

Determinants of Capital Structure: A Case Study of Automobile Sector of Pakistan

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Abstract

The present study focuses on the determinants of capital structure of Automobile Sector of Pakistan. The research examines whether the industry specific attributes of Automobile Sector affect the capital structure choice of firms and validates our results with Rajan and Zingales (1995) and Booth et. al. (2001) and provide an explanation for the behavior of firms in choosing debt equity ratio. The study uses pooled data regression model on the sample of 26 firms of Automobile sector of Pakistan and uses liquidity and cost of debt variables which were not used in earlier studies in Pakistan and have significant influence on the debt and equity financing decisions. The results show that the firms which are large in size and having good assets structure should go for debt financing to finance new projects. The results of profitability, taxes and liquidity are statistically significant and are consistent with Static Trade off Theory and Pecking Order Theory.

Key Words: Capital Structure, Debt Equity ratio, Cost of Debt.

1. Introduction

Capital Structure refers to the combination of debt and equity of a firm which shows the behavior of the firm in financing its overall operations and growth and is considered one of the important decisions in financial management. The primary objective of the firm is to maximize the shareholders wealth by making an appropriate mix of the main sources of finance for a firm including retained earnings, proceeds from the issue of ordinary shares, preference shares and debt. Debt financing include issuance of bond or long term notes payable, leasing and loans from bank. In developing countries like Pakistan, debt is analyzed in terms of short term financing and long term financing as small and medium sized firms prefer short term financing. The excessive use of debt financing makes the firms risky due to bankruptcy cost.

Debt capital is provided by banks, individuals and financial institutions i.e. investment, leasing and insurance firms which invest in debt securities such as bonds etc. The profitable firms may avail the tax shield by using debt financing otherwise the debt would increase the risk of bankruptcy. Bankruptcy costs include direct and indirect costs, the former consists of liquidation

cost which is higher for a small firm and lesser for a large size firm. Indirect costs are the result of changes in policies of firm regarding long term investments i.e. reduction in the staff of research and development department, reducing training and development budgets of employees and advertisement expenses etc. As a result, quality of goods and services fall down and also affect the sales revenue of the firms. Therefore, the potential benefits of leverage diminish due to bankruptcy cost and highly levered firms are considered to be highly risky by lenders and investors. If the borrowing firm has low credit rating, the borrowing will not be cost effective for the firm. Equity financing includes issuance of common stock and cost of equity is higher because shareholders demand higher dividend for the risk of volatility of earnings.

The present study also examines the influences of liquidity, cost of debt, non debt tax shield and taxes variables on capital structure decisions which are not studied in the previous studies in Pakistan .

1.2 Theoretical Framework

There are many theories which explain the behavior of the firm in making Capital Structure decisions. Each theory presents a different explanation of corporate financing. The existing empirical literature has mixed results of these theories. Few of the theories which are relevant to debt and equity decisions are given below:

Stewart C. Myers (1984) presented Pecking Order Theory which states that the firms prefer to use their internal sources of financing to equity financing. If internal financing do not meet the needs of the firm, they use external financing, first they apply for bank loan, then for public debts and as a last resort, equity financing is used. Thus the profitable firms are less likely to opt for debt for new projects because they have the available funds in the form of retained earnings.

Ross (1977) explains that debt is considered as a way to highlight investor's trust in the firm. If a firm issues debt, it provides a signal to the market that the firm is expecting positive cash flows in the future. Thus, the higher level of debt shows the confidence of the managers in future cash flows but another impact of the signaling factor is the problem of under pricing of equity. If a firm issues equity instead of debt for financing its new projects, investors will interpret the signal negatively.

Among other explanations about a firm's behavior in choosing its capital structure is the agency theory given by Jensen and Meckling, (1976) which identify the possible conflict between shareholders and a manager's interests because the share of manager is less than 100% in the firm. The managers are agent to shareholders, they try to transfer wealth from bondholders to shareholders by borrowing more debt and investing in risky projects.

