Significant Level of Financial Risk On Capital Structure

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INTRODUCTION

Finance is to play a vital role in all organizations and so, it leads the finance department to be a team player which is constructively involved in all operations of the sector. While analyzing the financial problems of an organization, the principal contents of the financial management can be said to be, **i)** How large should enterprises be and how fast should it grow? **ii)** In what form should it hold assets? And **iii)** What should be the composition of its liabilities? These three questions deal with the major financial problems of the firm. As such, the financial manager is concerned with the solution of three major problems relating to financial operations of the firm corresponding to investment, financing and dividend decisions. Of these three decisions, the most important decision to be made by the financial manager is decisions on financing. Broadly, finance personnel must decide when, where, and how to acquire funds to meet the investment needs of the firm. The central issue before the finance personnel is to determine the proportion of equity and debt with the effects of financial and operating risk factors. The combination of debt and equity is known as the capital structure of the firm. The finance personnel must strive to obtain the best financing combinations or the optimum capital structure for the firm.

OBJECTIVES OF THE STUDY

The problems in this regard were tested, particularly, the present study has intended to identify the background of financial risk on capital structure; to analyze the role of financial risk on capital structure decisions of selected industries and to offer suggestions for solving the problems and to enhance the capital structure decisions of the selected industries.

RESEARCH METHODOLOGY

Methodology is the science dealing with principles of procedure in research and study. Research methodology deals with the definition of the research problem, research design, methods of data collection, sampling design, statistical tools employed and interpretation of survey data.

RESEARCH DESIGN

The design of the present study is descriptive, analytical and conclusive. It is the arrangement of condition and analysis of data in a manner that aims to combine reference to the research purpose with economy in procedure.

PERIOD OF THE STUDY

The present study covers the period of 10 years that is, from 1997-98 to 2006-07; more specifically, the period subsequent to the initiation of liberalization measures.

SAMPLE DATA

The data used in this study are the financial statements of fifty-nine companies - ten each from Cement, Food, Pharmaceutical, Steel, Textile and nine from Information Technology for the years from 1997-98 to 2006-07. The target firms are identified using stratified sampling techniques based on size to identify the target firms, PROWESS data base. For the present study, data were collected through the secondary sources. Industries of the study were selected based on ten years' data availability and if the total assets value of the company were more than Rs.100 crores.

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SAMPLING TECHNIQUE

Companies were selected using stratified random sampling followed by simple random sampling technique. Stratified sampling techniques are generally used when the population is heterogeneous, or dissimilar, where certain homogeneous, or similar, sub-populations can be isolated (strata). Simple random sampling is most appropriate when the entire population from which the sample is taken is homogeneous in nature.

TOOLS OF ANALYSIS

The data used in the present study are of time series in nature, the statistical tools used for analyzing them varies from general descriptive analysis such as Mean, Standard Deviation, Coefficient of Variation, Compound Growth Rate to Linear Growth Rate. Also, Parametric t-test for ascertaining the level of significance of both compound and linear growth rates and one way analysis of variance, simply called F-test across selected industry sectors have also been used.

Dependent Debt Variables used in the studyare :

LTDTA - Long-Term Debt to Total Assets,

STDTA - Short-Term Debt to Total Assets,

TATA - Total Debt to Total Assets,

LEVB - Long-Term Debt to Book Value of Equity,

LEVM - Long-Term Debt to Market Value of Equity.

FINANCIAL RISK

Financial risk is the risk of being unable to cover required financial obligations such as interest, preference dividend, lease rent, other hiring charges, and so on. It also represents the risk emanating from financial leverage. When a firm employs high proportion of debt in capital structure, that is, when it has a high degree of financial leverage, it carries commitments. The variability of Earning per share (EPS) caused by the use of financial leverage is called financial risk. This type of risk is avoidable risk if the firm decides not to use any debt in its capital structure. It is concerned with earnings available to equity shareholders.

