



INTERNATIONAL JOURNAL OF RESEARCH IN COMPUTER APPLICATION AND MANAGEMENT

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DETERMINANTS OF CAPITAL STRUCTURE DECISION IN INDIAN MANUFACTURING INDUSTRIES - AN EMPIRICAL ANALYSIS

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ABSTRACT

The objectives of this paper is to examine the important determinants of capital structure decision of the select private sector manufacturing industries in India for the period 1991-92 to 2009-10. The investigation is conducted on a panel of 9 private sector manufacturing industries in India. The empirical results of this study justified our hypothesis. The econometric analysis shows that variables like profitability, size of the firm, cost of debt, debt service capacity and liquidity are the important determinants of capital structure of the select private sector manufacturing industries in India. The results indicate that most of the determinants of capital structure suggested by capital structure theories appear to be relevant for Indian firms. In this paper, Debt Equity Ratio has been used as the proxy for capital structure.

KEYWORDS

Capital Structure, Manufacturing Industries, India.

INTRODUCTION

Corporate sector growth is vital to economic development. The issue of finance has been identified as an immediate reason why businesses in developing countries fail to start or to progress. Corporate capital structure remains a controversial issue in modern corporate finance. Directors to make decision on capital structure should make a choice between debt and equity. Many studies were carried out on description of factors influencing capital structure decisions since Modigliani-Miller as an expression of a choice between debt and equity. As a result of these studies based on rationality within the framework of traditional finance, different theories were seen regarding description of capital structure in parallel with change in expectations and preferences of firm directors and shareholders.

Capital structure refers to the relationship between various long- term sources of financing such as debenture, preference share capital and equity capital including reserves and surplus. Financing firm's assets is a very crucial problem in every business and as a general rule there should be a proper mix of debt and equity capital in financing them. The use of long term fixed interest bearing debt and preference share capital along with equity shares is called "Financial Leverage or Trading on Equity". The long term fixed interest bearing debt is employed by a firm to earn more from the use of these sources than their cost, so as to increase the returns on the owner's equity. It is true that capital structure cannot affect the total earnings of the firm, but it can affect the share of earnings available to the equity shareholders.

THEORIES OF CAPITAL STRUCTURE

The literature review provides a summary of various views and theories held with regard to capital structure. David Durand in 1952 propounded **Net Income Approach** in which he states that the firm can increase its value by using debt capital. **Net Operating Income Approach** contends that the value of the firm is independent of capital structure. In 1963, Solomon developed the **Intermediate Approach** which states that the value of the firm increased to a certain level of debt capital and after that it tends to remain constant with the moderate use of debt. **Modigliani Miller** (1958) proved that a firm's value is unaffected by its capital structure with the assumptions of no corporate taxes and risk. In 1963, MM contend that in the presence of corporate tax the value of the firm varies with the variations in the use of debt.

Pecking Order theory (1984) by Myers & Mjulf proposes that firms follow a hierarchy in their capital structure choice, especially with regard to debt. **Trade-Off theory** states that firms endeavour to maximize returns by balancing the benefits of the tax shield that debt afford the firm against the possibility of bankruptcy brought upon by increased debt. **Agency Cost theory** asserts that the capital structure of a firm is influenced by management personnel who are conflicted by their pursuit of personal enrichment before the maximization of shareholder value i.e., Debt and the accompanying interest payments, however, may reduce the agency conflict between shareholders and managers. **Information Asymmetry theory** (1977) by Rose states that since managers have more information on the future of the firm, their decisions on capital structure could provide signals to the market on the firm's future.

STATEMENT OF THE PROBLEM

Capital structure is very important decision for firms so that they can maximize returns to their various stakeholders. Moreover an appropriate capital structure is also important to firm as it will help in dealing with the competitive environment within which the firm operates. Modigliani & Miller, (1958) argued that an 'optimal' capital structure exists when the risks of going bankrupt is offset by the tax savings of debt. Once this optimal capital structure is established, a firm would be able to maximize returns to its stakeholders and these returns would be higher than returns obtained from a firm whose capital is made up of equity only (all equity firm).

The studies on developing countries have not even agreed on the basic facts. They found that firms in developing countries made significantly more use of external finance to finance their growth than is typically the case in the industrialized countries. They also found that firms in developing countries rely more on equity finance than on debt finance. These findings seem surprising given that stock markets in developing countries are invariably less well developed than those in the industrial countries, especially for equities.