Empirical results of previous studies show that the determinants of capital structure are industry specific and this study will also validate whether the determinants of Capital Structure identified by Booth et. al. (2001) and Rajan and Zingales, (1995) provide an explanation for the Capital Structure decisions of firms in Automobile Sector of Pakistan. In Pakistan, the research culture is at its initial stage, the financial data is not maintained in a proper way by any authority and is very difficult to collect data of the relevant firms. The present study is based on the financial data collected from the balance sheets and income statements of 22 out of 26 firms of Automobile Sector from Karachi and Lahore Stock Exchanges of Pakistan. The data is taken for the period of 2003 to 2007, making 110 firm years for panel data analysis. The annual reports of the remaining firms were not available on either of the stock exchanges.

The paper is organized as follows: first section of the paper gives a brief view of the background of the study. Second section summarizes the relevant literature. Third section gives description of the data and the explanation of the variables. Fourth Section shows the data analysis and fifth section summarizes the results.

2. LITERATURE REVIEW

Many empirical researchers have explored the determinants of capital structure choice from different point of views and in different environments related to developed and developing economies.

Miller and Modigliani (1958) examined that the value of the firm was independent of its capital structure and the benefits and the cost of debt are set off, showing no affect on the value of the firm. The theory depends on few irrational assumptions such as ignoring the effects of taxes, transactions costs of equity and bankruptcy cost. However, it provides a starting point that helps understand the capital structure and its determinants affecting the decisions of financing mix.

Titman and Wessels (1988) analyzed the explanatory power of some of the recent theories of optimal debt equity ratio. They found that financing with debt was negatively related to firm's uniqueness regarding its type of business. Transactions costs might be an influencing determinant of capital structure decision and the results were consistent with existing theories.

Another study on testing the static trade off theory and pecking order theory on the attributes consisting of size, tangibility of asset, profitability of firm, growth and risk was done by Cassar and Holmes, (2003) and the results of regression analysis showed that the asset structure, profitability and growth were important factors which affected the debt equity ratio of the firms. Size and risk showed weaker influences on the debt financing of the firms. Their results were consistent with the static trade off, pecking order and agency cost theories. They proved that the theories applicable on capital structure of large firms are valid for small and medium enterprises of Australia. Rajan and Zingales (1995) pointed out that factors examined by previous researchers as correlated with the firm leverage in the United States, having similar relationship in other countries also.

Booth .et. al. (2001) analyzed data from ten underdeveloped countries including Pakistan and empirically proved that some of the characteristics of modern finance theory were transferable across countries. In a subsequent study, D Vasiliou et. al. (2003) concluded that the firms with heavy investments in fixed assets had higher leverage ratio than the smaller firms. The study affirmed the trade off theory and pecking order theory. Mitton T (2007) explained the tendency of firms in the emerging market for debt financing. In a recent study, Cespedes et.al. (2009) explained the behavior of firms in Latin America covering seven countries. They experienced that ownership oriented firms preferred equity financing and found out that there were lower tax shields and higher bankruptcy costs.

Jong et. al. (2008) analyzed that the debt equity ratio was related to a number of country specific factors such as bond market development, protection of creditors' right and growth rate of gross domestic product. Although many foreign researchers have studied the attributes affecting the choice of debt and equity ratio of firms in developed countries, few of them researched on firms in developing countries. In the perspective of Pakistan, Rahman (1990) studied the Industry and Size as determinants of Capital Structure decisions and the results showed that Engineering and Tobacco industries were heavily geared. Industry groups did not provide significant differences with respect to this measure of financial leverage. Focusing on the factors affecting capital structure decisions of firms of Japan, Malaysia and Pakistan, Mahmood, (2003) found that the firms in Japan and Pakistan showed very high leverage ratios more than 70% because of Japanese developed market status and underdeveloped capital market of Pakistan which forces firms to opt for bank loan rather than raising equity.

