0.754	5.111	0.001				
	CR	-0.514	-3.636	0.005				
Automobile	NDTS	0.663	2.939	0.013	0.440	8.636	0.013	1.346

Note: Significant at 5% level.

Table 6 presents the result of impact of capital structure variables on firm's performance measured by earning per share (EPS). According to the result that tangibility has significant negative relationship with EPS

in the steel industry, indicating that means excess investment in tangible assets leads to poor performance. For cement industry, the model is showing three independent variables LTDTA, CR and ICR which are sharing significant negative and positive relation with firm's performance (EPS) at confidence level of 95 percent. The negative relation between LTDTA with EPS implies that presence of long term debt in the capital structure raises the business risk and higher level of long term debt leads to lower EPS. The variable CR is also sharing negative relation that indicates holding of more liquid assets to meet the debt at maturity leads to financial risk as the liquid assets are low-yielding assets and it impacts negatively on firm's performance as measured by EPS. The variable ICR has significant positive relation with EPS which suggests that increase in ICR will also increase firm's performance. For automobile sector non debt tax shield (NDTS) has positive relation with EPS which is statistically significant at 95 percent confidence level. It indicates lower amount of debt content in the capital structure which can reduce the business risk in long term as well as corporate tax burden in long term. The regression models of steel, cement and automobile sector are showing the R-square value of 0.740, 0.908 and 0.440 respectively. The robustness of the model is proved by high F-value and corresponding low p-value. The DW test shows the value of 1.374, 2.871 and 1.346 respectively which evidence the absence of autocorrelation in the models.

Table 7. Summary of relationship between capital structure variables and firm's performance.

		Relation	
Industry	**Dependent Variables**	**Positive**	**Negative**
Steel	ROA	Growth	STDTA
	ROCE	-	LTDTA, STDTA, ICR
	EPS	-	TANG
Cement	ROA	ICR, NDTS	
	ROCE	ICR, SIZE	
	EPS	ICR	LTDTA, CR
Automobile	ROA	-	CR
	ROCE	LTDTA	
	EPS	NDTS	

Table 7 presents the relation between dependent and explanatory variables. In case of steel industry Growth variable is positively associated with ROA while ROA shares negative relation with STDTA. The variables LTDTA, STDTA, ICR and TANG are negatively related with ROCE and EPS respectively. In case of cement industry, the variables ICR, NDTS and Size have positive relation with firm performance. The explanatory variable CR is negatively related with ROA, whereas, the variables LTDTA and NDTS are positively related with ROCE and EPS in case of automobile industry.

7. Conclusion

The present paper aims to observe the influence of capital structure choice on firm's performance of Indian manufacturing sectors (steel, cement and automobile) by using three accounting based measures to estimate firm's performance (ROA, ROCE and EPS). The present study is using a sample of 56 companies for a period of 13 years since 2009-10 to 2021-22. Correlation matrix and multiple regression analysis are applied in the study to facilitate the analysis of data. The result of the study shows that capital structure (STDTA, LTDTA, ICR, and Tang) has negative significant impact on ROCE and EPS of steel and cement industries which is consistent with the study of Ebaid (2009) with the exception of significant positive relation between LTDTA and ROCE for automobile industry. Therefore, it can be said that incorporation of high level of debt in capital structure negatively affects the firm's performance. In other words, use of the more debt has negative impact on firm's performance and vice-versa. The variables ICR, NDTS and Size have significant positive effect on firm's performance. This finding is consistent with Penrose (1959) which suggests that large firms can have the benefit of economies of scale that can favorably impact the firm's performance. The positive relation between Size and firm's performance indicates that large firms have low bankruptcy cost and vice versa as the size of the firm and bankruptcy cost is inversely related. The bankruptcy cost negatively influence the performance of the firms.

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It is evident from the result that there is negative relation between firm's performance and liquidity. Agrawal and Nagarajan (1990) have found statistically significant negative relation between debt and liquidity which is consistent with the present study. It implies that while the firms hold more liquidity to meet the debt at maturity without hassle it leads to more financial risk. If the firms hold more liquid assets it is expected to have negative effect on firm's performance. Another important observation is that the variable ICR is mainly sharing positive relation with firm's performance indicating that the debt serving capacity of the firm increases and the firms are able to pay-off the financial cost of the external debt easily.

Overall, the present study reports a negative significant relation between debt and firm's performance signifying that use of high level of debt financing to finance the new projects may not be the prudent strategy for the sample industries under the study. The capital structure must be the mix of appropriate amount of debt and equity to enhance the shareholders' returns and minimize the risk and cost of capital. The firms should undertake a strategy to achieve suitable choice of capital structure as it affects the firm's performance. We can conclude that STDTA, LTDTA, Growth, ICR, CR, NDTS and Size are significant variables having significant influence on financial performance of firms under the study. Now it is expected that the concemed authority must utilize the resources in an effective and efficient way to optimize the operating and financial performance of the firms belonging to steel, cement and automobile sector. Hence, it can be said that the present study found the mixed result in the manufacturing sector of India. The firm performance is negatively related with capital structure variables like STDTA, LTDTA, ICR and TANG while ROA is positively related with Growth in case of steel industry. For cement industry, ROA, ROCE and EPS have positive relation with proxy variables used for capital structure like ICR, NDTS and SIZE but LTDTA and CR have negative relation with EPS. The firm performance as measured by ROCE and EPS show positive relation with capital structure variables like LTDTA and NDTS while projecting negative relation between ROA and CR. The present study can be extended by adding of more independent and control variables, large samples and longer period data in the regression models to get better results. The different methodology can also be implemented for further research.

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