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**CONTRIBUTIONS TO BOOKS**

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- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

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- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

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**DETERMINANTS OF CORPORATE CAPITAL STRUCTURE WITH REFERENCE TO INDIAN FOOD INDUSTRIES**

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**ABSTRACT**

*This paper is an attempt to determine the capital structure of listed firms in the Food Industry of India. The study covers the sample of 10 firms in the sector, listed at the BSE & NSE, covering the period from 2002-2011 and analyzed the data by using Fixed effects regression model was used for the analysis of PROWESS data for sample. Six variables i.e. firm size, tangibility of assets, profitability, Growth, Earning Risk, Non-Debt tax Shield, Business Risk and Debt Equity are used as explanatory variables, while Debt Equity Ratio is the dependent variable in the model. The results show that the variables of size, non-debt tax shields, and tangibility have highly significant positive relationship with the leverage ratio ( $p < 0.01$ ), while on the contrary, growth and profitability have highly significant negative relationship with debt ratio ( $p < 0.01$ ). The results are generally consistent with theoretical predictions as well as previous research papers. This paper adds to the existing literature on the relationship between the firm specific factors and capital structure. The paper is divided into five parts- Introduction and Literature Review, Objectives of Study, Data & Methodology, Results and Discussion and Conclusion.*

**KEYWORDS**

Capital Structure, Food and Personal Care.

**INTRODUCTION**

**F**inancial structure is to the affairs of the corporation what architecture is to the bricks, wood, and other materials which ultimately make a house. That is financial structure provides the basis frame-work or designing of the relations between the several elements composing the assets and liabilities as reflected in the balance sheet.<sup>1</sup> on the assets side the major divisions as they are apportioned among the current assets, fixed debts, and Net Worth, including surplus and the various kind of stock, constitute the structure of capital sources, or financial structure.<sup>2</sup> Therefore it is required that a proper balance should be maintained between the structural elements and the financial makeup of a concern.

**STATEMENT OF PROBLEMS**

The modern financial manager is concerned with determining the best financing mix or capital structure. If companies can change its total valuation by varying its capital structure, an optimal financing mix would exist, in which market price per share could be maximized. Since, firms regularly make new investment, the need for financing and hence the necessity of making the financing decisions are ongoing. The financial manager should decide, when, where and how to acquire funds to meet the firm's investment needs. The theories suggest that firms select capital structures depending on characteristics that determine the various costs and benefits associated with debt and equity financing. All the studies related to the relationship between industry grouping and capital of the corporations belongs to developed capital markets and it is important of sources responsible for the variations in capital structure. This study checks which of these sources can possibly be important in the Indian context, and so seeks to get answers to the following questions.

1. What is the capital structure of manufacturing industries in India?
2. What are the factors determining the capital structure?

**LITERATURE REVIEW**

**Ram Kumar Kakani, et al. (2001)**<sup>3</sup> have studied the financial performance of 566 Indian firm' across various dimensions for a period 1992-1996 and 1996-2000. It was revealed that the determinants of market based performance measured and accounting based performance measures differ due to capital market conditions. It was also found that the various determinants had a positive relation with a firm's market valuation.

**Vijayakumar and Kadirvel (2003)**<sup>4</sup> has studied the profitability and size of firm in India minerals and metals industry. The study revealed that size was significantly associated with the profitability during the study period. It was also evident from the analysis that size was positively associated with the profitability. Thus, larger firm was in a position to earn higher rate of return on investment through diversification and moving into higher technology.

**Puwanenthiren Pratheepkanth (2011)**<sup>5</sup> Capital structure is most significant discipline of company's operations. This researcher constitutes an attempt to identify the impact between Capital Structure and Companies Performance, taking into consideration the level of Companies Financial Performance. The analyze has been made the capital structure and its impact on Financial Performance capacity during 2005 to 2009 (05 years) financial year of Business companies in Sri Lanka. The results shown the relationship between the capital structure and financial performance is negative association at -0.114. Co-efficient of determination is 0.013. F and t values are 0.366, -0.605 respectively. It is reflect the insignificant level of the Business Companies in Sri Lanka. Hence Business companies mostly depend on the debt capital. Therefore, they have to pay interest expenses much.

