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Is there Optimality in Firm's Capital Structure ? An Empirical Study

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Abstract

The paper reports that, when firms follow the Pecking Order Theory, a sub-optimality with the cost components of firms' capital structure exists. The sub-optimality drives firms to follow the Trade - Off Theory to reach optimality concerning the cost components of capital structure. At higher LTD/EqR ratios firms follow the Pecking Order financing and subsequently change the capital structure due to the interplay of profitability, cost of financing and influence of financing on profitability. The approach of the firms investment with higher LTD/EqR. and reduction of the debt levels to maintain lower LTD/EqR ratio at long term ends and to obtain trade off benefit as well resolves the Psuedo conflict. When the effect of the pecking order hierarchy sets out severity on the firm, trade off track in the long run.

I. Introduction

IN CORPORATE FINANCE, the capital structure decision of a firm yet remains in much controversy even though the firms finance functions persevere the objective as "shareholders net wealth maximization" (Frank and Goyal, 2004 ; Fama and French, 2002, and 2005; Graham and Harvey, 2001; Welch, 2004; and also Baker and Wurgler, 2002). Numerous studies to resolve the capital structure puzzle (Harris and Raviv,1991) commonly presume firms investment decisions superfluous either by adhering the independence of the investment decision from the financing decision as guaranteed or simply by introducing under investment problem (Myers, 1977) or asset substitution problem (Jensen and Meckling, 1976) as an explanation. However, in a broader inspection, firms finance functions

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involve financing decision, and investment decision (Horne, 2000; Robichek and Myers, 1965). In corporate finance literature, however, while the traditional approach regards the capital structure as value relevant and opines in favour of an optimal capital structure, the Modigliani and Miller (1958) [herein after referred as MM] approach provides justification in support of value irrelevance and hence no optimal capital structure. Moreover, the modern finance theories provide competing views regarding the logics for relevance and its determinants as well. Nevertheless, criticizing the limitations, logics and rationality of popular modern theories, new theories of capital structure are emerging without making too much investigation on recognizing any link among various modern theories.

In particular, the goal of financial management is value creation for the shareholders which they can not create by themselves. This value creation function is subject to efficient management of the sources and the applications of the values. While the sources of value involve value creation through generation of operating profit and utilization of financial advantages, the application of value involves value distribution to the equity holders, the bondholders and the government. Thus, the shareholders value maximization can be possible by aligning the objective of "maximum value creation" for the firm with "maximum value distribution" to the shareholders. Hence, firms objective function involves minimization of the perceived overall cost of capital (K_0) and the cost of debt (K_d) as well, along with maximization of the expected returns to the equity holders (K_e) and the business rate of return (Br).

Thus, the capital structure decision and the objectives of firms can be viewed from the perspective of value creation and value distribution. The paper seeks to investigate the issue of "optimal capital structure" decision with regard to the sources side and the applications side of firms value creation.

The rest of the paper is organized as follows. Section II presents a brief literature review on capital structure, the concept of optimality and its relevance on shareholders value maximization. Section III provides the objectives of the present study. The Data and Methodology are given in Section IV with the definitions of the variables, the propositions in connection with the objectives, the hypotheses, and the related test statistic. The results and findings are reported in Section V which is followed by conclusion on the findings in Section VI.

II. Literature Review

In Corporate Finance, the traditional approach of capital structure views that the cost advantage of the debt capital over the equity capital derives an "optimal" or a "normal" debt to equity ratio. Theoretically, the "optimal" leverage equalizes the marginal benefit of debt with the marginal cost of debt, minimizes the overall cost of capital and maximizes the shareholders

wealth (Linter, 1956; Gordon, 1959). Again, debts low cost characteristic allows some "normal" debt capacity and up to the "normal" indebtedness judicious use of debt controls the cost of capitals (Donaldson, 1961).

But, since Modigliani and Millers (1958) seminal work on capital structure and firm value, the capital structure literature undergoes much controversy. MM (1963) subsequently put forward a tax correction but Miller (1977) reverts back to MMs (1958) irrelevance proposition in a corporate and personal tax world.

However, the modern finance theories pave their own foundation with the divergence from the assumptions of the MM (1958) theory and directly cancel out MMs 1st proposition. The trade off theory, one of the modern theories, views that the trade off between the increased interest tax shield benefits and the marginal bankruptcy costs of debt financing makes capital structure relevant to firm value (Modigliani and Miller,1963; Litzenberger and Horne, 1978 ; White, 1983; Altman, 1984 and Warner, 1977, and also Ross and Westerfield, 1988). The theory predicts a positive correlation between leverage and profitability. One subsequent theory, the Pecking order theory (Myers and Majluf, 1984, Myers, 1984) opines that external capital issue (or new equity issue) involves higher information problem and thus incurs higher information costs than internal financing (or new debt issue). The theory advocates in favour of that source of finance which is less sensitive to information problem and predicts a negative correlation between leverage and profitability. Moreover, according to the Signaling theory (Ross, 1977; Leland and Pyle,1977), the debt issue of lower profitable firms serves as a signal of higher quality investment, and firms with higher profitability in the past (and thus higher retained earnings at present) can not distinguish their investment in the market with new debt issue. Hence, the theory predicts a negative correlation between leverage and profitability. Finally, the Agency Cost theory (Jensen and Meckling, 1976) states that asymmetric information problem includes issuance cost, signaling cost and agency problem as well. The diversified shareholders of a firm can not manage the free cash flows to the management, and the interest and principal payment obligations of debt serve as a monitoring valve (Jensen and Meckling, 1986). Accordingly, the theory predicts a positive correlation between leverage and profitability.

Nevertheless the controversy among the above four theories remains, recent developments in corporate finance literature suggest few forceful solutions. Fama and French (2002) contribute the most comprehensive empirical examination of the trade off theory and the pecking order theory, and sustain some broad predictions of the pecking order theory. But their overall findings are not robust for the theories. Graham and Harvey (2001)s survey also provide a "soft target leverage" that the CEOs maintain for flexible restructuring of the capital structure. Finally, Fama and French (2005) encounter that frequent capital structure changes are not compatible to the predictions of the pecking order theory. However, contrary to Frank and Goyal (2004); Welch (2004) claims that the firm specific determinants of

leverage endow with spurious result if leverage includes the effects of past stock returns among the other determinants. However, Baker and Wugler (2002) go beyond investors "rationality" with a modified version of Myers (1984)s pecking order theory where firms rebalance their capital structure to "time the market".

Again, the critics of modern finance theories put forward new propositions and remark that the modern theories offer impracticable solutions to explain the complex reality. These criticisms are mostly "control of dominant groups" viz. managers, board members etc (Gordon, 1994), " the dominance of one group over the other groups" within the company (Chang, 1997; Zingales, 2000) and the "theory of employees governance" (Mramor and Valentineie, 2001). Moreover, the new theories prelude that a universal financial model does not exist (Frankfuter and Mc.Goun, 2000).

But the new theories merely circumvent modern finance logics and also overlook the application side of fund. The underinvestment problem (Myers, 1977) compels the equity holders indifferent to the new equity issue and thus highly levered firms fall short to penetrate equity financing to fund their prospective investment opportunities. Alternatively, the Asset substitution problem (Jensen and Meckling, 1976) involves shifting of risk from the shareholders to the bondholders and hence previous bond contracts restrict any change in projects if they were primarily financed by long-term debts. However, a joint determination of capital structure and investment risk leads an optimal risk strategy, which involves the tax advantages of default costs exceeding the agency costs of asset substitutions (Leland, 1998). So the application side of funds or the "investment opportunity set" of firms can explain much the relevance of capital structure (Barclay and Smith, 1995 & 1996; Barclay, Smith, and Ross, 1995). Again, renegotiation between the shareholders and the bondholders deteriorates Myers (1977) underinvestment problem, and the bondholders monitoring over the equity holders eliminates the excess risk and prevents any additional wealth transfer from the equity holders to the bondholders (Pawlina, 2005). Moreover, stronger shareholders control benefits the bondholders by disciplining the managers and foster events that can hurt bondholders (Cremars, Nair, and Wei, 2004). Cremars, Nair and Weis results reveal that the shareholders control consequences low yields (or high yields) when firms are protected from takeovers (or exposed to takeovers).

