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**CORPORATE SIZE AND CAPITAL STRUCTURE: AN EMPIRICAL ANALYSIS OF INDIAN PAPER INDUSTRY**

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**ABSTRACT**

*It is assumed that size plays a major role in raising debt and equity. Hence, it was hypothesized that there is a direct relationship between the capital structure of companies and its size. The size of a company was measured in terms of the size of total assets and fixed assets. It is found that the value of fixed assets increased steadily throughout the study period. It is also noticed that the year wise debt-equity ratio is consistent, whereas the value of both fixed assets and total assets have recorded a fluctuating trend over the years. The year wise overall debt-equity ratio is moderate i.e. it is not too high and not too low and the consistent increase in the size of both fixed assets and total assets also exhibits the effectiveness of the financial planning and soundness of the financial position of the selected large scale companies in Indian paper industry. The result of regression model of debt equity with fixed assets and total assets has proved a negative relationship between capital structure and size of the majority of the selected companies in Indian paper industry during the study period.*

**KEYWORDS**

Corporate Capital Structure, Corporate Size, Capital Structure Theories, Indian Paper Industry and Optimum Capital Structure.

**INTRODUCTION**

Financial management of any corporate sector revolves around three major decisions, viz., financial decisions, investment decisions and dividend decisions. Financial decisions are concerned with the sources of finance, i.e. from where finances should be raised. There are basically two sources of finance i.e. short-term and long-term. The capital structure of a company is determined by the long-term sources of finance. **Pandey (2005, p.5)** stated that the term capital structure is used to represent the proportionate relationship between debt and equity. A business enterprise generally procures its permanent capital in the form of long-term debt, preference shares, ordinary shares and reserves and surpluses. These are individual components, which when taken together, would constitute a company's capital structure. Thus the aim of capital structure management is the profit maximization or wealth maximization ensuring minimum cost of capital and maximum rate of return to the common shareholders. **Chakraborty (1981, p.111)** stated that a judicious mix of debt and equity securities would maximize the value of equity. The financial manager of corporate has to plan an optimum capital structure for the company in such a way that it gives the maximum benefits and thus maximizes the wealth of shareholders.

Having determined its investment policy, a company should plan the sources of finance and their mix. Companies which do not formally plan their capital structures are likely to have uneconomical and imbalanced capital structures and could face unforgivable difficulties in raising capital on favourable terms in the long-run. Also inappropriate mix of sources of finance can render the operations of the companies inflexible. The composition of capital structure is governed by a number of factors and no uniform standard can be prescribed for all the enterprises. Sectors of industry or trade to which a particular enterprise belongs can, however, provide a broad pattern of composition. For instance, a public utility concern, such as an electricity supply company can absorb a greater proportion of borrowed funds than an enterprise in a more competitive sector of industry due to more stability in earnings in the case of former than the latter. Within these broad parameters, each enterprise will have to plan its own capital structure keeping in view both its short-term requirements and long-term expansion programmes.

**OPTIMUM CAPITAL STRUCTURE**

An optimum or sound capital structure can properly be defined as that combination of debt and equity which achieves the goal of maximizing the company's market value. Hence, the optimum capital structure is concerned with two important factors at one time; the maximization of shareholder's wealth as well as minimization of cost of capital. In the wake of given objectives of maximization of shareholder's wealth, the requirement for an optimal capital structure cannot, therefore, be over-emphasized in the financial decision-making process, every company should try to design its own capital structure. But determination of an optimum capital structure is not an easy task. It should be clearly understood that determining the precise proportion of debt that will maximize price per share is almost impractical. It is possible, however, to ascertain the approximate share of debt to be used in the capital structure in tune with the objective of maximization of shareholder's wealth. It may be mentioned that there are certain common and conflicting considerations involved in deciding the methods of financing assets. Different companies falling under a particular industry may have much in common regarding their financial plan. But they still may exhibit different earning trends, accounting methods and practice, general future conditions and predictions about the economy and the capital market. Moreover, the management's capability to adjust the mix of debt and equity in conformity with these conditions is restricted by the availability of the various types of funds that are sought. Hence, these factors largely govern which pattern of capital structure is deemed desirable and which form of financing is chosen in a given situation.