<sup>1</sup> Floyd. Burtchett and Clifford M. Hicks, Corporation Finance, P.256

<sup>2</sup> Ibid, P.256.

<sup>3</sup> "Determinants of financial performance of Indian corporate sector in the post liberalization era: an empirical study", NSE research initiative paper 5.

<sup>4</sup> "Profitability and size of firm in Indian minerals and metals industry", Journal of economic integration, Vol.23,(2), PP.701-726.

<sup>5</sup> "Capital Structure And Financial Performance: Evidence From Selected Business Companies In Colombo Stock Exchange Sri Lanka", International Refereed Research Journal, Vol.- II, Issue -2, Journal of Arts, Science & Commerce, E-ISSN 2229-4686 & ISSN 2231-4172, April 2011.

**OBJECTIVES OF STUDY**

To investigate the determinants that influences the capital structure of selected industries.

**METHODOLOGY**

**SOURCES OF DATA**

This study is based on the secondary data collected from PROWESS data base of Centre for Monitoring Indian Economy Private limited (CMIE). This data for the sample companies is supplemented with information from various financial dailies, margarine reports, industry reports and annual reports of companies to enable proper analysis and to facilitate the attainment of study objective listed earlier.

**SELECTION OF SAMPLE AND PERIOD OF STUDY**

The data used in the study relates to the manufacturing companies listed in the BSE and NSE for which the date is available in the PROWESS database of CMIE. This study focuses, on manufacturing industry alone. The CMIE database reports accounting information for a large number of firms operating in the Indian manufacturing sector. There are 11,064 manufacturing companies available in prowess data base of CMIE. From this data set this study selects companies based on the criteria that the companies should have maintained its identity and reported in annual accounts without any gaps for the financial years 2002-2003 to 2010-2011. Screening for data consistency on the basis of this critession, led to the selection of a sample of 10 companies drawn from Foods Industries, Pharmaceuticals Industries, Information Technology Industries.

**FRAME WORK OF ANALYSIS**

Following statistical tools it also used to analyze the data in tune with the objectives of the studies. (i) summary statistics, (ii) Analysis of variance, (iii) Growth analysis, (iv) Correlation, (v) Multiple Regression, (vi) Factor analysis.

Suitable statistical hypothesis have been framed to supplement the results of the study and all the tests were tested at 5% level of significance.

**MEANING OF VARIABLES AND ACRONYMS USED TABLE**

	VARIABLES	MEASUREMENT
Independent Variables	Size	Natural Log of Total Asset.
	Tangibility	Fixed Asset to Total Asset.
	Growth	Percentage of Total Asset.
	Profitability	Profit Before Depreciation, Interest and Tax (PBDITA) to Total Asset.
	Earning Risk	Return On Capital Employed (ROCE)
	Non-Debt Tax Shield	Profit Before Interest and Tax (PBIT) to Average of Total Asset.
	Business Risk	Profit Before Tax (PBT)
Dependent variables	Debt Equity Ratio	Outsider funds to Share holders funds.

Source: CMIE PROWESS

**LIST OF THE FOOD COMPANIES ARE**

1	A D F Foods Ltd.	6	E I D-Parry (India) Ltd.
2	Agro Tech Foods Ltd.	7	Glaxosmithkline Consumer Healthcare Ltd.
3	Avanti Feeds Ltd.	8	Gujarat Ambuja Exports Ltd.
4	Britannia Industries Ltd.	9	Nestle India Ltd.
5	Dwarikesh Sugar Inds. Ltd.	10	Tata Coffee Ltd.

**RESULTS AND DISCUSSION**

In this section the selected determinates of capital structure such as size of Firm, Tangibility, Growth, Profitability, Earning Risk Non-debt tax shield, Business Risk is analysis through Summary Statistics of mean, Arithmetic Mean, Standard Deviation, Co-efficient of Variation, Co-effectives of Skewness, Co-effectives of Kurtosis, ANOVA, Correlation Analysis, Multiple Regression, Factor Analysis and Growth Analysis.

