

An Empirical Analysis on the Nature of Relationship between Capital Structure and Firms Performance: A Study of 40 Indian Firms

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Abstract: *The financing decision with regard to capital structure theory of finance has been a topic of many theories and their conflicting output for past many years. This paper aims to analyse the nature of relationship between the capital structure of a firm and its performance. The data of 40 firms excluding financial services firms listed on Nifty 50 on National Stock Exchange is studied. Financial services firms have been excluded from purview of this paper, as they are in the business of collecting money and investing in financial assets rather than producing goods, hence follow a unique business valuation model. This paper analyzes a period of 13 years (2001/02-2013/14) covering the phases of a business cycle starting from boom (2001/02-2006/07), recession (2007/08-2008/09) and then recovery (2009/10-2013/14). The complete business cycle will aid to demonstrate the results more accurately. This paper also surveys the topical developments in the empirical capital structure research. The data for a period of 13 years is analysed using descriptive statistics, correlation and multiple regression techniques. For research purpose, the ratios such as debt-equity ratio, debt-asset ratio and long term debt are taken as dependent variables whereas Net Profit, Net Profit Margin, ROCE, ROE and ROA are the ratios taken as independent variables.*

Key words: *Capital Structure, Firms Performance.*

JEL classification: *G32, L25.*

I. Introduction

Capital structure is defined as a mix of long term debt, short term debt, ordinary shares and preferred equity. The capital structure is how a firm finances its overall operations and the growth by using different sources of funds. Debt as a source of finance comes in the form of bond issues or long term notes payable, while equity is classified as common stock, preferred stock or retained earnings. Financing of working capital is also considered as a part of capital structure. At the time of raising finance for various objectives like expansion, restructuring, acquisitions- the decision regarding how to fund a venture is a centre of discussion.

The firm's management is always surrounded by the question as how to manage the balance sheet in a balanced approach. So there is no trouble of excess cash and liquidity crunch in the firm. To tackle this firstly, the balance has to be kept between profit retention for reinvestment and profit distribution as dividends. Secondly, should the firm finance its new venture by raising debt or new equity? So achieving the right capital structure comprising of equity and debt has been demanding for decades. One of the main objectives of a firm is to maintain a capital structure that maximises the value of a firm and minimizes its cost of capital which essentially means raising the funds at a low cost of capital. Cost of capital is a combination of fixed interest paid to the debenture holders and the dividend paid to the equity share holders. Hence, we can say that the fixed cost is the key factor whether it is involved in production process or fixed financial charges. The fixed cost should be kept low if the management is likely to confront an uncertain environment. But how low or how high the fixed cost should be is the basic question. The market price of the share is also be affected by the capital structure decision.

The decision regarding the capital structure is to be considered at different stages, initially at the time of promotion and subsequently, every time when the external funds have to be raised. A demand for raising funds generates a new capital structure which needs a critical analysis (Inghvi.M.N, 2012). Various theories have stated the relationship between capital structure and firm's market value. Traditional theory suggests that the market value of a firm can be increased up to certain level by substituting debt in place of equity beyond that the cost of equity and debt starts rising and firm's market value declines. But (Miller, 1958) changed the paradigm by "Irrelevance Theory" stating that there is no relationship between capital structure and firm's market value. They argued that the market values the earning power of a firm's fixed assets and that if the firm's capital investment program is held static and certain other assumptions are satisfied, the combined market value of a firm's debt and equity is independent of its choice of capital structure.

The notion of performance can be explained by two interconnected variables: financial and operational. A firm's operational performance can be measured by productivity, growth in sales, returns, sales per employee, growth in market share whereas the firm's financial performance can be measured and reflected by profit maximisation (Net Profit, Net Profit Margin), wealth maximisation, Return on Assets, Return on Capital Employed as firm's efficiency. Other variables to measure the firm's performance are earning per share, residual income, dividend yield.

The measurement of performance is based upon the information introduced in the measurement system. The classical indicators for measurement of firm's performance used in financial analysis are Net Profit Margin, Return on Assets, Leverage, Cash flow, efficiency, inventory turnover ratios, receivable turnover ratios. In addition to these other new indicators of performance are MVA (Market Value added), EVA (Economic Value added), CFROI (Cash flow Return on Investment), and NPV (Net Present Value). The choice of variables for measuring firm's performance depends upon its objectives. In the paper, variable selection is based on classical performance indicators reflecting profit and shareholders return maximisation namely NP, NPM, ROA, ROE and ROCE.

India as an emerging economy is influenced by various factors (internal and external) with regard to the capital structure decision. The decision regarding the capital structure is affected by economic environment apart from firm specific factors. The Indian economy was affected by various global crisis and events. The recent Subprime crisis also affected the world globally and Indian economy in particular. The firms altered their mode of raising funds as equity markets lost investors confidence and interest rates for debt financing rose. So the paper also analyze relationship between capital structure and firms performance in phases for the period of boom from 2001/02-2006/07, recession when subprime crisis hit Indian economy 2007/2008-2008/2009 and then the period of recovery from 2009/10-2013/14.

The paper is organised as follows: the next section consists of research objectives, followed by hypotheses of the study, research methodology, some of the theoretical and empirical literature review, analysis and findings and the last section consists of conclusion, limitations and further scope of the study.

II. Research Objective

The objectives of the study are:

- To identify the capital structure of a firm.
- To analyse the nature of relationship between capital structure and firms performance.
- To analyse the nature of relationship between capital structure and firms performance for various phases of a business cycle (Boom-recession- Recovery).

III. Hypotheses Of The Study

H₀: There is no significant relationship between capital structure and firms performance.

H₁: There is a significant relationship between capital structure and firms performance.

