LEVERAGE AND FINANCING DECISION –AN EMPIRICAL ANALYSIS

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ABSTRACT

In the process of selection of a target debt-equity mix, a company analyses a number of factors, one of such factors is the consideration of leverage. The management employs this tool, more often than not, to increase the company's return on net worth and more so when it is impossible to improve operating efficiency of the company and increasing the return on total investment. The study is divided into two parts- conceptual framework and case study. In the present article an endeavor has been made to through some light on the business risk, financial risk, financial break-even point and total risk of Hindustan Construction Company Limited by means of computing the degree of association between the various leverage ratios with the well-known profitability indicator viz. return on net worth (RONW), and statistical test viz.'t' test has been used to test the significance of the results of the empirical study. Ultimately, the article concludes with some valid recommendations which deserve the attention of the concerned company under study and government.

Keywords*: Leverage, DOL, DFL, Financial break-even point, DTL & RONW.*

Introduction:

Leverage not only tends to magnify shareholders' return, and return on investment under favorable conditions, but also exposes them to risk. Use of more and more debt capital raises the riskiness of the firm's earnings stream but it tends to provide a higher expected rate of return to the shareholders'. The closely related concepts of financial and business risk are crucial to the problem of financial structure design. Leverage is an important tool of financial planning because it is related to profits. As with lifting heavy objects, it allows us to accomplish things not otherwise possible at a given level of effort. This concept is valid in capital mixture of a company. The concept privatization leads to the use of more amounts of external funds in the capital structure of the Indian companies. The use of debt funds requires the payment of fixed contractual commitments and as a matter of fact the concepts financial risk and financial break-even point have came into the financing decision making process. The emphasis of the present study is to measure & analyze the operating risk, financial risk, financial break-even point and total risk by way of computing the Degree of Operating Leverage (DOL), Degree of Financial Leverage (DFL), financial break-even point and Degree of Total Leverage (DTL) of Hindustan Construction Company Ltd. for the accounting period from 2000-01 to2009-10. It can also be judged the degree of association between the various leverage ratios with the important profitability indicator viz. RONW of the selected company under study for the given study period.

Literature Review:

Several studies have been conducted in India regarding the comparative analysis and financing decision making process, a brief explanation regarding such studies is shown in the following paragraphs:

Chudson (1945) provides direct evidence on the industries with high proportion of fixed assets tending to use more long-term debt. Gorden (1962) found that gearing increased with size; return on investment is negatively related with debt ratio; and also confirmed the negative association between operating risk and debt ratio. Baxter (1967) reported that leverage would depend on the variance of net operating earnings. Gupta (1969) confirmed that total debt ratios were positively related to growth and negatively related to size. Remmer et al (1974) suggested that certain institutional variables, earning rate seem to be more important as determinants of debt ratio internationally.

Toy et al (1974) reported that the corporation size and the industry-class do not appear to be determinants of debt ratio. Scott and Martin (1975) concluded that industry class is indeed a determinant of financial structure. They also concluded that corporate size is the determinant of firm's financial leverage ratio. Elsamma Lukose (1976) recommended that the concern should reduce the proportion of borrowed funds either by conversion of debts into equity or by retiring part of debt capital through the issue of further shares. Carelton and Siberman (1977) concluded that higher the variability is in rate of return on invested capital, the lower will be the degree of financial leverage adopted. They also found the return on

investment to be negatively correlated with the debt ratios. Ferri and Jones (1979) found that the industry- class was linked to a firm's leverage, but not in a direct manner than what has been suggested in other researches. Bhat (1980) formed that the business risk (defined as earnings instability, profitability, and dividend payout and debt service capacity) are the significant determinants of the leverage ratio. Venkatesan (1983) found that only debt coverage ratio was found to be the important variable significantly affecting the financial structure of the firm.. Masulis (1983) found that the changes in stock prices are positively related to the changes in leverage; changes in non-convertible senior security prices are negatively related to the debt ratio; and the changes in the firm values are positively related to the changes in companies debt level. Pandey (1984) found that the practicing managers generally preferred to borrow instead of using other sources of funds because of low cost of debt due to the interest tax deductibility and the complicated procedures for raising the equity capital. Kolondy and Suher (1985) indicated that no relationship is shown between shareholders return and the company's pre-issue degree of financial leverage .Kosejohn (1987) revealed that, in the pure signaling case the equilibrium is characterized by direct contractual pre-commitments to implement investment policies, which are riskier than pare to optimal levels. Pandey (1988) revealed that the tendency of large size companies is to concentrate in the high-level leverage class, but it was difficult to conclude that the size has no impact on the degree of leverage. Rao and Mohana (1989) concluded that there is a negative correlation between retained earnings and the debt equity ratio in the sense that a company with higher volume of retained earnings had low debt- equity ratio.

