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IMPACT OF CAPITAL STRUCTURE ON PROFITABILITY: AN EMPIRICAL SEARCH

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In today's corporate world, every company needs to survive in the long run by becoming financially sustainable. Firms must cope with a variety of financial variables for a successful long-term financial existence, where the two most crucial issues are capital structure and profitability. The finance manager must design the capital structure in such a way so that the company can earn a good profit to satisfy all of its stakeholders. A modest attempt has been made in this study to understand how far profitability is affected by the capital structure design. This study considered 100 manufacturing companies of India's National Stock Exchange (NSE) as the sample companies. The study has been purely based on secondary data, and the required data has been gathered from the 'CAPITALINE' database for a period of 10 years, i.e., from 2011 to 2020. This study considered ROIC (proxy of profitability) as the dependent variable and leverage (proxy of capital structure) as the independent variable. Besides, some control variables such as firm size, Tangibility, uniqueness, growth, and firm quality have also been taken into account. A dynamic panel data regression model has been used in this study to examine the relationship between profitability and capital structure. The findings of the study clearly revealed that profitability is affected by the choice of capital structure design.

KEYWORDS: ***Capital Structure, Leverage, Profitability, ROIC, Dynamic Panel, NSE***

1. INTRODUCTION

In the contemporary corporate world, every company must become financially sustainable in order to endure and thrive in the face of fierce competition in a free market economy. Nearly all of an organization's stakeholders must be taken into account for financial sustainability through ethical decision-making and sound governance. In a pluralistic culture, corporate entities need to consider the interests of all stakeholders in order to thrive and expand in a sustainable manner. This goes beyond the notion that solely the confidence of shareholders holds in classical finance theory. Economic responsibility is one of several corporate obligations that a company must fulfill in order to multiply its economic command and pursue the goal of creating value for its stakeholders.

Firms are to exercise with a variety of financial variables to understand prosperous financial existence, short-term or long-term. Liquidity, profitability, leverage, cost factor, working capital, etc., are examples of some of the variables. Studying these financial variables over time requires

continuous analysis and close vigilance by the chief finance officers. So far as this paper is concerned, we are interested in two crucial issues. One is capital structure, and the other one is profitability. It is not hard to understand that the finance manager must design the capital structure in such a way so that the company can create a good surplus to satisfy all of its stakeholders.

The term "capital structure" refers to the different arrangements of Debt and equity that a business employs as funding sources for its assets. Empirical research verifies that choosing a fair, proportionate utilization of both funding sources can impact a company's profitability. Likewise, a company's profitability indicates its capacity to use available resources in a competitive, effective, and efficient way to achieve its goals. As soon as the financial manager can identify the potential capital structure deciding factor—that is, the cost associated with each source of funding—the company can reach its full potential.

There is a vast body of work on the relationship between company profitability and capital structure, both empirical and theoretical in nature. Theoretically, it has become almost a consensus that capital structure affects profitability, but empirical results of earlier studies do not always advocate this statement. The impact of a firm's capital structure on its profitability is quite mixed at large. Some studies show a positive impact of a firm's capital structure on its profitability, and some show a negative impact. Thus, this issue is still a matter of debate among the researchers. Thus, A modest attempt has been made in this study to understand how far profitability is affected by the capital structure design.

The structure of this paper is as follows: The second section summarizes the literature review of previous studies conducted in this field; the third section provides an overview of the study's objective; the fourth section highlights the hypothesis; the fifth section outlines the methodology; the sixth section focuses on the findings and their discussion; and the seventh section deals with the research's conclusion.

2. REVIEW OF EXISTING LITERATURE

There has been a lot of focus on the research of how leverage affects a company's profitability. Numerous scholars have investigated the effect of leverage on profitability; nevertheless, the results of these investigations vary. Therefore, before moving further with this empirical study, it appears appropriate to critically examine the previous works on this important issue.

