Vol 3 Issue 3 April 2013

Impact Factor : 0.2105

ISSN No : 2230-7850

Monthly Multidisciplinary Research Journal

Indian Streams Research Journal

Executive Editor

Ashok Yakkaldevi

Editor-in-chief

H.N.Jagtap

IMPACT FACTOR : 0.2105

Welcome to ISRJ

RNI MAHMUL/2011/38595 **ISSN No.2230-7850**

Indian Streams Research Journal is a multidisciplinary research journal, published monthly in English, Hindi & Marathi Language. All research papers submitted to the journal will be double - blind peer reviewed referred by members of the editorial Board readers will include investigator in universities, research institutes government and industry with research interest in the general subjects.

International Advisory Board

Flávio de São Pedro Filho
Federal University of Rondonia, Brazil

Kamani Perera
Regional Centre For Strategic Studies, Sri Lanka

Janaki Sinnasamy
Librarian, University of Malaya [Malaysia]

Romona Mihaila
Spiru Haret University, Romania

Delia Serbescu
Spiru Haret University, Bucharest, Romania

Anurag Misra
DBS College, Kanpur

Titus Pop

Mohammad Hailat
Dept. of Mathmatical Sciences, University of South Carolina Aiken, Aiken SC 29801

Abdullah Sabbagh
Engineering Studies, Sydney

Catalina Neculai
University of Coventry, UK

Ecaterina Patrascu
Spiru Haret University, Bucharest

Loredana Bosca
Spiru Haret University, Romania

Fabricio Moraes de Almeida
Federal University of Rondonia, Brazil

George - Calin SERITAN
Postdoctoral Researcher

Hasan Baktir
English Language and Literature Department, Kayseri

Ghayoor Abbas Chotana
Department of Chemistry, Lahore University of Management Sciences [PK]

Anna Maria Constantinovici
AL. I. Cuza University, Romania

Horia Patrascu
Spiru Haret University, Bucharest, Romania

Ilie Pintea,
Spiru Haret University, Romania

Xiaohua Yang
PhD, USA

Nawab Ali Khan
College of Business Administration

Editorial Board

Pratap Vyamktrao Naikwade
ASP College Devrukh,Ratnagiri,MS India

R. R. Patil
Head Geology Department Solapur University, Solapur

Rama Bhosale
Prin. and Jt. Director Higher Education, Panvel

Salve R. N.
Department of Sociology, Shivaji University, Kolhapur

Govind P. Shinde
Bharati Vidyapeeth School of Distance Education Center, Navi Mumbai

Chakane Sanjay Dnyaneshwar
Arts, Science & Commerce College, Indapur, Pune

Awadhesh Kumar Shirotriya
Secretary, Play India Play (Trust),Meerut

Iresh Swami
Ex - VC. Solapur University, Solapur

N.S. Dhaygude
Ex. Prin. Dayanand College, Solapur

Narendra Kadu
Jt. Director Higher Education, Pune

K. M. Bhandarkar
Praful Patel College of Education, Gondia

Sonal Singh
Vikram University, Ujjain

G. P. Patankar
S. D. M. Degree College, Honavar, Karnataka

Maj. S. Bakhtiar Choudhary
Director,Hyderabad AP India.

S.Parvathi Devi
Ph.D.-University of Allahabad

Sonal Singh

Rajendra Shendge
Director, B.C.U.D. Solapur University, Solapur

R. R. Yalikar
Director Managment Institute, Solapur

Umesh Rajderkar
Head Humanities & Social Science YCMOU, Nashik

S. R. Pandya
Head Education Dept. Mumbai University, Mumbai

Alka Darshan Shrivastava
Shaskiya Snatkottar Mahavidyalaya, Dhar

Rahul Shriram Sudke
Devi Ahilya Vishwavidyalaya, Indore

S.KANNAN
Ph.D , Annamalai University,TN

Satish Kumar Kalhotra

Address:-Ashok Yakkaldevi 258/34, Raviwar Peth, Solapur - 413 005 Maharashtra, India
Cell : 9595 359 435, Ph No: 02172372010 Email: ayisrj@yahoo.in Website: www.isrj.net

Indian Streams Research Journal
Volume 3, Issue. 3, April. 2013
ISSN:-2230-7850
Available online at www.isrj.net

ORIGINAL ARTICLE

FACTORS DETERMINING CAPITAL STRUCTURE OF CO-OPERATIVE SUGAR INDUSTRY IN TAMIL NADU – AN EMPIRICAL STUDY

A. PALVANNAN AND M. SEKAR

Ph.D., Research Scholar,(PTER) Dept. Of Commerce, Bharathiar University, Coimbatore, T.N.
Asst. Professor of Commerce, CBM College, Coimbatore, Tamil Nadu.