Qureshi and Azid (2006) identified that the public sector preferred financing through debts due to corporate governance, favorable terms and conditions of commercial banks and lesser accountability than private sector. Shah and Khan (2007) examined that there was highest leverage ratio for textile industry and the average profitability of textile industry was negative due to understatement of profit by family controlled firms. Hijazi (2006) examined the cement sector of Pakistan and the results, except for firm size, were found to be highly significant and rejected the static trade off theory as the size and leverage were positively correlated. Tangibility was an important attribute of corporate structure decision and was positively related to leverage. Kanwar (2007) explained the attributes of Capital Structure in Sugar industry of Pakistan and the results depicted that return on assets, asset tangibility, market to book ratio and size are found to be significant except tax rate. The developed provinces of Pakistan showed highest debt ratios. The average debt ratio was 48.3 % for Sindh, 23.7 % for Punjab and only 7.6 % for NWFP. Rafiq et. al. (2008) examined the chemical industry of Pakistan regarding capital structure choice and suggested that chemical sector preferred equity financing and less debt. Size influenced the leverage positively, showing that large size firms prefer debt financing than opting for equity. Growth showed positive association with debt, indicating tendency of debt financing.

The present study examines the influences of the independent variables such as tangibility of assets, size of firm, profitability of firm, taxes, cost of debt, non debt tax shield and liquidity on leverage ratio of Automobile Sector of Pakistan. On the basis of theoretical frame work of Ranjan and Zingales (1995) and previous empirical results, we have developed the following hypotheses between leverage as a dependent variable and tangibility, size, tax, profitability, liquidity, non-debt tax shield and cost of debt as independent variables.

H01 = A firm with higher percentage of fixed assets will not have high leverage.

Ha1 = A firm with higher percentage of fixed assets will have high leverage.

H02 = The size of a firm has negative relationship with leverage.

Ha2 = The size of a firm has positive relationship with leverage.

H03 = The profitability of a firm has positive relationship with leverage.

Ha3 = The profitability of a firm has negative relationship with leverage.

H04 = The higher rate of taxes has negative relationship with leverage.

Ha4 = The higher rate of taxes has positive relationship with leverage.

H05 = The higher cost of debt has positive relationship with leverage

Ha5 = The higher cost of debt has positive relationship with leverage

H06 = The firms with more current assets will not have less leverage

Ha6 = The firms with more current assets will have less leverage

Ha7 = The firms with higher rate of depreciation will not have less leverage

H07 = The firms with higher rate of depreciation will have less leverage

3. RESEARCH METHODOLOGY

According to the existing literature, the determinants of Capital structure have been analyzed under Pecking order Theory, Static Trade off Theory and Agency Cost Theory. These theories have empirically tested the relationship of debt and equity using secondary data mostly based on published financial statements listed at different stock exchanges. The present study also uses secondary data collected from Karachi Stock Exchange and Lahore Stock Exchange of Pakistan. Moreover, the Spearman's correlation and Regression model is used to develop statistical framework. This section includes the sample data and the variables used in investigating and distinguishing the determinants of Capital Structure of Automobile industries of Pakistan by using statistical techniques.

3.1 Data Description

The present study uses the data collected from the balance sheets and income statements of 22 out of 26 firms of Automobile Sector of Pakistan for the period of 2003 to 2007 making 110 firm years for panel data analysis. Moreover, all those firms which were delisted from either Lahore or Karachi Stock Exchange excluded from our sample.

3.2 Regression Model (Rajan & Zingales, 1995)

The existing literature provides empirical evidence for defining leverage as a function of industry specific variables. The present study uses panel data regression analysis known as Constant Coefficient Model and facilitates analysis of time series and cross sectional data. The use of panel data model minimizes multicollinearity among the attributes of debt equity ratio and improves the precision of econometric estimates. The equation of regression model is as follows:

$$LG = \beta_0 + \beta_1 (TG) + \beta_2 (SZ) + \beta_3 (PF) + \beta_4 (TX) + \beta_5 (LQ) + \beta_6 (CD) + \beta_7 (NDTS) + \varepsilon$$

Where

LG = Leverage

TG = Tangibility of assets

SZ = Firm Size

PF = Profitability

TX = Taxes

LQ = Liquidity

CD= Cost of Debt

NDTS=Non Debt Tax shield

ε = error term

The current study excluded growth attribute as we are already using size and asset tangibility variables. Our model included the tax provision, liquidity, cost of debt and non debt tax shield which were not used in the model by Ranjan & Zingales (1995), Hijazi & Tahir (2006) and Mahmood (2003).

