The Journal of Nepalese Business Studies Vol. I No. 1 Dec. 2004

# Determinants of Capital Structure: A Case Study of Listed Companies of Nepal

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**ABSTRACT**

In this paper, an attempt has been made to examine the determinants of capital structure -size, business risk, growth rate, earning rate, dividend payout, debt service capacity, and degree of operating leverage-of the companies listed to Nepal Stock Exchange Ltd. as of July 16, 2003. Eight variables multiple regression model has been used to assess the influence of defined explanatory variables on capital structure. In the preliminary analysis, manufacturing companies, commercial banks, insurance companies, and finance companies were included. However, due to the unusual sign problem in the constant term of the model, manufacturing companies were excluded in final analysis. This study shows that size, growth rate and earning rate are statistically significant determinants of capital structure of the listed companies.

IN FINANCE, THE MOST debatable topic is capital structure. The main issue of debate revolves around the optimal capital structure. There are two schools of thought in this regard. One school pleads for optimal capital structure and other does against it. Former school argues that judicious mixture of debt and equity capital can minimize the overall cost of capital and maximize the value of the firm. Hence, this school considers capital structure decision as relevant. Latter school of thought led by Modigliani and Miller contends that financing decision does not affect the value of the firm. Since value of the firm depends on the underlying profitability and risk of investment (Van Horne 2002). In this study, determinants of capital structure in Nepalese context are examined with reference to capital structure theories. So, the objective of this paper is to test the effect of different explanatory variables of capital structure.

## 1. Theoretical Framework

### 1.1 Review of Capital Structure Theories

There are different theories of capital structure. David Durand propounded the net income approach of capital structure in 1952 (Durand 1952). This approach states that firm can increase its value or lower the cost of capital by using the debt capital. Net operating income approach is converse to this approach. This approach contends that the value of a firm and cost of the capital are independent to capital structure. Thus, the firm can not increase its value by judicial mixture of debt and equity capital. These are two extreme approaches to capital structure.

Solomon developed the intermediate approach to the capital structure in 1963. This traditional theory of capital structure pleads that value of the firm goes increase to a certain level of debt capital and after then it tends to remain constant with a moderate use of debt capital, and finally value of the firm decreases (Solomon 1963). Thus, this theory holds the concept of optimal capital structure.

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The modern theory of capital structure began with the celebrated paper of Modigliani and Miller published in 1958 (Harris and Raviv 1991). In this paper, they supported the net operating income approach and rejected the traditional theory of capital structure. They contend in their first proposition that the market value of any firm is independent to its capital structure and is given by capitalizing its expected return at the rate appropriate to the risk class (Modigliani and Miller 1958). This was theoretically very sound but was based on the assumptions of perfect capital market and no tax world, which were not valid in reality. So, this was corrected in 1963. In correction, they incorporated the effect of tax on value and cost of the capital of the firm (Modigliani and Miller 1963); and contend that, in the presence of corporate tax, the value of the firm varies with the variation of the use of the debt due to tax benefit on interest bill (Baral 1996).

In 1976, Miller propounded the next version of irrelevancy theory of capital structure. He pleaded in his presidential address to Annual Meeting of American Finance Association held on September 17, 1976 in Atlanta City, New Jersey that capital structure decisions of firms with both corporate and personal taxes are irrelevant (Miller 1977). In 1974, Myers and Pogue developed three theories-the lenders chickens out first, the managers chickens out first, and the shareholders chickens out first-of debt capacity (Myers and Pogue 1974). The third theory-the shareholders chickens out first-pleads the optimal capital structure. In the 1970s, a number of scholars developed debt capacity theory. Among them, Scott's multi-period model of debt is considerable debt capacity theory. This theory pleads that the value of non-bankrupt firm is a function of expected earnings and the liquidating value of its assets and the optimal level of debt is an increasing function of liquidating value of the firm's assets, the corporate tax rate, and the size of the firm (Scott 1976). Martin and others summarized the debt capacity theories developed by different scholars during 1970s and concluded that the value of the firm is maximized when marginal benefit of debt is equal to the marginal cost of debt (1988, 356).

