

CAPITAL STRUCTURE: A STUDY OF MANUFACTURING VIS-A-VIS SERVICE INDUSTRIES IN INDIA

Rajesh Bagga*
Jaspinder Kaur**

Capital structure is the most debatable issue in the field of corporate finance. Corporations both manufacturing and service based, are vital industries impacting Indian economy. According to a study recently conducted by Global Management Consulting firm McKinsey and Company, the Indian manufacturing industry is expected to touch US\$ 1 trillion by 2025. According to India Brand Equity Foundation, the services sector, with around 52 per cent contribution to the Gross Domestic Product (GDP) in 2014-15, has made rapid strides in the past decade and a half to emerge as the largest and one of the fastest-growing sectors of the economy. This paper identifies factors affecting capital structure of manufacturing and service industries in India. To achieve this objective a sample of 196 companies for 11 years has been taken with the total observation of 21560. The findings of the study indicate that non debt tax shield and tax has positive significant affect on capital structure in manufacturing industries whereas tangibility and profitability are significant factors impacting the capital structure decision in case of service industry in India.

Key words: Capital Structure, Tangibility, Profitability, Tax, Non Debt Tax Shield, India

INTRODUCTION

The capital structure is a combination of two words capital and structure. Capital structure is a mix of different securities. A firm can issue dozens of different securities in various combinations. It will consist of warrants, forward contracts and bond swaps. Capital structure helps us to find the particular combination that minimize the cost of capital and maximize the overall value of the firm.

Chandra (2004) discussed that the two principal sources of finance for a business firm are equity and debt. It is essentially concerned with how the firm decides to divide its cash flows into two main components, a fixed component that is made to meet the obligations towards debt capital and a residual component that belongs to equity share holders. The objective of financial management is to maximize wealth of the shareholders and minimize the cost of capital, the valuation and cost of capital are inversely related .Given a certain level of earnings, the value of firm is maximized when the cost of capital is minimized and vice –versa following are the different sources of finance.

In theory, it is argued that the financing decision is irrelevant under perfect capital markets. When, within the framework of perfect capital markets, taxes and bankruptcy costs are assumed, the financial economists argue that an optimum capital structure, which maximizes the market value of the firm (or minimizes cost of capital), can exist. Firms in developing countries like India, are found following different financing policies-some aggressive and some conservative. Therefore, one needs to investigate into the causes of this behavior. Many international level researches have been taken in previous year which examined the determinants of capital structure of a particular firm. Some landmark contributions in this area have been made by Haris and Reviv,1991, Rajan and Zingales 1995, Wald 1999. Yet capital structure remains to be a crucial issue in present era. The path breaking work done by Modigliani and Miller (1958) served as a base for many researcheres to work out that is Capital structure irrelevance theory. Copeland, et al., explained that greater debt loads did not affect the operating profit of the firm.

LITERATURE REVIEW

Sheridan and Roberto (1988) in their study examined the theories of optimal capital structure. Result showed that debt level is negatively related to the uniqueness of firm. Short term debt ratio was shown to be negatively related to firm size. It also indicated that various leverage related costs and benefit may not be significant. This study found that there is no effect on debt ratio arising from non debt tax shield, volatility, collateral value or growth. The author analyzed measure of short term, long term and convertible debt rather than total debt.

Later, Bassam et al., (2001) examined the capital structure of South Korea for a time period extending from 1991 to 1999. The results found differences in the capital structure of the companies, and showed a positive relation between size and growth of the companies, but a negative impact at high

values. It was also found that the net fixed assets have a negative impact at low values of the debt ratios, and a significantly positive impact at medium or high values of the debt ratios. The observed determinants of capital structure are consistent with the agency cost theory of capital structure.

In a similar study, August (2001) studied two important issues like capital structure and dividend decisions. In the study on agency model of dividend policy is estimated and tested on a sample of Indian firms using Weighted Least Squares methodology. Non financial firms of Mauritius have been taken for analysis. Panel data analysis is used to find out the effects of determinants of capital structure on leverage.