SURVEY OF LITERATURE

Leland and Pyle(1977) argued that managers are penalized for bankruptcy on the one hand and rewarded for any rise in the value of the security on the other. The main practical implication of the Ross model is a positive association between leverage and the value of the firm. Leland and Pyle have argued that, the promoter stake can be used as a signal of quality. **Gabriel and Baker(1980)** developed a conceptual framework for linking production and investment decisions to the financing decision via risk constraint. This risk constraint can be divided into business and financial risk. Financial risk is defined as the added variability of net cash flows of the owners' equity that result from the fixed financial obligations associated with debt financing and cash leasing. The producer must balance these risks so that total risk does not exceed a specified level.

Ramesh K. Bhat (1980), has examined the relationship between financial leverage and several operational characteristics such as size, business risk, growth rate, profitability, dividend payout, operating leverage and debt service capacity of firms in the engineering industry. **Venkatesan (1983)** has examined the relationship between financial leverage and industrial classification and concluded that, there exists a statistical relationship between industry class and leverage but not a significant and conclusive relationship. He also examined the relationship between leverage and various characteristics of the firm. **Friend and Hasbrouck (1988)** investigated whether there is a systematic relationship between insider (managers) holding and debt. They suggested that, the reverse causality may also occur. A high level of debt increases the risk of firms stock and tends to drive out outside shareholders. **Mathew (1991)** analyzed the relationship between ownership structure and financial structure with a view to knowing whether the former has any impact on the latter.

Richerd (1991) investigated that the degree of operating leverage, the ratio of net profit to firm value, and the variability of unit output are all found to be positively correlated with each of the three risk measures. The degree of financial leverage, while positively related to total and unsystematic risk, does not appear to be related to systematic risk. **Lisa Koonce, McAnally and Mercer (2005)** have proposed and tested a risk model that explained how investors

perceive financial risks. The model combined conventional decision theory variables - probabilities and outcomes with behaviourial variables from psychology research by Slovic (1987) such as the extent to which a risky item is how, causes worry and is controllable. Their tests indicated that, both the decision theory variables and Slovic's (1987) behaviourial variables are important in explaining investors financial risk judgments. By identifying the unintended consequence of current risk disclosures, these results have the potential to influence the way accounting regulators, firm managers and academic researchers think about risk disclosure.

ANALYSIS OF FINANCIAL RISK ON CAPITAL STRUCTURE

Financial risk is measured in two ways say, one is through calculating the degree of financial leverage, and the other is through calculating various leverage ratios. The degree of financial leverage is similar to the degree of operating leverage in that both measure relative volatility. Financial leverage measures the fluctuation of earnings available to the common shareholders relative to the fluctuation of operating earnings (measured as earnings before interest and taxes (EBIT)) :

$$\textbf{Degree of Financial Leverage (DFL)} = \frac{\textbf{Percentage Change in EPS}}{\textbf{Percentage Change in EBIT}}$$

Companies with financial leverage ratio value of 30th percentile and below is considered as low group, between 30th and 70th percentile as moderate financial risk group and the companies with financial leverage ratio equal to and above 70th percentile are treated as high financial risk group. Then share of debt in capital structure is compared across company groups under each sector as well as for all sectors and significance of the difference in debt level across groups are tested with one ANOVA (F test). The results are tabulated and interpreted hereunder.

SIGNIFICANT OF DEBT IN CAPITAL STRUCTURE BY LEVEL OF FINANCIAL RISK

Table 1 presents the long-term debt, short-term debt and total debt relative to total assets as well as long-term debt relative to book value of assets and market value of assets across firm groups with low, medium and high financial leverage for the Cement sector.