- a. Descriptive Statistics:
  - Arithmetic Mean
  - Standard Deviation
  - Co-efficient of Variation
  - Co-effectives Skewness
  - Co-effectives of Kurtosis
- b. ANOVA
- c. Correlation Analysis
- d. Multiple Regression

All the tests are carried out @ 5 percent age level of signification. In this study the three important contributions towards capital structure such as determinants, components and dividend policy in maximizing share holders wealth are discussed.

The variables considered under determinants are:

- Dependent variable - Debt equity Ratio
- Independent variable – Size of the firm, Tangibility, Growth, Profitability, Earning Risk, Non-Debt tax shield, Business Risk.

**4.4.1 DESCRIPTIVE STATISTICS ANALYSIS**

Table shows the Determinants of Food Manufacturing Industries in India during the study period from 2001-2002 to 2010-2011.

**TABLE 1: RESULTS OF SUMMARY STATISTICS – FOODS INDUSTRIES**

Determinants	N	Mean	Std. Deviation	Variance	Skewness	Kurtosis
Size of Firm	100	7.12	622.71	3.88	1.13	0.84
Tangibility	100	0.37	0.15	0.02	0.55	-0.09
Growth	100	7.12	6.23	38.77	1.13	0.84
Profitability	100	0.15	0.13	0.02	1.37	1.62
Earning Risk	100	1.39	0.23	0.05	0.65	2.54
Non-Debt Tax shield	100	14.74	11.47	131.66	1.35	1.27
Business Risk	100	1.29	211.24	4.46	2.69	8.13

Source: Compute

It is found from the table 1. That the mean Non-Debt Tax shield is highest value (14.74) followed by size of Firm and Growth (7.12) Earning Risk (1.39) and so on. It is further revealed that the co-efficient of variation is also least in Tangibility, Profitability and Earning Risk by followed the value of (0.02), which indicates that in these industries the Tangibility is more uniform during the study period than the other variables, the co-efficient of skewness ranges from 0.55 to 2.69



indicates that the data is approximately normal and the values of co-efficient of Kurtosis for all the industries are more than two which clearly indicates the size of the firm during the study period is asymptotically normal.

It is concluded that the average Non-Debt Tax shield is highest value (14.74) followed by size of Firm and Growth (7.12) Earning Risk (1.39). The co-efficient of variation in Food Industries (0.37) is last indicating that the Tangibility is more consistent during the study period..

**4.4.2 ANOVA**

The technique of analysis of variance is an extension of T-test used to test the homogeneity of several means in this section the ANOVA is carried out to test whether there exists significant difference between the different industries in respect of various determinants in determining the Capital Structure. The results are presented for each determinant with suitable hypothesis and relevant interpretations.

**Hypothesis:** This is no Significant different between Food Industry in respect of Variables.

The table 2 describes the results of Analysis variance in terms of sources of variation, sum of squares, degree of freedom, mean sum of squares, F-Value, P Value and its significant on the Independent Variables.

**TABLE: 2 RESULTS OF ANOVA- FOOD INDUSTRY**

		Sum of Squares	df	Mean Square	F	Sig.
Size of Firm	Between Groups	2.366	60	394400.587	1.045	.449
	Within Groups	1.473	39	377574.621		
	Total	3.839	99			
Tangibility	Between Groups	1.684	60	.028	1.650	.049
	Within Groups	.663	39	.017		
	Total	2.347	99			
Growth	Between Groups	2365.973	60	39.433	1.044	.449
	Within Groups	1472.393	39	37.754		
	Total	3838.367	99			
Profitability	Between Groups	.901	60	.015	.822	.756
	Within Groups	.712	39	.018		
	Total	1.613	99			
Earning Risk	Between Groups	3.965	60	.066	1.751	.032
	Within Groups	1.472	39	.038		
	Total	5.438	99			
Non-Debt Tax shield	Between Groups	6785.606	60	113.093	.706	.889
	Within Groups	6248.563	39	160.220		
	Total	13034.169	99			
Business Risk	Between Groups	2013036.376	60	33550.606	.544	.983
	Within Groups	2404565.650	39	61655.529		
	Total	4417602.026	99			

Source: Computed

S-Signification (P-value <0.05), NS- Not Signification (p-Value >0.05)

From the table 2 the ANOVA test was applied to find whether there is any significant difference among various variables are size of firm, Tangibility, Growth, Profitability, Earning Risk, Non-Debt Tax Shield and Business Risk.