IV. Research Methodology

This paper aims to analyse the nature of relationship between the capital structure of a firm and its performance. Data of 40 companies excluding financial services firms listed on Nifty 50 of National Stock Exchange has been analyzed. Nifty 50 is a composition of 50 well diversified companies representing 12 sectors, hence reflecting accurately the overall market financial condition. Financial services firms have been excluded from purview of this paper. A Financial firm is an enterprise such as a bank whose primary business and function is to collect money from the public and invest it in financial assets and it that does not deal with production of goods. Further, financial services sector being of the most sensitive sectors with a unique business valuation model which is unlike with the goods manufacturing firms. In this paper a period of thirteen (13) years (i.e. 2001/02-2013/14) is studied as it reflect upon the several phases of an Indian economy business cycle starting from boom- recession-depression and then the recovery. Further the period is sub divided into various phases of a business cycle i.e. boom (2001/02-2006/07)-recession (2007/08-2008/09)-recovery (2009/10-2013/14). The business cycle phases/turning points are divided as per (OECD, 2015) report titled "OECD¹ Composite Leading Indicators" published in July 2015. There are 4159 observations from 2001/02-2013/14 that have been used for analysis. The aforementioned period will help demonstrate the question of relationship between firm financing and its capital structure accurately. Debt- Equity ratio (DER), Debt-Asset ratio (DAR) and Long Term Debt to Equity ratio (LTDER) are taken as independent variables whereas Net Profit, Net Profit Margin, Return on Equity (ROE), Return on Assets (ROA), Return on Capital Employed (ROCE) are taken as dependent variables for the study. The dependent variables have been log transformed to overcome the problem of non linearity with the data. Analysis is done by using descriptive statistics, correlation and multiple regressions technique.

Data Collection

Data collected for analysis is secondary in nature. The data for a period of thirteen years has been extracted from PROWESS (an electronic database developed and maintained by Centre for Monitoring Indian Economy). The data collected is tabulated, analysed and interpreted using SPSS 20 software.

V. Literature Review

The core objective of financial management is wealth maximization. The wealth maximization is gained from share price maximization. The first of the serious attempts to explore capital structure choice is the theory developed by (Paton, 1922) which postulates that companies value is free of substituting one form of capital for another in case of no taxation. This conclusion was also supported by the first proposition of (Miller, 1958) called Irrelevance Theorem, resting on some simplifying assumptions such as the presence of efficient capital market, fairly priced securities, and distorting taxes. Their theory believed in 100% debt financing due to the tax shields on interest payments.² Tax shielding is an advantage/benefit that a firm gets on interest payment of debt. These assumptions given by Arrow- Debreu about the debt irrelevance are hardly realistic. (Modigliani, 1963) waived off the no tax assumption and considered the advantages of tax shielding. The general paradigm changed in 1970's when many academicians believed that the optimal capital structure entailed balancing the tax shielding from debt against the present value of bankruptcy costs. It gained momentum when Miller presented a theory stating that under certain conditions the tax shielding from debt exactly offset the disadvantage of debt at the personal level. The outcome of this work is that if there are significant "leverage-related" costs, such as bankruptcy costs, agency costs of debt, and loss of non-debt tax shields, and if the income from equity is untaxed, then the marginal bondholder's tax rate will be less than the corporate tax rate and there will be a positive net tax advantage to corporate debt

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100% debt financing is also not possible due to statutory requirements. (Modigliani & Miller (1958)).

financing. The firm's optimal capital structure will involve the trade off between the tax advantage of debt and various leverage-related costs (O'Brien, 2003). On the other hand with regard to Miller and Modigliani propositions, that capital structure strategy choice is dynamic, not fixed over time. (Niresh, 2012) stated that the highly levered institutions explained that the total assets by mainly financed by debt and there is a negative correlation between capital structure and profitability. If their capital structure choices does not matter as suggested by (Miller M. , 1977) then they would be compelled not to make future capital structure choice that will affect the firm's performance. (Ross, Spring 1977) model suggested that the values of firms would increase with leverage, since increasing the market value. Firms with lower expected cash flows find it more costly to raise new debt. So, when the firm raise new debt, it commits itself to future interest payments and signals about its stable financial position and ability to make these payments in the future (Stewart, 1984) also stated that company always prefer internal funding (retained earnings) and then secured debt. Another theory developed on the similar lines by (Leland, 1998), the higher the quality of the project the manager wants to invest in, the higher will be the willingness to raising funds. Hence the manager will attract lower debt. The last alternative would be to raise new equity for financing. (Shyam-Sunder, 1999) provides a better explanation than any other traditional theories in the area of capital structure. The Pecking order theory emphasize on taxes and financial distress as important factors. The researchers started focussing on the relationship between capital structure and company's market value through a concept called as agency theory. The agency theory by (Jensen M, 1976), (Harris M, 1991)and (Myers, 2001) discussed about the concept of conflict between shareholders and managers on one hand and on the contrary about the potential conflict between the shareholders and debtholders. The conflict arose when the managers made an attempt to expropriate the wealth of the company to serve their personal motives in place of company's wealth maximization by investing into high risk ventures. The investment in the high risk ventures concentrated on serving the self motives for maximizing the rewards and compensation of managers first after that concerning the interests of all other shareholders of a company leading to maximize company's value.