Nimalathasan (2004) undertook a study titled "Capital structure and its impact on profitability: A study of listed manufacturing companies in Sri Lanka″ to examine the influence of "capital structure" on "profitability," taking into account the listed manufacturing companies of Sri Lanka during the period 2003-2007. The variables chosen for this purpose were "debt to equity ratio (D/E)," "debt to assets (d/a) ratio," "capital gearing (CG) ratio," "interest coverage (IC) ratio," and "profitability ratio" ["gross profit ratio (GPR)"; "operating profit ratio (OPR)"; and "net profit ratio (NPR), "return on capital employed (ROCE)," "return on investment (ROI)"]. Secondary data had been gathered. It was found out that all "capital structure ratios" had a positive association with "profitability ratio" except "ROCE" and "ROI." The conclusive evidence from the study was very fruitful for the entrepreneurs, the policymakers, etc., to make decisions about the capital structure of a company or firm and to control the bankruptcy costs.

Salawu (2009), through his paper titled "The Effect of Capital Structure on Profitability: An Empirical Analysis of Listed Firms in Nigeria," attempted to find out the influence of the "capital structure" on "profitability" of quoted companies in "Nigerian Stock Exchange" during the period from 1990 to 2004. Data were collected from fifty (50) non–financial quoted companies in the stock mentioned above in the exchange market. The pooled ordinary least squares (OLS) model, fixed effect model (FEM), and random effect model (REM) were used for data analysis. There was an insignificant impact of "capital structure" on "profitability," but there must be a positive relationship between "profitability" and "short-term debt." From this study, findings were extracted that Nigerian firms mainly depended on external financing. In that case, a high proportion (60%) of the Debt is "short-term debt." In this study, the relation between "capital structure" and "profitability" was affirmative in equity involvement. Researchers suggested that companies should implement an effective and efficient credit policy, and with this implementation, the turnover and growth performance levels will improve.

Gill et al. (2011) conducted a study titled "The Effect of Capital Structure on Profitability: Evidence from the United States" on two hundred and seventy-two (272) American manufacturing and service firms to find out the impact of "capital structure" on "profitability" during 2005-2007. A co-relational and non-experimental research design was used for this purpose. "Return on equity" (ROE) and "earning before tax and interest" (EBIT) were treated as dependent Variable and "debt ratios" like "short-term

debt to total asset," "long-term debt to total asset," and "total debt to total asset" were treated as independent variable. "Firm size," sales growth," and industry were taken up as control variables. Data were analyzed using the regression model and Pearson bivariate correlation analysis. It was evident from the study that there was a positive affiliation between "profitability," "short-term debt," and "total debt." Researchers suggested that short-term Debt is less expensive. So, if "short-term debt" increases, a low interest rate leads to more profit.

Ferati and Ejupi (2012), in their study titled "Capital Structure and Profitability: The Macedonian Case," were conducted among 150 firms in Macedonia regarding the influence of "capital structure" on "profitability" for ten years. In the study, researchers used the ordinary least square method for the assessment relating to "return on equity" with the "long-term and short-term debt" and "owner's equity." The findings from this investigation showed that the correlation between "return rates" and "long-term debt" and "equity" was an affirmative and negative correlation between "long-term debt" and "return rates."

Yousefi et al. (2012), through their paper "The Effect of Industry on the Relation between Capital Structure and Profitability of Tehran Stock Exchange Firms," attempted to investigate the effects of industry on the connection between the "capital structure" and the "profitability" of the "Tehran Stock Exchange" by employing a large sample that spans one hundred and thirty-six (136) companies across six (6) industries between 2005 and 2009. This study's descriptive design proved that the connection between a business's "profitability" and "capital structure" varies depending on its industry. The researchers collected data from the accounting reports of the sample firms. First, firms' "debt ratio" as the capital structure indicator and "return on investment (ROI)" as the profitability indicator were measured by using collected data. The Pearson Correlation Coefficient was used to examine the hypothesis. The conclusive evidence showed that the relationship differs among diverse industries and that a particular component of capital structure can lead to either a positive or negative significant relation or even no relation with "profitability." Consequently, it can be said that the type of industry is the most critical factor in firms' capital structure and determines whether or not there is a considerable relationship between "capital structure" and "profitability" and the type of the relationship.

