

DETERMINANTS OF CAPITAL STRUCTURE: A CASE STUDY OF AUTOMOBILE MANUFACTURING COMPANIES LISTED IN NSE

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ABSTRACT

In this paper, an attempt has been made to examine the determinants of capital Structure -size, business risk, earning rate, dividend payout, debt service capacity and degree of operating leverage-of the companies listed in Automobile index of the National Stock Exchange (NSE). Seven variables Multi regression model has been used to access influence of defined explanatory variables on capital structure. This study shows the dividend payout, debt service capacity, degree of leverage, and business risk are statistically significant determinants of financial leverage. 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.

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).

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 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.

1.2.3 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.

1.2.4 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.

1.2.5 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).

1.2.6 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 Auto Index of National Stock

Exchange Limited (NSE). Information and data were hunted on the official website

Of NEPSE and available financial statements were

downloaded from it.

2.2 Sampling and population

For the purpose of this study, population has been defined in term of the number of the companies listed in Auto Index of NSE as on January, 2012. As on this date, the total number of such Companies listed is 15 and those companies are given below.

- Amtek Auto Ltd.
- Apollo Tyres Ltd.
- Ashok Leyland Ltd.
- Bajaj Auto Ltd.
- Bharat Forge Ltd.
- Bosch Ltd.
- Escorts Ltd.
- Exide Industries Ltd.
- Hero MotoCorp Ltd.
- MRF Ltd.
- Mahindra & Mahindra Ltd.
- Maruti Suzuki India Ltd.
- Motherson Sumi Systems Ltd.
- TVS Motor Company Ltd.
- Tata Motors Ltd.

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:

HO1: There is no significant relation between the size and financial leverage.

HO2: There is no significant relation between the business risk and financial leverage.

HO3: There is no significant relation between the earning and financial leverage.

HO4: There is no significant relation between the dividend payout and financial leverage.

HO5: There is no significant relation between the debt service capacity and financial leverage.

HO6: There is no significant relation between the operating leverage and financial leverage.

2.4 Specification of the Model

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

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 \dots \dots (1)$$

Where

- X_1 = size of the firm
- X_2 = business risk
- X_3 = earning rate
- X_4 = dividend payout
- X_5 = Debt service capacity
- X_6 = 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:

$$FL = TD/TA \dots \dots (2)$$

Where, FL = financial leverage,

TD_{2010} = total debt at the end of the fiscal year 2009/10

TA_{2010} = total assets at the end of the fiscal year 2009/10

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:

$$X_1 = \text{Log}(S_{2010}) \dots \dots (3)$$

Where,

S_{2010} = sale for the fiscal year 2009/10

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

$$X_2 = \sigma_{EBIT} / \mu_{EBIT} \dots \dots (4)$$

Where,

μ_{EBIT} = the expected earning before interest and tax

S_{EBIT} = the standard deviation of earning before interest and tax

Earning Rate (X_3): It is defined in term of return on total

assets. It is given by:

$$X_3 = EBIT_{2010} / TA_{2010} \dots \dots (5)$$

Where

$EBIT_{2010}$ = earning before interest and tax for the fiscal year 2009/10

TA_{2010} = total assets at the end of the fiscal year 2009/10

Dividend Payout (X_4): 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:

$$X_4 = D_{2010} / NI_{2010} \dots \dots (6)$$

Where

D_{2010} = total dividend distributed in the fiscal year 2009/10

NI_{2010} = income available to shareholders in the fiscal year 2009/10

Debt Service Capacity (X_5): This is defined in term of interest coverage ratio. It is given by:

$$X_5 = EBIT_{2010} / I_{2010} \dots \dots (7)$$

Where

I_{2010} = total interest charge for the fiscal year 2009/10

$EBIT_{2010}$ = earning before interest and tax for the fiscal year 2009/10

Degree of Operating Leverage (X_6): It is defined as a percentage change in EBIT as a

Proportion of percentage change in sales. It is given by:

$$X_6 = \frac{(E_t - E_{t-1}) / E_{t-1}}{(S_t - S_{t-1}) / S_{t-1}} \dots \dots (8)$$

Where

E = earning before interest and tax

S = net sale

t = fiscal year 2009/10

3. ANALYSIS OF REGRESSION RESULTS

3.1 Preliminary analysis:

Multiple regressions were 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.