Table 1 :Comparison Of Debt Level Across Low, Medium And High Financial Risk Firms Under Cement The Sector

Debt Measures	Low Financial Risk Firms	Medium Financial Risk Firms	High Financial Risk Firms	All Firms	F Value
LTDTA	0.5257	0.6421	0.4657	0.5543	4.79***
	(0.2108)	(0.2670)	(0.1356)	(0.2281)	
STDTA	0.1302	0.1105	0.1315	0.1227	0.37
	(0.1129)	(0.0870)	(0.1141)	(0.1028)	
TDTA	0.6558	0.7526	0.5972	0.6770	3.57**
	(0.2046)	(0.2844)	(0.1089)	(0.2275)	
LEVB	0.6912	0.7936	0.6154	0.7094	3.91**
	(0.2684)	(0.2327)	(0.2153)	(0.2477)	
LEVM	0.6575	0.7441	0.6261	0.6827	1.62
	(0.2879)	(0.2369)	(0.2484)	(0.2585)	

2, 77 is the degrees of freedom for all 'F' values.

**Significant at 5% level. ***Significant at 1% level

Figures in parenthesis are values of standard deviation.

It seems that the firms with medium financial risk had more long-term debt in their capital structure (64.21%) followed by low financial risk firms (52.57%) when compared to firms with high financial risk (46.57%) and there was significant difference in the level of long-term debt among firm groups with different level of financial risk under cement sector (F value = 4.79, $p < 0.01$). Also, total debt differs significantly by level of financial risk across three risk

categories (F value = 3.57, $p < 0.01$). The same scenario as that of total debt is visible in the case of long-term debt relative to book value of equity. But, relative to market value of equity, the long-term debt has increased (reduction in ratio) for low and medium risk firms and it has declined (increase in ratio) for high financial risk firms under cement sector. So, on the whole, it is found that long-term debt relative to total assets is significantly related to financial risk whereas relative to MVE is independent of the financial risk for firms under cement sector.

A glance at Table 2 reveals that the long-term debt relative to TA is higher for low risk firms (29.82) when compared to that of the firms with high (23.87%) and medium (16.02%) financial risk firms under the Food sector. Due to significant difference in the short-term debt, there is significant difference in the total borrowed fund utilized by the firms under food sector (F Value = 2.91, $p < 0.10$).

Table 2: Comparison Of Debt Level Across Low, Medium And High Financial Risk Firms Under The Food Sector

Debt Measures	Low Financial Risk Firms	Medium Financial Risk Firms	High Financial Risk Firms	All Firms	F Value
LTDTA	0.2982	0.1602	0.2387	0.2251	2.07
	(0.3429)	(0.1727)	(0.2419)	(0.2576)	
STDTA	0.0977	0.0485	0.0519	0.0643	2.72*
	(0.1220)	(0.0660)	(0.0537)	(0.0858)	
TDTA	0.3959	0.2088	0.2906	0.2894	2.91*
	(0.3916)	(0.1999)	(0.2619)	(0.2939)	
LEVB	0.3651	0.2903	0.3581	0.3331	0.49
	(0.3936)	(0.2614)	(0.3010)	(0.3155)	
LEVM	0.3565	0.2014	0.4333	0.3175	3.94**
	(0.3455)	(0.2501)	(0.3634)	(0.3282)	

2, 77 is the degrees of freedom for all 'F' values.

*Significant at 10% level. **Significant at 5% level.

Figures in parenthesis are values of standard deviation.

However, relative to market value of equity, the long-term debt is higher for high financial risk firms. Further, the difference in long-term debt relative to market value of equity is significant at 5 per cent level (F value = 3.94, $p < 0.05$).