Abstract:

Finance is an important input for any type of business and is needed for working capital and for permanent investment. The financial success of a firm depends mainly on its capital structure. The choice of debt and equity in the capital structure of corporate firms is an important financial decision because it influences both the return and risk of shareholders. In the present day challenges facing the Indian sugar industry are about 50 % of production of north India and Tamil Nadu are governed by State Advised Prices, Government controls on domestic sales and exports make commercial planning very difficult. Erratic financial returns have made the business less bankable, only industry in the country to bear financial burden of a social welfare program of the government.

KEYWORDS:

Factors , Industry , Empirical Study , Structure , Literature , Methodology.

INTRODUCTION :

Cash flow planning/freedom not with sugar mills, but decided by government through monthly sugar sales quota. Market forces should be allowed to determine price and requirement of sugar in the country. Financial losses to sugar industry due to high sugar stocks/surplus, problems of bank loan repayment and defaults, priority sector lending at 10% interest rate. In addition to that the sugar industry in India has been in great financial stress since year 2001. The above challenges create the necessity to understand the factors that have contributed to capital structure of sugar industry.

REVIEW OF LITERATURE

Many of the research works have been conducted over the period to evaluate the factors determining capital structure of the firm.Kakani R.K (1999)1 identified that profitability, non-debt tax shield and capital intensity were significant determinants of capital structure during the pre-liberalization period, whereas net exports were found to be significant in the post liberalization period. Pandey I.M. (2001)2observed that profitability, size, growth, earning volatility and tangibility are influencing capital structure.Bhaduri (2002)3 his study revealed that capital structure is influenced by factors such as growth, cash flow, size and product and industry characteristics. Garg Mahesh C and Chandra Shekhar (2002)4 they found that assets composition, collateral value, life and corporate size are the most significant factors in deciding capital structure of the Cotton, Chemical, Engineering, and Cement industries. Gavin Cassor,

Title :FACTORS DETERMINING CAPITAL STRUCTURE OF CO-OPERATIVE SUGAR INDUSTRY IN TAMIL NADU – AN EMPIRICAL STUDY Source:Indian Streams Research Journal [2230-7850] A. PALVANNAN AND M. SEKAR yr:2013 vol:3 iss:3

Scott Holmes (2003)5 are examined the determinants of capital structure by using size, asset structure, profitability, growth and risk and resulted in the asset structure influenced the capital structure. Gunasekaran.M (2008)6 found that collateral value of assets has maximum influence on the capital structure among the public sector companies. Kaur R. and Rao N.K (2009)7are identified the important variables that affect the debt equity choice of the Indian cotton textile industry. The result of the study suggested that profitability and growth opportunity, liquidity and business risk were the most important determinants of debt-equity choice in the Indian cotton textile industry at 1% level and uniqueness at 7.2 %.

STATEMENT OF THE PROBLEM

"Success does not make a company great, what really matters are its contributions towards making life better for everybody". For sound Capital Structure, the companies struggle while raising funds, is whether to raise debt or equity because equity and debt are the two principal sources of finance for a company. As it is said already, debt capital is generally refunded as less expensive than equity capital a company should try to fund its operations with as much debt as possible. The tough problem facing companies which raising funds, so there arises inconclusive debate on this issue.

A firm cost of debt is always less than its cost of equity and it should use as much debt and as little equity as possible. When a company uses more debt with the result it will go fast growth. Theoretically, one can study the number of factors that determine capital structure planning. But practically it has some problems. Therefore as a consequence of the above points the researcher is induced to take this study. This study also checks which of these sources can possibly be important in Tamil Nadu Sugar Industry context and also seeks to get answers to the following questions.

1. What is the capital structure of co-operative sugar industry in Tamil Nadu?
2. What are the factors determining the capital structure?

OBJECTIVE OF THE STUDY

The present research work is carried out with the objective of finding out the determinants of capital structure of co-operative sugar industry in Tamil Nadu.