**THEORIES OF CAPITAL STRUCTURE**

There are three major capital structure theories namely Trade-off Theory [**Krus, Litzenberger, R., (1973)**], Pecking-Order Theory [**Myers and Majluf (1984)**] and Agency Cost Theory [**Jensen and Meckling (1976)**]. Considerable amount of work on the theory of capital structure since **Modigliani and Miller's** provocative irrelevance propositions has resulted in what **Myers (1977)** has called the 'static trade off' theory of capital structure. According to this theory, a firm's optimal debt ratio is viewed as determined by a trade off of the costs and benefits of borrowing, holding the firm's assets and investment plans constant. The various costs considered in the literature are bankruptcy costs (**Scott, 1977**), agency costs (**Jensen and Meckling, 1976**) and loss of non-debt tax shields (**DeAngelo and Masulis, 1980**). These costs become especially relevant in a situation of financial distress and have often been subsumed under costs of financial distresses. As against these costs the major benefit of debt financing is the tax shield of interest expense. The tax-based theory hypothesizes that the firms choose their debt equity ratio by trading off the benefits from tax reduction on interest payments against the costs of financial distress due to accumulating more debt.

The signalling theory is based on asymmetric information problems. The firms where individuals who supply capital do not run the firms themselves, there exists two types of asymmetric information problems. The first problem arises when there is adverse selection. The controlling managers may possess some information that is unknown to outside investors. In such cases the financing method can serve as a signal to outside investors. Facing information asymmetry

between inside and outside investors, firms end up having a financial hierarchy. First they try to use their retained earnings, and then move to debt when their internal funds run out. Equity is issued only when firms have no more debt capacity. This process is termed as 'Pecking Order Theory'.

The agency cost theory is based on another problem due to information asymmetry that is the principal-agent conflict. The conflict arises when there is moral hazard inside the firm, which is called the agency costs of equity. Managers may pursue their own interests which may conflict with shareholders' benefits. This agency problem can be solved by increasing management ownership because high management ownership aligns the interests of management and shareholders. Other possibilities include monitoring of management by large shareholders and the use of debt financing to discipline managers (Stulz, 1990). However, debt financing creates other agency costs. Jensen and Meckling (1976) argue that managers on behalf of the existing shareholders are likely to appropriate wealth from their debt-holders by conducting asset-substitution behaviour. That is, they may invest in risky projects because if the project is unsuccessful, the costs will be shared. But, if it is successful, the existing shareholders will capture the gain. On the other hand Myers (1977) argues that firms with heavy debt may have to pass up their value-increasing projects merely because they cannot afford to pay their current debt. Therefore, in choosing their debt equity level, firms should trade off between the agency costs of debt and the agency cost of equity.

## RESEARCH METHODOLOGY

### STATEMENT OF THE PROBLEM

Size of a firm plays an important role in the financing decisions of the management. Larger companies have more access to capital market and can raise funds from a variety of sources in comparison to small concerns. The size of a concern can be measured in many ways, i.e. by capital employed, paid-up capital, total assets, fixed assets, etc. For the study of capital structure, normally fixed assets and total assets are taken as the measures of size. Thus, an attempt has been made in this study to find the relationship between the size of the firm and the capital structure. Based on the above facts, the researcher has probed the following questions.

1. Is there any systematic relationship between size and capital structure of the selected large scale companies in Indian Paper Industry?

### SELECTION OF SAMPLE

Keeping in view of the scope of the study, it is decided to include all the large scale paper companies under Indian paper industry working before or from the year 1996-97 to 2009-2010. There are 21 large scale paper companies operated in India. But, owing to several constraints such as the non-availability of financial statements or the non-working of a company in a particular year and merger and acquisition etc., it is compelled to restrict the number of sample companies to ten. The Capitaline and CMIE database publish key financial data of Indian corporate sector systematically. Hence, Capitaline and CMIE databases proved to be complimentary to finalize the sample for the study. The exhaustive list of paper industry in India from Capitaline was cross checked with CMIE database to sort out companies to fit in as the sample for the study. The comprehensive list of companies prepared from the database was modified by sorting out the firms using the following criteria.