Mathew (1991) concluded that where the management's stake is high, the leverage will be low and vice-versa and there exists a significant relationship between ownership structure and financial structure of companies. Israel (1991) pointed out that the optimum debt level balances, a decrease in the profitability of acquisition against a higher share of the synergy for the target shareholders'. Chungchang (1992) found that the leverage can be used as an instrument to transfer wealth between investors and employees. The transfer can go in either direction. Dhankar and Boora (1996) found that optimal capital structure in Indian companies, both at the macro and micro level affects the value of a company. There is no definite relationship between change in capital structure and the value of a company at the macro level. Kakoni (1999) found that diversification strategy and size were found to be of significant strategy and sizes were found to be of insignificant in deciding the leverage level of the firm. Jarrel and Kim (2002) found that debt to (book) asset ratio is negatively related to both the volatility of annual operating earnings and to advertising and research and development expenses. Mohanty (2002) found that leverage is negatively related with profitability and value of the firm within an industry as well as within the Indian economy. Rajan and Zingales (2002) found that the extent to which firms are levered is fairly similar across the G-7 countries, with only United Kingdom and Germany being relatively less levered. Hull (2002) found that the industry debt to equity norms are significantly more negative than returns for the firms moving' closer to' these norms.

Nissim and Penman (2003) stated that the financial statement analysis distinguishes leverage in financing activities from leverage in operations. Azhagaiah and Gangadevi (2008) studied the leverage and financing decision for the selected 30 electronic companies for the five years period ranging from1998 to 2003. In his study he found that the company has a high operating leverage should kept low financial leverage and vice-versa. So, it is desirable that a company has low operating leverage and a high financial leverage.

Objective of the study:

The study has the following objectives:

1. To study the trend of leverages of Hindustan Construction Company Ltd for the period from 2000-01 to 2009-10.
2. To analyze the risk patterns of the selected company under study by introducing the well known devices of measuring risks, viz. DOL, DFL, financial break-even point and DTL.
3. To assess the degree of association between the various leverage ratios with the well-known profitability indicator viz. RONW of the selected company during the period under study.
4. To provide valid recommendations these deserve the attention of the management of the studying company and government.

Data base and Methodology:

The data for the period from 2000-01 to 2009-10 used in this study have been collected from secondary sources i.e. from the published annual reports of the selected company, various reputed journals, e-journals from UGC-Inflibnet centre, various reputed books on finance, etc. " CAPITALINE 2000" data base package has also been used for procuring data. In order to analyze the data the values of DOL, DFL, DTL, financial break-even point and return on net worth (RONW) are to be measured on the basis of data available in the published annual reports of the company under study. For assessing the degree of association between the various leverage ratios with the profitability indicator viz. return on net worth (RONW), Pearson's simple correlation coefficient has been applied and Student's 't' test has been used to examine the significance of the computed values of correlation coefficients between those leverage ratios with RONW during the period under study.