Neither theory nor empirical research has been able to provide satisfactory explanation as to what factors affect the capital structure decision. The theories suggest that the firms select capital structure depending on characteristics that determine the various costs and benefits associated with debt and equity financing. Empirical work in this area lagged behind the theoretical work as the relevant firm characteristics are expressed in abstract concepts and are rarely directly observable. Moreover, the theories that have been developed in the context of mature economies need to be tested for their adoptability in developing economies for the firms are facing different environments. Clearly, more empirical work needs to be done before any financial theory and or any behavioral theory of capital structure can be fully recognized. With this background, this paper seeks to enquire into the major determinants of capital structure decision in the sample industries chosen for the present study.

OBJECTIVE OF THE STUDY

To analyze the important determinants of capital structure decision in Indian private sector manufacturing industries.

HYPOTHESES OF THE STUDY

This study has tested the following null hypotheses on relation between the defined variables and capital structure of listed companies:

- Ho1:** There is no significant relation between capital structure and Tangibility.
Ho2: There is no significant relation between capital structure and Non tax shield
Ho3: There is no significant relation between capital structure and Size of the firm
Ho4: There is no significant relation between capital structure and Dividend Pay Out
Ho5: There is no significant relation between capital structure and Profitability
Ho6: There is no significant relation between capital structure and Growth
Ho7: There is no significant relation between capital structure and Debt Service Capacity
Ho8: There is no significant relation between capital structure and Cost of Debt
Ho9: There is no significant relation between capital structure and Liquidity.

METHODOLOGY

The study covers a period of 19 years from 1991-92 to 2009-10. The present study is based on secondary data. The main source of data is PROWESS, the database of Centre for Monitoring Indian Economy (CMIE). And then, official website of BSE Annual reports of individual companies, various issues of magazines and journals, working papers and newspapers were also accessed for the relevant data.

For the purpose of the study, the population has been defined in terms of number of manufacturing companies listed in Bombay Stock Exchange (BSE) under the private corporate sector. The total number of companies falling under this category was 704. It was decided to include only those companies having continuous and uniform data throughout the period 19 years from 1991-92 to 2009-10 and whose total assets were more than Rs.500 crores as on 31st March 2010. Based on the above criteria, 73 companies belonging to nine selected group of manufacturing industries were selected for this study under judgment sampling method.

SPECIFICATION OF THE MODEL

The following regression model is developed to investigate the effect of chosen variables on the capital structure.

$$DER = \alpha + \beta_1 TANG + \beta_2 NDTS + \beta_3 SIZE + \beta_4 DPO + \beta_5 PROF + \beta_6 GROWTH + \beta_7 DSC + \beta_8 COD + \beta_9 LIQ + U$$

Where,

- DER = Debt Equity Ratio
 TANG = Tangibility
 NDTS = Non-Debt Tax Shield
 SIZE = Size
 DPO = Dividend Payout
 PROF = Profitability
 GROWTH = Growth
 DSC = Debt Service Capacity
 COD = Cost of Debt
 LIQ = Liquidity
 α = Constant
 $\beta_1 \dots \beta_n$ = Estimated coefficients
 U = Error Term

DEFINITION OF VARIABLES

DEPENDENT VARIABLE

The most commonly used measure of financial leverage i.e., Debt-Equity Ratio is used as the dependent variable. The Debt Equity Ratio is computed as the ratio of debt (long-term borrowings) and Equity consist of Share Capital and Reserves. Book value figures have been used to measure both Debt and Equity, because the use of market value measure of leverage could introduce bias into the regression analysis.

INDEPENDENT VARIABLES

1. Tangibility (TANG)

The tangibility is measured in terms of the nature of the ratio of fixed assets to total assets. It measures the level of collateralizable assets a firm can offer to lenders.

2. Non-Debt Tax Shields (NDTS)

The non debt related corporate tax shields relating to depreciation, investment allowance etc would be treated as substitutes for the tax benefits of debt financing.

It is given by: $NDTS = PBIT - (1 - t) / T$.

3. Size of the firm (SIZE)

The natural logarithm of sales has been used as a measure of firm size as it was felt that it is the level of sales that determines ultimately the productive activity of the firm.

4. Dividend Payout (DPO)

It is defined as the ratio of dividend to total income available to shareholders. Here, dividend includes only cash dividend not stock dividend and other forms of dividend.