METHODOLOGY

Sample

This study is based on both empirical and descriptive method. It analyses the determinants of capital structure of co-operative sugar industry in Tamil Nadu. At present the Tamil Nadu sugar mills comprises of 42 Sugar Mills. It consists of 17 mills are co-operative sector, public sector 3, and private sector 22. Among these only 38 mills are operational and 4 mills were stopped functioning. Out of 17 co-operative sugar mills, 15 sugar mills which presently working were selected as sample of this study. The purposive sampling technique is adopted to select the co-op sugar mills for the present study.

Period of the Study

The period of the study is 10 financial years from 2000-01 to 2009-10.

Data

The data for present study is Balance Sheet and Profit and Loss accounts of the select co-operative sugar mills in Tamil Nadu. The required data were gathered from various Annual Reports of the co-operative sugar mills.

Design

An evaluation of factors determining capital structure of co-operative sugar mills in Tamil Nadu is based on the following statistical tools was used: Summary Statistics, Correlation and Path Co-efficient Analysis, Regression Analysis and ANOVA.

Meaning of Variables and Acronyms Used

Variables	Measures
Size	Natural Log of Total Assets
Tangibility	Fixed Assets / Total Assets
Growth	Percentage of Total Assets
Profitability	Profit Before Depreciation, Interest and Tax (PBDIT) / Total Assets
Earnings Risk	Co-Efficient of Variation of Return On Capital Employed (ROCE)
Non - Debt Tax Shields	Profit Before Interest and Tax (PBIT) / Average Total Assets
Business Risk	Standard Deviation of Profit Before Tax
Debt Service Capacity	Interest / Profit Before Interest and Tax (PBIT)
Leverage or Trading on Equity	Profit Before Interest and Tax (PBIT) / Value of the firm (V)

Size of the Firm

Size has been viewed as a determinant of a firm's capital structure. Larger firms are more diversified and hence have lower variance of earnings, making them able to tolerate high debt ratios. Smaller firms, on the other hand, may find it relatively more costly to resolve information asymmetries with lenders, thus, may present lower debt ratios. Empirical evidence on the relationship between size and capital structure supports a positive relationship.

Tangibility

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. It is expected that firms that have higher value of assets in place, which can be offered as security, will have the ability to raise funds from financial institutions and hence greater will be the level of debt in the capital structure. The co-efficient of tangibility expected to be positive with Debt Equity Ratio. It implies that the increase in tangibility would tend to increase the debt equity ratio.

Growth

Growth is likely to place a greater demand on internally generated funds and push the firm into borrowing. The agency cost theory and Packing Order Theory explain the contradictory relation between the growth rate and capital structure. Hence, growth rate is negatively related with long- term debt level. Higher growth rate implies a higher demand for funds, a greater reliance on external financing through the preferred source of debt.

Profitability

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. Myers (1984) in line with Donaldson (1967) and Brealy and Myers (1986) suggested to prefer raising capital first from retained earnings than debt and finally from equity. The amount of earnings available to be retained should be an important determinant of firm's capital structure.

Earnings Risk

In capital structure decisions two elements of risk namely business risk ad financial risk are considered. Business risk are influenced by demand, price, input cost, fixed cost, business cycles, competition etc., The Business risk of a firm is determined by the accumulated investments the firm makes over time. A firm with high business risk prepares to have low levels of debt, since the volatility if its earnings are more. A firm with low level of business risk can have higher debt component in capital structure, since the risk of variations in expected earnings is lower.

Non-debt Tax Shields

De Anglo and Masulis (1980) in their model of optimal Capital structure, predict that the firms expense that are except from taxes like the non-debt related corporate tax shields relating to depreciation, investment allowance etc. would treat them as substitutes for the tax benefits of debt financing. As a result, firms with large non debt tax shelter relative to their expected cash flows include less debt in their capital structure.

Business Risk

The level of risk is said to be one of the primary determinants of a firm's capital structure. The tax shelter-bankruptcy cost theory of capital structure determines a firm's optimal leverage as a function of business risk. Given agency and Bankruptcy costs, there are incentives for the firm not to fully utilize the tax benefits of 100% debt within the static framework model. Both agency and bankruptcy cost theories suggest the negative relation between the capital structure and business risk.