For analyzing the available data and calculating the risk position, the following formulas are to be used:

1. Degree of Operating Leverage (DOL) =

$$\frac{\text{Total Contribution}}{\text{EBIT}} \quad \ldots\ldots\ldots\ldots\ldots\ldots 1$$

2. Degree of Financial Leverage (DFL) =

$$\frac{\text{EBIT}}{\text{EBIT-I-Dp(1-t)}} \quad \ldots\ldots\ldots\ldots\ldots\ldots 2$$

3. Degree of Total Leverage (DTL) =

$$\frac{\text{Total Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{EBIT-I-Dp(1-t)}} \quad \ldots\ldots 3$$

4. Financial Break Even Point = I + Dp / (1-t)….4

Where,

EBIT=Earnings before interest and taxes
I= Interest t = tax rate

5. Formula used for calculating $|t| = \frac{r \times \sqrt{(n-2)}}{\sqrt{(1-r2)}}$

with (n-2) df…….. 5

Section-I

Conceptual Framework:

A firm can make use of different sources of financing whose costs are different. These sources may be classified into those which carry a fixed rate of return i.e. external sources of financing i.e., debt capital and those on which the return may vary, i.e., internal sources of financing, i.e., owned capital.

'**Leverage'** is the employment of an asset or source of finance for which firm pays fixed cost/ fixed return. The term 'leverage' arises only when a firm uses debt capital in its capital structure.

'Capital Structure' is the proportion of debt, preference & equity shares on a firm's balance sheet for the creation of pool of fund. If the appropriate proportion of debt capital is used in the capital structure then it leads to the maximization of the value of the firm and/or minimization of the value of cost of capital. So, it is very important to the management to take decision regarding the proportion of external debt that can be used in the capital structure so that the above mentioned objective(s) will be fulfilled. There are two types of leverage---- operating & financial.

'Operating leverage' results from the existence of fixed operating expenses in the firm's income stream. The operating costs of a firm fall into three categories--- (i) fixed costs which may be defined as those which do not vary with sales volume; they are a function of time, they must be paid regardless of the amount of revenues available, (ii) variable costs which vary directly with sales volume and (iii) semi-variable or semi fixed costs --- those which are partly fixed and partly variable. They are fixed over a certain range of sales volume and increase to higher levels for higher sales volumes. Since the last category of costs can be broken down into fixed and variable components. The costs of a firm in operational terms can be divided into (a) fixed & (b) variable. The operating leverage may be defined as the firm's ability to use fixed operating costs to magnify the effects of changes of sales on its earnings before interest and taxes. Operating leverage can be used to measure operating risk. Operating risk is the risk of the firm not being able to cover its fixed operating costs. The larger the magnitude, the larger the volume of sales required to cover all fixed costs. It is more precise measurement in terms of Degree of Operating Leverage (DOL). The greater the DOL, the higher is the operating leverage i.e., higher is the operating risk. If the value of DOL is equal to one then it signifies that there is no operating leverage. Now, we may conclude that operating leverage arises only when there are fixed costs in the cost structure of the company, if there is no fixed operating costs, then there will be no operating leverage i.e., operating risk.

Financial Leverage results from the presence of fixed financial charges in the firm's income stream. As we mentioned earlier, the sources from where funds can be raised by a firm, from the view point of costs/charges, can be categorized into (i) those which carry a fixed financial charges and (ii) those which do not involve any fixed contractual obligations. The sources which carry fixed contractual obligations are long term debts including bonds, debentures, etc. If a firm does not use any external debt in its capital structure then there will be no question of financial leverage. It can also be defined as the ability of a firm to use fixed financial charges to magnify the effects of changes in EBIT on the earnings per share. Fixed financial charges do not vary with the earnings before interest and taxes (EBIT) or operating profit. They are to be paid regardless of the amount of EBIT available to pay them. Financial Leverage can be used to measure the financial risk. The financial risk refers to the risk of the firm not being able to cover its fixed financial costs. With the increase in the financial charges, the firm is also required to enhance the level of EBIT necessary to meet financial charges. If the firm cannot cover these financial charges, it can be technically forced into liquidation. The main objective to use external capital in a firm's capital structures is to enhance the earnings available to the real owner of the firm, i.e., to increase the Earnings per Share (EPS). Financial Leverage can be more precisely expressed in terms of the Degree of Financial Leverage (DFL).

Difference between business risk and financial risk:

There are certain differences between business risk and financial risk, these are:

(i) Business risk is associated with the operation of the business firm whereas financial risk is concerned with the financing decision of the firm.
(ii) Business risk arises out of dispersion of the expected return on total fund invested. But financial risk arises out of the possibility of failing to meet fixed contractual obligations.