5. Profitability (PROF)

The rate of generation of earnings determines the efficiency of capital employed. To the extent that highly profitable firms are able to retain earnings and finance further investment, such firms can be expected to use less debt in their capital structure. The ratio of Earning before Interest and Taxes scaled over Invested Capital is used as an indicator of profitability.

6. Rate of Growth (GROWTH)

Growth has been defined in this exercise as the annual compounded rate of growth in invested capital. It is given by:

$$\text{Rate of Growth} = TA_n / TA_0 - 1$$

7. Debt Service Capacity (DSC):

This is defined in term of interest coverage ratio. The higher the debt coverage, the greater the likelihood of a firm having a higher debt component in its financial structure. The ratio between EBIT and Interest has been taken as measures of Debt Service Capacity.

8. Cost of Debt (COD)

The contractual or coupon rate of interest forms the basis for calculating the cost of any form of debt. The payment on account of interest is tax-deductible expenses. The after tax cost of debt is otherwise called as cost of debt.

It is given by:

$COD = Wk_d$ Where,
 Wk_d = Weighted Cost of Debt

9. Liquidity (LIQ)

The extent to which the firm has to bring outside funds also depends on the composition of current assets in its portfolio. The measure considered here is the ratio of current assets over current liabilities.

THEORETICAL PREDICTIONS OF KEY VARIABLES THAT AFFECT THE LEVERAGE OF A FIRM

As per available literature following factors have been identified that affect the capital structure decision of the firm. Enumerated below are the key variable along with the relationship with leverage of the firm.

TABLE 1: RELATIONSHIP BETWEEN DETERMINANTS AND LEVERAGE RATIO

Variable	Variable Definitions	Expected Sign
Tangibility	Fixed Asset / Total Asset	+ (ve)
Non-Debt Tax Shield	$EBIT \cdot (1-t) / T$	- (ve)
Size of the Firm	Log (Sales)	+ (ve)
Dividend Pay-out	Dividend / PAT	+ (ve)
Profitability	$EBIT / \text{Capital Employed}$	- (ve)
Rate of Growth	$((Tan / TAO) - 1)$	- (ve)
Debt Service Capacity	$INT / EBIT$	+ (ve)
Cost of Debt	Weighted Cost of Debt	- (ve)
Liquidity	Current Asset / Current Liabilities	- (ve)

In this study, positive relationship of Tangibility, Size, Dividend Pay out, Debt Service Capacity with Leverage, and negative relationship of Growth, Profitability, Non Debt Tax Shield, Cost of Debt and Liquidity with Leverage is expected.

EMPIRICAL RESULTS

The regression results are shown in Table 2 and it discloses that the regression equations estimated for all the sample industries seem to satisfy all the specifications. This is because of the co-efficient of determination adjusted for the degree of freedom is statistically significant in all the sample industries as is evident from their F values. The value of R^2 is found to be very high ranging in between 0.70 to 0.97 in the sample industries. This very high value of R^2 showed that the estimated regression equation explain well the capital structure behavior of the sample industries to a significant extent.

The results of the analysis showed that Tangibility has negative effect on leverage. According to trade-off and pecking order theory, as tangibility increases, firms should be able to be financed by more debt. However, according to our findings, tangibility is inversely related with leverage. Non-debt tax shield as expected negatively correlated with capital structure in all the sample industries except Cement and Sugar industries. With the increase in Non Debt Tax Shield the firm tends towards less debt finance.

TABLE NO. 2: DETERMINANTS OF CAPITAL STRUCTURE – REGRESSION RESULTS

$$DER = a + \beta_1 TANG + \beta_2 NDTs + \beta_3 SIZE + \beta_4 DPO + \beta_5 PROF + \beta_6 GROWTH + \beta_7 DSC + \beta_8 COD + \beta_9 LIQ + U$$