Table 3: Comparison Of Debt Level Across Low, Medium And High Financial Risk Firms Under The Pharmaceutical Sector

Debt Measures	Low Financial Risk Firms	Medium Financial Risk Firms	High Financial Risk Firms	All Firms	F Value
LTDTA	0.3029	0.1738	0.2874	0.2466	3.38**
	(0.2172)	(0.1743)	(0.2305)	(0.2115)	
STDTA	0.0682	0.0737	0.0499	0.0649	1.21
	(0.0612)	(0.0665)	(0.0388)	(0.0580)	
TDTA	0.3711	0.2475	0.3373	0.3115	2.17
	(0.2321)	(0.2204)	(0.2453)	(0.2350)	
LEVB	0.4257	0.2416	0.3606	0.3325	3.95**
	(0.2705)	(0.2173)	(0.2679)	(0.2587)	
LEVM	0.3599	0.1721	0.3684	0.2873	4.91***
	(0.2795)	(0.2085)	(0.3241)	(0.2817)	

2, 77 is the degrees of freedom for all 'F' values.

**Significant at 5% level. ***Significant at 1% level

Figures in parenthesis are values of standard deviation.

It is understood from the above results, which interprets the use of debt fund, which is high among firms with low financial risk whereas it is less in respect of medium and high financial risk firms under the food sector. From the Table 3, the long-term, short-term and total debt relative to 30.29 per cent, 6.82 per cent and 37.11 per cent for the firms with low financial risk under pharmaceutical sector is observed.

In the case of firms with medium financial risk, the LTDTA, STDTA and TDTA is 17.38 per cent, 7.37 per cent and 24.75 per cent and for firms with high financial risk, they are 28.74 per cent, 4.99 per cent and 33.73 per cent respectively. So, from the overall interpretation of the results, it is clearly understood that the firms with medium financial risk have used significantly less debt fund in their capital than use of debt fund by low and high financial risk firms under the pharmaceutical sector. At the same time, use of debt fund by high risk firms is marginally less than that of low risk firms, indicating that low risk firms under the pharmaceutical sector opt for more debt fund, but maintain it at the one-third level.

Table 4 : Comparison Of Debt Level Across Low, Medium And High Financial Risk Firms Under The Information Technology (IT) Sector

Debt Measures	Low Financial Risk Firms	Medium Financial Risk Firms	High Financial Risk Firms	All Firms	F Value
LTDTA	0.1891	0.0661	0.2194	0.1505	6.26***
	(0.1860)	(0.1384)	(0.1705)	(0.1756)	
STDTA	0.0144	0.0317	0.0800	0.0412	4.75***
	(0.0221)	(0.0727)	(0.1023)	(0.0773)	
TDTA	0.2035	0.0979	0.2994	0.1917	7.77***
	(0.1923)	(0.1654)	(0.1859)	(0.1967)	
LEVB	0.3773	0.1122	0.3285	0.2593	10.37***
	(0.2938)	(0.1692)	(0.1952)	(0.2490)	
LEVM	0.2369	0.0791	0.2417	0.1770	4.03**
	(0.2678)	(0.1745)	(0.2606)	(0.2430)	

2, 77 is the degrees of freedom for all 'F' values.

**Significant at 5% level. ***Significant at 1% level

Figures in parenthesis are values of standard deviation.

Table 4 shows the level of debt across low, medium and high financial risk firms under the information technology sector. It is clearly apparent that the use of debt fund either from long-term and short-term sources is significantly related to the level of financial risk as the calculated F values for LTDTA (F value = 6.26, $p < 0.01$), STDTA (F value = 4.75, $p < 0.01$), TDTA (F value = 7.77, $p < 0.01$), LEVB (F value = 10.37, $p < 0.01$) and LEVM (F value = 4.03, $p < 0.05$) are all significant at the required hypothetical level. The total debt in capital of the firms with high financial risk is 29.94 per cent on the average during the period from 1998-99 to 2005-06. Moreover, use of short-term debt is found to be much higher for high financial risk firms (8.0%) whereas, it is much lower for low risk firms (1.44%). However, long-term debt relative to book value of equity is found to be higher for low risk firms while LTD relative to market value has been almost similar for both low and high financial risk firms. At the same time, firms with high operating risk have low debt agency cost and so tend to use more leverage (Myers, 1977). To sum up, it is very clear from the above interpretation that proportion of debt financing in capital structure is significantly influenced by the financial risk among the firms under the information technology sector. The proportion of the debt financing in the capital structure of firms with low, moderate and high financial risk under the steel sector is compared and the results are presented in Table 5. It is known that proportion of debt financing provided by long-term debt is well above 50 per cent across firms with all levels of financial risk, and the proportion does not vary significantly by levels of financial risk (F value = 0.89 is insignificant).It is further understood from the observation of the Table 5 that long-term debt finance relative to book value of equity and market value of equity is well above 70 per cent for all risk groups, but does not differ significantly. This has revealed that proportion of debt financing relative to book value of equity and market value of equity is unaffected by the levels of financial risk for firms under the Steel sector. So, it is concluded that proportion of debt fund relative to total assets is significantly affected by the financial risk whereas relative to net