Despite the above findings, the operating efficiency is positively related to debt levels and the positive effect decreases with increase in leverage (Neith and Lu, 2004). This result is consistent with the trade-off theory and Agency cost theory. However, capital structure and profitability gives a saucer-shaped (i.e. U shaped) relation (Pandey, 2004) and the "U-shape" is due to the interplay of agency costs, costs of external financing and debt tax shield. But, Mayer and Sussman (2004) report that firms follow the pecking order theory in the short run and the trade off theory in the long run and

suggest that "*projects are predominantly financed with debts ..... and firms show a strong tendency to revert back to their initial leverage*". Their pattern proposes that equity adjustments are suspended until certain thresholds from the bondholders are arrived at. However, Nucci, Pozzole and Schivandi (2005) have documented a negative relationship between leverage and productivity. Their findings are consistent with the trade off theory and the agency cost theory. However, the following section sets the objects of the paper keeping in view the modern theories of capital structure and the implications of investment decisions on firm value.

III. Objectives

The paper seeks to investigate the issue of "optimal capital structure" from the perspective of value creation and value distribution with regard to the sources side (i.e. leverage levels and cost of capitals) and the applications side (i.e. the operating rate of return).

Though the modern finance theories generally view "optimality" in or "relevance" of capital structure, the trade off theory and the agency cost theory directly relate the cost of capital components with leverage levels. In contrast, the pecking order theory and the signaling theory view the signaling power and the asymmetric information problem of firms capital structure change. Hence, the costs of capitals of the firms following the pecking order theory may have no direct relationship with leverage and should not be placed as a priori assumption. Again, the investment side may have a direct impact on capital structure changes and firms may restructure the leverage relating it with the changes in the operating profitability of the firm. Hence, the paper seeks to examine whether firms capital structure decision involve optimality from costs of capitals perspectives and also whether firms restructure the leverage attuning it with the operating returns and investment opportunities, even though they follow a particular theory of capital structure. These objectives concerning the capital structure decision, the investment decisions and the operating profitability of the firm may be accomplished through the examination of whether

i. the Optimality relating to the maximization of equity holders perceived returns exists;
ii. Long Term Debt Restructuring has any relationship with the cost elements of capital structure components and the operating rate of return; and
iii. any pattern of change among the equity holders perceived rate of return, the overall perceived cost of capital and the operating rate of return exist or not.

IV. Data and Methodology

Keeping in view the objectives and the conflicts among different research findings and their explanations, the following methodology has been adopted.

4.1 *Data and study period*

Data utilized in the present study have been collected from the "capitaline" database and they include four capital intensive industries (The Automobile industry, the Auto - Ancillary industry, the Chemical industry, and the Cement industry). The paper covers a long run study period of the twelve years ranging within between 1994 and 2005.

4.2 *Variables*

A firm can create value for its shareholders by minimizing the overall cost of capital and maximizing the rate of operating returns as well as the returns to the equity holders. Since the equity holders perceive the returns on their investments, the cost of equity capital (K_e) is regarded from the equity holders perspectives. The overall cost of capital (K_o) is considered from the views of market perceptions and thus we avoid the use of weighted average cost of capital. The cost of debt capitals (K_d) is tax adjusted and the adjustment is made on firms factual basis instead of taking any predetermined tax rate. The rate of business return (B_r) has been defined to make present operating rate of return compatible with the project selection criterion. Because, to maintain the shareholders value intact firms should invest in projects which enhance the present operating rate of return. The "Market Capitalization" value is the figure from the said database on the balance sheet date and the "Debt Capital" appears at the Book Value. The Long Term Debt to Equity Ratio [LTD/EqR] (as supplied in the "Capitaline" data base) is taken here as the capital structure variable. Again, since Preference Share capital and its existence in firms capital structure as well have its peculiar characteristics, the values of preference dividend and Preference Share capital are excluded in these variables to eliminate the effects of Preference Share capital on "K_o, K_e and B_r". So the perceived cost variables are (K_o) and (K_d) and the perceived return variables are (K_e) and (B_r). The explanatory variable ([LTD/EqR] ratio) for each firm with its associated explained variables (K_o, K_d, B_r, and K_e) are arranged with ascending order of LTD/EqR levels. All the variables are then averaged to arrive at the industry levels. Regarding the above views these variables are defined as under:

$$K_0 = \frac{\text{EBIT} * (1 - t) - \text{Preference Dividend}}{\text{Debt Capital} + \text{Market Capitalisation of Equity}} \quad (1)$$

$$K_d = \frac{\text{Interest} (1 - t)}{\text{Debt Capital}} \quad (2)$$

$$B_r = \frac{\text{EBIT} - \text{Preference Dividend}}{\text{Debt Capital} + \text{Net Worth}} \quad (3)$$

$$K_e = \frac{\text{PAT} - \text{Preference Dividend}}{\text{Market Capitalisation of Equity}} \quad (4)$$

and $(1 - t)$ = effected cost rate

where, tax rate $(t) = (1-\frac{PAT}{PBT})X100\%$

4.3. *Sample Selection Criteria*

From a primary set of 127 companies belonging to the selected industries, only those firms have been selected for whom the data on profitability are found to be positive at least for six years. Based on this criterion the observation sample size varies over changes in the Ltd/Eq levels. Again a few observations of K_o, B_r, and K_e, where $K_o \leq 3\%$, $B_r \leq 5\%$, and $K_e \leq 4\%$ are excluded since these values are too small and may distort the average relationships. Thus, the final sample size for automobile, auto ancillary, chemical, and cement industry vary between 8 and 14, 22 and 26, 18 and 26, and 9 and 16 respectively.

4.4 *Propositions*

In connection with the objectives, the paper puts following three propositions. Theoretically, optimal capital structure involves minimization of overall cost of capital and maximization of the shareholders wealth with the assumption of $K_d < K_e$. Thus we set "$K_e > K_0 > K_d$" as the condition for trade off benefits and lay down the 1st proposition for judging optimality. Accordingly, the pecking order theory predicts a negative correlation between profitability and leverage and thus the 2nd proposition is formulated to judge the relationship among profitability and cost of capital and leverage. Again, the pecking order theory advocates firms to follow a pattern of financing depending on the operating returns of the firm. Hence, the 3rd proposition is designed to investigate whether there is any symmetry among the changes in firms K_o and K_e and B_r with their financing pattern. The propositions are:

i. when K_e is maximum $K_e > K_0 > K_d$ relationship would be significant & vice versa. Fulfillment of $K_e > K_0 > K_d$ is referred as case 1 otherwise case 2 ;
ii. with increase in the industry average of the Ltd./eq. levels, the average B_r, K_0 ,and Ke have negative and significant correlation ; and
iii. with change in the average LTD/EqR levels the average B_r, K_0 ,and Ke have a predictable pattern of consistency (or uniformity).