Jensen and Meckling developed the capital structure theory based on the agency costs in 1976. Firm incurs two types of agency costs-cost associated with the outside equity holders and cost associated with the presence of debt in capital structure (Jensen and Meckling 1976). Total agency cost first decreases and after certain level of outside equity capital in capital structure, it increases. The total agency cost becomes minimal at certain level of outside equity capital. Thus, this theory pleads the concept of optimal capital structure.

Two sets of capital structure theories were developed during the latter half of the 1970s and first half of the 1980s. Ross developed one set of capital structure theories based on the asymmetric information in 1977, and Myers and Majluf developed the next set in 1984. The first set pleads that the choice of firm's capital structure signals to outside investors the information of insiders, and the second set contends that capital structure is designed to mitigate the inefficiency in the investment decision caused by the information asymmetry (Harris and Ravis 1991). In the course of the development of capital structure theory, Myers elaborated and brought out the Pecking order theory in 1984 originally developed by Donaldson in 1961. According to this theory, management strongly favors internal generation as a source of new funds even to the exclusion of external sources except for occasional unavoidable bulge in the need for funds (Donaldson 1961). This theory explains the negative relation between profitability and debt ratio and contends that there is no target debt-equity ratio. In financing, first, management prefers the internal equity financing, and then debt financing and finally external equity financing (Martin and others 1988). Thus, this theory explains the financing behavior of management.

## 1.2 Determinants of Capital Structure

Capital structure of a firm is determined by various internal and external factors. The macro variables of the economy of a country like tax policy of government, inflation rate, capital market condition, are the major external factors that affect the capital structure of a firm. The characteristics of an individual firm, which are termed here as micro factors (internal), also affect the capital structure of enterprises. This section presents how the micro-factors affect the capital structure of a firm with reference to the relevant capital structure theories stated earlier.

### 1.2.1 Size of a Firm

The bankruptcy cost theory explains the positive relation between the capital structure and size of a firm. The large firms are more diversified (Remmers and others 1974), have easy access to the capital market, receive higher credit ratings for debt issues, and pay lower interest rate on debt capital (Pinches and Mingo 1973). Further, larger firms are less prone to bankruptcy (Titman and Wessels 1988) and this implies the less probability of bankruptcy and lower bankruptcy costs. The bankruptcy cost theory suggests the lower bankruptcy costs, the higher debt level. The empirical studies carried out during the 1970s, as suggested by this theory, also show the positive relation between the size of firms and capital structure (Martin and others 1988). But results of some empirical studies do not corroborate with this theoretical relation.

### 1.2.2 Growth Rate

The agency cost theory and pecking order theory explain the contradictory relation between the growth rate and capital structure. Agency cost theory suggests that equity controlled firms have a tendency to invest sub-optimally to expropriate wealth from the enterprises' bondholders. The agency cost is likely to be higher for enterprises in growing industries which have more flexibility in their choice of future investment. Hence, growth rate is negatively related with long-term debt level (Jensen and Meckling 1976). This theoretical result is backed up by the empirical studies carried out by Kim and Sorensen (1986), and Titman and Wessels (1988) but Kester study rejected this relation (1986). Pecking order theory, contrary to the agency cost theory, shows the positive relation between the growth rate and debt level of enterprises. This is based on the reasoning that a higher growth rate implies a higher demand for funds, and, ceteris paribus, a greater reliance on external financing through the preferred source of debt (Sinha 1992). For, pecking order theory contends that management prefers internal to external financing and debt to equity if it issues securities (Myers 1984). Thus, the pecking order theory suggests the higher proportion of debt in capital structure of the growing enterprises than that of the stagnant ones. Chung (1993), Chaplinsky and Niehaus (1990) showed the evidence contrary to the pecking order theory.

### 1.2.3 Business Risk

Both agency and bankruptcy cost theories suggest the negative relation between the capital structure and business risk. The bankruptcy cost theory contends that the less stable earnings of the enterprises, the greater is the chance of business failure and the greater will be the weight of bankruptcy costs on enterprise financing decisions. Similarly, as the probability of bankruptcy increases, the agency problems related to debt become more aggravating. Thus, this theory suggests that as business risk increases, the debt level in capital structure of the enterprises should decrease (Taggart 1985). Studies carried out in western countries during 1980s show the contradictory evidence in this regard (Martin and others 1988). The

studies carried out in India and Nepal also show the contradictory evidence on the relation between the risk and debt level. Sharma (1983) and Chamoli (1985) show the evidence against, and Garg (1988) and Paudel (1994) do for the relation consistent with the bankruptcy and agency cost theories.