The research work done by Alerksanda and Bojan (2001) investigated the determinants of corporate capital in Poland and Hungary. Previous studies of corporate capital structure is related with countries and found that variables like tangibility and growth are more important variables in capital structure determinants. Regression analysis was used to examine the correlation between the variable of corporate capital structure in Poland and Hungary with developing countries.

Pandey (2001) analyzed the relationship between capital structure and profitability and found a cubic relationship. It explained that at higher and lower ranges of Tobin Q, firms use more debt whereas it uses lesser debt at intermediate range of Tobin Q due to market conditions, agency cost and bankruptcy cost. This relationship showed a saucer shaped relationship.

In the recent years, Handoo and Sharma (2014) examined ten independent variables and three dependent variables using regression analysis. The study concluded that factors such as tax rate, debt serving capacity, profitability, growth, asset tangibility, size, cost of debt, have significant impact on the capital structure chosen by firms in the Indian context.

RESEARCH OBJECTIVES

The study aims to examine the following objectives:

1. To determine the significant factors affecting capital structure decision of manufacturing companies in India.
2. To determine the significant factors affecting capital structure decision of service companies in India.

RESEARCH METHODOLOGY

For the purpose of the study, secondary data has been collected from the annual report of companies, Prowess database from CMIE of India and Bombay Stock Exchange. The time period of the study is 11 years ranging from financial year 2003-04 to 2013-14. From an initial sample of 200 companies, fourteen companies were eliminated due to incomplete information, leaving the final sample to 196 companies.

In order to determine the relationship between capital structure (dependent variable) and nine independent variables, ordinary least square regression is used for different years. Here tangibility, growth, size, profitability, age, liquidity, uniqueness are taken as independent variables and debt equity has been taken as the dependent variable. The description of the variables has been presented in the table given below.

Table 1: Description of Variables

<i>Dependent variables</i>	
Equity ratio	Shareholder funds/ Outsider funds
<i>Independent variables</i>	
Tangibility	Fixed asset/total asset
Growth	% change in net sales
Size	Natural logarithm of sales
Profitability	Return on assets
Age	Number of years since incorporation of the company
Liquidity	Current assets/Current liability
Non debt tax shield	Depreciation /total asset
Operating leverage	Earnings before interest and tax/net sales
Tax	1-Earning after tax/Earning before tax

Source: Author's own compilation based on review of literature

Multiple regression analysis has been applied to examine the effect of independent variables on the capital structure decision of the firms and the following regression equation has been made:

$$Z = \beta_0 + \beta_1 \text{tangibility} + \beta_2 \text{growth} + \beta_3 \text{size} + \beta_4 \text{profitability} + \beta_5 \text{age} + \beta_6 \text{Liquidity} + \beta_7 \text{non debt tax shield} + \beta_8 \text{operating leverage} + \beta_9 \text{tax} + e$$

where, Z reflects the regression score

β_0 reflects the constant

β reflects the regression coefficient

E reflects the error term

Hypothesis of the study

Based on the objectives of the study, the following hypotheses have been framed:

H₀₁-Tangibility does not affect the capital structure of the firm.

H₀₂-Growth does not affect the capital structure of the firm.

H₀₃-Size does not affect the capital structure of the firm.

H₀₄-Profitability does not affect the capital structure of the firm.

H₀₅-Age does not affect the capital structure of the firm.

H₀₆-Liquidity does not affect the capital structure of the firm.

H₀₇-Non debt tax shield does not affect the capital structure of the firm.

H₀₈-Operating leverage does not affect the capital structure of the firm.

H₀₉-Tax does not affect the capital structure of the firm.

RESULTS AND DISCUSSIONS

Results related to manufacturing industries

The table below presents a descriptive statistics of the dependent and independent variables for 104 manufacturing firms.