worth, use of debt financing is independent of the financial risk of the firms under the steel sector.
Table 6 is depicted with proportion of long-term debt, short-term debt and total debt relative to total assets as well as long-term debt relative to BVE and MVE across three levels of financial risk for firms under the textile sector. From the table, it is apparent that proportion of long-term funding though long-term debt is more than 50 per cent for low financial risk firms, while it has been 49.72 per cent and 42.09 per cent for high and medium risk firms under the textile sector.

Table 5 : Comparison Of Debt Level Across Low, Medium And High Financial Risk Firms Under The Steel Sector

Debt Measures	Low Financial Risk Firms	Medium Financial Risk Firms	High Financial Risk Firms	All Firms	F Value
LTDTA	0.5835	0.5102	0.5025	0.5299	0.89
	(0.2378)	(0.2848)	(0.1456)	(0.2360)	
STDTA	0.1879	0.0797	0.1241	0.1255	6.51***
	(0.1468)	(0.0813)	(0.1038)	(0.1185)	
TDTA	0.7714	0.5900	0.6266	0.6554	4.74***
	(0.2140)	(0.2771)	(0.1414)	(0.2353)	
LEVB	0.7088	0.7267	0.7280	0.7217	0.11
	(0.1760)	(0.1691)	(0.1449)	(0.1626)	
LEVM	0.7418	0.8086	0.7475	0.7702	1.20
	(0.1911)	(0.1703)	(0.1867)	(0.1821)	

2, 77 is the degrees of freedom for all 'F' values.
***Significant at 1% level.
Figures in parenthesis are values of standard deviation.

Table 6 : Comparison Of Debt Level Across Low, Medium And High Financial Risk Firms Under The Textile Sector

Debt Measures	Low Financial Risk Firms	Medium Financial Risk Firms	High Financial Risk Firms	All Firms	F Value
LTDTA	0.5014	0.4209	0.4972	0.4679	2.98*
	(0.1599)	(0.1082)	(0.1587)	(0.1445)	
STDTA	0.0824	0.0535	0.0984	0.0756	1.20
	(0.1056)	(0.0482)	(0.1621)	(0.1103)	
TDTA	0.5838	0.4744	0.5956	0.5436	10.29***
	(0.1219)	(0.1017)	(0.1140)	(0.1242)	
LEVB	0.5183	0.4180	0.4732	0.4646	1.33
	(0.2253)	(0.2192)	(0.2471)	(0.2306)	
LEVM	0.6439	0.4876	0.6353	0.5788	2.50*
	(0.2870)	(0.2847)	(0.3256)	(0.3037)	

2, 77 is the degrees of freedom for all 'F' values.
*Significant at 10% level.***Significant at 1% level.
Figures in parenthesis are values of standard deviation.

However, relative to BVE, the long-term debt tends to be at same degree for firm groups with all levels of financial risk (F value not significant). In essence, it is found from the overall results that firms with low and high financial risk tend to rely on more debt fund compared to those firms with medium financial risk. More hypothetically, it is summed up

that choice of debt in capital structure is significantly associated with levels of financial risk for firms under the textile sector.