Table 1: Summing up of capital structure theories

Theory	Relationship	Causality
Modigliani & Miller	Positive	Performance affects debt
Trade Off	Positive	Performance affects debt
Pecking Order Theory	Negative	Performance affects debt
Agency problem	Positive	Debt effects performance
Signaling	Positive	Performance affects debt

Source: Author's compilation

The study by (Mustafa M Soumadi, 2007) on Jordanian firms listed on Amman stock market also showed a negative relationship between financial leverage and firm's performance. This negative relationship ultimately leads to the conclusion that a firm should finance its operations through debt which in turn may lead to bankruptcy and decrease in tax shields then to minimize firm's performance. It also states that there are no significant differences between a high levered and a low levered firm to significantly affect the firm's performance. (V Krishnan, 1997), (R Simerly, 2000), (M. King, 2008) and (A Onaolapo, 2010) established that capital structure also related negatively with firm performance. (Lawal Babatunde Akeem, 2014) also got similar results that capital structure measures (total debt and debt to equity ratio) are negatively related to firm performance. It recommended that firms should employ more of equity than debt in financing their business activities; so that as much as possible the value of a firm can be maximised using debt capital. It is further concluded that firms should establish the point at which the weighted average cost of capital is minimum and maintain that leverage ratio so that the firm's value is not eroded, as the firm's capital structure is optimal at this point. (Kimberly C Gleason, 2000) found that capital structure may vary even the cultural classification of retailers among seven European countries. They identified that retailer's performance is independent of any culture. Capital structure influences culture. Finally agency conflicts are majorly responsible for overleveraging of retailers resulting in a negative relationship between capital structure and firms performance.

(Wipperm, 1966) investigated that the relationship between financial leverage and firm value in some sectors marked on a high degree in difference characteristics for growth, cost and demand. The study used debt to equity ratio as financial leverage indicator and earnings to market value of common stock as performance indicator. Results revealed that leverage effect positively on firm value and the conventional evidence which said that shareholders wealth can enhance by using debt financing. (D Roberta, 2003) found that financial leverage positively affects the expected performance. They described that low growth firms endeavour to depend on the borrowing for utilizing the expected growth opportunities and investing debt funds in profitable projects, therefore it will add to the firm performance.

(Edim, 2014) a research done on the lines of traditional theory of capital structure found mixed results. It suggested judicious employing of debt for maximization of firms value. Firms can borrow when profit are high and can take advantage of tax shield. Further it is suggested that, long term debts should be employed in the financing of long term projects and short term debts should be employed in financing fast maturing financial obligation. Financial managers should only focus on choosing policies increase shareholder's wealth. (A Saeedi, 2011) studied the capital structure and financial performance of Iranian firms considering four performance measures namely- return on assets, return on equity, earning per share and Tobin's Q as dependent variable and three capital structure measures including long term debt, short term debt and total debt ratios as independent variables for analyzing 320 listed firms on Tehran Stock Exchange. They proved that financial performance of the firms measured by EPS and Tobin's Q are significantly and positively associated with capital structure, while ROA has the negative relationship with capital structure and ROE has no significant relationship with capital structure. (Weill, 2008) investigated the effect of financial leverage on the firm performance in seven European countries. The study abridged that financial leverage related positively and significantly on firm performance in Spain and Italy, whereas negatively and significantly in Germany, France, Belgium and Norway, but insignificantly in Portugal.

VI. Analysis & Findings

The relationship between capital structure and firms performance is analysed by using multiple regression model:

$$Y_{it} = \alpha_i + \beta_1 X_{it} + U_{it}$$

Where α_i is a regression constant, i is firms, t is time period, Y_{it} is a dependent variable, β_1 is parameters, X_{it} are explanatory variables, and U is a random unobserved component that reflects unobserved shocks affecting the performance of firms.

So the model formed is as follows with regard to the selected dependent and independent variables:

- Equation 1** $\text{Ln NP} = \beta_0 + \beta_1 \text{DER} + \beta_2 \text{DAR} + \beta_3 \text{LTDER} + U_{it}$
- Equation 2** $\text{Ln NPM} = \beta_0 + \beta_1 \text{DER} + \beta_2 \text{DAR} + \beta_3 \text{LTDER} + U_{it}$
- Equation 3** $\text{Ln ROE} = \beta_0 + \beta_1 \text{DER} + \beta_2 \text{DAR} + \beta_3 \text{LTDER} + U_{it}$
- Equation 4** $\text{Ln ROA} = \beta_0 + \beta_1 \text{DER} + \beta_2 \text{DAR} + \beta_3 \text{LTDER} + U_{it}$
- Equation 5** $\text{Ln ROCE} = \beta_0 + \beta_1 \text{DER} + \beta_2 \text{DAR} + \beta_3 \text{LTDER} + U_{it}$

Where notations:

- Ln = Natural Logarithm.
- NP= Net Profit is measured by Profit after tax.
- NPM= Net profit margin is measured by Net profit to net sales.
- ROE= Return on Equity is measured by profit after tax to equity.
- ROA= Return on Assets is measured by profit after tax to Total assets.
- ROCE= Return on capital employed is measured by profit after tax to capital employed.
- DER= Debt to equity ratio for firm I in year t.
- DAR= Debt to asset ratio for firm I in year t.
- LTDAR= Long term debt to equity ratio for firm I in year t.
- U= error term for firm I in year t.

Descriptive Statistics

Table 2 explains descriptive statistics from year 2001/02-2013/14 and further sub sections base on the phases of a business cycle.