Table 2: Descriptive Statistics of Dependent and Independent Variables

Variables	Mean	Std. Deviation	N
Leverage	4.1824	20.53043	104
Size	13.8567	69.96104	104
Growth	11.8671	62.31004	104
Age	1.2040	6.27639	104
Tangibility	.8285	4.14585	104
Non debt tax shield	.0634	.30443	104
Liquidity	1.1791	5.93013	104
Operating leverage	.2559	1.26405	104
Profitability	.1947	.97608	104
Tax	2.7832	17.47001	104

Source: Author's own calculations based on secondary data

In order to examine the effect of various independent variables on the capital structure decision, stepwise multiple regression has been applied to the 104 manufacturing companies. However, before applying regression analysis the assumptions of multicollinearity, auto correlation and homoscedasticity have been examined via, histogram, scatter plot, Durbin Waston Test and VIF. The results indicated existence of multicollinearity for some variables hence, step wise regression has been applied by excluding those variable. The results of the stepwise regression analysis have been presented in the following tables.

Table 3 Describing the Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.295 ^a	.087	.077	.58751	
2	.448 ^b	.201	.184	.55254	
3	.512 ^c	.262	.238	.53385	
4	.546 ^d	.298	.268	.52336	
5	.576 ^e	.332	.295	.51364	2.112

Source: Author's own calculations based on secondary data

- Notes: a. Predictors: (Constant), tangibility
- b. Predictors: (Constant), tangibility, age
- c. Predictors: (Constant), tangibility, age, liquidity
- d. Predictors: (Constant), tangibility, age, liquidity, tax
- e. Predictors: (Constant), tangibility, age, liquidity, tax, profitability
- f. Dependent Variable: log_leverage

Table 3 indicates the model summary where only tangibility, age, liquidity, tax and profitability have shown a significant impact on the capital structure while other variables like growth, size, non debt tax shield and operating leverage do not have any impact on the degree of financial leverage of the firm. The results further reveal that tangibility alone causes a significant 8.70% impact on the degree of financial leverage of a firm, where as tangibility, age, liquidity, tax and profitability together contribute a 33.2% variation in the capital structure decision of a firm. The finding of the study are consistent with Kester (1986) and Titman and Wessels (1988).

Table 4: Explanation of Unstandardized and Standardized Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.401	.161		-2.494	.014		
	Tangibility	1.084	.360	.295	3.009	.003	1.000	1.000
2	(Constant)	-.186	.162		-1.147	.254		
	Tangibility	1.289	.343	.351	3.754	.000	.973	1.027
	Age	-.007	.002	-.342	-3.661	.000	.973	1.027
3	(Constant)	.176	.204		.865	.389		
	tangibility	.930	.356	.253	2.613	.010	.845	1.183
	Age	-.008	.002	-.403	-4.340	.000	.919	1.089
	Liquidity	-.259	.094	-.276	-2.775	.007	.801	1.249
4	(Constant)	.255	.203		1.254	.213		
	tangibility	.985	.350	.268	2.814	.006	.841	1.189
	Age	-.009	.002	-.430	-4.677	.000	.903	1.108
	Liquidity	-.357	.102	-.380	-3.501	.001	.646	1.547
	Tax	-.032	.015	-.218	-2.182	.032	.763	1.310
5	(Constant)	.434	.217		2.006	.048		
	tangibility	.984	.343	.268	2.865	.005	.841	1.189
	Age	-.009	.002	-.432	-4.786	.000	.902	1.108
	Liquidity	-.371	.100	-.395	-3.701	.000	.644	1.554
	Tax	-.032	.014	-.220	-2.245	.027	.763	1.311
	Profitability	-1.672	.787	-.183	-2.125	.036	.994	1.006

a. Dependent Variable: log_leverage

The results of the table 4 show that there is a positive significant effect of tangibility on leverage with a t-value of 2.865 which is statistically significant at 5% level. Further results indicate that age(t-value -4.786), liquidity(t-value -3.701), tax(t-value -2.245) and profitability(t-value -2.125) have a negative effect on the capital structure of the firm, significant at 5% level. The hypothesis related to growth, size, non debt tax shield, operating leverage doesn't have any effect capital structure is accepted as these variables doesn't have impact on capital structure.