Debt Service Capacity

A high debt service capacity means that the firm can meet its interest burden even is Earnings before Interest and Taxes (EBIT) suffer a considerable decline. In other words the higher the debt coverage, the greater the likelihood of a firm having a higher debt component in its financial structure. So the capacity of a firm to borrow will be directly proportional to its ability to discharge its fixed payment obligations. Hence, higher the capacity of the company to service debt, the greater is the likelihood of the debt ratio being higher.

Leverage / Trading on Equity

A company may raise funds either by issue of shares or by debenture. Debenture carries a fixed rate of interest and this interest has to be paid irrespective of profits. Of course, preference shares are also entitled to a fixed rate of dividend but payment of dividend depends upon the profitability of the company. In case the rate of return (ROI) on the total capital employed (shareholders' funds plus long term borrowed funds) is more than the rate of interest on debentures or rate of dividend on preference shares, it is said that the company is trading on equity. The use of the fixed - charges sources of funds, such as debt and preference capital along with the owners' equity in the capital structure, is described as financial leverage or gearing or trading on equity.

RESULTS AND DISCUSSION

The table 1 shows that the Size, Tangibility, Growth, Profitability, Earning risk, Non –debt tax shields, Business risk, Debt service capacity and Leverages of the co-operative sugar mills.

The size refers the Log of Total Assets. It is observed from the table that except M1, M2, M13 andM14 all other co-operative sugar mills show the high mean value. The least co-efficient of variation in M6 showed the consistence performance of this variable during the study period. Therefore it is noted that the size is determined the capital structure.

Tangibilitymeans level of collateralizable assets and it measures in terms of the nature of the ratio of Fixed Assets to Total Assets. It is noted from the table that the tangibility is high in M1, M4, M6, M8, M10 and M14. It implies that the increase in tangibility would tend to increase in the debt equity ratio.Growthmeasures the percentage of Total Assets. The result shows that M3, M4, M7, M8, M9, M11, M13 and M15 are high mean value. It means growth is likely to place a greater demand on internally generated funds and push the sugar mills in to borrowings and also it is positively related with long term debt level and high growth rate implies a higher demand for funds.Profitabilityis measured by EBIT to Total Assets. The result shows over a period is less in all co-operative sugar mills. It implies that the capital structure and profitability are negatively associated, the amount of earnings do not determined the capital structure of the co-operative sugar mills. Earnings Risk is measured by Co-efficient of variation of Return on Capital Employed (ROCE).It is that the earnings risk is less in all co-operative sugar mills. It implies that the sugar mills have high debt component and low volatility of earnings.

Non -debt tax shields is measured by EBIT to Average Total Assets. It is noted that the non-debt tax shields of all co-operative sugar mills are less that means sugar mills with less tax shields is high likely to finance with debt with the result high debt in their capital structure.Business risk is measured by Standard Deviation of Profit before tax. It is found that majority of the co-operative sugar mills have high debt and high business risk.Debt service capacityis measured by Interest to EBIT. Hence, higher the capacity of the sugar mills to serve debt, the greater is the likelihood of the debt ratio being higher. The result shows that the debt service capacity is high in all the co-operative sugar mills. Leverage / Trading on Equityis determined by EBIT to Value of the firm. The leverage of all the co-operative sugar mills Mean range between 0.053 to 0.401 except M9 and M10. It is noted that the leverage is high in majority of the co-operative sugar mills.