Table 2: Time period 2001-2014

Variables	Observations	Mean Estimate	Variance	Minimum	Maximum
DER	520	.219	.142	0	2.598
DAR	520	.094	.014	0	0.581
LTDER	520	.176	.108	0	2.522
NP	519	28134.21	1720596782	-46455.5	251229.2
NPM	520	17.99	503.53	-223.63	90.86
ROE	520	29.51	396.62	-37.23	142.68
ROA	520	16.299	81.91	-23.92	50.79
ROCE	520	27.48	384.20	-32.05	130.01

Table 2.1: Boom Phase: Time Period 2001/02-2006/07

Variables	Observations	Mean Estimate	Variance	Minimum	Maximum
DER	242	.107	.018	0	0.722
DAR	242	.052	.003	0	0.390
LTDER	242	.084	.014	0	0.709
NP	232	15453.52	670313464.9	-2124.5	195063.9
NPM	240	15.49	533.46	-223.63	90.86
ROE	240	23.52	376.71	-37.23	130.01
ROA	240	12.40	82.12	-23.92	50.79
ROCE	240	20.04	376.19	-32.05	130.01

Table 2.2: Recession Phase: Time Period 2007/08-2008/09

Variables	Observations	Mean Estimate	Variance	Minimum	Maximum
DER	81	.292	.204	0	2.227
DAR	81	.141	.021	0	0.562
LTDER	81	.218	.122	0	2.015
NP	81	29333.54	1295325890	-689.5	167016.5
NPM	80	17.34	204.76	-40.05	73.04
ROE	80	24.31	396.62	-37.23	142.68
ROA	80	13.02	81.91	-23.92	50.79
ROCE	80	21.11	384.20	-32.05	130.01

Table 2.3: Recovery Phase: Time Period 2009/10-2013/14

Variables	Observations	Mean Estimate	Variance	Minimum	Maximum
DER	200	.219	.142	0	2.599
DAR	200	.094	.014	0	0.581
LTDER	200	.176	.108	0	2.522
NP	200	29264.86	1723120647	-46455.5	251229.20

NPM	200	16.01	505.47	-223.630	90.86
ROE	200	23.72	418.46	-37.230	130.01
ROA	200	13.03	81.91	-23.920	50.79
ROCE	200	20.91	412.73	-32.050	130.01

In table 2, the mean for DAR is lowest at 9.4% with a minimum variance. The mean for LTDER is 17.6% during the period from 2001/02-2013/14. The mean increased to around 22% around recession because of augment in debt financing. However this percentage is still less risky for the sample firms. It depicts that many firms survive on no debt and few are funded by the government. The mean for DER, DAR and LTDER is least during the boom phase. While the maximum value for DER and LTDER is at 2.60 and 2.52. The minimum value for DER, DAR and LTDER is zero through all the phases. However, the maximum increase in debt levels was in the recessionary phase and recovery phase as explained by Table 2.2 and 2.3 to build up for the losses. This refers to the importance of debt financing to firms for all the decisions in finance. Moreover equity markets were deficient in confidence during these phases. The DAR also showed the maximum level during the recession phase. With regard to ROE, ROA and ROCE the figures does not vary to a great extent between various phases. The mean for NPM speckled very small but its variance speckled high. The lowest minimum and highest maximum is in recovery phase. This shows that the market in full swing gained confidence and momentum gradually.

Karl Pearson Correlation

Table 3 and its sub tables show the correlation between dependent and independent variables.

Table 3: Time Period 2001-2014

Variables	Pearson correlation signed (2 tailed)	DAR	DER	LTDER	NP	NPM	ROE	ROA	ROCE
DAR		1	.874	.845	0.018	-0.091	-0.300	-0.439	-0.382
DER		.874	1	.967	-0.012	-0.075	-0.237	-0.387	-0.310
LTDER		.845	.967	1	0.012	-0.041	-0.210	-0.352	-0.285
NP					1	0.157	0.050	0.116	0.063
NPM						1	0.277	0.493	0.279
ROE							1	0.800	0.980
ROA								1	0.821
ROCE									1

Table 3.1 Boom Phase: Time Period 2001/02-2006/07

Variables	Pearson correlation signed (2 tailed)	DAR	DER	LTDER	NP	NPM	ROE	ROA	ROCE
DAR		1	.824	.820	0.031	0.072	-0.221	-0.234	-0.220
DER		.824	1	.953	0.007	0.012	-0.168	-0.303	-0.198
LTDER		.820	.953	1	0.009	0.047	-0.160	-0.271	-0.186
NP					1	0.061	-0.042	-0.036	-0.023
NPM						1	0.298	0.519	0.305
ROE							1	0.804	0.983
ROA								1	0.823
ROCE									1

Table 3.2 Recession Phase: Time Period 2007/08-2008/09

Variables	Pearson correlation signed (2 tailed)	DAR	DER	LTDER	NP	NPM	ROE	ROA	ROCE
DAR		1	.743	.716	-0.027	-0.194	-0.300	-0.439	-0.382
DER		.743	1	.928	-0.065	-0.165	-0.237	-0.387	-0.310
LTDER		.716	.928	1	-0.031	-0.095	-0.210	-0.352	-0.285
NP					1	0.140	0.081	0.137	-0.096
NPM						1	-0.061	-0.012	-0.043
ROE							1	0.800	0.980
ROA								1	0.821
ROCE									1

Table 3.3 Recovery Phase: Time Period 2009/10-2013/14

Variables	Pearson correlation signed (2 tailed)	DAR	DER	LTDER	NP	NPM	ROE	ROA	ROCE
DAR		1	.874	.845	0.018	-0.091	-0.440	-0.439	-0.520
DER		.874	1	.967	-0.012	-0.075	-0.335	-0.387	-0.418
LTDER		.845	.967	1	0.012	-0.041	-0.286	-0.352	-0.374
NP					1	0.157	0.168	0.116	0.168
NPM						1	-0.085	0.493	-0.083
ROE							1	-0.163	0.984
ROA								1	-0.171
ROCE									1

In table 3, the correlation between DER and DAR, DAR and LTDER is the highest (near to 1). Whereas the correlation between ROA and DER, ROA and DAR, ROA and LTDER is negative depicting that debt goes without physical collateral. Similar, association is depicted between ROE and DER, ROE and DAR. The association between DER and NPM, DAR and NPM, LTDER are found to be negative demonstrating that whenever the debt level goes up, the profit margins decline in all the phases represented by Table 3.1, 3.2 and 3.3. This association is positive during boom phase stating with rise in debt level the net profit margins does not decline.