### 1.2.4 Profitability

The static trade-off hypothesis pleads for the low level of debt capital of risky firms (Myers 1984). The higher profitability of firms implies higher debt capacity and less risky to the debt holders. So, as per this theory, capital structure and profitability are positively associated. But pecking order theory suggests that this relation is negative. Since, as stated earlier, firm prefers internal financing and follows the sticky dividend policy. If the internal funds are not enough to finance financial requirements of the firm, it prefers debt financing to equity financing (Myers 1984). Thus, the higher profitability of the enterprise implies the internal financing of investment and less reliance on debt financing. Most of the empirical studies support the pecking order theory. The studies of Titman and Wessels (1988), Kester (1986), Friend and Hasbrouck (1989), Friend and Lang (1988), Gonedes and others (1988) show the negative relation between the level of debt in capital structure and profitability. Indian and Nepalese studies also show the same evidence as foreign studies do (Baral 1996). Only a few studies show the evidence in favor of static trade-off hypothesis contention.

### 1.2.5 Dividend Payout

The bankruptcy costs theory pleads for adverse relation between the dividend payout ratio and debt level in capital structure. The low dividend payout ratio means increase in the equity base for debt capital and low probability of going into liquidation. As a result of low probability of bankruptcy, the bankruptcy cost is low. According to the bankruptcy cost theory, the low bankruptcy cost implies the high level of debt in the capital structure. But the pecking order theory shows the positive relation between debt level and dividend payout ratio. According to this theory, management prefers the internal financing to external one. Instead of distributing the high dividend, and meeting the financial need from debt capital, management retains the earnings. Hence, the lower dividend payout ratio means the lower level of debt in capital structure.

### 1.2.6 Debt Service Capacity

The higher debt level in capital structure increases the probability of bankruptcy and bankruptcy costs of the enterprises. Probability of bankruptcy refers to the chances of cash flows to be less than the amount required for servicing the debt. The debt service ratio measured by the ratio of operating income to total interest charges indicates the firms' ability to meet its interest payment out of its annual operating earnings (Keoun and others 1986). Therefore, the higher debt service ratio shows the higher debt capacity of the enterprises. Hence, the debt capacity theory suggests the positive relation between the debt service capacity and capital structure of the enterprises. But contrary to this theoretical relation, empirical studies show the negative relation (Bhat 1980).

### 1.2.7 Operating Leverage

The use of fixed cost in production process also affects the capital structure. The high operating leverage-use of higher proportion of fixed cost in the total costs over a period of time-can magnify the variability in future earnings. Both the bankruptcy cost theory and agency cost theory suggest the negative relation between operating leverage and debt level

in capital structure. The bankruptcy cost theory contends the higher operating leverage, the greater the chance of business failure and the greater will be the weight of bankruptcy costs on enterprise financing decisions. Similarly, as the probability of bankruptcy increases, the agency problems related to debt become more aggravating. Thus, these theories suggest that as operating leverage increases, the debt level in capital structure of the enterprises should decrease.

## 2. Methodology

### 2.1 Source of Information

This study is based on secondary data. The main source of data is Nepal Stock Exchange Limited (NEPSE). First, information and data were hunted on the official website of NEPSE and available financial statements were downloaded from it. And then, Securities Board of Nepal was visited to collect the required financial statements not available on line.

### 2.2 Sampling and Population

For the purpose of this study, population has been defined in term of the number of companies listed to NEPSE as on July 16, 2003.[1] As on this date, the total number of such companies falling in different eight groups-commercial banks, manufacturing and processing, hotels, others, trading, insurance, finance, development bank-was 108. Of these, depending on the availability of information, 40 listed companies-9 manufacturing, 9 commercial banks, 6 insurance companies, and 16 finance companies-were sampled for this study. Hotels, others, tradings, development banks are excluded from the study due to their small number and unavailability of online information. Manufacturing companies are excluded from the final analysis due to the unusual sign problem.