4.5 *Hypothesis*

To test the above three propositions following respective null hypotheses are formulated :

Hypothesis H1 : *There is no cost advantage for debt capital (i.e. no room for firms trade off benefits) and* $K_e = K_o = K_d$;

Hypothesis H2: *With changes in the industrys average Ltd./eq. levels, the average* B_r, K_0 *and* K_e *have insignificant or no correlation ; and*

Hypothesis H3 : *With changes in the average Ltd./eq. levels the mean* K_o, K_e, *and* B_r *have no uniformity i.e. Kendals co-efficient of concordance W of* (K_o, K_e, *and* B_r) *with increasing Ltd./eq is insignificant or zero.*

Following above three propositions and their respective null Hypothesis H0, required test statistic are formulated as follows :

i. $(K_e - K_0)$and $(K_0 - K_d)$ follow right tail t-distribution where t_1 and t_2 are t-statistic and defined as follows with $[N(K_e)+ N(K_o) -2]$, and $[N(K_o)+ N(K_d) -2)]$ d.f. respectively

$$t_1 = \frac{\text{Mean } K_e - \text{Mean } K_o}{S\sqrt{1/N(K_e) + 1/N(K_o)}}$$

and $$t_2 = \frac{\text{Mean } K_o - \text{Mean } K_d}{S\sqrt{1/N(K_o) + 1/N(K_d)}}$$

where, S^2 is the unbiased estimate of the common population variance of the concerned variables.

ii. Co-efficient of correlations, r_{ij} is defined as linear correlation coefficient between i and j, $i \neq j$, i and j stand for mean of K_o, K_e, K_d, and B_r & LTD/EqR for each LTD/EqR level. $t = \frac{r}{\sqrt{1 - r^2}}\sqrt{n-2}$ follows t-distribution with (n - 2) degree of freedom.

iii. Kendals co-efficient of concordance (i.e. W) among the mean values of K_0, K_e, and B_r with changing LTD/EqR levels follows χ^2 distribution [i.e. $W(K_0, K_e, B_r) \sim \chi^2$ distribution], where $\chi^2 = K * (n-1) * W$, with (n-1) d.f. and n is the number of set of observations of (K_o, K_e, B_r) and K = set of explanatory variables ,(ie. K_o, B_r, and K_e) ie. (K=3).

4.6 *Regression Eqution*

However, the correlation coefficients show the association between the concerned variables and can not reveal the characteristics of the variables and the extent of effects of one variable on the other variable as well. Hence, the following regression equation V_{ij}, in a general cubic polynomial form is set as

$$V_{ij} = C_0 + C_{1j} * (LTD/EqR_j)^1 + C_{2j} * (LTD/EqR_j)^2 + C_{3j} * (LTD/EqR_j)^3 + U_{ij}$$

where, U_{ij} is defined as $\hat{U}_{ij} = V_{ij} - \hat{E}[V_{ij}]$

and $\hat{E}[V_{ij}]$ is defined as follows

$$\hat{E}[V_{ij}] = \hat{C}_0 + \hat{C}_{1j} * (LTD/EqR_j)^1 + \hat{C}_{2j} * (LTD/EqR_j)^2 + \hat{C}_{3j} * (LTD/EqR_j)^3$$

where, V_{ij} represents the value of the i th variable with the j th value of LTD/EqR, U_{ij} represents the error term in the regression equation, $\hat{U}_{ij}$ is the estimated value of the residual error term, i s are the variables K_o, K_e, K_d, B_r, $R(B_r)$, $R(K_e)$, $R(K_o)$, $R(K_d)$, $(B_r - K_o)$, and $(K_e - K_d)$, and j indicates the case of each variable with each value of LTD/EqR. The K_o, K_e, K_d, and B_r are the cost and return variables as defined in the sub-section 4.2 ; and $R(B_r)$, $R(K_e)$,

$R(K_o)$, and $R(K_d)$ are the volatility (i.e. risk) parameters of these cost and return variables, C_o is the constant term of the equation, and C_{1j}, C_{2j}, and C_{3j} are coefficients of the explanatory variable. The volatility (i.e. risk) parameters respectively surrogate the firms operating risk exposure, expected risk exposure of the equity holders, the firms overall risk exposure and default risk exposure of interest payment. These risk exposure parameters are defined by the standard deviations of B_r, K_e, K_o and K_d accordingly. Finally $(B_r - K_o)$ and $(K_e - K_d)$ are the arithmetic difference between the B_r and K_o, and that between the K_e, and K_d respectively. The arithmetic difference of the B_r over the K_o indicates the "firms command" on the new and higher positive NPV project selection and that of the K_e over the K_d refers the "equity holders command" over the Bond holders. Thus in total we have ten regression equations for the B_r , K_e , K_o , K_d , $R(B_r)$, $R(K_e)$, $R(K_o)$, $R(K_d)$, $(B_r - K_o)$, and $(K_e - K_d)$. The coefficients of these regression equations are tested by applying t- test. The predictive power of each regression equation is judged with respect to the multiple R- square (i.e. the coefficient of determination) values and then the significance of the R- square value is tested by applying the F test. The testing of the regression coefficients and the multiple R- square values are done in SPSS and hence the procedure of the testing is not mentioned in the paper.

V. Empirical Results and Findings

Perceived cost components (K_o, and K_d), return components K_e, and B_r, and related t-values (related with the 1st proposition) for cement industry, automobile industry, auto-ancillary industry and chemical industry are shown in Table I, II, III, and IV. The relevant correlation values, χ^2 - value against Kendal coefficient of concordance and t-values of the correlation coefficients (related with the 2nd and 3rd propositions) are shown in table V. Table VI gives the coefficients values of the parameters in the regression equations which is followed by their predicted values of the variables in Table VII and Figure 1, 2, and 3.

From Table I, II, III, and IV it is observed that for Cement, Auto - Ancillary, Automobile and Chemical industry, up to 0.696, 0.749, 0.585 and 0.546 LTD/EqR ratios respectively use of debt is concerned with continuous trade off benefits (i.e. Case 1). Within these trade-off limits, maximum values of K_e are found at 0.696, 0.542, 0.473 and 0.546 LTD/ EqR ratio levels for those industries respectively. However, the maximum value of K_e may (or may not) involve significant relationship of $K_e > K_0 > K_d$ and vice versa. Both K_e maximization and stated theoretical relationship among K_e, K_d, and K_o (that is $K_e > K_0 > K_d$), in connection with the 1st proposition, are found to be satisfied in case of auto ancillary industry at 0.542 LTD/EqR ratio. The higher LTD/EqR ratios of these industries are not associated with trade off benefits (i.e. case 2).

Table I
Summary Statistics of LTD/Eq Ratios, Cost of Capital, and Rate of Return Components of Cement Industry : Proposition I

	Long Term Debt to Equity Levels											
	1	2	3	4	5	6	7	8	9	10	11	12
Mean LTD/EqR	0.408	0.455	0.521	0.697	0.810	1.03	1.089	1.354	1.459	1.675	1.709	1.892
Mean of Cost and Return Variables												
B_o	0.236	0.206	0.169	0.119	0.162	0.144	0.127	0.114	0.089	0.092	0.123	0.117
K_e'	0.173	0.178	0.169	0.205	0.151	0.133	0.132	0.139	0.089	0.115	0.181	0.159
K_o	0.148	0.142	0.122	0.104	0.108	0.094	0.115	0.099	0.074	0.088	0.085	0.110
K_d	0.097	0.087	0.116	0.098	0.139	0.129	0.116	0.118	0.104	0.107	0.091	0.112
Standard Deviation of Variables												
B_o	0.141	0.089	0.094	0.075	0.097	0.087	0.056	0.038	0.042	0.04	0.107	0.072
K_e'	0.167	0.166	0.119	0.15	0.199	0.117	0.086	0.126	0.097	0.107	0.191	0.109
K_o	0.134	0.089	0.072	0.069	0.087	0.043	0.033	0.058	0.038	0.047	0.063	0.061
K_d	0.034	0.037	0.049	0.061	0.074	0.101	0.026	0.042	0.051	0.046	0.047	0.042
Number of Observations												
B_o	15	15	16	16	15	14	13	13	14	11	12	11
K_e'	15	15	14	13	14	13	12	11	9	10	10	9
K_o	15	15	16	15	15	14	13	13	12	11	14	11
K_d	15	16	16	16	16	16	16	16	12	12	14	13
t-values of												
$K_e - K_o$	0.448	0.710	1.278	**2.238**	0.736	1.119	0.642	0.968	0.469	0.720	1.685	1.193
$K_o - K_d$	1.362	**2.180**	0.287	0.261	-1.031	-1.175	-0.087	-0.986	-1.536	-0.948	-0.255	-0.050
Case applicable	**Case (1)**			**Case (2)**								
	1	1	1	1	2	2	2	2	2	2	2	2