Regression Analysis
Time Period 2001-2014

Table 4.1: Regression results for Net Profit and independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		9.412	.085		110.484	.000
Ln(NP)	DER	-1.123	.753	-.291	-1.491	.137
Ln(NP)	DAR	1.099	1.115	.089	.986	.325
Ln(NP)	LTDER	1.399	.786	.318	1.780	.076
R	.131	R ²	.017	Adj R ²	.011	
S.E	1.45	F	2.898	Sig (at .05 level)	.035	

*DV is dependent variable, INV is independent variable, and S.E is standard error

The value of R for these independent variables is .131 reflecting the degree of association among variables. The value of R² is .017 i.e. 1.7% of the variation in NP explained by these variables (DER, DAR, LTDER) with a standard error of 1.45 whereas 98.3% of the variation is unexplained by these variables. This statistically shows a very weak relationship among NP and the independent variables. It also means that the variation is explained by some other independent variables. The value of F (2.898) is substantiated at 5% level of significance. All the independent variables show an insignificant association with NP at 5% level of significance.

Table 4.2: Regression results for NPM and independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		2.766	.043		63.958	.000
Ln(NPM)	DER	-3.059	.386	-1.416	-7.928	.000
Ln(NPM)	DAR	-.591	.570	-.086	-1.038	.300
Ln(NPM)	LTDER	3.108	.402	1.262	7.727	.000
R	.415	R ²	.172	Adj R ²	.167	
S.E	.743	F	34.86	Sig (at .05 level)	.000	

*DV is dependent variable, INV is independent variable, and S.E is standard error

The value of R for these independent variables is .415 reflecting the degree of association among variables. The value of R² is .172 i.e. 17.2% of the variation in NPM explained by these variables (DER, DAR, LTDER) with a standard error of .743 whereas 82.8% of the variation is unexplained by these variables. This statistically shows a moderate relationship among NPM and the independent variables. The value of F (34.86) is substantiated at 5% level of significance. All the independent variables except DAR show a significant association with NPM at 5% level of significance. However, all the independent variables show a positive association with NPM as reflecting by Beta i.e. a unit increase in independent variables will lead to increase in NPM.

Table 4.3: Regression results for ROE and Independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		3.186	.043		74.901	.000
Ln(ROE)	DER	-.498	.379	-.243	-1.312	.190
Ln(ROE)	DAR	-2.559	.560	-.393	-4.565	.000
Ln(ROE)	LTDER	.797	.396	.341	2.014	.045
R	.330	R ²	.109	Adj R ²	.104	
S.E	.731	F	40.52	Sig (at .05 level)	.000	

*DV is dependent variable, INV is independent variable, and S.E is standard error

The value of R for these independent variables is .330 reflecting the degree of association among variables. The value of R² is .109 i.e. 10.9% of the variation in ROE explained by these variables (DER, DAR, LTDER) with a standard error of .731 whereas 79.1% of the variation is unexplained by these variables. This statistically shows a moderate relationship among ROE and the independent variables. The value of F (40.52) is substantiated at 5% level of significance. DER and LTDER shows an insignificant association except DAR with ROE at 5% level of significance. However, all the independent variables show a positive association with ROE as reflecting by Beta i.e. a unit increase in independent variables will lead to increase in ROE.

Table 4.4: Regression results for ROA and independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		2.632	.042		62.997	.000
Ln(ROA)	DER	-1.270	.373	-.589	-3.407	.001
Ln(ROA)	DAR	-2.092	.551	-.305	-3.800	.000
Ln(ROA)	LTDER	1.065	.389	.434	2.741	.006
R	.473	R ²	.224	Adj R ²	.219	
S.E	.718	F	48.19	Sig (at .05 level)	.000	

*DV is dependent variable, INV is independent variable, and S.E is standard error

The value of R for these independent variables is .473 reflecting the degree of association among variables. The value of R² is .224 i.e. 22.4% of the variation in ROA explained by these variables (DER, DAR, LTDER) with a standard error of .718 whereas 77.6% of the variation is unexplained by these variables. This statistically shows a moderate relationship among ROA and the independent variables. The value of F (48.19) is substantiated at 5% level of significance. All the independent variables show a significant association with ROA at 5% level of significance. Moreover, all the

independent variables show a positive association with ROA as reflecting by Beta i.e. a unit increase in independent variables will lead to increase in ROA.

Table 4.5: Regression results for ROCE and independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		3.090	.046		66.694	.000
Ln(ROCE)	DER	-.915	.413	-.379	-2.214	.027
Ln(ROCE)	DAR	-3.265	.610	-.425	-5.348	.000
Ln(ROCE)	LTDER	.898	.431	.327	2.084	.038
R	.488	R ²	.238	Adj R ²		.234
S.E	.796	F	52.36	Sig (at .05 level)		.000

*DV is dependent variable, INV is independent variable, and S.E is standard error

The value of R for these independent variables is .488 reflecting the degree of association among variables. The value of R² is .238 i.e. 23.8% of the variation in ROCE explained by these variables (DER, DAR, LTDER) with a standard error of .796 whereas 76.2% of the variation is unexplained by these variables. This statistically shows a moderate relationship among ROCE and the independent variables. The value of F (52.36) is substantiated at 5% level of significance. All the independent variables show a significant association with ROCE at 5% level of significance. Moreover, all the independent variables show a positive association with ROCE as reflecting by Beta i.e. a unit increase in independent variables will lead to increase in ROCE.