Results related to service industries

As compared to manufacturing industries, service industries showed the following results of multiple regression analysis. Before proceeding with regression it's assumptions are examined where scatter plot indicates linear relationship with variables. Durbin Waston test has been run which indicates absence of auto correlation. Further, pairwise correlation reveals absence of muticollinearity in the

dataset. According to Back (1993), a value greater than or equal to 8 indicates the multicollinearity problem. Our results reveal that the pair wise coefficient of correlation is less than 8 for all variables indicating that variables of capital structure are not related with each other and there exists no problem of multicollinearity and multiple regression analysis can be applied.

Table 5: Describing the Mean and Standard Deviation

Variables	Mean	Std. Deviation	N
Leverage	-.1620	.62931	92
Age	.3098	.22394	92
Growth	4.5916E3	27606.75648	92
Size	63.3354	198.69573	92
Tangibility	.4848	.22172	92
Operating leverage	5.8519	3.66105	92
Non debt tax shield	.0361	.01986	92
Liquidity	1.0689	.79608	92
Profitability	.2413	.14121	92
Tax	1.4574	13.79270	92

Source: Author's own calculations based on secondary data

Descriptive analysis

The descriptive statistics show that size, amongst all 10 variables has the maximum mean value in service industries in contrast to non debt tax shield which has the lowest mean value. It is observed that in case of standard deviation, growth has the highest and non debt tax shield has the minimum standard Deviation. A total of 92 companies have been taken for analysis of capital structure decision in service industries.

Table 6: Depicts the correlation among the different variables

	Leverage	Age	Growth	Size	Tangibility	Operating leverage	Non debt tax shield	Liquidity	Profitability	Tax
Leverage	1.000	-.051	-.099	.087	.179	.131	-.047	-.014	-.203	.037
Age	-.051	1.000	-.013	.010	.026	.064	-.193	-.077	.191	-.025
Growth	-.099	-.013	1.000	-.031	-.056	.025	-.057	-.071	-.006	-.009
Size	.087	.010	-.031	1.000	-.058	.013	-.175	-.088	.003	.003
Tangibility	.179	.026	-.056	-.058	1.000	.450	.371	-.228	.157	.037
Operating leverage	.131	.064	.025	.013	.450	1.000	-.312	-.194	.088	.050
Non debt tax shield	-.047	-.193	-.057	-.175	.371	-.312	1.000	.012	.019	-.106
Liquidity	-.014	-.077	-.071	-.088	-.228	-.194	.012	1.000	-.021	.332
Profitability	-.203	.191	-.006	.003	.157	.088	.019	-.021	1.000	-.062
Tax	.037	-.025	-.009	.003	.037	.050	-.106	.332	-.062	1.000

Source: Author's own calculations based on secondary data

Table 7: Explains model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.351 ^a	.123	.027	.62085	1.886

Source: Author's own calculations based on secondary data

The model summary shows that the R square value is 12.3% which depicts very weak prediction of the model. It means that in case of service industries, the variables selected have a low impact on capital structure decisions. Table 8 shows the F value of 1.277 which is statistically insignificant.

Table 8: Results from ANOVA Analysis

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4.431	9	.492	1.277	.262
	Residual	31.608	82	.385		
	Total	36.039	91			

Source: Author's own calculations based on secondary data

Table 9: Explains the Unstandardized and Standardized Coefficients

Model	Unstandardized Coefficients	Standardized Coefficients	T	Sig.	Collinearity Statistics
-------	-----------------------------	---------------------------	---	------	-------------------------