Notes : Case (1) indicates trade off benefits ie.,($K_e > k_o > k_d$) , and otherwise case (2). Bold t - values are significant at 5 % level of significance with $(N_1+N_2 - 2)$ d.f.. Cells containing a - mark indicates negative value.

Table II
Summary Statistics of LTD/Eq Ratios, Cost of Capital, and Rate of Return Components of Automobile Industry : Proposition I

	Long Term Debt to Equity Levels											
	1	2	3	4	5	6	7	8	9	10	11	12
Mean LTD/EqR	0.375	0.435	0.473	0.586	0.729	0.941	1.013	1.265	1.45	1.707	1.952	3.951
Meanof Cost and Return Variables												
B_o	0.239	0.261	0.283	0.248	0.213	0.201	0.147	0.194	0.166	0.186	0.208	0.176
K_e'	0.131	0.131	0.162	0.154	0.112	0.151	0.115	0.118	0.099	0.061	0.105	0.051
K_o	0.118	0.110	0.131	0.129	0.083	0.117	0.112	0.114	0.107	0.096	0.095	0.079
K_d	0.086	0.088	0.115	0.087	0.103	0.110	0.106	0.114	0.125	0.097	0.096	0.132
Standard Deviation of Variables												
B_o	0.157	0.202	0.236	0.202	0.21	0.151	0.105	0.111	0.1	0.114	0.136	0.095
K_e'	0.086	0.135	0.177	0.167	0.089	0.106	0.087	0.121	0.064	0.039	0.061	0.047
K_o	0.058	0.062	0.097	0.073	0.059	0.088	0.058	0.095	0.044	0.077	0.048	0.048
K_d	0.051	0.059	0.134	0.052	0.074	0.052	0.049	0.079	0.072	0.059	0.052	0.076
Number of Observations												
B_o	14	13	13	13	14	12	13	13	14	12	11	12
K_e'	15	14	12	14	12	10	12	13	12	11	10	9
K_o	15	14	14	14	15	13	14	14	15	13	12	13
K_d	15	15	15	15	15	15	15	15	15	15	15	15
t-valuesof												
$K_e - K_o$	0.466	0.491	0.545	0.494	0.992	0.802	0.104	0.082	-0.359	-1.301	0.388	-1.537
$K_o - K_d$	1.548	0.934	0.352	**1.744**	-0.812	0.242	0.287	-0.004	-0.787	-0.079	-0.051	-2.078
Case applicable	**Case (1)**			**Case (2)**								
	1	1	1	1	2	1	1	2	2	2	2	2

Notes : Case (1) indicates trade off benefits ie.,($K_e > k_o > k_d$) , and otherwise case (2). Bold t - values are significant at 5 % level of significance with $(N_1+N_2 - 2)$ d.f.. Cells containing a - mark indicates negative value.

Table III
Summary Statistics of LTD/Eq Ratios, Cost of Capital, and Rate of Return Components of Auto Ancillary Industry : Proposition I

	Long Term Debt to Equity Levels											
	1	2	3	4	5	6	7	8	9	10	11	12
Mean LTD/EqR												
	0.275	0.343	0.389	0.438	0.497	0.542	0.598	0.682	0.749	0.845	1.086	1.966
Mean of Cost and Return Variables												
B	0.223	0.233	0.195	0.191	0.197	0.176	0.198	0.184	0.202	0.195	0.183	0.184
K_e'	0.124	0.155	0.149	0.178	0.162	0.203	0.163	0.159	0.187	0.122	0.109	0.087
K_e^o	0.107	0.127	0.126	0.127	0.122	0.126	0.131	0.127	0.126	0.105	0.089	0.078
K_d^o	0.075	0.083	0.085	0.089	0.088	0.092	0.109	0.105	0.094	0.112	0.099	0.108
Standard Deviation of Variables												
B	0.109	0.100	0.101	0.091	0.086	0.078	0.095	0.079	0.095	0.095	0.08	0.095
K_e'	0.069	0.099	0.092	0.135	0.114	0.159	0.112	0.122	0.162	0.095	0.120	0.082
K_e^o	0.047	0.057	0.067	0.062	0.053	0.067	0.064	0.062	0.064	0.039	0.039	0.040
K_d^o	0.059	0.049	0.047	0.045	0.046	0.046	0.051	0.050	0.039	0.059	0.038	0.038
Number of Observations												
B	26	26	26	25	25	25	25	26	25	24	25	25
K_e'	26	26	26	25	25	24	25	25	25	24	24	22
K_e^o	26	26	26	26	25	25	25	26	25	23	24	25
K_d^o	26	26	26	26	26	26	26	26	26	25	25	26
t-values of												
$K_e' - K_e^o$	1.025	1.245	1.001	**1.734**	1.579	**2.154**	1.177	1.158	**1.695**	0.763	0.790	0.459
$K_e^o - K_d^o$	**2.179**	***2.958***	***2.524***	***2.409***	***2.345***	**2.108**	1.356	1.406	**2.094**	-0.426	-0.981	-2.631
Case applicable	**Case (1)**									**Case (2)**		
	1	1	1	1	1	1	1	1	1	2	2	2

Notes : Case 1 indicates trade off benefits ie.,($K_e' > k_o > k_d$) , and otherwise case (2).
Bold t – values are significant at 5 % level of significance with (N_1+N_2-2) d.f..
Italic bold *t – values* are significant at 1 % level of significance with ($N_1 + N_2$ -
Cells containing a – mark indicates negative value.

Table IV
Summary Statistics of LTD/Eq Ratios, Cost of Capital, and Rate of Return Components of Chemical Industry : Proposition I

	Long Term Debt to Equity Levels											
	1	2	3	4	5	6	7	8	9	10	11	12
Mean LTD/EqR												
	0.291	0.339	0.414	0.484	0.546	0.612	0.712	0.836	0.974	1.201	1.576	1.436
Mean of Cost and Return Variables												
B	0.194	0.185	0.186	0.174	0.188	0.156	0.165	0.169	0.164	0.148	0.150	0.139
K_e'	0.137	0.145	0.170	0.149	0.174	0.139	0.135	0.109	0.129	0.119	0.163	0.105
K_e^o	0.107	0.112	0.151	0.099	0.124	0.099	0.105	0.092	0.112	0.091	0.112	0.086
K_d^o	0.106	0.110	0.108	0.092	0.097	0.109	0.134	0.105	0.138	0.098	0.126	0.111
Standard Deviation of Variables												
B	0.089	0.124	0.106	0.080	0.089	0.097	0.102	0.109	0.077	0.089	0.124	0.106
K_e'	0.147	0.091	0.188	0.119	0.171	0.116	0.125	0.067	0.104	0.099	0.179	0.128
K_e^o	0.068	0.046	0.183	0.077	0.069	0.059	0.069	0.057	0.069	0.063	0.089	0.051
K_d^o	0.103	0.075	0.046	0.048	0.056	0.071	0.102	0.059	0.069	0.057	0.059	0.056
Number of Observations												
B	28	28	28	26	27	28	26	27	27	25	22	23
K_e'	27	25	26	24	26	25	23	23	24	21	19	18
K_e^o	26	26	28	27	27	28	25	27	27	25	23	23
K_d^o	25	28	28	28	28	28	28	28	28	28	24	23
t-values of												
$K_e' - K_e^o$	0.915	0.132	0.371	**1.762**	1.367	1.423	1.019	0.927	0.717	1.145	1.153	0.664
$K_e^o - K_d^o$	0.033	**0.088**	1.196	0.409	1.559	-0.566	-1.183	-0.815	-1.370	-0.473	-0.622	-1.195
Case applicable	**Case (1)**					**Case (2)**						
	1	1	1	1	1	2	2	2	2	2	2	2