(iii) Business risk is influenced by the cost structure of the firm as well as the investment policy adopted by it. But financial risk is influenced by the capital structure of the firm.

(iv) Business risk can be reduced to some extent but it cannot be fully avoided whereas financial risk can be fully avoided if the firm has no external capital in its capital structure so that there will be no fixed contractual obligations.

Financial B-E-P:

Financial BEP is the level of EBIT which is equal to firm's fixed financial costs i.e., EPS is equal to zero. In other words, it is the level of EBIT at which the firm can satisfy all fixed financial charges (i.e., interest and preference dividend).Any level of EBIT below the financial break-even point yield negative EPS. The higher the degree of financial leverage the higher is the financial break- even point. Beyond the financial break-even point, proportionate increase in EPS is more than the proportionate increase in EBIT.

Combined Leverage or Total Leverage:

Combined or total leverage is the product of operating leverage and financial leverage. Since both these leverages are closely concerned with ascertaining the ability to cover fixed charges (fixed operating charges in the case of operating leverage and fixed financial charges in the case of financial leverage).If they are combined the result is total leverage and the risk associated with combined leverage is known as total risk. Combined leverage is the measure of the total risk of the firm. To keep the risk within manageable limits, a firm which has high degree of operating leverage should have low financial leverage and vice-versa.

Section- II (Data Analysis)

Company Profile:

Hindustan Construction Company Limited (HCC) is a spearheading force in engineering construction, both in India and the rest of the world. Seth Walchand Hirachand founded the company and it was incorporated in January 27th of the year 1926. HCC has been entrusted with the construction of high value projects across segments like transportation, power, marine projects, oil and gas pipeline constructions, irrigation and water supply, utilities and urban infrastructure. In Power Generation, HCC have constructed Hydroelectric, Nuclear, Thermal Gas and Diesel based Power Projects. In Transportation, the company concentrates road and rail bridges, expressways & roads and marine construction. The company is ISO 9001; ISO 14001 and OHSAS 18001 certified for its quality, environmental and occupational health & safety management systems. During the year 1997, the contracts are jointly valued at Rs. 410.40 crore and awarded by the National Highway Authority of India. As at September 2006, HCC bagged two prestigious Hydel project contracts from NHPC worth Rs.794crores. It has bagged the Chutak Hydroelectric Project for Rs. 410.54 crores and Nimo Bazgo Hydel project for Rs.383.90 crores both in Jammu and Kashmir. The Company received Golden Peacock National Quality Award for the Year 2006 in the category for Private Large Service by IOD (Institute of Directors) in association with World Environment Foundation (WEF) and also Golden Peacock Award for Occupational Health & Safety - 2007 from IOD in association with WEF. During December of the year 2007, HCC received a prestigious contract worth Rs. 297.51 crore in a joint venture with Alpine Mayreder, Austria from Delhi Metro Rail Corporation (DMRC). HCC incorporated a Special Purpose Vehicle (SPV) company in January of the year 2008 that is HCC Singapore Enterprises Pte, as a wholly owned subsidiary of the company for promoting its business and also the business of group companies. Further its wholly owned Subsidiary; HCC Real Estate has also incorporated a Special Purpose Vehicle (SPV) company that is Charosa Wineries for undertaking wine business. In May of the year 2008, HCC joined 18 other companies in an unprecedented statement to the 'Group of Eight' countries, urging heads of state and government to take action on the emerging global crisis in water and sanitation. During July of the year 2008, HCC bagged the prestigious order from National Highway Authority of India (NHAI) to construct the 4.4 km elevated highway at Badarpur on National Highway 2 (Mathura Road) near Delhi on BOT basis.

Computations and Major Findings of the study:

Table 1 : Simple Correlation Analysis of Various Leverage ratios with Return on Net Worth of Hindustan Construction Company Ltd for the period from 2000-01 to 2009-10

Year	DOL	DFL	DTL	RONW (%)
2000-01	1.32	1.72	2.28	31.19
2001-02	1.25	1.56	1.94	47.05
2002-03	1.35	2.13	2.88	22.10
2003-04	1.40	1.80	2.52	23.52
2004-05	1.36	1.67	2.28	28.64
2005-06	1.27	1.41	1.79	13.40
2006-07	1.38	1.80	2.47	4.10
2007-08	1.30	2.09	2.70	11.40
2008-09	1.28	2.48	3.18	8.29
2009-10	1.31	2.97	3.91	6.46
Correlation Coefficient (r)	-0.174	-0.54	-0.56	_
Calculated value of \t\ with (n-2) d. f.	0.50	1.82	1.91	_

Source: Complied and computed from the published annual reports of the studying company.