		B	Std. Error	Beta		Tolerance	VIF
1	(Constant)	-.130	.283		-.459	.648	
	Age	-.117	.305	-.042	-.384	.702	1.103
	Growth	-1.973E-6	.000	-.087	-.830	.409	1.016
	Size	.000	.000	.080	.753	.453	1.049
	Tangibility	.840	.431	.296	1.949	.055	2.155
	Operating leverage	-.003	.025	-.015	-1.105	.917	1.916
	Non_debt_tax_shield	-5.044	4.571	-.159	-1.103	.273	1.946
	Liquidity	.042	.092	.054	.460	.646	.263
	Profitability	-1.064	.477	-.239	-2.229	.029	1.072
	Tax	-.001	.005	-.024	-.217	.829	1.190

Source: Author's own calculations based on secondary data

The results of the service sector indicate that only profitability has a statistically significant impact on the capital structure decision of the firm.

FINDINGS OF THE STUDY

After empirically testing the results for both manufacturing and service industries, it can be concluded that in case of manufacturing industries two variables viz a viz non debt tax shield and tax has positive and statistically significant effect on leverage. We reject the hypothesis that non debt tax shield and tax does not affect the leverage. However, we accept the other hypothesis that tangibility, size, growth, age, profitability, liquidity and operating leverage does not affect the leverage statistically as per our results. In contrast to this, in service industries size, tax and operating leverage have a positive relationship with capital structure and other variables age, growth, tangibility, liquidity, profitability, non debt tax shield have negative relationship with leverage. Tangibility and profitability show statistically significant result in case of service industries. Moreover, the results of manufacturing industries are consistent with result of service industries and with Titman and Wessels (1988) and Kester (1986) which shows profitability is negatively related with leverage. Conversely, tangibility has been found to be positively related with capital structure which is same as Rajan and Zinglas, (1995) Williamson (1988) and Harris and Raviv (1990).

CONCLUSION AND SUGGESTIONS

There is no one specific model in Indian context like in west due to their perfect capital markets. In India we have imperfect market and no specific way of determining the optimal capital structure. In our study we present the results of manufacturing and service industries Results suggest that capital structure is affected by the different variables differently. Further we suggest that capital structure is very vast issue and leaves a lot of scope for further research. The result has been conducted with only two industries namely, manufacturing and service, in future more industries can be taken for the analysis. Further the analysis techniques can be modified like panel analysis can be used, fixed effects can be tested. Quantity of data can be increased. Capital structure is a controversial issue till date so the future research can give more defined line to the managers to opt for a capital structure.

REFERENCES

- Agrawal, A., & Nagarajan, N. J. (1990). Corporate capital structure, agency costs, and ownership control: The case of all-equity firms. *The Journal of Finance*, 45(4), 1325-1331.
- Altman, E. I. (1984). A further empirical investigation of the bankruptcy cost question. *The Journal of Finance*, 39(4), 1067-1089.
- Baral, K. J. (1996). *Capital Structure and Cost of Capital in Public Sector Enterprises in Nepal* (Doctoral dissertation, Ph. D thesis. Delhi University).
- Booth, L., Aivazian, V., Demircug-Kunt, A., & Maksimovic, V. (2001). Capital structures in developing countries. *The journal of finance*, 56(1), 87-130.