Notes : Case (1) indicates trade off benefits ie.,($K_e' > k_o > k_d$) , and otherwise case (2).
Bold t – values are significant at 5 % level of significance with (N_1+N_2-2) d.f..
Cells containing a – mark indicates negative value.

Table V, in relation to the 2nd proposition, indicates that LTD/EqR ratios have significantly negative correlation coefficient with B_r for cement, automobile and chemical industry, with K_0 for cement, automobile and auto ancillary Industry, with K_e for automobile and auto ancillary industry only and significantly positive correlation with K_d for automobile and auto-ancillary. The significant (or insignificant) positive association between K_0 and B_r occurs only with significant positive (or insignificant negative) association between K_e and B_r. That is, when the projects returns have significant positive effect on the overall cost of capital, the operating returns have significant positive effect on the equity holders expected return as well; but an insignificant negative shock on the equity holders expected return is followed if the projects returns have positive but insignificant impact of on overall cost of capital. In other words, the new projects that bear insignificant positive relationship with the overall cost of capital, a positive change in the projects return can dilute the equity holders expected return and a negative change in the projects return can satisfy the equity holders.

The table also illustrates that insignificant (or significant) negative association between K_d and B_r occurs only with significant (or insignificant) negative association between LTD/EqR ratio and B_r. That is, when the issue of long term debt capital has significant negative impact on the projects returns, the cost of debt capital has insignificant negative effect on the projects returns; but at insignificant negative impact of issue of the long term debt capital on the projects return, the cost of debt capital have significant negative effect on the projects returns. In other words, when issue of debt controls firms project selection the interest costs of debt capital plays no significant role on its project selection criterion at all.

However, with reference to the 3rd proposition, in Table V, the Kendals co-efficient of concordance for Cement, Auto - Ancillary, Automobile and Chemical industry are 0.7094, 0.5338, 0.8026 and 0.7327 respectively. The observed x^2 value of these coefficients are significant in all cases except Auto Ancillary industry. Even though the Kendals co-efficient of concordance (W = 0.5448) for auto ancillary industry is moderate but its x^2 value is not significant at 5% level of significance. This implies that, for Cement, Automobile and Chemical industry, the K_0, K_e, and B_r follows uniformity in their capital structure change. Again, the uniformity among the changes in K_0, K_e and B_r match with the significant correlation (negative) between B_r and LTD/EqR ratio. This suggests that the firms which follow the pecking order theory (and/or the signaling theory) of corporate finance, and restructure the level of debt depending on the operating profitability, the cost of capital, and the expected rate of return to the equity holders.

Table V
Summary Statistics of LTD/EqR Ratio ,Cost of Capital and Return Components : Proposition II & III

Cement Industry					
K#[r]	**t value of r***				
K [r]	**mean LTD**	**mean K_o**	**mean K_e**	**mean K_d**	**mean B_r**
mean LTD		**- 3.4555**	- 1.62600	0.08210	**- 4.27571**
mean K_o	- 0.738400		**2.04910**	- 0.66320	**6.41132**
mean K_e	- 0.457560	0.5437		- 1.30540	**1.84788**
mean K_d	0.029379	- 0.2053	- 0.38200		- 0.47156
mean B_r	- 0.803960	0.8968	0.50450	- 0.14750	
Automobile Industry					
K#[r]	**t value of r***				
K [r]	**mean LTD**	**mean K_o**	**mean K_e**	**mean K_d**	**mean B_r**
mean LTD		**- 3.0042**	**- 4.23700**	**2.50540**	**- 2.09884**
mean K_o	- 0.688760		**5.29300**	-0.99380	**1.83967**
mean K_e	- 0.801000	0.8585		- 1.28330	**2.66834**
mean K_d	0.620998	- 0.2998	- 0.37600		- 1.74479
mean B_r	- 0.552990	0.5029	0.64490	- 0.48310	
Auto Ancillary Industry					
K#[r]	**t value of r***				
K [r]	**mean LTD**	**mean K_o**	**mean K_e**	**mean K_d**	**mean B_r**
mean LTD		**- 4.18660**	**- 2.61160**	**2.63713**	- 1.71585
mean K_o	- 0.79800		**5.87181**	- 0.93891	0.673463
mean K_e	- 0.63680	0.88044		- 0.85454	- 0.14301
mean K_d	0.64050	- 0.28460	- 0.26090		**- 2.25927**
mean B_r	- 0.47690	0.20830	- 0.04520	- 0.58132	
Chemical Industry					
K#[r]	**t value of r***				
K [r]	**mean LTD**	**mean K_o**	**mean K_e**	**mean K_d**	**mean B_r**
mean LTD		- 1.50330	- 0.74090	1.15768	**- 5.74851**
mean K_o	- 0.42930		**3.69914**	0.23240	**2.427322**
mean K_e	- 0.22810	0.76011		- 0.25459	**4.84465**
mean K_d	0.34380	0.07329	- 0.08020		- 0.95168
mean B_r	- 0.87620	0.60889	0.40500	- 0.28818	
Kendals co efficient of concordance					
Industry	**Cement**	**Auto-ancillary**	**Automobile**	**Chemical**	
K(of K_o,K_e & B_r)	3.00000	3.00000	3.00000	3.00000	
W(of K_o,K_e & B_r)	0.70940	0.53380	0.80264	0.73270	
c^2 values	**23.41**	17.61500	**26.48720**	**24.17900**	

Notes: * Bold t values of correlations coefficient are significant at 5% level with (n- 2) =10 d.f.

^ Bold c^2 - values are significant at 5 % level of significance with (n -1) =11 d.f.

K[r] in down-left indicates the correlation matrix.

K#[r] in up - right indicates the t - values of correlation matrix.

The $\hat{U}_{ij}$ for all regression equations follows standard normal distribution (with mean = 0 and variance =1), that is, the regression equations are free from error of wrong specification. Again, each of the dependent variable is explained in a higher order form of the explanatory variable and thus, the effect of the multicolinearity problem does not noise the predictability of dependent variables. The regression equations, in Table VI, show that with respect to significant coefficients of the independent variable leverage (LTD/ EqR ratio) B_r is quadratic at 5 % level, and at any level K_d is cubic, and the K_o

and K_e are linear polynomials. However, a cubic estimation of the dependent variables K_o and K_d (in Figure 1) shows that at 0.80 LTD/EqR ratio the declining K_o equates K_d and then after reduces steadily. The predicted values (in Figure 1) of the function B_r is decreasing up to 1.088 LTD/EqR ratio and the expected Br never goes below the expected K_e. The K_e and K_o are also decreasing and at higher LTd/EqR ratios K_e approaches towards K_d. However, the F- values of the multiple R- square values of the cubic equations explain the level of significance. Besides these findings, the value of K_d at zero LTD/EqR level is not zero rather positive (6.021 %). Since we measure K_d by $K_d = \frac{\text{Interest } (1 - t)}{\text{Debt Capital}}$, K_d represents the interest rate of short term debt capitals where the Ltd/Eq ratio is zero. At this Ltd/Eq level (i.e. zero) the values of K_o, K_e, K_d, and B_r represent the respective rate of costs and returns of an all equity firm.