TABLE - 1
SUMMARY STATISTICS

S.No	Variables	CO-OPERATIVE SUGAR MILLS														
	Size	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15
1	Mean	39.653	37.210	67.543	57.104	64.429	68.561	89.121	56.192	36.596	54.060	73.649	68.934	35.331	43.396	52.644
2	SD	11.735	11.675	13.079	15.110	18.872	7.225	19.432	16.139	15.891	17.025	37.674	22.009	10.484	12.943	9.937
3	CV (%)	29.595	31.377	19.364	26.461	29.290	10.537	21.804	28.721	43.424	31.492	51.153	31.928	29.674	29.826	18.877
4	Skewness	0.737	-0.608	2.028	1.331	0.586	-0.406	0.675	-1.578	0.380	2.027	1.006	1.606	0.519	-0.577	1.157
5	Kurtosis	-0.110	-0.702	5.457	1.027	0.377	-0.007	1.376	3.403	0.278	5.146	1.528	3.487	1.008	-0.271	0.912
	Tangibility															
1	Mean	0.708	0.271	0.442	0.752	0.236	0.679	0.520	0.638	0.543	1.282	0.458	0.585	0.392	0.884	0.460
2	SD	0.199	0.119	0.154	0.193	0.065	0.078	0.109	0.081	0.339	0.323	0.322	0.148	0.128	0.379	0.091
3	CV (%)	28.191	44.033	34.711	25.665	27.660	11.486	21.035	12.703	62.333	25.209	70.209	25.317	32.637	42.906	19.790
4	Skewness	-0.203	1.493	-2.163	1.159	0.824	0.880	1.055	0.677	2.315	-0.588	2.527	0.160	1.414	1.605	0.278
5	Kurtosis	-0.807	2.146	5.429	2.901	-0.167	1.879	2.250	1.122	6.251	0.239	7.236	0.165	2.612	1.958	-1.235
	Growth															
1	Mean	66.588	87.842	119.821	109.102	82.096	96.947	100.633	317.648	103.671	97.178	133.061	93.091	107.161	82.455	108.904
2	SD	19.707	27.562	23.202	28.869	24.046	10.216	21.942	91.233	45.018	30.603	68.065	29.722	31.799	24.593	20.558
3	CV (%)	29.595	31.377	19.364	26.461	29.290	10.537	21.804	28.721	43.424	31.492	51.153	31.928	29.674	29.826	18.877
4	Skewness	0.737	-0.608	2.028	1.331	0.586	-0.406	0.675	-1.578	0.380	2.027	1.006	1.606	0.519	-0.577	1.157
5	Kurtosis	-0.110	-0.702	5.457	1.027	0.377	-0.007	1.376	3.403	0.278	5.146	1.528	3.487	1.008	-0.271	0.912
	Profitability															
1	Mean	0.214	0.066	0.088	0.163	0.065	0.158	0.157	0.082	-0.091	0.064	0.062	0.197	0.147	0.007	0.068
2	SD	0.158	0.186	0.169	0.101	0.140	0.235	0.115	0.120	0.234	0.130	0.233	0.135	0.210	0.163	0.144
3	CV (%)	73.852	282.598	191.923	61.642	213.937	148.050	73.229	145.760	-256.506	203.861	378.370	68.372	143.307	2232.030	213.740
4	Skewness	0.371	-0.352	-0.814	-0.538	-0.294	0.737	-1.479	-1.406	-1.052	-0.756	-1.721	0.207	-0.363	-0.911	-0.405
5	Kurtosis	-1.843	-0.230	-0.485	0.283	0.336	-0.617	1.684	2.768	4.295	-0.491	3.868	0.213	-1.269	-0.149	-1.031
	E.Risk															
1	Mean	0.131	0.039	0.089	0.155	0.101	0.070	0.220	0.065	-0.045	-0.009	0.088	0.187	0.084	0.042	0.044
2	SD	0.102	0.103	0.147	0.125	0.208	0.142	0.115	0.126	0.094	0.069	0.291	0.190	0.136	0.093	0.136
3	CV (%)	77.863	259.878	164.715	80.891	206.448	203.362	52.192	192.251	-207.464	-729.771	330.718	101.733	162.467	221.656	306.660
4	Skewness	0.051	-0.586	-0.707	0.649	-0.315	0.610	-1.027	-1.285	-0.397	-1.414	0.052	1.997	-0.193	-0.475	-0.368
5	Kurtosis	-2.165	-0.365	0.302	2.274	0.669	-0.648	0.615	2.490	2.591	2.074	1.812	5.289	-0.643	0.199	-0.946