- Bowen, R. M., Daley, L. A., & Huber Jr, C. C. (1982). Evidence on the existence and determinants of inter-industry differences in leverage. *Financial Management*, 10-20.
- Bradley, M., Jarrell G. A. and Kim E. H. (1984) On the Existence of an Optimal Capital Structure: Theory and Evidence, *Journal of Finance*, 39(3), p857-878
- Castanias, R., & DeAngelo, H. (1981). Business Risk and Optimal Capital Structure. *Unpublished working paper, University of Washington*.
- Copeland, W., & Weston, J. F. Shastri. 2005. Financial Theory and Corporate Policy.
- DeAngelo, H., & Masulis, R. W. (1980). Optimal capital structure under corporate and personal taxation. *Journal of financial economics*, 8(1), 3-29.
- Fama, E. F., & French, K. R. (2002). Testing trade-off and pecking order predictions about dividends and debt. *Review of financial studies*, 15(1), 1-33.
- Fattouh, B., Harris, L., & Scaramozzino, P. (2008). Non-linearity in the determinants of capital structure: evidence from UK firms. *Empirical Economics*, 34(3), 417-438.
- Frank, M. Z., & Goyal, V. K. (2003). Testing the pecking order theory of capital structure. *Journal of financial economics*, 67(2), 217-248.
- Handoo, A., & Sharma, K. (2014). A study on determinants of capital structure in India. *IIMB Management review*, 26(3), 170-182.
- Harris, M., & Raviv, A. (1990). Capital structure and the informational role of debt. *The Journal of Finance*, 45(2), 321-349.
- Harris, M., & Raviv, A. (1991). The theory of capital structure. *the Journal of Finance*, 46(1), 297-355.
- Jensen, M. C. (1986). Agency cost of free cash flow, corporate finance, and takeovers. *Corporate Finance, and Takeovers. American Economic Review*, 76(2).
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics*, 3(4), 305-360.
- Kahle, K. M., & Walkling, R. A. (1996). The impact of industry classifications on financial research. *Journal of financial and quantitative analysis*, 31(03), 309-335.
- Kenig, B., Novičić, Z. K., Patenković, A., Stamenković-Radak, M., & Anđelković, M. (2015). Adaptive role of inversion polymorphism of *Drosophila subobscura* in lead stressed environment. *PloS one*, 10(6), e0131270.
- Kester, Carl W., 1986, Capital and ownership structure: a comparison of United States and Japanese corporations, *Financial Management??*, 5-16.
- Masulis, R. W. (1983). The impact of capital structure change on firm value: Some estimates. *The Journal of Finance*, 38(1), 107-126.
- Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American economic review*, 48(3), 261-297.
- Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: a correction. *The American economic review*, 53(3), 433-443.
- Myres , S.C. and Majluf, N.S. (1984). Corporate Financing and Investment Decision When Have Information that Investors Do not Have , *The journal of financial Economics*, 13,187-221.
- Pahuja, D., & Sahi, A. (2012). Factors affecting capital structure decisions: empirical evidence from selected indian firms. *International journal of marketing, financial services and management research*, 3(3), 76-86.
- Pandey, I. M. (2001). Capital Structure and the Firm Characteristics: Evidence from an Emerging Market.
- Pao, H. T. (2008). A comparison of neural network and multiple regression analysis in modeling capital structure. *Expert Systems with Applications*, 35(3), 720-727.
- Prasanna, C., "Financial Management Theory and Practice," 6th Edition , *Tata McGraw Hill*, 2004 505-532.
- Rajan G. Raghuram, and Luigi Zingales, 1995, What do we know about capital structure? Some evidence from international data, *Journal of Finance* 50, 1421-1460.
- Roy, M., & Das, S. (2012). Inter-industry differences in capital structure: Evidence from India.
- Sharma, S. K. (1983). Determinants of Capital Structure and Its Implications: with Special Reference to Chemical and Pharmaceutical Industry in India: 1969-1978. *M. Phil diss. Department of Commerce, The University of Delhi*.
- Shastri, K. Weston, J. F., Weston & Copeland, T. E., "Financial theory and Corporate policy", Pearson education , Fourth Edition, 2009, 579-581
- Titman, S., & Wessel, R. (1988). The Determinants of Capital Structure Choice: *The Journal of Finance*, Vol XLIII (1), March.
- Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of finance*, 43(1), 1-19.
- Van Horne, J. C., 2002. Financial Management Policy, 12th ed. Delhi: *Pearson Education Asia*.
- Wald, J. K. (1999). How firm characteristics affect capital structure: an international comparison. *Journal of Financial research*, 22(2), 161-187.
- Williamson, O., 1988, Corporate finance and corporate governance, *Journal of Finance* 43, 567-591.