The ANOVA result shows that the **Size of Firm** Calculated F- ratio value is 1.045 which are more than the significant value p = (.449) at 5 percent level of significant, Hence **Tangibility** are calculated F- ratio value is 1.650 which are more than the significant value p=(.049) at 5 percent level of significant, **Growth** are calculated F- ratio value is 1.044 which are more than the significant value (p=.449) at 5 percent level of significant. **Earning Risk** are calculated F- ratio value is 1.751 which are more than the significant value (p=.032) at 5 percent level of significant.

Hence, it is inferred that there is significant difference among all the four measurement variables, have the hypothesis is accepted. And the another three variables that the ANOVA result shows that the **Profitability** are calculated F- ratio value is .822 which are more than the significant value (p=.756) at 5 percent level of significant. **Non-Debt Tax Shield** are calculated F- ratio value is .706 which are more than the significant value (p=.889) at 5 percent level of significant. **Business Risk** are calculated F- ratio value is .544 which are more than the significant value (p=.983) at 5 percent level of significant. Hence, it is inferred that there is insignificant difference among Profitability, Non-Debt Tax Shield and Business Risk.

**4.4.3 Growth Analysis**

All the industries either small or big are interested in their growth and it can be measured by percent. If the percent is positive, it indicates the positive growth and it is negative which indicates the negative growth. In this section the growth analysis is carried out for each determinant of the Capital Structure considered for the various industries by taking 2001-2002 as the base year.

Further its mean, standard deviation and co-effective of variation is also determined for each industry. The results are presented for each determinant separately.

The table 3 describes the results of growth analysis for the various industries in terms of growth in each year, Arithmetic Mean, Standard Deviation, Co-efficient of Variation.

TABLE 3: RESULTS OF GROWTH ANALYSIS

Industries / Year		2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar	mean	std deviation	co-variation
Size of the firm	Value in Cr.	4533.07	4549.05	4462.45	4676.41	5727.29	6774.76	8540.53	9587.68	10569.78	11780.85	7120.187	2791.383	0.392
	% of Growth		0.353	-1.904	4.795	22.472	18.289	26.064	12.261	10.243	11.458	11.559	9.55	0.826
Tangibility	Value in Cr.	4.23	4.06	3.42	3.49	3.87	3.82	3.54	3.5	3.42	3.33	3.668	0.307	0.084
	% of Growth		-4.019	-15.764	2.047	10.888	-1.292	-7.33	-1.13	-2.286	-2.632	-2.391	7.113	-2.975
Growth	Value in Cr.	45.34	45.48	44.63	46.75	57.28	67.76	85.41	95.87	105.7	117.81	71.203	27.914	0.392
	% of Growth		0.309	-1.869	4.75	22.524	18.296	26.048	12.247	10.253	11.457	11.557	9.559	0.827
Profitability	Value in Cr.	1.46	1.47	1.54	1.61	1.54	1.56	1.36	1.71	1.64	1.58	1.547	0.099	0.064
	% of Growth		0.685	4.762	4.545	-4.348	1.299	-12.821	25.735	-4.094	-3.659	1.345	10.636	7.907
Earning Risk	Value in Cr.	14.45	13.02	14.01	13.67	13.43	13.13	15.73	13.86	13.95	13.25	13.85	0.796	0.057
	% of Growth		-9.896	7.604	-2.427	-1.756	-2.234	19.802	-11.888	0.649	-5.018	-0.574	9.525	-16.602
Non-Debt tax shield	Value in Cr.	155.84	136.49	150.17	157.57	151.05	139.06	129.27	162.1	145.42	147.09	147.406	10.182	0.069
	% of Growth		-12.417	10.023	4.928	-4.138	-7.938	-7.04	25.396	-10.29	1.148	-0.036	12.046	-331.582
Business Risk	Value in Cr.	815.96	674.32	829.93	944.99	1101.48	1112.98	1236.07	2243.46	1863.75	2117.73	1294.067	570.332	0.441
	% of Growth		-17.359	23.077	13.864	16.56	1.044	11.059	81.499	-16.925	13.627	14.05	29.072	2.069