Industry	Constant	TAN	NDTS	SIZE	DPO	PROF	DSC	GROWTH	LIQ	COD	R2 square	Adj. R sq	F-Value
Cement	3.88 (2.49)	1.32 (0.81)	16.85 (2.96)*	-1.14 (2.20)*	-0.22 (1.21)	-6.74 (2.32)*	0.15 (2.31)*	0.00 (0.38)	-0.16 (1.84)	22.45 (3.08)**	0.95	0.90	17.97**
Electrical	0.28 (0.19)	1.27 (1.10)	-41.46 (3.46)**	0.10 (0.23)	-0.12 (0.81)	25.83 (5.20)**	-0.16 (1.53)	0.00 (0.43)	0.72 (2.99)*	-7.52 (0.98)	0.94	0.87	13.17**
Fertilizer	13.65 (3.38)	-2.13 (1.57)	-41.25 (1.79)	-2.63 (2.18)*	0.02 (0.32)	4.40 (2.68)*	0.00 (2.77)*	0.00 (0.73)	-0.21 (1.02)	15.55 (2.30)*	0.91	0.82	9.42**
Paper	12.03 (3.82)	0.78 (0.52)	31.78 (1.77)	-3.44 (3.19)**	0.18 (1.41)	0.46 (0.06)	-0.47 (4.74)**	0.00 (3.00)**	0.19 (0.59)	-17.60 (1.75)	0.90	0.80	8.34**
Steel	5.34 (1.14)	-1.28 (0.37)	27.72 (0.83)	-0.59 (0.46)	0.06 (0.33)	-3.91 (2.04)*	0.00 (0.55)	0.00 (0.01)	-0.56 (1.41)	-11.96 (0.98)	0.70	0.36	2.06
Sugar	2.83 (5.07)	-2.09* (3.87)	33.84 (7.50)**	-0.08 (0.45)	-0.02 (0.51)	1.18 (0.72)	-0.14 (1.73)	0.00 (0.20)	-0.20 (3.62)**	-37.50 (4.62)**	0.97	0.94	32.40**
Textile	3.75 (1.88)	-0.86 (0.41)	25.28 (1.62)	-0.75 (1.45)	0.01 (0.26)	8.83 (3.05)**	-0.43 (2.46)*	0.00 (3.86)**	0.10 (0.68)	-21.72 (1.80)	0.96	0.91	20.08**
Transport	9.62 (3.75)	-2.88 (0.89)	16.07 (1.31)	-1.62 (1.92)	0.19 (2.17)*	-3.60 (2.03)*	-0.00 (0.27)	0.00 (0.60)	-0.20 (0.93)	-13.06 (1.72)	0.93	0.86	12.22**
Diversified	7.65 (3.66)	0.02 (0.30)	0.29 (0.73)	-1.28 (2.26)*	0.01 (0.98)	-1.73 (0.66)	-0.06 (0.72)	0.00 (1.91)	-0.62 (3.71)**	-7.68 (1.19)	0.83	0.65	4.47**

* Significant at 5% level

** Significant at 1% level

A figure in parenthesis denotes t-value.

Non-debt tax shield is found significant in determining the Capital Structure of Cement, Electrical Fertilizer and Sugar industry

The Size was found to be important determinants of capital structure in Cement, Fertilizer, Paper, Transport and Diversified industries. Size of the firm has negative sign in all the cases except Electrical and Sugar Industry. This may indicate that large firms are having sufficient funds to finance its investments and they do not prefer long term debt. The Dividend Payout factor found to be negatively related with capital structure in the case of Cement and Electrical Industry, while it was positively associated with capital structure ratios in all other industries. Dividend Pay Out has significant impact on capital structure behavior of Transport industry only.

The profitability is negatively correlated with leverage ratio, which is line with the pecking-order hypothesis; firms prefer using surplus generated by profits to finance investments. This result may also indicate that firms in general always prefer internal funds rather than external funds, irrespective of the characteristic of an asset shall be financed.

The Growth of the firm has negative impact on leverage in most of the sample industries which indicate that growing companies do not rely on debt to finance their new investment opportunities. The regression co-efficient of Growth was almost zero in all the industries, which does not have significant impact on capital structure decision.

The other explanatory variable Debt Service Capacity has the negative sign in all the industries except Cement, Fertilizer and Steel industry. This result is inconsistent with Mittal and Singla (1993) who have argued that there is a positive relationship between Debt Service Capacity and level of debt. They suggest that higher the capacity of the company to serve debt, greater is the likelihood of the debt ratio.

The Cost of Debt has negative relationship with capital structure ratios in all the sample industries except Cement and Fertilizer industry which evidences that the Cost of Debt plays an important role in determining the capital structure decision of these industries. It is found that high cost of debt charges discourage the use of debt finance.

Further, the capital structure decision is primarily influenced by the Liquid Ratio in the case of Electrical, Sugar and Diversified industries. The result signifies that firms with sufficient level of liquid assets do not prefer long term debt.