Note: E.Risk – Earnings Risk

TABLE -1 (Cont.)
SUMMARY STATISTICS

S.No	Variables	Co-Operative Sugar Mills														
	NDTS	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15
1	Mean	0.179	0.060	0.088	0.148	0.060	0.118	0.151	0.072	-0.100	-0.004	0.043	0.179	0.141	0.048	0.058
2	SD	0.167	0.185	0.141	0.100	0.139	0.250	0.079	0.121	0.235	0.134	0.228	0.138	0.209	0.154	0.143
3	CV (%)	93.307	306.763	159.236	67.690	231.926	212.391	52.361	166.648	-235.616	-306.78	534.815	77.179	148.777	317.719	244.368
4	Skewness	0.402	-0.353	-0.735	-0.337	-0.333	0.801	-0.989	-1.395	-1.028	-0.697	-1.879	0.397	-0.329	-0.265	-0.441
5	Kurtosis	-1.972	-0.192	0.510	0.197	0.328	-0.461	0.700	2.649	4.181	-0.188	4.365	-0.013	-1.305	-0.035	-1.009
	BRisk															
1	Mean	3.298	-4.705	-2.315	7.185	0.678	-5.231	7.867	0.814	-14.651	-12.867	1.699	5.979	0.340	-7.166	-2.857
2	SD	4.398	6.936	12.380	8.187	11.192	17.936	10.260	8.322	8.222	5.124	17.769	15.794	8.479	10.199	8.153
3	CV (%)	133.363	-147.420	-534.789	113.948	1650.701	-342.883	130.423	1022.396	-56.122	-39.822	1045.905	264.154	2493.833	-142.323	-285.355
4	Skewness	-1.101	-0.331	-1.458	1.115	0.115	0.805	0.570	-1.501	-1.050	-0.952	0.462	2.119	-1.198	-1.222	-1.054
5	Kurtosis	2.814	-0.654	2.538	3.177	1.749	-0.025	0.214	3.260	2.543	1.546	2.047	5.440	0.661	1.181	0.365
	DSC															
1	Mean	4.209	3.651	-1.298	0.125	0.427	-3.262	0.416	-0.032	-8.173	-2.306	0.764	0.567	-4.539	0.862	0.490
2	SD	5.320	4.894	5.452	0.364	0.887	11.494	1.032	1.860	11.024	10.952	0.825	1.223	16.923	3.826	1.968
3	CV (%)	126.399	134.057	-420.188	290.107	207.912	-352.373	247.909	-583.092	-134.886	-474.935	108.032	215.505	-372.825	443.914	402.079
4	Skewness	1.310	1.198	-2.278	-1.992	1.214	-3.025	0.025	-2.439	-1.777	-2.052	-0.922	-1.199	-3.121	1.605	0.711
5	Kurtosis	0.113	0.629	5.192	5.114	2.536	9.366	3.143	7.308	2.881	5.498	-0.133	3.232	9.809	4.466	3.406
	Leverage															
1	Mean	0.173	0.053	0.142	0.338	0.401	0.077	0.245	0.110	-0.046	-0.004	0.111	0.256	0.103	0.065	0.080
2	SD	0.150	0.120	0.218	0.238	0.615	0.157	0.152	0.198	0.096	0.070	0.348	0.240	0.148	0.139	0.244
3	CV (%)	86.702	225.277	154.135	70.482	153.287	204.387	62.198	180.756	-209.912	-199.574	314.470	93.686	143.509	213.441	304.295
4	Skewness	0.534	-0.617	-0.514	-0.212	1.082	0.613	-0.408	-1.057	-0.446	-0.589	-0.099	2.008	-0.183	-0.556	0.311
5	Kurtosis	-1.131	-0.562	-0.082	1.421	2.122	-0.634	-0.256	2.106	2.703	-0.623	2.048	5.196	-0.843	-0.202	-0.463

Source: Annual Reports of the co-operative sugar mills (2001-02 to 2009-10)
Note: NDTS – Non Debt Tax Shield, B.RBusiness Risk, DSC Debt Service Capacity.
M1 – Amaravathi, M2 – Ambur, M3 – Chengalrayan, M4-Cheyyar, M5 –Dharmapuri District, M6-Kallakurichi I, M7-Kallakurichi II,
M8-M.R.Krishnamoorthi, M9-National, M10-NPKR.Ramasamy, M11-Salem, M12-Subramaniya Siva, M13-Thirupattur, M14-Tiruttani, M15-Vellore

Correlation and Path Co-Efficient Analysis

Inter-Correlation

In order to study the relationship between the independent variables and their influence on the dependent variable, the inter-correlation matrix of explanatory variables namely X_1, X_2,X_3, X_4, X_5, X_6, X_7, X_8 and X_9, with dependent variable X10 is furnished in the table given below.