These variables have significance in Static Trade off Theory and Pecking Order Theory. Tax is considered a basic element for Static Trade off Theory as it encourages firms for debt financing to avail tax shield if the firm is operating in profits. The firm is considered liquid if it can pay off its current liabilities over a period of time and is significant feature of pecking order theory which is usually having negative relationship with leverage. The cost of debt is the cost of using long term debts which influences the firm for further debt or equity financing.

3.3 Variables of the Study

a-Explanation of Variables

The study follows the frame work of Rajan and Zingales, (1995) and Shah and Hijazi (2005) and uses tangibility of assets, firm size, profitability, taxes, liquidity, cost of debt and non debt depreciation of the firm as independent variables to examine the degree of leverage. We present the description of these variables and their measurement in this section.

3.3.1 Leverage (LG) :Dependent Variable

The existing literature gives different proxies for the measurement of leverage. Titman and Wessels (1988), Rajan and Zingales (1995) used market value based and book value based measures of leverage. Market value of Leverage is calculated by dividing the book value of debt by book value of debt and market value of equity where as book value of leverage can be calculated by dividing the book value of debt by book value of debt and book value of equity. The present study uses book value measure of leverage as it is easy to calculate and in the case of bankruptcy; book value of debt is taken into consideration. Secondly the market value of debt

does not affect the tax shield (Banerjee et. al. 2000) and is immaterial in affecting the payment of debt and generating the cash saving through tax shield.

In Pakistan, short term debt financing is easier than long term debt financing as the average size of firm is either small or medium and short term financing is cost effective and technically feasible (Shah and Hijazi, 2004). The major source of debt financing in Pakistan are commercial banks and now bond market and term finance certificate are growing rapidly. Booth et al (1999) pointed out that the use of long term financing was not as common as the short term financing.

3.3.2 Tangibility of Assets (TG):Independent Variable

The firms having large amount of fixed assets can obtain loan easily as the long term assets are used as collateral for security. Bankers may offer lower rate of interest to firms having large portfolio of fixed assets. The tangibility of assets is positively related with leverage. The present study takes gross fixed assets as numerator to have uniformity in the data as different firms use different methods of depreciation. Secondly, the firm can mortgage fully depreciated assets.

3.3.3 Firm Size (SZ)

There are controversial point of views about the relationship of size and leverage of a firm. Bankruptcy costs do not affect the debt financing decision of large size organization as those costs are fixed and do not form the major proportion of the value of the firm. Titman and Wessels, (1988) argued that the large firms have less chances of bankruptcy as they are diversified, therefore, a positive relationship is expected between size and leverage of a firm. Rajan and Zingales,(1995) argued that the possibility of under pricing of new equity is reduced due to less asymmetric information about the large firms, encourages to use equity financing. It indicated size and leverage are negatively related.

3.3.4 Profitability (PF)

Debt financing is attractive for firms due to tax shield. According to the trade off theory, when a firm has higher profitability, it will issue further debt to reduce its tax burden but the pecking order theory assumes that the firms choose to use retained earnings to finance its operation and growth needs. When retained earnings are not sufficient to cater the need, the firm moves towards debt financing and equity is the last resort for the firm. Titman and Wessels (1988), Rajan and Zingales (1995), Booth et al (2001) found a negative relationship between leverage and profitability in emerging countries.

3.3.5 Tax Provision (TX)

All researchers believe that tax provision influences debt equity ratio. Higher rate of tax encourages profitable firms to opt for high gearing to obtain tax shield. There are theoretical and empirical arguments that the tax shield of debt financing induces the firms to get more debt to maximize the value of the firm. However, Miller (1977), Fama and French (1998) found no evidence in supporting tax benefits of debt financing. Barclay and Smith (1995) and Graham (2000) found mixed results for tax shield of debts.