Fig : 1 Return Variables

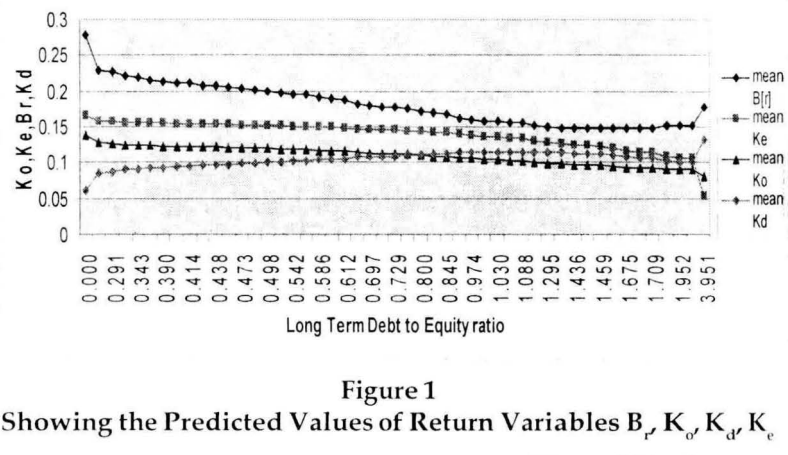

Figure 1
Showing the Predicted Values of Return Variables B_r, K_o, K_d, K_e

In Table VI, The volatility/risk parameters of B_r, and K_e, that is, $R(B_r)$, and $R(K_e)$ respectively are significantly linear at any level even though the R-square value of their cubic regression equations can explain them (only 12 % and 15 %) at higher level (6.67 and 11.86 percent) of significant F value respectively. However, the volatility/risk parameters of K_o, and K_d, that is, R (K_o) and R (K_d) respectively are significantly linear at any level, and their cubic estimations with respect to the LTD/EqR ratios hardly explain them. Again, the figures on the predicted values in Figure : 2 also show that $R(B_r)$ and $R(K_d)$ remain fixed to the extent of 0.697 and 1.088 LTD/EqR levels respectively. The values of R (K_o) reduces and approaches towards the R (K_d). However, R (B_r) reduces rapidly and approaches towards R (K_o) at higher limits of LTD/EqR ratios. The difference between R (B_r) and R (K_o) primarily increases, then maximizes at 1.088 LTD/EqR ratio, and finally

decreases. The business risk premium, differential variable ($B_r - K_o$) and the financial risk premium, differential variable ($K_e - K_d$) are declining functions of LTD/EqR ratio and respectively are quadratic and linear with significant coefficients at 5 % level of significance. The changes of the ($B_r - K_o$)) and ($K_e - K_d$)) are explained by LTD/EqR. in their particular cubic regression equations by 20.53 % and 42.98 % respectively at 1.67 % and at any level of significance. However, the Figure:3 shows that the difference between these two risk premiums (i.e. ($B_r - K_o$) and the ($K_e - K_d$)) remains more or less equal up to 1.013 LTD/EqR ratio and then increases.

Table VI

Table Showing Regression Statistics and Coefficient Values

Variables	parameter	C_o	C_1	C_2	C_3	Mul. R	R^2	Adj. R^2	F
B_r	Equation	0.27786	-0.2001	0.0944	-0.01270	0.6329	0.4005	0.3596	9.8[a]
	Std. error	0.02747	0.0730	0.0491	0.00834				
	t-statistic	**10.11****	**-2.74****	**1.9214***	-1.52360				
K_e	Equation	0.16513	-0.0241	-0.0044	0.00083	0.5827	0.3396	0.2946	7.5[a]
	Std. error	0.02346	0.0623	0.04196	0.00712				
	t-statistic	**7.039****	-0.3871	-0.1045	0.11616				
K_d	Equation	0.06021	0.1106	-0.0678	0.01124	0.6021	0.3626	0.3191	8.3[a]
	Std. error	0.01034	0.0275	0.01849	0.00314				
	t-statistic	**5.821****	**4.02****	**-3.66****	**3.579****				
K_o	Equation	0.13904	-0.0454	0.01324	-0.00140	0.6629	0.4396	0.4013	11.0[a]
	Std. error	0.01171	0.0311	0.02095	0.00356				
	t-statistic	**11.87****	-1.4584	0.63204	-0.39364				
$R[B_r]$	Equation	0.15215	-0.0921	0.0389	-0.00480	0.3512	0.1234	0.0636	2.07[a]
	Std. error	0.03326	0.0883	0.0595	0.01009				
	t-statistic	**4.574****	-1.0414	0.6551	-0.48120				
$R[K_e]$	Equation	0.12244	0.0255	-0.0304	0.00485	0.3857	0.1488	0.0908	**2.56**[a]
	Std. error	0.03082	0.0819	0.05512	0.00935				
	t-statistic	**3.973****	0.3113	-0.5522	0.51899				
$R[K_d]$	Equation	0.05296	0.0251	-0.0234	0.00468	0.2268	0.0514	-0.0132	0.79[a]
	Std. error	0.01677	0.0446	0.02999	0.00509				
	t-statistic	**3.157****	0.5613	-0.7804	0.91934				
$R[K_o]$	Equation	0.08878	-0.0399	0.01548	-0.00202	0.3139	0.0986	0.0371	1.60[a]
	Std. error	0.02067	0.0549	0.03696	0.00627				
	t-statistic	**4.295****	-0.7272	0.41876	-0.32229				
$[B_r - K_o]$	Equation	0.13883	-0.1547	0.08118	-0.01131	0.4531	0.2053	0.1511	3.8[a]
	Std. error	0.02736	0.0727	0.04894	0.00831				
	t-statistic	**5.073****	**-2.13****	**1.6586***	-1.36121				
$[K_e - K_d]$	Equation	0.10492	-0.1347	0.06339	-0.01041	0.6556	0.4298	0.3909	11.0[a]
	Std. error	0.02618	0.0696	0.04682	0.00795				
	t-statistic	**4.008****	**-1.936***	1.35389	-1.31013				

Notes : * t at 5 % significant level

** t at 5 % significant level

a F at 0.01% in B_r; K_e; K_d; K_o; $[K_e - K_d]$ and 11.8 % in $R[B_r]$; F at 6.67% in $R[K_o]$; F at 50.31% in R $[K_d]$; F at 20.21 in $R[K_0]$ and F at 0.016% in $[B_r - K_o]$

Table VII
Showing the Predicted Values of the Dependent Variable B_r, K_o, K_d, K_e, R (B_r), R (K_o), R (K_d), R (K_e), ($B_r - K_o$), and ($K_e - K_d$)