Koech (2013), through his study titled "The Effect of Capital Structure on Profitability of Financial Firms Listed at Nairobi Stock Exchange" investigated the leverage risk of the selected financial firms, the relationship between "debt" and "performance," the impact of interest rate on "capital structure" and to understand the "performance" of debt-equity combination of the firm taking into consideration eleven (11) financial firms which were listed in "Nairobi Stock Exchange" during the period 2008-2012. In this study, secondary quantitative data were used, and "capital structure" was measured by "Indebtedness Ratio," and firm performance was measured by "return on equity." Multiple linear regressions were used to analyze the data. The result from the study showed that capital structure was negatively related to performance, and it was also revealed that Kenya was more dependent on Debt than equity capital.

Ahmed and Munir (2013) undertook a study titled "The Effect of Capital Structure on Profitability: Evidence from the Petrochemical Companies in the Kingdom of Saudi Arabia" to enquire about the association between "profitability and capital structure" among petrochemical industry in Saudi Arab for 2008-2011. In this investigation, "debt ratio" was used for the independent Variables, and "profitability ratio" was used for the dependent variables and for analyzing the data regression model with cross-sectional panel data. The result revealed from this study that there was no significant relationship between "capital structure" and "profitability."

Chechet and Olayiwola (2014) conducted a study titled "Capital Structure and Profitability of Nigerian Quoted Firms: The Agency Cost Theory Perspective" among seventy (70) NSE listed companies out of two hundred and forty-five (245) listed companies for the period of 2000-2009 to observe the link between "capital structure" and "profitability" from the angle of "agency cost theory." Panel data was taken up for the study, and "Fixed-Effects," Random-Effects," and "Housman Chi-square estimation" were used for the analysis of the panel dataset. The two independent variables were used for "capital structure" i.e., "debt ratio" and "equity ratio" while "Profitability" was one of the dependent Variable. This study showed a negative relationship between "debt ratio and "profitability" and "equity ratio" was directly related to profitability. This study found consistency with the prior empirical studies and provides evidence against agency cost theory.

Kumari (2015), in the paper "Effect of Capital Structure on Profitability: Evidence from Portugal and Spain," examined the firms situated in Portugal and Spain to look into the reality of how the crisis of

the Eurozone had affected the capital structure decisions and also to investigate how "capital structure" affects "profitability" for 2003-2013. In this study, "ROE" and "ROA" were used as "Profitability Ratio" and "Leverage Ratio" as a variable of capital structure. Correlation and regression analysis were used to interpret the data. From "correlation analysis," it appeared that a negative correlation was established between "capital structure" and "profitability." On the other hand, regression analysis revealed that there was no negative significant association between "ROE" and "Leverage Ratio," and only a negative association with "ROA" was established. After the abovementioned debt crisis, another result revealed no substantial change in firms' financing decisions. These findings help entrepreneurs, loan creditors, and policy planners.

Kalyani and Mathur (2015), in their study titled "Impact of Capital Structure on Profitability: Concerning Select Companies from Oil and Natural Gas Industry of India analyzed utilizing seventy (70) BSE and NSE-listed oil and gas industry businesses. To see how "capital structure" affected "profitability" between 2005 and 2015. Parameters in this study that were used as independent variables in this study variables are "sales," "total assets of the firm," "debt service capacity," "dividend pay-out ratio', "degree of financial leverage," "degree of operating leverage" and "ROA" and "Net Profit" are the variables that were utilized as dependent variables. Judgmental sampling was used to gather a sample for this investigation. Correlation and regression methods were used to analyze the data. The investigation showed that "log sales," "degree of operating leverage," and "growth of assets" were significant in determining profitability. On the other hand, "ROA," "log assets," "degree of financial leverage," "log sales," "degree of operating leverage," and "growth of assets" have a significant relation with the NPR of selected companies.

A review of previous studies by academics and researchers clearly shows that there is an ample amount of literature on how leverage affects a firm's profitability. However, the literature review also makes it clear that the research findings are not entirely consistent. Therefore, an modest attempt has been made here to bridge the gap in the reservoir of knowledge about the influence of leverage on profitability.