	X1	X2	X3	X4	X5	X6
X1	1					
X2	0.224	1				
X3	0.489	0.367	1			
X4	0.516*	0.211	0.528*	1		
X5	0.282	0.338	0.597*	0.171	1	
X6	0.063	-0.079	0.489	0.074	0.499	1

*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 R2 near to 1 indicates the high multicollinearity and larger R2 indicates the larger multicollinearity. But none of the regression resulted in the R2 near to 1.

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

Model	Model R ²	Adj R ²	S.E
1.1	0.357	0.022	0.408
1.2	0.284	-0.114	0.127
1.3	0.652	0.458	0.113
1.4	0.407	0.077	1.097
1.5	0.476	0.185	180.5
1.6	0.45	0.144	1.52

3.2 Final Analysis: Test of Hypothesis

Variables	Beta co efficient	S.E	t- value
Constant	0.42	0.501	0.839
Corporate size X1	-0.161	0.138	-0.448
Business risk X2	0.299	0.442	0.877
Earnings rate X3	-0.629	0.497	-1.289
Dividend payout X4	0.516	0.003	1.376
Debt service capacity X5	0.434	0.06	-0.41
Degree of leverage X6	0.225	0.037	0.578

R ²	0.334
Adjusted R ²	-0.166
F	0.668
S.E of the estimate	0.169

Beta coefficient associated with the X1 found to be negative, so there is no influence of size of the firm in determining the financial leverage. Beta coefficient of the variable X2 is positive but there is not much influence of Business risk in determining the capital structure of the automobile firms. Beta coefficient of the variable X3 is also showing the negative influence of earnings rate on financial leverage.

Beta coefficient value of the variable X4 is found to be positive and thus Dividend payout ratio is having positive influencing in determine the capital structure of the firms. Beta value of X5 variable is also found to be positive so it has an influence in financial leverage decisions. Beta value of X6 also gives positive co efficient value but not at the level of X4, X5. But it shows positivity in determine the capital structure decisions. Explanatory power of the model as indicated by R2 and adjusted R2 is fairly good.

4. CONCLUSION

Out of six examined explanatory variables - Size, business risk, growth, earning rate, dividend payout, debt service capacity and degree of operating leverage four variables dividend payout, debt service capacity, degree of leverage, and business risk are statistically significant determinants of financial leverage. The other variables like corporate size and earnings rate are statistically insignificant determinants of financial leverage and show a negative influence on financial leverage. So as for us the selected companies for the analysis dividend payout, debt service capacity, operating leverage, business risk are the influential determinants of capital structure and size, earnings rate are not an important variables in capital structure decisions.

Appendix 1: Regression Models Used to Assess the Multicollinearity Problems

Model 1.1 $X_1 = a + b_1X_2 + b_2X_3 + b_3X_4 + b_4X_5 + b_5X_6$

Model 1.2 $X_2 = a + b_1X_1 + b_2X_3 + b_3X_4 + b_4X_5 + b_5X_6$

Model 1.3 $X_3 = a + b_1X_1 + b_2X_2 + b_3X_4 + b_4X_5 + b_5X_6$

Model 1.4 $X_4 = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_5 + b_5X_6$

Model 1.5 $X_5 = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_6$

Model 1.6 $X_6 = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5$

Where

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

REFERENCES

- Baral, Keshar Jung. 1996. "Capital Structure and Cost of Capital in Public Sector Enterprises in Nepal." Ph.D thesis. Delhi University.
- Bhat, Ramesh Kumar. 1980. Determinants of Financial Leverage : Some Further Evidence. Chartered Accountant 29: 451-456.
- Keshar J. Baral, PhD*,. Determinants of Capital Structure: A Case Study of Listed Companies of Nepal
- Chamoli, P.C. 1985. A Panorama of Capital Structure Planning of Indian Cement Industry. Lok Udhyog 19: 23-30.
- Chaplinsky, Susan, and Greg Niehaus. 1990. The Determinants of Inside Ownership and Leverage. Working Paper, University of Michigan.
- Chung, Kee H. 1993. Asset Characteristics and Corporate Debt Policy: An Empirical Test. Journal of Business Finance and Accounting 20: 83-98.