Mean Ltd/Eq	B(r)	K_e	K_o	K_d	B(r)	sdev K_e	sdev K_o	sdev K_d	B(r) $-K_o$	K_e $- K_d$
0	0.27786	0.16513	0.13904	0.06021	0.15215	0.122440	0.08878	0.052960	0.1388	0.10492
0.2752	0.22968	0.15817	0.12752	0.08573	0.12967	0.127252	0.07892	0.058163	0.1022	0.07244
0.2911	0.22730	0.15775	0.12691	0.08692	0.12854	0.127402	0.07841	0.058367	0.1004	0.07083
0.3389	0.22039	0.15648	0.12512	0.09033	0.12524	0.127773	0.07694	0.058925	0.0953	0.06615
0.3432	0.21979	0.15636	0.12496	0.09062	0.12496	0.127801	0.07681	0.058971	0.0948	0.06574
0.3754	0.21537	0.15549	0.12379	0.09275	0.12283	0.127978	0.07586	0.059293	0.0916	0.06274
0.3896	0.21348	0.15511	0.12328	0.09366	0.12192	0.128039	0.07545	0.059423	0.0902	0.06145
0.4080	0.21107	0.15461	0.12263	0.09479	0.12076	0.128104	0.07492	0.059581	0.0884	0.05981
0.4136	0.21035	0.15446	0.12243	0.09513	0.12041	0.128121	0.07476	0.059626	0.0879	0.05932
0.4346	0.20768	0.15388	0.12169	0.09638	0.11911	0.128169	0.07418	0.059788	0.0860	0.05750
0.4376	0.20731	0.15380	0.12159	0.09655	0.11893	0.128174	0.07410	0.059809	0.0857	0.05725
0.4550	0.20516	0.15332	0.12099	0.09754	0.11788	0.128195	0.07362	0.059930	0.0842	0.05578
0.4731	0.20298	0.15282	0.12038	0.09853	0.11682	0.128202	0.07313	0.060044	0.0826	0.05429
0.4836	0.20173	0.15253	0.12002	0.09909	0.11621	0.128199	0.07286	0.060105	0.0817	0.05344
0.4976	0.20010	0.15214	0.11956	0.09982	0.11540	0.128187	0.07249	0.060181	0.0805	0.05232
0.5206	0.19747	0.15149	0.11880	0.10098	0.11411	0.128147	0.07190	0.060292	0.0787	0.05051
0.5420	0.19511	0.15089	0.11810	0.10201	0.11294	0.128089	0.07136	0.060379	0.0770	0.04889
0.5464	0.19463	0.15077	0.11796	0.10221	0.11270	0.128074	0.07125	0.060396	0.0767	0.04855
0.5857	0.19049	0.14966	0.11671	0.10397	0.11064	0.127905	0.07029	0.060514	0.0738	0.04569
0.5984	0.18920	0.14929	0.11632	0.10450	0.10999	0.127836	0.06999	0.060542	0.0729	0.04479
0.6121	0.18783	0.14890	0.11589	0.10506	0.10930	0.127753	0.06967	0.060567	0.0719	0.04384
0.6820	0.18127	0.14689	0.11379	0.10764	0.10597	0.127209	0.06810	0.060609	0.0675	0.03925
0.6969	0.17996	0.14646	0.11336	0.10814	0.10529	0.127067	0.06778	0.060600	0.0666	0.03833
0.7125	0.17861	0.14601	0.11291	0.10863	0.10460	0.126908	0.06745	0.060585	0.0657	0.03737
0.7286	0.17726	0.14554	0.11245	0.10912	0.10390	0.126734	0.06712	0.060562	0.0648	0.03642
0.7492	0.17559	0.14494	0.11187	0.10972	0.10303	0.126496	0.06670	0.060522	0.0637	0.03522
0.8000	0.17169	0.14344	0.11048	0.11103	0.10098	0.125840	0.06570	0.060379	0.0612	0.03242
0.8361	0.16912	0.14237	0.10952	0.11183	0.09960	0.125315	0.06503	0.060238	0.0596	0.03054
0.8448	0.16852	0.14211	0.10930	0.11201	0.09928	0.125181	0.06487	0.060200	0.0592	0.03011
0.9414	0.16254	0.13922	0.10687	0.11359	0.09599	0.123514	0.06321	0.059660	0.0557	0.02562
0.9743	0.16076	0.13822	0.10609	0.11397	0.09498	0.122875	0.06269	0.059431	0.0547	0.02425
1.0133	0.15880	0.13704	0.10518	0.11433	0.09385	0.122070	0.06210	0.059133	0.0536	0.02270
1.0300	0.15802	0.13653	0.10480	0.11445	0.09339	0.121712	0.06186	0.058997	0.0532	0.02207
1.0860	0.15561	0.13481	0.10357	0.11473	0.09194	0.120446	0.06107	0.058504	0.0520	0.02009
1.0881	0.15553	0.13475	0.10352	0.11473	0.09189	0.120396	0.06105	0.058484	0.0520	0.02001
1.2014	0.15168	0.13124	0.10119	0.11469	0.08940	0.117554	0.05964	0.057332	0.0505	0.01656
1.2947	0.14946	0.12834	0.09943	0.11412	0.08777	0.114963	0.05863	0.056257	0.0500	0.01421
1.3538	0.14846	0.12648	0.09838	0.11354	0.08692	0.113216	0.05807	0.055527	0.0501	0.01294
1.4357	0.14756	0.12390	0.09702	0.11249	0.08597	0.110672	0.05737	0.054465	0.0505	0.01141
1.4500	0.14746	0.12345	0.09679	0.11227	0.08582	0.110213	0.05725	0.054274	0.0507	0.01117
1.4592	0.14741	0.12316	0.09665	0.11213	0.08574	0.109917	0.05718	0.054152	0.0508	0.01102
1.5758	0.14724	0.11945	0.09491	0.11010	0.08488	0.106029	0.05637	0.052555	0.0523	0.00936
1.6750	0.14785	0.11630	0.09358	0.10805	0.08450	0.102563	0.05581	0.051169	0.0543	0.00825
1.7073	0.14818	0.11527	0.09317	0.10733	0.08443	0.101405	0.05565	0.050717	0.0550	0.00794
1.7093	0.14820	0.11521	0.09315	0.10728	0.08443	0.101335	0.05565	0.050689	0.0551	0.00792
1.8915	0.15115	0.10940	0.09108	0.10289	0.08462	0.094619	0.05494	0.048188	0.0601	0.00651
1.9520	0.15248	0.10748	0.09048	0.10135	0.08485	0.092340	0.05477	0.047396	0.0620	0.00612
1.9656	0.15280	0.10704	0.09035	0.10100	0.08492	0.091825	0.05473	0.047222	0.0625	0.00604
3.9507	0.17741	0.05238	0.08007	0.13215	0.09722	0.047477	0.04793	0.075004	0.0973	-0.07970

These results are consistent with the following propositions that : (a) higher debt performs as a monitoring factor and reduces the Ko as well as the R(K_o), (b) increase in leverage is subject to the restriction of reducing the Br and the R(B_r) as well, (c) debts monitoring over the Br and R(B_r) reduces equity holders expected Ke as well as R(K_e), (d) the default risk, R(K_d) remains more or less constant and the additional risk of the new projects attributable to the increase in the leverage is accommodated by increasing the Kd and / or decreasing the Br and restricting the R(Br) at a specific level or reducing the level, and (e) with increase in debt levels, the "firms command" on the project selection reduces in parallel with the reduction of the "equity holders command" over the Bond holders, and (f) the extreme command of the bond holders over the equity holders (i.e. at LTD/EqR ratio greater than 1.013) advances the Br, R(Br), and (Br-Ko) toward stabilization and enhance the business risk premium, ($B_r - K_o$) over the financial risk premium, ($K_e - K_d$) .