Boom Phase: Time period: 2001/02-2006/07

Table 4.6: Regression results for NP and independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		8.749	.147		59.442	.000
Ln(NP)	DER	-1.019	2.596	-.088	-.392	.695
Ln(NP)	DAR	-1.411	3.195	-.052	-.442	.659
Ln(NP)	LTDER	2.878	2.917	.219	.987	.325
R	.104	R ²	.011	Adj R ²		-.003
S.E	1.59	F	.806	Sig (at .05 level)		.492

*DV is dependent variable, INV is independent variable, and S.E is standard error

In a boom phase, the value of R for these independent variables is .108 reflecting a weak degree of association among variables. The value of R² is .011 i.e. 1.1% of the variation in NP explained by these variables (DER, DAR, LTDER) with a standard error of 1.59 whereas 98.9% of the variation is unexplained by these variables. This statistically shows a no relationship among NP and the independent variables. The value of F is very low (.806) and is not substantiated at 5% level of significance. All the independent variables show an insignificant association with NP at 5% level of significance. This makes NP an unfit variable in a model. Moreover, all the independent variables show a highly aggressive and positive association with NP as reflecting by Beta i.e. a unit increase in independent variables will lead to increase in NP.

Table 4.7: Regression results for NPM and independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		2.669	.068		39.355	.000
Ln(NPM)	DER	-9.419	1.248	-1.552	-7.547	.000
Ln(NPM)	DAR	2.802	1.513	.197	1.851	.065
Ln(NP)M	LTDER	9.152	1.402	1.329	6.530	.000
R	.449	R ²	.201	Adj R ²		.191
S.E	.747	F	45.95	Sig (at .05 level)		.000

*DV is dependent variable, INV is independent variable, and S.E is standard error

In a boom phase, the value of R for these independent variables is .449 reflecting a moderate degree of association among variables. The value of R² is .201 i.e. 20.1% of the variation in NPM explained by these variables (DER, DAR, LTDER) with a standard error of .747 whereas 79.9% of the variation is unexplained by these variables. The value of F (45.95) and is substantiated at 5% level of significance. DER and LTDER shows a significant association except DAR with NPM at 5% level of significance. Moreover, all the independent variables show a positive association with NPM as reflecting by Beta i.e. a unit increase in independent variables will lead to increase in NPM.

Table 4.8: Regression results for ROE and independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		2.669	.068		39.355	.000
Ln(ROE)	DER	-9.419	1.248	-1.552	-7.547	.000
Ln(ROE)	DAR	2.802	1.513	.197	1.851	.065
Ln(ROE)	LTDER	9.152	1.402	1.329	6.530	.000
R	.289	R ²	.083	Adj R ²		.006
S.E	.753	F	1.846	Sig (at .05 level)		.412

*DV is dependent variable; INV is independent variable, S.E

In a boom phase, the value of R for these independent variables is .289 reflecting a moderate degree of association among variables. The value of R² is .083 i.e. 8.3% of the variation in ROE explained by these variables (DER, DAR, LTDER) with a standard error of .753 whereas 91.7% of the variation is unexplained by these variables. The value of F is very low (1.846) and is not substantiated at 5% level of significance. DER and LTDER shows a significant association

except DAR with ROE at 5% level of significance. Moreover, all the independent variables show a positive association with ROE as reflecting by Beta i.e. a unit increase in independent variables will lead to increase in ROE.

Table 4.9: Regression results for ROA and independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		2.345	.081		28.936	.000
Ln(ROA)	DER	.484	2.057	.081	.235	.814
Ln(ROA)	DAR	-2.911	1.776	-.209	-1.639	.103
Ln(ROA)	LTDER	.990	2.145	.154	.461	.645
R	.135	R ²	.018	Adj R ²		.003
S.E	.815	F	1.165	Sig (at .05 level)		.324

*DV is dependent variable, INV is independent variable, and S.E is standard error

In a boom phase, the value of R for these independent variables is .135 reflecting a degree of association among variables. The value of R² is .018 i.e. 1.8% of the variation in ROA explained by these variables (DER, DAR, LTDER) with a standard error of .815 whereas 98.2% of the variation is unexplained by these variables. The value of F is very low (1.165) and is not substantiated at 5% level of significance. All the independent variable shows an insignificant association with ROA at 5% level of significance. Moreover, all the independent variables show a highly aggressive and positive association with ROA as reflecting by Beta i.e. a unit increase in independent variables will lead to increase in ROA.

Table 4.10: Regression results for ROCE and independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		2.780	.091		30.563	.000
Ln(ROCE)	DER	.002	2.309	.000	.001	.196
Ln(ROCE)	DAR	-3.070	1.993	-.197	-1.540	.125
Ln(ROCE)	LTDER	1.480	2.407	.205	.615	.540
R	.512	R ²	.262	Adj R ²		.201
S.E	.805	F	55.63	Sig (at .05 level)		.000

*DV is dependent variable, INV is independent variable, and S.E is standard error

In a boom phase, the value of R for these independent variables is .512 reflecting a moderate degree of association among variables. The value of R² is .262 i.e. 26.2% of the variation in ROCE explained by these variables (DER, DAR, LTDER) with a standard error of .805 whereas 73.8% of the variation is unexplained by these variables. The value of F (55.63) and is substantiated at 5% level of significance. All the independent variable shows an insignificant association with ROCE at 5% level of significance. Moreover, all the independent variables show a positive association with ROCE as reflecting by Beta i.e. a unit increase in independent variables will lead to increase in ROCE.

Recession Phase: Time Period 2007/08-2008/09

Table 4.11: Regression results for NP and independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		9.813	.159		61.578	.000
Ln(NP)	DER	-.686	.700	-.313	-.980	.330
Ln(NP)	DAR	-.042	1.162	-.006	-.036	.972
Ln(NP)	LTDER	.883	.868	.313	1.018	.312
R	.119	R ²	.014	Adj R ²		-.025
S.E	1.011	F	.367	Sig (at .05 level)		.777

*DV is dependent variable, INV is independent variable, and S.E is standard error

During recessionary phase, the value of R for these independent variables is .119 reflecting a low degree of association among variables. The value of R² is .014 i.e. 1.4% of the variation in NP explained by these variables (DER, DAR, LTDER) with a standard error of 1.011 whereas 99.4% of the variation is unexplained by these variables. The value of F is very low (.367) and is not substantiated at 5% level of significance. All the independent variable shows an insignificant association with NP at 5% level of significance. Moreover, all the independent variables show a positive association with NP as reflecting by Beta i.e. a unit increase in independent variables will lead to increase in NP.