Table 7 : Comparison Of Debt Level Across Low, Medium And High Financial Risk Firms Under All Selected Sectors

Debt Measures	Low Financial Risk Firms	Medium Financial Risk Firms	High Financial Risk Firms	All Firms	F Value
LTDTA	0.4031	0.3345	0.3706	0.3660	2.77*
	(0.2704)	(0.2883)	(0.2192)	(0.2647)	
STDTA	0.0979	0.0670	0.0894	0.0831	4.41***
	(0.1156)	(0.0747)	(0.1071)	(0.0992)	
TDTA	0.5010	0.4015	0.4600	0.4491	4.92***
	(0.3038)	(0.3143)	(0.2367)	(0.2922)	
LEVB	0.5163	0.4372	0.4794	0.4737	2.74*
	(0.3082)	(0.3273)	(0.2743)	(0.3076)	
LEVM	0.5031	0.4226	0.5125	0.4739	3.47**
	(0.3334)	(0.3608)	(0.3347)	(0.3468)	

2, 77 is the degrees of freedom for all 'F' values.

*Significant at 10% level.**Significant at 5% level.***Significant at 1% level.

Figures in parenthesis are values of standard deviation.

It shows that proportion of fund through long-term debt relative to total assets are 40.31 per cent for low financial risk groups, followed by high risk groups with 37.06 per cent and medium risk firms with 33.45 per cent. The firms with medium financing risk tend to rely on less debt fund and differ significantly in this aspect from low and high financial risk counterparts (F value = 2.77, $p < 0.10$). Further, debt fund in capital structure relative to BVE (F value = 2.74, $p < 0.10$) and MVE (F value = 3.47, $p < 0.01$) is also varying significantly across firms which belong to low, medium and high financial risks. So, from the above picture, it is well understood that proportion of debt fund provided by the long-term debt as well as by short-term debt is significantly related to the level of financial risk of the firms under Cement, Food, Pharmaceutical, Information technology, Steel and Textile sectors.

FINDINGS

The followings are the findings of this empirical study:

1. It is found that long-term debt relative to total assets is significantly related to financial risk whereas, relative to MVE, it is independent of the financial risk for firms under the cement sector.

2.It is evident that use of debt fund is high among firms with low financial risk whereas, it is less in respect of medium and high financial risk firms under the food sector.

3.The study interpreted that the firms with medium financial risk have used significantly less debt fund in their capital than use of debt fund by low and high financial risk firms under the pharmaceutical sector.

4.At the same time, use of debt fund by high risk firms is marginally less than that of low risk firms, indicating that low risk pharmaceutical firms opt for more debt fund but maintain at one-third level (total fund).

5.It is found that proportion of debt financing in capital structure is significantly influenced by the financial risk among the firms under the information technology sector.

6.It is identified that proportion of debt fund relative to total assets is significantly affected by the financial risk whereas, relative to net worth, use of debt financing is independent of the financial risk of the firms under the steel sector.

7.It is elicited that choice of debt in capital structure is significantly associated with levels of financial risk for firms under the textile sector.

8.It is found that proportion of debt fund provided by the long-term debt as well as by short-term debt is significantly related to the level of financial risk of the firms under Cement, Food, Pharmaceutical, Information technology, Steel

and Textile sectors.

CONCLUSION

As far as the relationship between financial risk factors and debt financing in capital structure is concerned, it is concluded that financial risk variables, particularly interest risk followed by volatility in ROE has significant effect on determining the additional variation in use of debt financing in business through long-term sources among firms under all selected sectors. With regard to financial risk -that is the risk arising out of degree of financial leverage, it is well understood that proportion of debt fund provided by the long-term debt as well as by short-term debt is significantly related to the level of financial risk of the firms under Cement, Food, Pharmaceutical, Information technology, Steel and Textile sectors.

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