3.3.6 Non Debt Tax Shield (NDTS)

The non debt tax shield consists of depreciation charges and investment tax credit. De Angelo and Masulis (1980) examined that tax shield on depreciation can be replaced by tax benefits of debt financing. Therefore, a firm with larger amount of non debt tax shield is expected to use less amount of debt. Heshmati (2002) argued that firms get tax saving for debt financing and non debt tax shield due to depreciation expenses reduce the use of debt financing. There is a negative relationship between leverage and non debt tax shield.

3.3.7 Liquidity (LQ)

Profitability and liquidity of firms is an indicator of their ability to pay off interest and original amount of debt (Brennan and Schwartz, 1984). Signaling theory suggest that debt financing

gives signal of positive cash flow to investor. Pecking Order Theory explains that firm favor internal funds for financing the growth and business operations, then chooses debt financing if internal funds are not sufficient and equity financing is considered last resort due to high flotation cost.

3.3.8 Cost of Debt (CD)

Interest is the cost which a firm has to pay to use the money for investment and business operation. According to Static Trade off Theory, the behavior of the firm is affected with the increase and decrease in cost of debt. There are advantages of using debt financing in the form of tax saving and cost of debt is in the form bankruptcy and agency costs. To take the benefit of tax saving, the firm will get maximum loan for business financing but high debt investment will take the firm to bankruptcy and to avail the tax saving, the firm must be in profits otherwise, the firms in business losses can not avail tax savings. The financial distress cost is of two types.

4. Analysis

The descriptive analysis of each variable affecting the debt equity level of the sample firms in terms of mean, maximum, minimum, standard deviation is made to see the variation of data for Automobile Sector of Pakistan. We have explained the behavior of industry specific variables selected for the present study.

Table 4.1 shows that the highest mean value of size 20.81 where as the profitability has 0.12 which is the lowest value. The current assets to current liabilities ratio has highest standard deviation of 3.12 where as the profitability has the lowest standard deviation of 0.17.

To check the degree of correlation and direction of relationship between the independent and dependent attributes of capital structure choice, the spearman's correlation is run using SPSS.

Table 4.2 indicates that the highest correlation is between liquidity and leverage with the coefficient value of 0.701 which is significant at 0.01 confidence level. There is no multicollinearity problem in our selected variables.

Table 4.3 presents the summary of the influences of independent variables on debt equity ratio. The independent variables influence the leverage by 29.3%. Tangibility is positively influencing the leverage and is consistent with Static Trade off Theory with coefficient value of 0.083 which is not significant. The firms of Automobile sectors with large asset structure prefer debt financing to avail the benefits of tax shield. Profitability is negatively related with leverage with coefficient value of -0.609 which is significant at 1% confidence level.

The profitable firms of Automobile Sector prefer to use retained earnings for financing the projects first and then debt financing if further funds are required and consider equity financing as a last resort. The behavior of firms in Automobile Sector is following the Pecking Order Theory.

Taxes are having positive relationship with leverage with coefficient value of 0.025 which is statistically significant, showing that the increase in tax provision encourages the firm to go for debt financing to avail the tax shield which is following the Static Trade off Theory. The non debt tax shield is negatively related with leverage and is insignificant which is consistent with literature, showing the firms having high depreciation expenses do not prefer debt financing as depreciation itself provide tax shield to firms. The liquidity variable has negative relationship with leverage which is statistically significant, showing that liquid firms prefer internal resources for financial needs and is consistent with theoretical model of Pecking Order Theory.

Cost of Debt is negatively related with leverage and is statistically insignificant, indicating that the firms having high cost of debt avoid debt financing which is consistent with Static Trade off Theory. The size is positively related with leverage and is insignificant, reflecting the behavior

of large firms in Automobile Sector for debt financing as the bankruptcy costs form a small portion of the total value of the large firm and there are less chances of bankruptcy for larger firm.