### 2.3 Statement of Hypotheses

This study has tested the following null hypotheses on relation between the defined variables and capital structure of listed companies:

$H_{O1}$: There is no significant relation between the size and financial leverage.
$H_{O2}$: There is no significant relation between the business risk and financial leverage.
$H_{O3}$: There is no significant relation between the growth and financial leverage.
$H_{O4}$: There is no significant relation between the earning and financial leverage.
$H_{O5}$: There is no significant relation between the dividend payout and financial leverage.
$H_{O6}$: There is no significant relation between the debt service capacity and financial leverage.
$H_{O7}$: There is no significant relation between the operating leverage and financial leverage.

### 2.4 Specification of the Model

Following multiple regression model has been used to test the theoretical relation between the financial leverage and characteristics of the firm.

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

Where

$X_1$ = size of the firm
$X_2$ =business risk
$X_3$ =growth rate
$X_4$ =earning rate
$X_5$ = dividend payout

[1] Website of Nepal Stock Excharge Ltd. was visited on June 5,2004.

$X_6$ = debt service capacity
$X_7$ =degree of operating leverage
a= constant term of the model
b's= coefficients of the model

### 2.5 Definition of Variable

#### 2.5.1 Dependent Variable (Y)

It is defined as the ratio of total debt to total assets. The total debt includes both short term and long term interest bearing debt. It is given by:

$$FL = \frac{TD_{2001}}{TA_{2001}} \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

Where, FL=financial leverage,
$TD_{2001}$=total debt at the end of the fiscal year 2000/01
$TA_{2001}$=total assets at the end of the fiscal year 2000/01

#### 2.5.2 Independent Variables

**Size of the Firm($X_1$ )**: It is defined as the logarithm of sale of the firms. It is given by:

$$X_1 = Log(S_{2001}) \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

Where,
$S_{2001}$=sale for the fiscal year 2000/01

**Business Risk ($X_2$ )**: It is defined as coefficient of variation in earning before interest and tax. It is given by :

$$X_2 = \frac{\sigma_{EBIT}}{\mu_{EBIT}} \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

Where,
$\mu_{EBIT}$ = the expected earning before interest and tax
$s_{EBIT}$ = the standard deviation of earning before interest and tax[2]

**Growth Rate ($X_3$)**: It is defined as a compound growth rate of total assets. It is given by:

$$X_3 = \sqrt[n]{\frac{TA_n}{TA_0}} - 1 \quad \ldots \quad \ldots \quad \ldots \quad (5)$$

Where
$TA_n$=total assets at the end of the observed period
$TA_o$=total assets at the beginning of observed period
n=number of observed period[3]

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[2] *μEBIT and EBIT have been worked out on the basis of five years' operating profit (fiscal year 1996/97 through 2000/01) of the sampled companies.*

[3] *Fiscal year 1996/97 and 2000/01 have been taken as a beginning and ending of observed period respectively. Thus, the number of observed period is 5.*

**Earning Rate ($X_4$)**: It is defined in term of return on total assets. It is given by:

$$X_4 = \frac{EBIT_{2001}}{TA_{2001}} \quad \ldots \quad \ldots \quad \ldots \quad (6)$$

Where

$EBIT_{2001}$=earning before interest and tax for the fiscal year 2000/01
$TA_{2001}$=total assets at the end of the fiscal year 2000/01

**Dividend Payout ($X_5$ )**: It is defined as the ratio of dividend to total income available to shareholders. Here, dividend includes only cash dividend not stock dividend and other forms of dividend. It is given by:

$$X_5 = \frac{D_{2001}}{NI_{2001}} \ldots\ldots \quad \ldots \quad (7)$$

Where

$D_{2001}$=total dividend distributed in the fiscal year 2000/01
$NI_{2001}$=income available to shareholders in the fiscal year 2000/01

**Debt Service Capacity ($X_6$)**: This is defined in term of interest coverage ratio. It is given by:

$$X_6 = \frac{EBIT_{2001}}{I_{2001}} \quad \ldots \quad \ldots \quad \ldots \quad (8)$$