Table 4.12: Regression results for NPM and independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		2.898	.092		31.427	.000
Ln(NPM)	DER	-2.420	.401	-1.501	-6.031	.000
Ln(NPM)	DAR	-1.056	.667	-.212	-1.582	.118
Ln(NPM)	LTDER	2.908	.497	1.402	5.847	.000
R	.637	R ²	.405	Adj R ²		.382
S.E	.579	F	17.04	Sig (at .05 level)		.000

*DV is dependent variable, INV is independent variable, and S.E is standard error

During recessionary phase, the value of R for these independent variables is .637 reflecting a high degree of association among variables. The value of R² is .405 i.e. 40.5% of the variation in NPM explained by these variables (DER, DAR, LTDER) with a standard error of .579 whereas 59.5% of the variation is unexplained by these variables. The value of F (17.04) and is substantiated at 5% level of significance. DER and LTDER shows a significant association except DAR with NPM at 5% level of significance. Moreover, all the independent variables show a positive association with NPM as reflecting by Beta i.e. a unit increase in independent variables will lead to increase in NPM.

Table 4.13: Regression results for ROE and independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		2.898	.092		31.427	.000
Ln(ROE)	DER	-2.420	.401	-1.501	-6.031	.000
Ln(ROE)	DAR	-1.056	.667	-.212	-1.582	.118
Ln(ROE)	LTDER	2.908	.497	1.402	5.847	.000
R	.450	R ²	.203	Adj R ²		.137
S.E	.427	F	15.13	Sig (at .05 level)		.000

*DV is dependent variable, INV is independent variable, and S.E is standard error

During recessionary phase, the value of R for these independent variables is .450 reflecting a moderate degree of association among variables. The value of R² is .203 i.e. 20.3% of the variation in ROE explained by these variables (DER, DAR, LTDER) with a standard error of .427 whereas 79.7% of the variation is unexplained by these variables. The value of F (15.13) and is substantiated at 5% level of significance. DER and LTDER shows a significant association except DAR with ROE at 5% level of significance. Moreover, all the independent variables show a positive association with ROE as reflecting by Beta i.e. a unit increase in independent variables will lead to increase in ROE.

Table 4.14: Regression results for ROA and independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		2.810	.107		26.240	.000
Ln(ROA)	DER	-1.167	.466	-.693	-2.506	.014
Ln(ROA)	DAR	-1.855	.775	-.356	-2.394	.019
Ln(ROA)	LTDER	1.261	.577	.582	2.183	.032
R	.516	R ²	.266	Adj R ²		.237
S.E	.672	F	78.36	Sig (at .05 level)		.000

*DV is dependent variable, INV is independent variable, and S.E is standard error

During recessionary phase, the value of R for these independent variables is .516 reflecting a high degree of association among variables. The value of R² is .266 i.e. 26.6% of the variation in ROA explained by these variables (DER, DAR, LTDER) with a standard error of .672 whereas 73.4% of the variation is unexplained by these variables. The value of F is high (78.36) and is substantiated at 5% level of significance. All the independent variable shows a significant association with ROA at 5% level of significance. Moreover, all the independent variables show a positive association with ROA as reflecting by Beta i.e. a unit increase in independent variables will lead to increase in ROA.

Table 4.15: Regression results for ROCE and independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		3.312	.119		27.760	.000
Ln(ROCE)	DER	-.958	.519	-.503	-1.846	.069
Ln(ROCE)	DAR	-2.605	.863	-.442	-3.018	.003
Ln(ROCE)	LTDER	1.061	.644	.433	1.649	.103
R	.536	R ²	.287	Adj R ²		.259
S.E	.750	F	81.23	Sig (at .05 level)		.000

*DV is dependent variable, INV is independent variable, and S.E is standard error

During recessionary phase, the value of R for these independent variables is .536 reflecting a high degree of association among variables. The value of R² is .287 i.e. 28.7% of the variation in ROCE explained by these variables (DER, DAR, LTDER) with a standard error of .750 whereas 71.3% of the variation is unexplained by these variables. The value of F is high (81.23) and is substantiated at 5% level of significance. DER and LTDER shows an insignificant association except DAR with ROCE at 5% level of significance. Moreover, all the independent variables show a positive association with ROCE as reflecting by Beta i.e. a unit increase in independent variables will lead to increase in ROCE.

Recovery Phase: Time Period 2009/10-2013/14

Table 4.16: Regression results for NP and independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		10.346	.103		100.374	.000
Ln(NP)	DER	-2.059	.965	-.954	-2.134	.034
Ln(NP)	DAR	-.813	1.344	-.110	-.605	.546
Ln(NP)	LTDER	2.322	.912	.983	2.548	.012
R	.214	R ²	.046	Adj R ²		.031
S.E	1.031	F	3.081	Sig (at .05 level)		.029

*DV is dependent variable INV is independent variable, S.E is standard error

In recovery phase, the value of R for these independent variables is .214 reflecting a degree of association among variables. The value of R² is .046 i.e. 4.6% of the variation in NP explained by these variables (DER, DAR, LTDER) with a standard error of 1.031 whereas 94.4% of the variation is unexplained by these variables. The value of F is very low (3.081) and is substantiated at 5% level of significance. DER and LTDER shows a significant association except DAR with NP at 5% level of significance. Moreover, all the independent variables show a positive association with NP as reflecting by Beta i.e. a unit increase in independent variables will lead to increase in NP.