- (i) Those were not in operation for a year during the period of study.
- (ii) Those were in operation but non-availability of data for the whole study period.
- (iii) Those that were merged with another company during the period of study.
- (iv) Those that had below 50,000 MT installed capacity.

The list of large paper companies selected included in the present study along with the year of incorporation, ownership pattern and its market share is presented in Table 1. It is evident from Table 1 that sample companies represent 60.37 percentage of market share in the Indian paper industry. Thus, the findings based on the occurrence of such representative sample may be presumed to be true representative of paper industry in the country.

### PERIOD OF STUDY

The period 1997-98 to 2009-10 is selected for this study of Indian paper industry. This 13 years period is chosen in order to have a fairly, reasonably reliable and up-to-date financial data would be available.

### SOURCES OF DATA

The data required for the study have been obtained from secondary sources. The study is mainly based on secondary data. The major sources of data analysed and interpreted in this study related to all those companies selected is collected from "PROWESS" database, which is the most reliable and the empowered corporate database of Centre for Monitoring Indian Economy (CMIE). Besides Prowess database, relevant secondary data have also been collected from BSE Official Directory, CMIE publications, published annual reports of the companies, annual survey of industries, business news papers, Reports on Currency and Finance, Centre for Industrial and Economic Research (CIER's) Industrial Data Book, publications of the Indian Pulp and Paper Technical Association (IPPTA), Libraries of various research institutions, through internet and from official websites of the selected companies. Various journals and periodicals on finance and industry have also been reviewed.

## ANALYSIS OF THE EMPIRICAL RELATIONSHIP BETWEEN CAPITAL STRUCTURE AND SIZE

Capital structure is the composition of debt and equity securities with which the company's assets are financed. It is assumed that the size plays a major role in raising debt and equity. A company which is small in size has to face more problems in raising finance by either of the source than a concern which is bigger in size. Size of a firm plays an important role in the financing decisions of the management. Larger companies have more access to capital market and can raise funds from a variety of sources in comparison to small concerns. The size of a concern can be measured in many ways, i.e. by capital employed, paid-up capital, total assets, fixed assets etc. The measuring variable to be selected precisely depends upon the nature of problem on hand. For the study of capital structure, normally fixed assets and total assets are taken as measures of the size. However, in this study, size of a company can be measured in terms of the size of its total assets. For further analysis, fixed assets have also been taken separately as a determinant measure of size of firms. Chudson (1945), Gorden (1962), Gupta (1969), Bhat (1980), Nazeer (1991), Bharti (1995), Karamjeet Singh (2006), Debatrata Datta (2009) and Bidyut Jyoti Bhattacharjee (2010) took fixed assets and total assets as the measure of size for analyzing the capital structure of companies.

Fixed assets are those assets, which remain with the business for more than one year. They represent the earning base of the company. They are acquired for the purpose of using them in the conduct of business operations and not for reselling to earn profit. These assets are not readily convertible into cash in the normal course of business operations. Fixed assets may be either tangible or intangible. The financing of total assets of a business concern is done by owners' equity (also known as internal equity) as well as outside debts (known as external equities). How much amount of funds owners have provided and how much outsiders have provided in the acquisition of total assets is a very significant factor affecting the solvency position of a concern. Thus, this part covers the relationship between capital structure and size of the companies.

Table 2 presents the debt equity ratio, fixed assets and total assets of selected companies during the study period. The debt equity ratio of all the selected large scale paper companies exhibits the highest ratio of 1.60 in the year 1997-98 and it is the lowest in the year 2005-06 (0.93). It is also clear that the ratio of debt is more than one as compared to the equity during the entire 13 years span except in the year 2005-06, which indicates that all the selected companies are enjoying the benefit of cheaper source of finance except in the year 2005-06. Further, it can be seen that the debt equity ratio is reducing from the years 1997-98 to 2005-06, thereafter, the debt equity ratio starts increasing. This upward trend is visible only in the year 2006-07 and then this ratio shows the downward trend up to 2008-09, again in the year 2009-10 it shows increasing trend. The size of the fixed assets represents the earning capacity of the business concern. The table shows that the value of fixed assets increases steadily throughout the study period. The position of fixed assets represents the solvency position of the companies. From the table, it is clear that the amount of total assets has increased from Rs. 585.68 crores in the year 1997-98 to Rs.1299.01 crores in the year 2009-10, which indicates that the solvency position of all the selected companies are good. It is also noticed from Table 2 that the CV value of debt equity ratio is consistent, whereas, it has registered a fluctuating trend in the case of both fixed assets and total assets. The CAGR of fixed assets and total assets have recorded a positive growth during the study period. Thus, it is concluded that the debt equity ratio is moderate i.e. it is not too high and not too low, which is favourable