TEST OF HYPOTHESES

Table 2 demonstrates clearly about the relationship and accept or rejection of hypothesis.

TABLE 2: TESTING OF HYPOTHESES

Variable	+ (ve)	- (ve)	Ho accepted	Ho rejected
Tangibility	Cement, Electrical, Paper & Diversified	Fertilizer, Sugar, Steel, Textile & Transport	Cement, Electrical, Fertilizer, Paper, Steel, Textile, Transport & Diversified	Sugar
NDTS	Cement, Paper, Steel, Sugar, Textile, Transport & Diversified	Electrical & Fertilizer	Paper, Steel, Textile, Transport & Diversified	Cement, Electrical, Fertilizer & Sugar
SIZE	Electrical	Cement, Fertilizer, Paper, Steel, Sugar, Textile, Transport & Diversified	Electrical, Steel & Sugar, Textile,	Cement, Fertilizer, Paper, Transport & Diversified
DPO	Fertilizer, Paper, Steel, Textile, Transport & Diversified	Cement, Electrical & Sugar	Cement, Electrical, Fertilizer, Paper, Steel, Sugar, Textile & Diversified	Transport
Profitability	Electrical, Fertilizer, Paper, Sugar, & Textile,	Cement, Steel, Transport & Diversified	Paper & Diversified	Cement, Electrical, Fertilizer, Steel, Sugar, Textile & Transport
Growth	Cement, Electrical, Fertilizer, Paper, Steel, Sugar, Textile, Transport & Diversified	-----		-----
DSC	Cement, Fertilizer & Steel,	Electrical Paper, Sugar, Textile, Transport & Diversified	Electrical, Steel, Transport & Diversified	Cement, Fertilizer, Paper Sugar and Textile
COD	Cement & Fertilizer	Electrical, Paper, Steel, Sugar, Textile, Transport & Diversified	Electrical, Paper, Steel, Textile & Diversified	Cement, Fertilizer, Sugar & Transport
Liquidity	Electrical, Paper & Textile	Cement, Fertilizer, Steel, Sugar, Transport & Diversified	Cement, Fertilizer, Paper, Steel, Textile & Transport	Electrical, Sugar & Diversified

SUMMARY AND CONCLUSION

This study investigates the determinants of capital structure of select private sector manufacturing industries in India cover the period of 19 years from 1991-92 to 2009-2010. The sample of this study consists of panel data for all industrial companies listed in Bombay Stock Exchange, a total of 73 companies belonging to nine groups of manufacturing industries. The findings of this study contribute towards a better understanding of financing behavior in Indian corporate sector. This study considered nine explanatory variables including Tangibility, Non-debt tax shield, Size of the firm, Dividend Pay Out, Profitability, Growth, Debt Service Capacity, Cost of Debt and Liquidity

The independent variables- Tangibility is inversely related with leverage and Non-debt tax shield proves to be statistically significant determinants of capital structure decision of Cement, Electrical, Fertilizer and Sugar Industry. The Size of the firm has negative relationship with leverage it has significant impact on the capital structure decision of Cement, Fertilizer, Paper, Transport & Diversified industries. The beta coefficient of Dividend Payout positively related with leverage in Fertilizer, Paper, Steel, Textile, Transport & Diversified industries but it has significant impact on capital structure only in Transport sector. The other explanatory variable Profitability has significant impact on determination of capital structure in the case of Cement, Electrical, Fertilizer, Steel, Sugar, Textile & Transport industry. Growth of the firm does not have significant impact on capital structure decision of the sample industries. The Debt Service Capacity was found to be the important determinants of capital structure of Cement, Fertilizer, Paper Sugar and Textile industry. The Cost of Debt negatively related with leverage in case of Electrical, Paper, Steel, Sugar, Textile, and Transport & Diversified industries. The liquidity played important role in determining capital structure pattern in the case of Electrical, Sugar & Diversified industries.

Important observations of this study is that both agency cost model and static trade-off model help describe the capital structure pattern of the Indian private corporate sector as because most of the determinants have shown desired sign as predicted by these two theories. Yet, some independent variables show mixed results. Financing pattern and choice of individual company, legal and regulatory environment, corporate tax policies, tax holiday treatment, study period, sampling error etc. might cause some variables of this study to show mixed behavior and not to explain the capital structure in a better way. Further future study on capital structure determinants may be extended and this will surely lead to significant new insights.

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