Note: (i) Tabulated values of 't' with (n-2) d .f. i.e., 8 d. f. both at 5% and 1% levels of significance for both tailed tests are 2.31 and 3.36 respectively.
(ii) Since the calculated values of \t\ in all cases are less than the tabulated values of't' with 8 d. f., so the correlation coefficients are statistically insignificant for both 5% and 1% levels of significance. $r \times \sqrt{n-2}$
(iii) Formula used for calculating |t| =
…….. With (n-2) d f. $\sqrt{(1-r2)}$

Chart-1: Diagrammatic Representation of Various Leverage Ratios of Hindustan Construction Company Ltd for the period from 2000-01 to 2009-10

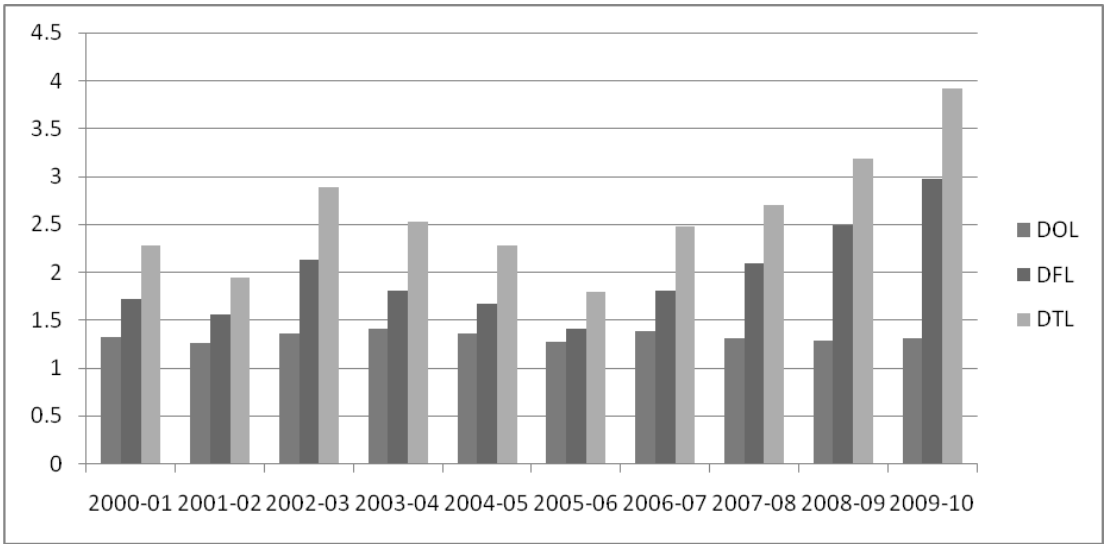
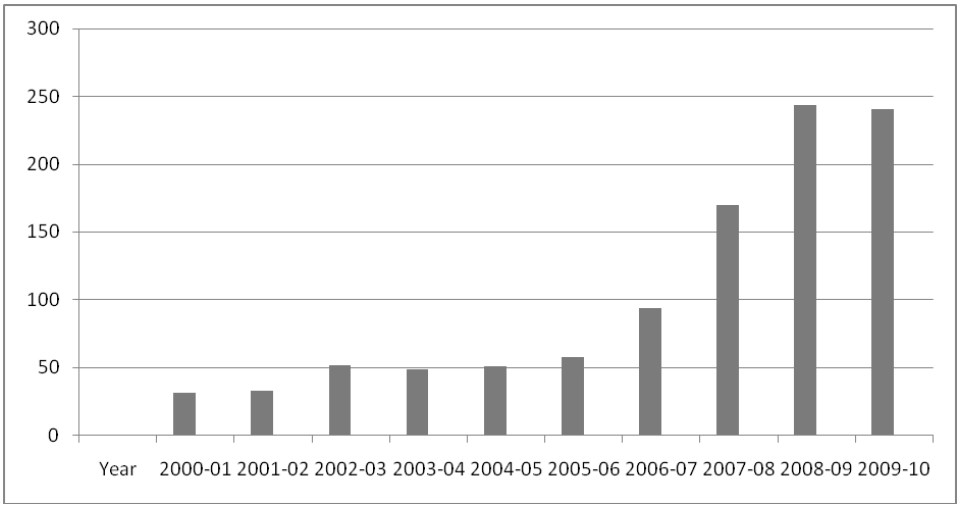