for the companies and the consistent increase in the size of both fixed assets and total assets also exhibits the effectiveness of the financial planning and soundness of the financial position of the selected large scale companies in Indian paper industry.

#### MODEL-I

For the purpose of studying the impact of capital structure on the size of the firms during the reference period, simple regression technique has been used. Debt equity ratio was taken as dependent variable and fixed assets as independent variable. The regression model fitted to test the debt equity with fixed assets is as follows.

$$D/E = \alpha + \beta (FA) + e$$

Where,

D/E	-	Debt equity ratio,
$\alpha, \beta$	-	Parameters to be estimated (intercept and co-efficient respectively)
FA	-	Fixed assets and
e	-	Error term.

Table 3 presents the regression analysis of the debt equity with the size of fixed assets of the selected companies during the study period. It is evident from the table that the maximum level of co-efficient of determination ( $R^2$ ) in the Indian paper industry is 0.46. But in case of the sector average, the value of  $R^2$  is 0.61. The co-efficient of determination ( $R^2$ ) has registered the highest value of 0.77 in Andhra Pradesh Paper Mill Limited and it is the lowest in Hindustan Newsprint Limited (0.29). This suggests that 75 per cent changes in debt equity of Andhra Pradesh Paper Mill Limited are explained by the size fixed assets. It is inferred from the F- Test that the selected model is good because of the positive and significant relationship between debt equity and fixed assets of selected large scale companies in Indian paper industry.

The beta co-efficient of fixed assets shows a positive impact on debt equity of the Indian paper industry, but it is negative (-0.01) in the large scale sector of the paper industry during the study period. However, it is statistically significant in explaining the relationship between capital structure and the size of the firms. The regression co-efficient of fixed asset is positive in six out of ten companies. Further, though the beta co-efficient is negative in the remaining four companies, but statistically significant in all the selected companies at five per cent level of significance. This proves that beyond a certain level of debt equity ratio the relationship between capital structure and size of the firms may be negative. The analysis of 't' test also shows that, the relationship between capital structure and size of all the selected companies are statistically significant during the study period. Thus, the empirical result of regression analysis of debt equity with size of majority of companies depicts positive relationship. The result of this study are consistent with the results of Nazeer (1991), Bharti (1995), Ramesh K. Singla (1996), Ramkumar et al., (1996), Sudhansu (2005), Karamjeet Singh (2006), Seetana et al., (2007), Debatrata Datta (2009) and Bidyut Jyoti Bhattacharjee (2010) found a positive relationship between capital structure and size of the firms.

#### MODEL-II

Table 4 explores the regression analysis of the debt equity with total assets of the selected large scale companies in Indian paper industry during the study period.

The linear regression model fitted to test debt equity with fixed assets is as follows.

$$D/E = \alpha + \beta (TA) + e$$

Where,

D/E	-	Debt equity ratio,
$\alpha, \beta$	-	Parameters to be estimated (intercept and co-efficient respectively)
TA	-	Total assets and
e	-	Error term.