3. OBJECTIVE OF THE STUDY

The precise objective of this study is to examine the relationship between capital structure and profitability.

4. HYPOTHESIS OF THE STUDY

To accomplish the above-stated goal of the study, the following null hypothesis is formulated:

There is no significant relationship between leverage and profitability.
Rejection of the null hypothesis indicates a statistically significant relationship between leverage and profitability.

5. DATABASE AND METHODOLOGY OF THE STUDY

This article is purely based on secondary data, and all the required facts & figures are congregated from the 'CAPITALINE- 2000 Database'. The study is exclusively based on secondary data extracted from the companies' financial statements under study and secondary databank, i.e., 'CAPITALINE- 2000 Database'. 100 reputed Indian firms listed in NSE from 10 manufacturing Industries (From each industry, 10 major top-ranking firms based on their annual turnover) for the period from 1st April 2011 to 31st March 2020 have been considered here as a sample by applying a convenient sampling procedure for carrying out the present study.
The study has used dynamic panel regression to examine the impact of capital structure on profitability. Leverage (LEV), Tangibility (TAN), Liquidity (LIQ), Uniqueness (UN), Size (SZ), Growth (GR), and Firm Quality (FQ) have been used as independent variables, and Return on Invested Capital (ROIC)has been used as a dependent variable.

Independent variables	**Measuring formula**
Leverage	Long-Term Debt/Total Assets
Tangibility	Total Fixed Assets/Total Assets
Liquidity	Current Assets/ Current Liabilities
Uniqueness	Selling Expenses/Sales
Size	Log of Total Assets
Growth	Year after Year Change to Total Average Assets
Firm-Quality	Altman Z –Score
Return on Invested Capital	ROIC=[(PAT+Interest)/ Capital Employed]*100

The following dynamic regression equation has been used here-

$ROIC_{it} = \alpha_0 + \beta_1 LEV_{it} + \beta_2 SZ_{it} + \beta_3 GR_{it} + \beta_4 LIQ_{it} + \beta_5 TAN_{it} + \beta_6 UN_{it} + \beta_7 FQ_{it} + \beta_8 ROIC_{it-1} + e_{it}$

Where α_0 is the intercept term, e_{it} is the residual term, i = 1, 2,….. 100 number of companies and t = 1,2….,10 years. β_1, β_2 , ….., β_8 are coefficient of independent variables.

We have used panel data as it enables us to take into account the heterogeneity of firm-specific characteristics. Combining both time series of cross-section observations makes it more efficient and informative, gives more degrees of freedom, and reduces collinearity among variables.

6. MAJOR FINDINGS OF THE STUDY

6.1 DESCRIPTIVE STATISTICS

Table 6.1:Descriptive Statistics of Independent and Dependent Variables

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
LEVERAGE	1000	.0000	2.5939	.226262	.24264	.059
SIZE	1000	3.4920	15.0000	8.415414	1.96345	3.855
TANGIABILITY	1000	-1.5957	1.0755	.480037	.34514	.119
LIQUIDITY	1000	.0000	55.0000	2.812098	3.09905	9.604
UNIQUENESS	1000	.0015	23.0000	.243498	.91223	.832
GROWTH	1000	-92.3847	1115.5463	11.841085	49.38507	2438.885
FIRMQ	1000	-37.8961	44.4818	3.806124	4.13425	17.092
ROIC	1000	-6378.0000	3088.0000	11.933999	241.52580	58334.717

Table 1 illustrates the descriptive statistics of all variables used in the regression analysis. The average leverage in this study was 0.2262, which indicates that average liabilities account for 22.62% of the chosen enterprises' total assets. The arithmetic mean of the used leverage ratio generally explains 22.62% during the period and widely scatters between the min 0.00 and the max 2.59. This specifies the fact that the companies under the study, on average, tended to finance 22.62% of their assets through Debt. The average size was 8.415, indicating a relatively low level of assets across all industries. The average Tangibility was 48%, indicating that the chosen Indian company's total fixed assets are sufficient. The average liquidity was 28.12%, which was inadequate to cover the firm's liabilities. The selected firms' average growth was 11.84%, which indicates that their average growth was subpar.