Table 4.17: Regression results for NPM and independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		2.827	.078		36.465	.000
Ln(NPM)	DER	-1.906	.663	-1.127	-2.875	.004
Ln(NPM)	DAR	-1.218	.998	-.209	-1.220	.224
Ln(NPM)	LTDER	1.903	.625	1.023	3.045	.003
R	.393	R ²	.155	Adj R ²		.142
S.E	.768	F	11.72	Sig (at .05 level)		.000

*DV is dependent variable INV is independent variable, S.E is standard error

In recovery phase, the value of R for these independent variables is .393 reflecting a moderate degree of association among variables. The value of R² is .155 i.e. 15.5% of the variation in NPM explained by these variables (DER, DAR, LTDER) with a standard error of .768 whereas 84.5% of the variation is unexplained by these variables. The value of F (11.72) and is substantiated at 5% level of significance. DER and LTDER shows a significant association except DAR with NPM at 5% level of significance. Moreover, all the independent variables show a positive association with NPM as reflecting by Beta i.e. a unit increase in independent variables will lead to increase in NPM.

Table 4.18: Regression results for ROE and independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		3.381	.065		52.017	.000
Ln(ROE)	DER	-.253	.608	-.155	-.416	.678
Ln(ROE)	DAR	-5.792	.848	-1.037	-6.833	.000
Ln(ROE)	LTDER	1.361	.575	.762	2.367	.019
R	.580	R ²	.336	Adj R ²		.326
S.E	.650	F	32.58	Sig (at .05 level)		.000

*DV is dependent variable INV is independent variable, S.E is standard error

In recovery phase, the value of R for these independent variables is .580 reflecting a high degree of association among variables. The value of R² is .336 i.e. 33.6% of the variation in ROE explained by these variables (DER, DAR, LTDER) with a standard error of .650 whereas 66.4% of the variation is unexplained by these variables. The value of F (32.58) and is substantiated at 5% level of significance. DAR and LTDER show a significant association except DER with ROE at 5% level of significance. Moreover, all the independent variables show a positive association with ROE as reflecting by Beta i.e. a unit increase in independent variables will lead to increase in ROE.

Table 4.19: Regression results for ROA and independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		2.254	.100		22.574	.000
Ln(ROA)	DER	-.095	.932	-.056	-.102	.919
Ln(ROA)	DAR	.131	1.251	.023	.105	.917
Ln(ROA)	LTDER	.275	.846	.148	.325	.745
R	.414	R ²	.171	Adj R ²		.102
S.E	.752	F	46.57	Sig (at .05 level)		.000

*DV is dependent variable INV is independent variable, S.E is standard error

In recovery phase, the value of R for these independent variables is .414 reflecting a moderate degree of association among variables. The value of R² is .171 i.e. 17.1% of the variation in ROA explained by these variables (DER, DAR, LTDER) with a standard error of .752 whereas 82.9% of the variation is unexplained by these variables. The value of F (46.57) and is substantiated at 5% level of significance. All the independent variables show an insignificant association with ROA at 5% level of significance. Moreover, all the independent variables show a positive association with ROA as reflecting by Beta i.e. a unit increase in independent variables will lead to increase in ROA.

Table 4.20: Regression results for ROCE and independent variables

DV	INV	Coefficient	Beta	S.E.	t value	P value (at .05 sig level)
Constant		2.925	.105		27.818	.000
Ln(ROCE)	DER	2.630	.984	1.366	2.674	.008
Ln(ROCE)	DAR	-2.889	1.313	-.448	-2.200	.029
Ln(ROCE)	LTDER	-2.235	.903	-1.070	-2.476	.014
R	.249	R ²	.06	Adj R ²		.044
S.E	.918	F	3.475	Sig (at .05 level)		.018

*DV is dependent variable INV is independent variable, S.E is standard error

In recovery phase, the value of R for these independent variables is .249 reflecting a degree of association among variables. The value of R² is .06 i.e. 6% of the variation in ROCE explained by these variables (DER, DAR, LTDER) with a standard error of .918 whereas 94% of the variation is unexplained by these variables. The value of F is low (3.475) and substantiated at 5% level of significance. All the independent variables show a significant association with ROCE at 5% level of significance. Moreover, all the independent variables show a positive association with ROCE as reflecting by Beta i.e. a unit increase in independent variables will lead to increase in ROCE.

VII. Conclusion

The study revealed the relationship between capital structure choice and firms financial performance. The study used five dependent variables (NP, NPM, ROE, ROA and ROCE) to analyze the nature of relationship between capital structure and financial performance of a firm with three independent variable (DER, DAR, LTDER). It studied the temporal movements in the variables. NP was found to have a weak and insignificant relationship with DER, DAR and LTDER during boom and recession phase. However, the relationship was positive and significant during recovery phase for non financial Nifty 50 firms. NPM was found to have a positive and significant relationship with DER, DAR and LTDER during all the phases. ROA and ROCE showed an insignificant relationship with DER, DAR and LTDER during boom phase. However, it showed a positive and moderately significant relationship during recession and recovery phase. Lastly, ROCE showed a positive and moderately significant relationship during boom and recession phase but showed a weak and insignificant relationship during recovery phase.

Limitations And Further Scope Of The Study

- The number of sample firms studied is 41. So the study can be further extended to a larger sample size. Though the study is not sector specific and included various sector firms listed on Nifty 50 excluding financial services firms. So further studies can be conducted on a specific sector for a large sample size.
- The study can be further conducted by inclusion of external/macroeconomic factors for nature of relationship analysis between capital structure and firms financial performance. In other words, this study can be further extended by increasing the number of independent variables for the set of dependent variables.

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