Where

$I_{2001}$=total interest charge for the fiscal year 2000/01
$EBIT_{2001}$=earning before interest and tax for the fiscal year 2000/01

**Degree of Operating Leverage ($X_7$ )**: It is defined as a percentage change in EBIT as a proportion of percentage change in sales. It is given by:

$$X_7 = \frac{\left[\frac{(E_t - E_{t-1})}{E_{t-1}}\right]}{\left[\frac{(S_t - S_{t-1})}{S_{t-1}}\right]} \quad \ldots \quad \ldots \quad \ldots \quad (9)$$

Where

E= earning before interest and tax
S= net sale
t= fiscal year 2000/01

## 3. Analysis of Regression Results

### 3.1 Preliminary Analysis

Multiple regression was run in SPSS to test the set hypotheses. Before running the regression, investigation into the multicollinearity problem was carried out. First of all, bivariate correlations among the independent variables were examined to find out the multicollinearity problem. The existence of correlation of about .8 or larger indicates that there is problem of multicollinearity (Lewis-Back 1993). None of the pair-wise coefficient of correlation was .8 or larger. So, examination of correlation among the explanatory variables found no multicollinearity problem.

Table 1: Pair-wise Correlation Matrix of Explanatory Variables

| Variables | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ | $X_7$ |
|---|---|---|---|---|---|---|---|
| Corporate Size ($X_1$) | 1.000 | | | | | | |
| Business Risk ($X_2$) | .145 | 1.000 | | | | | |
| Growth ($X_3$) -.254 | -.144 | 1.000 | | | | | |
| Earning Rate ($X_4$) | -.089 | .215 | .037 | 1.000 | | | |
| Dividend Payout ($X_5$) | | .295 | -.031 | -067 | .361* | 1.000 | |
| Debt Service Capacity ($X_6$) | .114 | -.031 | -.105 | .064 | .339* | 1.000 | |
| Degree of Leverage ($X_7$) | .041 | .021 | -.054 | .024 | .065 | .022 | 1.000 |

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

The pair-wise correlation approach of diagnosing the multicollinearity problem does not take the relation of an independent variable with all other independent variables into account. So, regression of each independent variable on all other independent variables was run to assess the multicollinearity problem more precisely. The $R^2$ near to 1 indicates the high multicollinearity and larger $R^2$ indicates the larger multicollinearity. But none of the regression resulted in the $R^2$ near to 1.

Table 2: Results of the Models Used to Assess the Multicollinearity

| Problem | Models $R^2$ | Adjusted $R^2$ | S. E. |
|---|---|---|---|
| Model (1.1) | .212 | .069 | .653 |
| Model (1.2) | .121 | -.038 | 2.442 |
| Model (1.3) | .087 | -.079 | .127 |
| Model (1.4) | .245 | .108 | .043 |
| Model (1.5) | .341 | .221 | 7.462 |
| Model (1.6) | .126 | -.033 | 86.648 |
| Model (1.7) | .007 | -.174 | 17.646 |

After clearing up the multicollinearity problem, model was run. The model explains around 71 % of variation in financial leverage. The incorporated variables except to business risk and degree of operating leverage, have statistically significant effect on the leverage. But the constant term of the model is with unusual sign. This indicates the severe problem of the model. Statistically, this model is fit to check the influence of firm's

Table 3: Determinants of Financial Leverage- Regression Results

| Variables | Beta Coefficients | S.E | t-Value | |
|---|---|---|---|---|
| Constant | -.475 | .329 | -1.443 | insignificant |
| Corporate Size ($X_1$) | .141 | .039 | 3.610 | Significant* |
| Business Risk ($X_2$) | .006 | .010 | .540 | insignificant |
| Growth ($X_3$) | .989 | .201 | 4.913 | Significant* |
| Earning Rate ($X_4$) | -1.254 | .601 | -2.087 | Significant** |
| Dividend Payout ($X_5$) | -0.012 | .003 | -3.365 | Significant* |
| Debt Service Capacity ($X_6$) | -0.001 | .000 | -3.251 | Significant* |
| Degree of Leverage ($X_7$) | 0.001 | .001 | .960 | insignificant |
| $R^2$ =.713 | | | | |
| Adjusted $R^2$ =.65 | | | | |
| F =11.36 | | | | |
| S.E of Estimate =.1468 | | | | |