6.2 CORRELATION MATRIX AND MULTICOLLINEARITY TEST

Table 6.2: Correlation Matrix among the variables

	LEV	SZ	TAN	LIQ	UN	GR	FQ	ROIC
LEV	1.00							
SZ	0.08*	1.00						
TAN	-0.147**	0.492**	1.00					
LIQ	-0.149**	-0.305**	-0.108**	1.00				
UN	-0.112**	0.089**	0.143**	0.040	1.00			
GR	0.006	-0.047	-0.010	-0.027	-0.107**	1.00		
FQ	-0.146**	-0.047	-0.112**	-0.062	-0.046	0.040	1.00	
ROIC	-0.028	0.003	-0.001	0.005	0.001	0.008	-0.009	1.00

* significant at 0.05 level, ** significant at 0.01 level

In addition to descriptive statistics, table 6.2 also demonstrates the correlation coefficients. The correlation matrix primarily measures the relationship between each pair of the variables of the study. This matrix is useful for checking the multicollinearity problem in regression. This Correlation matrix shows that the degree of correlation among the variables is meager except for Tangibility and size, whose correlation coefficient is 0.492. So, it is necessary to verify whether it contains a multicollinearity problem.

Table:6.3 Multicollinearity test

Measure	LEV	SZ	TAN	LIQ	UN	GR	FQ	ROIC
Tolerance value	0.894	0.677	0.709	0.875	0.961	0.983	0.946	0.996
VIF	1.12	1.48	1.41	1.14	1.04	1.02	1.06	1.00

The above table shows the multicollinearity test among the explanatory variables. In order to check the multicollinearity, the VIF (variance inflation factor) test is used. According to Gujrati (2003), if the VIF value is more than 10, there must be a multicollinearity problem. However, in the above table, all the VIF values are less than 5. So, it can be said that there are no multicollinearity problems.

6.3 PANEL UNIT ROOT TEST

Test for Stationarity has been verified for all variables considered in the study through the Unit Root Testing using Levin, Lin & Chu (LLC) Test (2002). In Table 6.4, the test results clearly showed that the null hypothesis of a panel unit root in the series level was rejected (p-value < 0.05) at various lag lengths, indicating that the series has no unit root and is stationary. As all variables are stationary at a constant level by applying the LLC test, time-series characteristics carried through the panel data are stable over time.

Table-6.4: Unit Root Test

Variables	t-statistics	p-value
Leverage (LEV)	-56.7895	0.0000
Size (SZ)	-5.8083	0.0000
Tangibility (TAN)	-12.4250	0.0000
Liquidity (LIQ)	-11.1953	0.0000
Uniqueness (UN)	-62.7269	0.0000
Growth(GR)	-20.4074	0.0000
Firm Quality(FQ)	-20.7848	0.0000
ROIC	-49.7655	0.0000

6.4 SELECTION OF APPROPRIATE MODEL

This study uses the dynamic panel to control the endogeneity issue among our variables.

GMM technique of Arellano and Bond (1991). In STATA statistical software, we ran the GMM method where system GMM, difference GMM, pooled OLS, and fixed effect methods were run. Here, the model selection procedure is followed by the following procedure-

Step 1:Estimation of regression output by pooled OLS methods (upper boundary)

Step 2: Estimation of regression output by fixed effect methods (lower boundary)

Step 3: Estimation of regression output by difference GMM method

Step 4: Since the estimators of both one-step difference GMM and two-step difference GMM are above the fixed effect estimator, the Difference GMM method can be preferred for the estimation of regression outcomes (if the estimate obtain is close to or below the FE model, system GMM should be preferred)

Table:6.5 Model Estimation

Methods Name (Estimators)	Estimation value (coefficient)
Pooled OLS	-0.0242128
Fixed effect Model	-0.1368094
One-step difference GMM	-0.0401832
Two-step difference GMM	-0.0591464
One-step system GMM	-0.0374954
Two-step system GMM	-0.0531052

The table unequivocally demonstrates that the fixed effect model's coefficient is smaller than the GMM's coefficient of difference. Therefore, the difference GMM methods can be used to estimate the regression result by following the abovementioned approach. Ultimately, because the two-step difference GMM approach produces more reliable and robust regression output, it has been taken into consideration.