TABLE 2
Inter-Correlation Matrix

Financial Variable	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
X_1	1.00									
X_2	-0.06	1.00								
X_3	0.10	0.00	1.00							
X_4	0.33	0.02	-0.10	1.00						
X_5	0.61	-0.21	-0.09	0.79	1.00					
X_6	0.31	-0.11	-0.10	0.96	0.86	1.00				
X_7	0.49	-0.33	0.10	0.76	0.94	0.84	1.00			
X_8	0.13	-0.10	-0.06	0.45	0.47	0.51	0.53	1.00		
X_9	0.47	-0.31	-0.11	0.54	0.79	0.61	0.80	0.41	1.00	
X_{10}	-0.61*	-0.18	-0.21	-0.49	-0.59*	-0.54*	-0.57*	-0.50	-0.62*	1.00

*- Significant at 5 % level **-Significant at 1 % level

It is seen from the above table the correlation between the explanatory variables X_1–X_{10} are highly significant correlated between them. They are also significantly correlated with the dependent variable X_{10}.

Note:
X_1 – Size,X_2 – Tangibility, X_3 – Growth, X_4 - Profitability, X_5 – Earning risk, X_6 – Non-Debt tax shields, X_7 Business Risk, X_8 – Debt service Capacity, X_9 – Leverage and X_{10} – Long term debt to equity.

Path Co-Efficient Analysis

The direct effect of each of the explanatory variables on the dependent variable and the indirect effect of each explanatory variable on the dependent variable through other explanatory variables are furnished in the table given below.

TABLE 3
Direct & Indirect Effect of Explanatory Variables on Dependent Variable

Independent Variable	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
X_1	-0.83	0.03	-0.01	0.39	0.92	-0.62	-0.15	-0.03	-0.31	-0.61
X_2	0.05	-0.49	0.00	0.02	-0.32	0.23	0.10	0.02	0.20	-0.18
X_3	-0.08	0.00	-0.11	-0.12	-0.13	0.19	-0.03	0.01	0.07	-0.21
X_4	-0.27	-0.01	0.01	1.19	1.20	-1.93	-0.23	-0.10	-0.35	-0.49
X_5	-0.50	0.10	0.01	0.95	1.51	-1.75	-0.29	-0.11	-0.52	-0.59
X_6	-0.25	0.06	0.01	1.14	1.31	-2.02	-0.25	-0.12	-0.40	-0.54
X_7	-0.41	0.16	-0.01	0.91	1.42	-1.70	-0.30	-0.12	-0.52	-0.57
X_8	-0.11	0.05	0.01	0.54	0.71	-1.03	-0.16	-0.23	-0.27	-0.50
X_9	-0.39	0.15	0.01	0.64	1.19	-1.23	-0.24	-0.09	-0.66	-0.62

It is seen from the above table that among the nine explanatory variables, the explanatory variable X_2 has higher positive direct effect on the dependent variable X_{10}; it has higher positive indirect effect on X_{10} through X_3. The variable X_6 through has smaller negative direct effect on the dependent variable X10; it has higher positive indirect effect on the dependent variable X_{10} through X_3. The variable X_7 through has smaller negative direct effect on X_{10}; it has higher positive indirect effect on X_{10} through X_3. Thus three variables X_2, X_6 and X_7 are substantially important contributing variables to X_{10}.

Note:
X_{10} – Dependent Variable

Multiple Regression Analysis

Step wise multiple regression analysis of Y- Long Term Debt to Equity dependant variables was performed with the independent variablesX_1, X_2,X_3, X_4, X_5, X_6, X_7, X_8, and X_9 are the following regression model is fitted for performance:

$$Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + \ldots\ldots\ldots$$

Where b_1, b_2, b_3 and b_4 are partial regression co-efficient; b_0-constant the results are presented in the following table.

TABLE 4
Regression Model for Y- Long Term Debt to Equity

Variables	Regression Co-efficient	Standard Error	t- value (d.f = 5)	R^2
Constant	9.273	1.790	5.181	.927
X_1	-0.099	0.027	-3.617*	
X_2	-3.603	1.196	-3.012*	
X_3	-0.004	0.006	-0.602	
X_4	28.772	12.213	2.356	
X_5	41.251	19.965	2.066	
X_6	-51.601	16.881	-3.057*	
X_7	-0.086	0.182	-0.473	
X_8	-0.142	0.095	-1.503	
X_9	-10.149	3.440	-2.950*	

*- Significant at 5 % level **-Significant at 1 % level

Regression Fitted: $Y = 9.273 - 0.099 X_1 - 3.603 X_2 - .004 X_3 + 28.772 X_4 + 41.251 X_5 - 51.601 X_6 - 0.086 X_7 - 0.142 X_8 - 10.149 X_9$

TABLE 5
Analysis of Variance for Regression

Source	S S	D F	M S	F
Regression	46.70	9	5.19	7.02 **
Residual	3.70	5	0.74	

*- Significant at 5 % level **-Significant at 1 % level

The step wise multiple regression models indicated that out of the explanatory variables under study, four variables X_1, X_2,X_6, and X_9 have significantly contributing to Y. The analysis of variance of multiple regressions modal for Y-Leverage indicates the overall significance of the model fitted. The Co-efficient of determination R^2 value showed that these variables put together explained the variations of Y to the extent of 92.7 %.