Sources: Computed

4.4.4 CORRELATION ANALYSIS

The correlation is the study of finding the relationship between the variable. If there are only two variables in the study of correlation then it is called simple correlation other wise the study is either partial for multiple correlation. The simple correlation is measured by the Karl Pearson's co-efficient of correlation<sup>®</sup>. In this section the inter relationship between the determinants of capital structure is studied using the Karl Pearson's co-efficient of correlation. The significance of correlation is also tested at 5% level of significance using 'T' test. The result is presented in the form of correlation matrix for each industry separately with suitable interpretation.

FOODS INDUSTRIES

The table 4 describes the interrelationship between the determinates of Foods Industries in terms of correlation matrix. Further the significance of correlation is also indicated.

TABLE 4: RESULTS OF CORRELATION MATRIX- FOODS INDUSTRIES

Variables	Size of Firm	Tangibility	Growth	Profitability	Earning Risk	Non-Debt Tax Shield	Business Risk
Size of Firm	1						
Tangibility	-.058	1					
Growth	1.000**	-.058	1				
Profitability	.383**	.329**	.383**	1			
Earning Risk	.014	.061	.014	.127	1		
Non-Debt Tax Shield	.481**	.086	.481**	.797**	.106	1	
Business Risk	.011	.017	.011	.078	.093	-.048	1

Source: Computed

\*Correlation is significant at the 0.05 level (2-tailed).

\*\* Correlation is significant at the 0.01 level (2-tailed).

It is found from the table 4. That among the various determinants of capital structure considered the growth explains. It is clear that there is no severe problem of multi-co linearity among independent variables except Growth of firm, Earning Risk, Non-Debt Tax Shield , profitability and tangibility and it is tolerable. However, the table explains some interesting facts about the correlation among these independent variables. Firstly, there is a positive correlation of size with profitability of the firm. It is the fact that whenever the size (log of sales) of the company increases than it will increase the profitability of the company. There is positive relationship between size and tangibility and it is common because the growing companies always heading toward tangibility. As we also know there is a great demand of products in the world so if a firm is doing well than it definitely need more tangibility for meeting the requirements of the customers. Size and growth are also positively correlated with each other. It can also be seen anywhere that as the size (log of sales) increases the company need more growth (percentage increase in the fixed assets).

There is a positive relationship between Non-Debt Tax shield and tangibility it shows that for increasing profits the manufacturing firms have to increase their tangibility (ratio of fixed assets as compared to total assets). Profit and growth are negatively correlated with each other. There is negative relationship between tangibility and growth. It shows there is growth (percentage change in the total assets) but this growth is not in the Tangibility (percentage change in the fixed assets). It can be interpreted that the growth is in the current assets or the tangibility is decreasing. Both can be possible because the firm can purchase more assets as compared to fixed assets. The meaning of decrease in tangibility is that the fixed assets are decreasing and we know it is happening everywhere in the form of depreciation. Instead of all these factors, the negative growth is also possible.

4.4.5 MULTIPLE REGRESSION ANALYSIS

The regression is a functional relationship between the variable. If there are only two variables in the study of regression then it is called simple regression then it is called simple regression, otherwise the study is multiple regressions. In this sections the multiple regressions. In this section the multiple regression analysis is carried out between the dependent variable (debt equity ratio) and the different independent variables (determinants of capital structure) is carried out to ascertain the percentage of explanation each variable provides on the dependent variable. The multiple regression analysis is performed by introducing one variable at a time and based on the incremental value of R<sup>2</sup> (co-efficient of determination) the percentage explained by each variable on the dependent variable is analyzed. The results are presented for each industry separately in terms of correlation co-efficient (R), Co-efficient of determination (R<sup>2</sup>) and the incremental value in R<sup>2</sup>.