Table 4 exhibits the extent to which the changes in debt equity ratio are explained by the changes in size of total assets. In case of industry, the co-efficient of determination ( $R^2$ ) is 0.39; which explains 39 per cent changes in debt equity ratio by one per cent change in the size of total assets. But in the sector average (0.47) one per cent change in total assets influence 47 per cent changes in debt equity ratio. The co-efficient of determination ( $R^2$ ) has registered the highest value of 0.79 in Andhra Pradesh Paper Mills Limited followed by Hindustan Paper Corporation Limited (0.52), West Coast Paper Mills Limited (0.47), Ballarpur Industries Limited (0.33), JK Papers Limited (0.33), Hindustan Newsprint Limited (0.31), Tamil Nadu Newsprint and Papers Limited (0.28), Seshasayee Paper and Boards Limited (0.24) and it was the lowest in Rama Newsprint and Papers Limited (0.19) during the study period. This suggests that 19 per cent to 79 per cent changes in debt equity are explained by the variation in the size of total assets of the selected companies in Indian paper industry during the study period.

The beta co-efficient of total assets of Indian paper industry explains a negative relationship between the capital structure and size of the firms, however, it exhibits a positive relationship with the large scale sector of the Indian paper industry during the study period. The regression analysis also reveals that the beta co-efficient of total assets is positive in four out of ten companies, but statistically significant in all the selected companies. These results are against the results of Nazeer (1991), Bharti (1995), Sudhansu (2005) and Karamjeet Sing (2006) who found a positive relationship between debt equity and the size of firms. Thus, it is concluded that the empirical analysis of regression model of debt equity with total assets depicts a significant relationship between capital structure and size of total assets of the selected companies during the study period.

#### CONCLUSION

For the purpose of studying the impact of size of the firms on the capital structure during the reference period, simple regression technique has been used by taking debt equity ratio as dependent variable and fixed assets as independent variable. The regression analysis showed a positive relationship between the size of the fixed assets and debt equity of the whole Indian paper industry, but in case of large scale sector, it was negative (-0.01) during the study period. The relationship between fixed assets and capital structure is negative (six out of ten companies) but statistically significant in all the selected companies at five per cent level of significance. This shows that majority of the selected companies proved a negative relationship between size of the firms and capital structure, because a very low or high debt proportion in the capital structure is the cause for the negative relationship between capital structure and size of firms. The regression analysis reveals that the total asset of Indian paper industry explains a negative relationship between the capital structure and size of the firms, however, it exhibits a positive relationship with the large scale sector of the Indian paper industry during the study period. The analysis also reveals that the beta co-efficient of total assets were positive in four out of ten companies, but statistically significant in all the selected companies. Thus, the result of regression model of debt equity with fixed assets and total assets has proved a negative relationship between capital structure and size of the majority of the selected companies in Indian paper industry during the study period.

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## ANNEXURE

TABLE 1: SELECTED PAPER COMPANIES FOR THE STUDY

S. No	Name of the Company	Year of incorporation.	Ownership	Market Share
1.	Andhra Pradesh Paper Mills Limited	1964	Bangur L.N.,	2.84
2.	Ballarpur Industries Limited	1945	Avantha group	9.26
3.	Hindustan Paper Corporation Limited	1983	Govt. of India	4.49
4.	Hindustan Newsprint Limited	1970	Govt. of India	10.49
5.	JK Paper Mills Limited	1960	Singhania Harishanker	4.51
6.	Mysore Paper Mills Limited	1936	State Govt. of Karnataka	8.73
7.	Rama Newsprint and Papers Limited	1991	Bangur group	9.71
8.	Seshasayee Paper and Boards Limited	1960	Ervin group	2.63
9.	Tamil Nadu Newsprint and Papers Ltd.	1979	State Govt. of Tamil Nadu	4.50
10.	West Coast Paper Mills Limited	1955	Bangur group	3.11
<b>Total Market Share</b>				<b>60.37</b>

Source: Prowess database

TABLE 2: ANALYSIS OF DEBT EQUITY WITH FIXED ASSETS AND TOTAL ASSETS

Year	Debt - equity ratio	Fixed assets (Rs. in crores)	Total assets (Rs. in crores)
1997-98	1.60	302.09	585.68
1998-99	1.50	313.07	592.89
1999-00	1.50	346.28	610.92
2000-01	1.45	358.41	639.63
2001-02	1.34	401.12	698.15
2002-03	1.39	481.69	829.83
2003-04	1.28	494.65	887.69
2004-05	1.05	537.26	906.84
2005-06	0.93	554.38	948.63
2006-07	1.18	601.52	999.83
2007-08	1.17	676.74	1155.71
2008-09	1.14	768.20	1296.37
2009-10	1.27	774.39	1299.01
<b>MEAN</b>	<b>1.29</b>	<b>508.45</b>	<b>880.86</b>
<b>CV</b>	<b>0.15</b>	<b>0.32</b>	<b>0.29</b>
<b>CAGR</b>	<b>-1.91</b>	<b>8.16</b>	<b>6.86</b>

Source: computed from annual reports of respective units.