*significant at .01 level

** significant at .05 level

characteristics on the leverage, but the constant term of the model is contradictory to the reality. In real word, leverage ratio does never pass the vertical axis below the origin. So, investigation was conducted in detail to single out the cause of the unusual sign. Incorporating different variables and observations, different models were run in SPSS. Finally, manufacturing firms were found culprit. So, manufacturing companies were excluded from the analysis.

### 3.2 Final Analysis: Test of Hypotheses

As stated earlier, manufacturing companies were excluded from the final analysis. So, 31 listed companies are included in the final analysis. Beta coefficient associated with $X_1$ rejected the first null hypothesis. The size of the financial institutions explains about 30% variation in the leverage ratio. It is apparent from the result that size of the financial institutions has statistically significant influence on financial leverage. The statistically significant positive relation is consistent with the theoretical relation explained by the bankruptcy costs theory. The past empirical evidences also show the same results. This result corroborates with the

findings of study conducted by Baral (1996), and Paudel (1994) in Nepalese context.

Table 4: Determinants of Financial Leverage- Regression Results

| Variables | Beta Coefficients | SE | t- Value | |
|---|---|---|---|---|
| Constant | 0.038 | .256 | .148 | |
| Corporate Size ($X_1$) | 0.094 | .030 | 3.178 | Significant* |
| Business Risk ($X_2$) | 0.007 | .009 | .833 | insignificant |
| Growth ($X_3$) | .634 | .158 | 4.015 | Significant* |
| Earning Rate ($X_4$) | -2.504 | .510 | -4.908 | Significant* |
| Dividend Payout ($X_5$) | -0.025 | .021 | -1.168 | Insignificant |
| Debt Service Capacity ($X_6$) | 0.002 | .002 | 1.102 | insignificant |
| Degree of Leverage ($X_7$) | 0.002 | .001 | 1.743 | insignificant |
| R Square =.774 | | | | |
| Adjusted R Square= .706 | | | | |
| F =11.274 | | | | |
| SE of Estimate = 0.09 | | | | |

*Significant at .01 level

Beta coefficient of $X_2$ tests the second hypothesis. The relation between the business risk and financial leverage is positive but it is insignificant. Thus, the second hypothesis is accepted. Business risk contributes just 0.2 % to the variation in the leverage ratio. This is inconsistent with the theoretical relation stated by bankruptcy cost theory. The most of the past studies also do not corroborate with the bankruptcy cost theory in this regard.

Beta coefficient of $X_3$ has rejected the third hypothesis at .01 level. In other words, growth rate has turned out as a highly significant determinant of the leverage ratio of the financial institutions. This variable explains around 19 % of the variation in the financial leverage ratio. The highly significant coefficient of $X_3$ holds the relation postulated by pecking order theory true in Nepalese context.

The regression coefficient of $X_4$ has rejected the fourth hypothesis. It is negative and statistically significant at .01 level. This variable explains about 23 % of the total variation in leverage ratio. The statistically significant negative coefficient of $X_4$ backs up the pecking order theory. The past empirical studies carried out in Nepalese context also show the conclusion in the same vein.

Both hypothesized and observed relations between the dividend payout and leverage ratio are adverse. But the observed one is statistically insignificant. This insignificant coefficient of $X_5$ suggests that dividend policy does not explain the variation in the leverage ratio and statistically accept the fifth hypothesis. This implies that financial institutions having different dividend payout ratio do not have different leverage ratio. This variable explains only 0.2% of the total variation. Thus, the coefficient associated with dividend payout ratio tends to support the bankruptcy cost theory. This empirical tendency is consistent with the past empirical studies.