5. Conclusion

There are two main theories which affect the determinants of capital structure of firm either positively or negatively. The first one is the Trade off theory which elaborates the tradeoff between the cost of bankruptcy and benefits of tax shield. The second is pecking order theory, introduced by Myers and Majluf (1984).

The behavior of firms in Automobile Sector indicates that they avail the cash saving through tax shield by debt financing and increase in depreciation does not encourage the firms for further debt financing, supporting the static trade off theory. Non debt tax shield, liquidity and cost of debt variables are negatively related to leverage and are consistent with the results of previous researches. The firms with better liquidity position prefer equity financing than debt investment in the business and the results are significant, supporting the pecking order theory. The study indicates some policy implications for the managers and investors of firms in this sector. The large firms of Automobile Sector having good asset structure should finance their growth and current operations by debt financing and the firms with increasing cost of debt should use retained earnings to meet the financing needs, followed by equity financing if further funds are required.

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Annexure

Table 2.1 Summary of Expected Results

Determinants	Proxy used in this study	Expected relationship
Tangibility of Assets	Total Gross Fixed Assets/ Total Assets	Positive
Size of firm	Log of Total Sales	Positive
Profitability	EBT/ Total Assets	Negative
Taxes	Tax provision/ Net profit before taxes	Positive
Non-Debt Tax Shield	Depreciation / Total Assets	Negative
Liquidity	Current Assets/ Current Liabilities	Negative
Cost of Debt	Interest before Tax/ Long term debts	Negative

Table 4.1 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Leverage	110	.00	1.69	.5894	.32529
Tangibility	107	.00	2.00	.5977	.38459
Profitability	110	-.31	1.00	.1190	.17327
Taxes	110	-1077	24.82	.4388	2.36748
Liquidity	107	.18	31.64	1.8741	3.11880
Cost of Debt	106	.00	3.04	.3463	.52405
Size	110	.00	24.65	20.8123	2.90611
NDTS	104	-.02	.08	.0271	.01845

Table 4.2 Spearman’s Correlation Coefficient Analysis

		LG	TG	PF	TX	NDTS	LQ	CD	SZ
Leverage	Correlation Coefficient.	1.000	.089	-.292**	.005	.084	-.701**	.034	.098
	Significance	.	.361	.002	.962	.394	.000	.728	.307
Tangibility	Correlation Coefficient.	.089	1.000	-.444**	-.260**	.537**	-.361**	.114	-.602**
	Significance	.361	.	.000	.007	.000	.000	.247	.000
Profitability	Correlation Coefficient.	-.292**	-.444**	1.000	.414**	-.081	.477**	.160	.528**
	Significance	.002	.000	.	.000	.412	.000	.102	.000
Taxes	Correlation Coefficient.	.005	-.260**	.414**	1.000	-.037	.184	.179	.540**
	Significance	.962	.007	.000	.	.710	.057	.067	.000
NDTS	Correlation Coefficient.	.084	.537**	-.081	-.037	1.000	-.174	.312**	-.086
	Significance	.394	.000	.412	.710	.	.077	.001	.387
Liquidity	Correlation Coefficient.	-.701**	-.361**	.477**	.184	-.174	1.000	-.117	.189
	Significance	.000	.000	.000	.057	.077	.	.235	.051
Cost of Debt	Correlation Coefficient.	.034	.114	.160	.179	.312**	-.117	1.000	.103
	Significance	.728	.247	.102	.067	.001	.235	.	.295
Size	Correlation Coefficient.	.098	-.602**	.528**	.540**	-.086	.189	.103	1.000
	Significance	.307	.000	.000	.000	.387	.051	.295	.

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

Table 4.3 Regression Analysis

Variable	B	Std. Error	t value	Significance
(Constant)	.426	.364	1.170	.245
Tangibility	.083	.125	.667	.507
Profitability	-.609	.177	-3.448	.001
Taxes	.025	.011	2.207	.030
Non-Debt Tax Shield	-.465	1.918	-.243	.809
Liquidity	-.032	.010	-3.264	.002
Cost of debt	-.073	.055	-1.321	.190
Size	.014	.015	.905	.368