6.5 GMM REGRESSION ANALYSIS

Table 6.6 presents the outcomes of the two-step difference GMM estimation to investigate the association between firm profitability and capital structure.

Table-6.6:Two-Step Difference GMM Regression Outcomes

ROIC: Dependent Variable				
Variables	**Coefficient**	**Standard Error**	**t**	**p-value**
ROIC.L1	-.0401832	.0207057	-1.94	0.055
LEV	82.95778	51.20136	1.62	0.091
SZ	-95.61655	71.69093	-1.33	0.185
TAN	205.2944	214.2446	0.96	0.340
LIQ	.6687565	1.403029	0.48	0.635
UN	1.465714	3.017332	0.49	0.628
FQ	-8.115131	6.735783	-1.20	0.231
GR	.1452143	.2159021	0.67	0.503
F(7, 99) = 3.30 , Prob > F = 0.002				
Arellano-Bond test for AR(1) in first differences: z = -1.07 Pr > z = 0.286				
Arellano-Bond test for AR(2) in first differences: z = 0.67 Pr > z = 0.504				
Sargan test of overid. restrictions: chi2(7) = 6.33 Prob > chi2 = 0.502				
Hansen test of overid. restrictions: chi2(7) = 4.60 Prob > chi2 = 0.709				

Regression results appended in Table 6.6 capture the effect of leverage on firm Profitability. The coefficient of LEV points out that leverage has a statistically significant and positive impact on firm Profitability, as measured by ROIC at a 10% significance level. When it comes to the effects of the control variables, the regression results indicate that while farm size and firm quality have negative effects, there is no statistically significant correlation between them. However, the Tangibility, Liquidity, Uniqueness, and Growth coefficients indicate a positive relation with the firm's profitability, but their relationship is not statistically significant.

Arellano and Bond (1991) suggested two preliminary diagnostic tests to examine the validity of GMM estimator models: the Arellano-Bond autocorrelation errors test and the Hansen J over-identification test. While the residuals in AR(2) should not be associated, the later test permits serial correlations between the GMM model's error terms in AR(1). This test's initial hypothesis presupposes no serial connection between the residuals. Additionally, the former test necessitates the validity of over-identifying restrictions in the GMM model. The initial hypothesis of the Hansen J test presumes that the over-identifying restrictions are valid and can be rejected if the instrument variables are endogenous or if the instruments are omitted from the GMM model.

The outcomes of the two diagnostic tests are presented in Table 6.6 above. The results show that the p-values of Arellano-Bond serial correlation tests are 0.286 for AR(1) and 0.504 for AR(2), which are greater than 0.1. Therefore, the initial hypothesis of no serial correlation in the residuals cannot be rejected. Moreover, the outcomes of the Hansen J test disclose the validity of the instrument variables. The probability values of the Hansen J-statistics are 0.709, i.e., greater than 0.1. Thus, the instruments are valid, and we cannot reject such a hypothesis.

7. CONCLUSION

The study uses dynamic panel regression analysis and robust regression estimations to empirically explore the relationship between capital structure and profitability. The study made an attempt to critically demonstrate how capital structure influences a company's profitability and how finance managers should exercise extreme caution when creating capital structures since it is one of the key factors influencing a company's profitability. The results of the econometric model estimations showed that capital structure is positively associated with a firm's profitability. In addition, the regression results show that there is no statistically significant association between farm size and firm quality despite the fact that both have negative consequences. The firm's profitability is positively correlated with the Tangibility, Liquidity, Uniqueness, and Growth factors; however, this correlation is not statistically significant. Ultimately, the study's findings demonstrated that the firm's profitability is greatly impacted by the design of the capital structure. For this reason, the finance manager must plan the capital structure in such a way so that the business can generate a healthy surplus to satisfy all of its stakeholders.

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