The coefficient of $X_6$ also accepts the sixth hypothesis. Though the beta coefficient shows the hypothesized theoretical relation between the debt service capacity and leverage ratio, this is statistically insignificant. This suggests that financial institutions do not manage the funds considering their debt service capacity and they do not have debt according to

their debt service capacity. This variable contributes only 1.6 % to the total variation in leverage. The result of this study supports the empirical study conducted by Baral on the capital structure of the public sector enterprises in Nepal in 1996. The foreign and Indian studies also show the results in the same line.

The coefficient of $X_7$ accepts the final hypothesis. The beta coefficient is statistically insignificant at .05 level. But this shows the relation contradictory to the theoretical relation postulated by both bankruptcy cost theory and agency cost theory. This variable explains about 3 % of the total variation in the financial leverage ratio. Indian studies also show the result similar to the result of this study.

Explanatory power of the model as indicated by $R^2$ and adjusted $R^2$ is fairly good. The model explains around 77% of the variation in the endogenous variable. The adjusted explanation of the model is about 71%. Thus, the unexplained proportion of the variation is fairly low. After removing the manufacturing listed companies from the study, multicollinearity was reexamined by constructing the pair-wise correlation matrix of all the exogenous variables of the model. Some of the variables-$X_3$ and $X_4$, and $X_5$ and $X_7$- are significantly inter-correlated but they are tolerable. Thus, the estimates of coefficients do not appear substantially biased by the effect of multicollinearity problem.

Table 5: Pair-wise Correlation Matrix of Explanatory Variables

| Variables | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ | $X_7$ |
|---|---|---|---|---|---|---|---|
| Corporate Size ($X_1$) | 1.000 | | | | | | |
| Business Risk ($X_2$) | .039 | 1.000 | | | | | |
| Growth ($X_3$) | -.008 | .052 | 1.000 | | | | |
| Earning Rate ($X_4$) | .119 | -.037 | .403** | 1.000 | | | |
| Dividend Payout ($X_5$) | .163 | .301 | -.001 | -.031 | 1.000 | | |
| Debt Service Capacity ($X_6$) | -.048 | .045 | -.044 | .134 | .011 | 1.000 | |
| Degree of Leverage ($X_7$) | -.066 | -.138 | .019 | .131 | -.500* | -.226 | 1.000 |

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

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

## 4. Conclusions

Out of seven examined explanatory variables-size, business risk, growth, earning rate, dividend payout, debt service capacity and degree of operating leverage, three–size, growth and earning rate-are statistically significant determinants of financial leverage. Beta coefficients associated with corporate size, corporate growth and earning rate are statistically significant at .01 level. These variables explain around 72% of variation in financial leverage. The remaining variables incorporated in the model explain only 5% of the variation. These facts conclude that corporate size, growth rate, and profitability play a major role in determination of the financial leverage in financial institutions; and business risk, dividend payout ratio, debt service capacity, and degree of operating leverage do a dismal role. Further, statistically insignificant coefficients associated with business risk, and debt service capacity; and significant coefficient associated with size, and growth imply that financial institutions do not care of their debt service capacity but do care of the expansion of their business. This may, if not monitored by concerned authority properly and timely, invite the crisis in financial sector in future.

Appendix 1: Regression Models Used to Assess the Multicollinearity Problems

$$X_1 = a + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 \ldots \quad \ldots \quad \ldots \quad (1.1)$$

$$X_2 = a + b_1X_1 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 \ldots \quad \ldots \quad \ldots \quad (1.2)$$

$$X_3 = a + b_1X_1 + b_2X_2 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 \ldots \quad \ldots \quad \ldots \quad (1.3)$$

$$X_4 = a + b_1X_1 + b_2X_2 + b_3X_3 + b_5X_5 + b_6X_6 + b_7X_7 \ldots \quad \ldots \quad \ldots \quad (1.4)$$

$$X_5 = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_6X_6 + b_7X_7 \ldots \quad \ldots \quad \ldots \quad (1.5)$$

$$X_6 = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_7X_7 \ldots \quad \ldots \quad \ldots \quad (1.7)$$

$$X_7 = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 \ldots \quad \ldots \quad \ldots \quad (1.8)$$

Where

$X_1$, $X_2$, $X_3$ ...$X_7$ , a and $b_1$, $b_2$, $b_3$ ...$b_4$ indicate the same as in the model (1)

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