Table-2: Financial Break-even Points of Hindustan Construction Company Ltd for the period from 2000-01 to 2009-10

Year	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Financial B-E-P	31.01	32.47	50.91	48.10	50.47	57.24	93.84	169.52	243.74	240.15

Source: Complied and computed from the published annual reports of the studying company.

Chart-2: Diagrammatic Representation of table-2



Major Findings of the study:

1. The value of correlation coefficient between the degree of operating leverage (DOL) and return on net worth (RONW) is (-) 0.174 and this relationship is statistically insignificant both at 5% and 1% levels of significance. It signifies that there is a low degree of negative association between these two variables and this association is not statistically significant both at 5% and 1% levels of significance.
2. Again, the value of correlation coefficient between DFL and RONW is (-) 0.54. It signifies that there is a moderately high degree of negative association between these two variables and this relationship is not statistically significant both at 5% and 1% levels of significance during the period under study.
3. It is observed from table-1 that 'on an average' the values of DFL are higher than those of DOL during the study period. It signifies that the company has the higher financial risk than operating risk, so, it can be concluded that much emphasis has been given by the management of the company on fixed contractual commitments than the fixed operating cost during the entire study period.
4. The value of correlation coefficient between DTL and RONW is (-) 0.56 and also the association between these two variables is not statistically significant both at 5% and 1% levels of significance. So, we can conclude that there is a moderately high degree of negative association between these two variables during the period under study.
5. If we go through the rates of return on net worth it can easily be seen that in the very first five years of study (i.e., from 2000-01 to 2004-05) the rates of return on net worth are high and then from the accounting year 2005-06 to 2009-10 these rates are comparatively very low. But there is no Similarity in these rates; rather it is very much fluctuating in nature throughout the entire study period.
6. If we go through the diagram-2 it can be seen that there is an upward movement in the levels of financial break-even point throughout the entire study period. It signifies that there is an increasing trend in the use of external capital in the capital structure of the company under study during the period under study.

Concluding Remarks:

The basic proposition is that if a company has both the leverages at a high level, it will be a very risky position because the combined effect of the two is a multiple of these two leverages. Therefore, if a company has a high operating leverage, the financial leverage should be kept at a low level. Accordingly, if a company has high operating leverage and low financial leverage, it can partly dilute the effect of high operating leverage. A low operating leverage means high controllable costs (variable costs) and low uncontrollable costs (fixed costs) and therefore a less risky situation. In the present study, the company has the higher financial risk as compared to operating risk throughout the study period. Low operating risk means the company has low uncontrollable cost and high controllable cost and therefore, a less risky situation.

Recommendations:

1. To cover the fixed operating costs the firm should have to improve its net sales so as to maintaining the operating risk within the manageable limit in the years to come.
2. The use additional external capital (i.e., fixed charge bearing capital) in its capital structure leads to enhance the earnings after tax as the rewards to the external funds provider are tax deductible expenditure which can ultimately lead to make the equity shareholders happy and reliable on the firm's operating as well as financing performance.
3. The companies should be maintaining a sound short-term debts paying capacity because the use of more amount of external funds may lead to short-term insolvency.
4. For the very existence and growth, every company has to earn adequate profit. As regards profitability, the company witnessed a fluctuating as well as decreasing trend throughout the entire study period, which is not desirable from the management of the company. The rate of return on net worth should be consistent in the years to come in order to keep the shareholders' happy and reliable about the firm's operating as well as financing performance.

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