TABLE 3: DEBT EQUITY WITH FIXED ASSETS - SIMPLE LINEAR REGRESSION ( $D/E = \alpha + \beta (FA)$ )

Companies	Constant( $\alpha$ )	Co-efficient of FA ( $\beta$ )	R <sup>2</sup>	Adj.R <sup>2</sup>	F	P	DW
AP	0.51	0.001 (6.06*)	0.77	0.75	36.72*	0.00	1.33
BAL	2.09	-0.001 (2.26**)	0.32	0.25	5.09**	0.05	2.21
HP	4.31	-0.01 (3.86*)	0.58	0.54	14.88*	0.00	0.33
HNP	-0.68	0.007 (2.12**)	0.29	0.23	4.51**	0.06	0.91
JK	3.05	-0.001 (2.38**)	0.34	0.28	5.65*	0.04	0.95
MP	3.61	-0.014 (1.82**)	0.23	0.16	3.31**	0.10	0.58
RN	-3.12	0.002 (2.78*)	0.41	0.36	7.73*	0.02	0.52
SP	0.93	0.002 (2.26**)	0.32	0.26	5.1*	0.05	1.50
TNPL	1.39	0.001 (2.01**)	0.27	0.20	4.03**	0.07	1.79
WC	0.95	0.001 (3.34*)	0.50	0.46	11.17*	0.01	1.65
SECTOR	1.76	-0.01 (3.56*)	0.61	0.49	12.70*	0.00	0.88
INDUSTRY	2.11	2.56E-07 (2.78*)	0.46	0.36	7.74*	0.02	1.94

\* - Significant at 0.01 level; \*\* - Significant at 0.05 level;  
 Figures within parentheses indicate 't' values;  
 DW- Durbin Watson Statistics

Source: Computed

TABLE 4: DEBT EQUITY WITH TOTAL ASSETS - SIMPLE LINEAR REGRESSION ( $D/E = \alpha + \beta (TA)$ )

Companies	Constant( $\alpha$ )	Co-efficient of TA ( $\beta$ )	R <sup>2</sup>	Adj.R <sup>2</sup>	F	P	DW
AP	0.41	0.001 (6.34*)	0.79	0.77	40.24*	0.00	1.39
BAL	2.44	-0.012 (2.35*)	0.33	0.27	5.52*	0.04	2.12
HP	5.22	-0.006 (3.47*)	0.52	0.48	12.01*	0.01	0.42
HNP	2.02	0.011 (2.2**)	0.31	0.24	4.84*	0.50	1.60
JK	-3.05	-0.002 (2.34**)	0.33	0.27	5.47*	0.04	0.93
MP	0.99	0.007 (2.19**)	0.30	0.24	4.79*	0.50	1.85
RN	4.85	-0.001 (1.63**)	0.19	0.12	2.65**	0.13	0.47
SP	1.01	0.001 (1.85**)	0.24	0.17	3.40**	0.09	0.98
TNPL	1.69	-0.001 (2.06**)	0.28	0.21	4.23**	0.06	1.59
WC	0.90	-0.001 (3.11*)	0.47	0.42	9.70*	0.01	1.59
SECTOR	1.75	0.02 (3.107*)	0.47	0.42	9.65*	0.01	0.80
INDUSTRY	2.22	-7.00E+08 (2.19**)	0.39	0.24	4.81*	0.50	1.97

\* - Significant at 0.01 level; \*\* - Significant at 0.05 level;  
 Figures within parentheses indicate 't' values;  
 DW- Durbin Watson Statistics

Source: Computed.

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