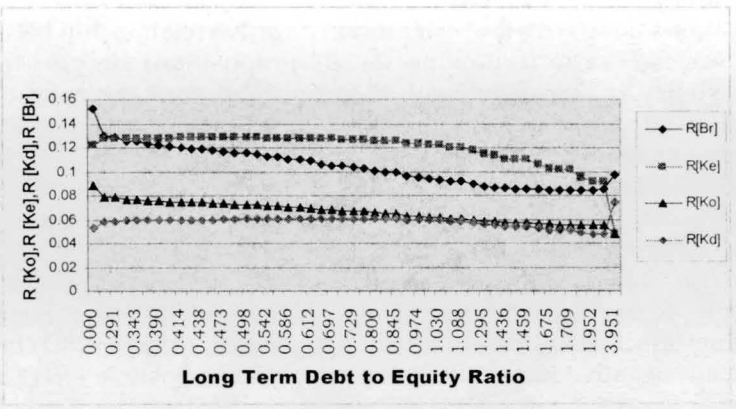

Figure 2
Showing the Predicted Values of Risk Variables R [B_r], R [K_o],R [K_d], R [K_e]

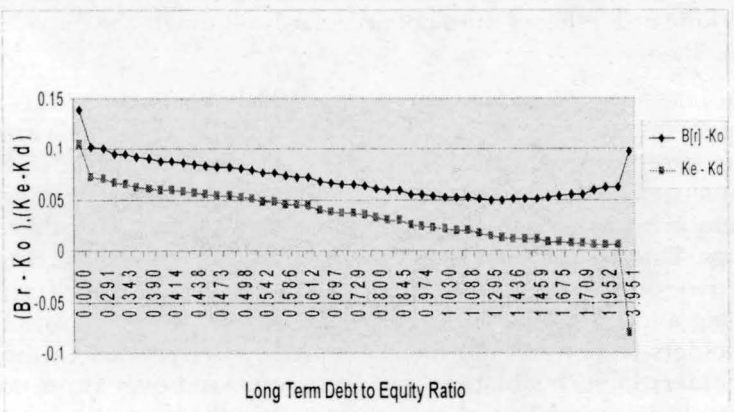

Figure 3
Showing the Predicted Values of Difference Varibales [$B_r - K_o$] & [$K_e - K_d$]

VI. Discussion and Conclusions

The results and findings suggest that the significant relationship, positive (or negative) correlation coefficient, between K_o and B_r has a similarity with that between K_e and B_r. Besides, the relationship between K_d and B_r, significant (or insignificant), is comparable with the insignificant (or significant) relationship between LTD/EqR ratio and B_r. The uniformity among the changes in K_0, K_e and B_r with increase in LTD/EqR levels is also observed with the significant negative correlation between B_r and Ltd./eq. ratio. These findings suggest that K_0, Ke, K_d, and B_r can provide sufficient information (as discussed in the previous section) on capital structure decisions.

Now, a categorical discussion with respect to each industry can provide concise conclusion. For auto ancillary industry, "K_e maximization subject to significant relationship of "$K_e > K_0 > K_d$" and vice versa" (following the1st proposition) and the inconsistency among K_0, K_e and B_r (following the 3rd proposition) along with the insignificant negative relationship between B_r and LTD/EqR ratio (following the 2nd proposition) suggest that the inconsistency is associated with the applicability of the condition for optimality (also see Table III along with Table V). These findings advocate that at inconsistent pattern among K_o, K_e and B_r firms find trade off benefits (where LTD/EqR has insignificant impact on Br but significant effect on K_d) on using debts in the capital mix. Furthermore, the absence of "K_e maximization subject to significant relationship of "$K_e > K_0 > K_d$" and vice versa" (for cement and chemical industry) suggests that the consistency among K_0, K_e and B_r, firms capital issue follow pecking order theory with signaling effect of capital structure components (where LTD/EqR has significant negative impact on B_r but insignificant positive effect on K_d). However, in case of automobile industry, LTD/EqR has significant impact of on B_r (negative) and on K_d(positive) as well, but an inconsistency among K_0, K_e and B_r. This result shows in-between evidence with the pecking order theory and the trade off theory, and confirms the theoretical prediction that the pecking order theory does not necessarily eliminate the impacts of the trade off theory.

The relevance of firms capital structure and the above differences among the capital intensive industries require broad explanation. The variation is not the direct influence of the capital structure decision rather the consequence of project selection. When firms follow the pecking order hierarchy in capital structure change, issue of debt is a back up to the retained earnings. This kind of debt issue is more uncertain than those firms who follow trade off theory. Again, the pecking ordered firms rely much on internal financing and may try to pass the excess risk of the new project to the bondholders if they can not finance it wholly by retained earnings. So, bondholders in such situations put their command over firms arbitrary project selection even though they either adjust the interest rates with the excess risk or simply paralyze firms project selection. This behavior of the bondholders is guided by their theoretical apprehension that in the future

years of profit the firm will again employ internal reserves and at the days of losses they will exercise the issue of external debts. This apprehension of the bondholders supports Myers (1977) underinvestment problem and Jensen and Mecklings (1976) asset substitution problem.

The results are consistent with that - the firms which follow the trade off theory (with the trade off benefits of debt capital), default risk to interest payments on debt capital is included in the interest rates and not with project selection (i.e. if there is positive and highly significant correlation between LTD/EqR and K_d, the correlation between LTD/EqR ratio and B_r will be insignificantly negative). On the other hand, firms following the pecking order theory (with their hierarchical financing pattern), that risk is incorporated by imposing restrictions on the selection of positive NPV projects with higher risk (i.e. there will be significant negative correlation between LTD/EqR and B_r). Again, default risk of interest payments on debt capital which is an effect of the trade of theory may exist in case of the pecking ordered firms as well. And the higher is the bondholders control on project selection the lower is the pressure of default risk to interest payments (i.e. the higher is the negative effect of LTD/EqR ratios on B_r, the lower is the positive impacts of LTD/EqR on K_d and vice versa).

Findings in the paper suggest that if firms follow the pecking order pattern in managing the capital structure, it finds out itself in suboptimal position from the view points of the cost of capital. The occurrence of optimality (or significant $K_e > K_0 > K_d$ relation) is concerned with lower confidence on following the pecking order theory. Firms obtain tradeoff benefit at lower LTD/EqR levels and with more dependence on long term debt capital firms tend to follow sub-optimal capital restructuring. So the financing decisions follow a changing pattern and the changes in firms capital structure come to happen in a rational manner with the change in the investment decisions.

The overall findings are in the line of the findings of Mayer and Susman (2004) but it differs regarding the level of LTD/EqR Mayer and Susman suggest that firms "predominantly follow the pecking order theory in short-run and the tradeoff theory in the long run". But the findings in the paper prompts that tradeoff theory is associated with lower LTD./EqR. ratio and the pecking order theory and the signaling effects are associated with higher LTD/EqR ratio (with no cost benefit due to the use of debt capital). The approach of firms investment with higher LTD./EqR. and reduction of the debt levels to maintain lower LTD/EqR ratio at long term ends and to obtain trade off benefit as well resolves the pseudo conflict. When the effect of the pecking order hierarchy sets out severity on the firm, the firm reverts back to follow trade off track in the long run. Firms behave in this manner to avail certain flexibility in their capital structure and secure both the owners (shareholders and bondholders) value. The explanation regarding the sub-optimality in this paper also supports Martijn, Vinay & Chenyangs (2004) findings that the shareholders control consequences low yields (high yields) when firms are protected from takeovers (or exposed to takeovers).

Finance literature addressing capital structure and firm value mostly discusses the issue on the contest of the developed countries. But virtually a very few works are done in the context of the developing economy of the third world countries. To rationalize this gap the present authors regard the concern of the dynamic capital restructuring in Indian context. Prospective research in this area may focus further insights on building linkages among the various theories of capital structure and firms value and their applicability as well. However, some other sort of definitions for the cost and return components considered in the paper may also be sought under a cross check.

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