FOODS INDUSTRIES

The table 5 describes the results of multiple regression analysis for Foods Industries by taking debt equity ratio as a dependent variable and the determinants as independent variable through the correlation co-efficient (R), Co-efficient of determination (R<sup>2</sup>) and incremental value in R<sup>2</sup>.

TABLE – 5: RESULT OF MULTIPLE REGRESSION ANALYSIS – FOODS INDUSTRIES

Determinants	R	R Square	Incremental value of R Square
Size of Firm	.193	.037	-0.037
Tangibility	.203	.041	-0.004
Growth	.193	.037	0.004
Profitability	.464	.216	-0.179
Earning Risk	.011	.000	0.216
Non-Debt Tax shield	.052	.003	-0.003
Business Risk	-.314	.099	-0.096

The table describes the result of multiple regression analysis of Food industries the various determinants of capital structure considered the Earning Risk explains 21.6% and followed by profitability is a negative value of 17.9 percent are on the dependent variable of debt equity ratio in the industries of food industries.

It is concluded that Earning Risk in food industries are contributes a incremental value is 21.6 percent on the independent variables of debt equity ratio in the food industries.

#### 4.4.6 Factor Analysis

The factor analysis is employed in any study in social science and management not only for factor reduction but also for identifying the important factors/variables. In this study the factor analysis is employed to group the various determinants of capital structure. This analysis is carried out for each industry separately using extraction method of principal component analysis with Varimax Kaiser Normalization rotation method. The results are presented for each industry separately.

Using all the seven variables Size of Firm, Tangibility, Growth, Profitability, Earning Risk, Non-Debt Tax Shield, Business Risk, factor analysis is performed in order to condense, simplify, and extract groups called factors on priority basis to classify the variable in to the factors and the results are presented in the following tables.

#### FOOD INDUSTRIES

The table 6 describes the results of factor analysis is terms of factor loadings by grouping the determinants of Food Industries.

**TABLE 6: RESULTS OF FACTOR ANALYSIS FOOD INDUSTRIES**

Variables	Factor		Communalities
	Group 1	Group 2	
Size of Firm	.943	.006	.888
Tangibility	.972	-.027	.946
Growth	.943	.006	.888
Profitability	.929	-.346	.983
Earning Risk	.821	.009	.674
Non-Debt Tax Shield	.917	-.383	.988
Business Risk	-.039	.995	.991
Eigen values	5.103	1.257	
% of Variance	72.893	17.950	
Cumulative %	72.893	90.843	

**TABLE 6 (a): CLUSTERING OF VARIABLES INTO FACTORS**

Variables	Rotation Factors	
	Group 1 (72.893%)	Group 2 (17.950%)
Size of Firm	.943	
Tangibility	.972	
Growth	.943	
Profitability	.929	
Non-Debt Tax shield	.821	
Business Risk	.917	
Earning Risk		.995

Table 6 gives the rotated factor loading communalities, eign values and the percentage of variance explained by these factors. out of seven industries two factors have been extracted and these two factors put together and explain the total variance of cumulative value is 90.843.

The result of factor analysis form the table 5(a). Food Industries classified the determinants under two groups because of two eign values (5.103 and 1.257) are greater than one. The table5 (a). a further classified the determination in to two groups such as.

**Group 1:** Size of Firm, Tangibility, Growth, Profitability, Non-Debt Tax Shield, Business Risk.

**Group 2:** Earning Risk.

## 5. CONCLUSION

In this paper we have examined the change in the nature of food demand in India in the last ten years. We identify two distinct stages of diet transition associated with the period of economic growth. The impact of globalization has accelerated the nature of dietary change and this has implications for food supply systems. Liberalization has meant that large food chains have a strong incentive to enter the very large Indian market but given their relative bargaining power this could have adverse effects on Indian suppliers.

However, the multiple regression analysis is applied in respect of each industry to determine the explanatory power of the various determinants on the capital structure. The analysis reveals that the size of the firm, the profitability and business risk are found to have significant effect on the capital structure.

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