FINDINGS

Size is determined the capital structure of majority of the co-operative sugar mills except M1, M2, M13 and M14. Tangibility is high in M1, M4, M6, M8, M10 and M14 it implies that the increase in tangibility would tend to increase in the Debt Equity Ratio. Growth is likely to place a greater demand on internally generated funds and push the sugar mill 3, M4, M7, M8, M9, M11, M13 and M15 in the borrowings and also it is positively related with long term debt level and high growth rate noted a higher demand for funds. Profitability is less in all co-operative sugar mills during the study period. It indicates that the capital structure and profitability are negatively associated, theamount of earnings does not determine the capital structure. Earnings risk is less in all co-operative sugar mills. It confines that the sugar mills have high debt components and low volatility of earnings. Non- debt tax shields are less in all co-operative sugar mills that means sugar mills with less tax shields is high likely to finance with debt, with the

result high debt in their capital structure. Business risk is high in majority of the co-operative sugar mills because they have high debt. The high debt service capacity reveals that higher the capacity of the sugar mills to serve debt the greater in the likelihood of the debt ratio being higher. Leverage is high in majority of the co-operative sugar mills.

According to inter-correlation, path co-efficient analysis, regression analysis and ANOVA the nine explanatory variables are highly significant correlated between them. The four variables namely Size, Growth, Non- debt tax shields and Leverage significantly contributing to debt equity.

CONCLUSION

It is found that the factorssuch as Size, Growth, Earningsrisk, Non-debt tax shields, Business risk, Debt service capacity and Leverage are determined the capital structure of the co-operative sugar mills and all these variables have significantly contributing to each others.

REFERENCES

i.Kakani R.K (1999), "The Determinants of Capital Structure: An Econometric Analysis", Finance India Vol. 13, No. 1, pp 51-69.
ii.Pandey I.M. (2001), "Capital Structure and the Firm Characteristics", Evidence from an Emerging Market, Working Paper No. 10-14, IIM Ahmadabad.
iii.Bhaduri (2002) "Determinants of Corporate Borrowing: Some Evidence from the Indian Corporate Sector", Journal of Economics and Finance, Vol. 26, No.2, pp.200-215.
iv.Garg Mahesh C. & Chandra Shekhar (2002) "Determinants of Capital Structure in India", Management Accountant, pp.86-92.
v.Gavin Cassor, Scott Holmes (2003), "Capital Structure and Financing of SMEs: Australian Evidence", University of California Accounting and Finance, No. 43, pp 123-147.
vi.Gunasekaran .M (2008) "Determinants of Capital Structure – An Empirical Study on Indian Industries", Finance India, Vol. XXII, No. 1, pp.199-201.
vii.Kaur R, and Rao N.K (2009), "Determinants of Capital Structure: An Experience of Indian Cotton Textile Industry", Vilakshan Vol. 4, No. 2, pp. 97-112.

Publish Research Article
International Level Multidisciplinary Research Journal
For All Subjects

Dear Sir/Mam,

We invite unpublished research paper.Summary of Research Project,Theses,Books and Books Review of publication,you will be pleased to know that our journals are

Associated and Indexed,India

- International Scientific Journal Consortium Scientific
- OPEN J-GATE

Associated and Indexed,USA

- Google Scholar
- EBSCO
- DOAJ
- Index Copernicus
- Publication Index
- Academic Journal Database
- Contemporary Research Index
- Academic Paper Databse
- Digital Journals Database
- Current Index to Scholarly Journals
- Elite Scientific Journal Archive
- Directory Of Academic Resources
- Scholar Journal Index
- Recent Science Index
- Scientific Resources Database

Indian Streams Research Journal
258/34 Raviwar Peth Solapur-413005,Maharashtra
Contact-9595359435
E-Mail-ayisrj@yahoo.in/ayisrj2011@gmail.com
Website : www.isrj.net