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CAPITAL STRUCTURE AND PROFITABILITY: Case of Islamabad Stock Exchange

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Capital Structure refers to the various financing options of the assets by a firm. A business concern can go for different levels of the mixtures of equity, debt and/or other financial facilities with equity having the emphasis on maximizing the firm's value. Capital Structure affects the liquidity and profitability of a firm. In our research we have tried to examine the effect of Capital Structure on the profitability of firms listed on Islamabad Stock Exchange. In this regard we have selected a sample of 94 non financial firms for a period of six years from 1999 – 2004. The data is collected from the financial statements (Annual Reports) of these 94 non financial firms. For analysis purpose, we have used Pearson's correlation, and regression analysis. Pooled ordinary least square model is used in the estimation of a function relating to the Net operating profitability with the independent variables including Debt Ratio, Long Term Debt to Liabilities, Equity to Liabilities and size of the Firm measured in terms of natural logarithm of sales. The results indicate that the capital structure of the non financial firms listed on Islamabad Stock Exchange has a significant effect on the profitability of these firms. If these firm want to increase their profitability, they will have to give due consideration to the financing mix, otherwise it may suffer from losses.

Area of Research: Corporate Finance

1. Introduction

Capital Structure refers to the various financing options of the assets by a firm. A business concern can go for different levels of the mixtures of equity, debt and/or other financial facilities. This may be lease financing, term financing, debentures, direct loans from bank etc with equity having the emphasis on maximizing the firm's value. Not all the firms use a standardized capital structure they differ in their financial decisions in various terms. It is a difficult decision for the firms to determine the capital structure in which risk and cost is minimum and can give high profits, and therefore can increase the value of share holders. This difference of choices about the financing decisions gives rise to the various capital structure theories.

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These theories try to justify and explain the differences of the capital structure across regions and/or over times. Empirical studies dealing with capital structure are not recent (Taggart, 1977; Marsh, 1982; Jalilvand and Harris, 1984; Titman and Wessels, 1988). The latter authors made a significant contribution in formulating and testing the determinants of the capital structure as identified by theory. There are other studies, which have addressed the nature of capital structure decisions, Marsh (1982), Harris and Raviv (1991), Rajan and Zingales (1995), Chirinko and Singha (2000) and Frank and Goyal (2003). The most famous theories which present a clear direction and firm behavior about debt and capital structure are trade off theory and pecking order theory.

According to Tradeoff Theory (TOT) by Miller, (1977) if firms are more profitable they prefer debt financing as compared to equity for the sake of profit. It is driven by three forces. First more debt in a firm's capital structure allows more tax benefits as their tax liabilities come lower and even in some cases it is waved off. So firms having more profits go for more debt rather equity. Secondly if a firm has low profit than there are greater chances of bankruptcy. So, if the firm takes more debt there are more chances that it is bankrupt and as a result of this investor cannot trust on it. Alternatively, if firm have more profits there are less chances of bankruptcy so investor trust and firm tend to be earn more profit. Third force is the agency cost which has to be borne by investor or shareholder. It is a cost which is in form of interest rate because creditor always check the position of the company and monitor the management so if firm has good image than it can get loan at lower cost because creditors are not worry about bankruptcy and there agency cost is very low. Ju, Parrino, Poteshman and Weisbach, (2005) Highlighted that Miller, (1977) characterizes the discrepancy by comparing the trade-off between tax gains and bankruptcy costs as "like the recipe for the fabled horse-and-rabbit stew – one horse and one rabbit".

According to Pecking Order Theory (POT), developed by Myers and Majluf, (1984) and Myers, (1984), firms having high profits they attain low debt because when firms are more profitable their first priority is to generate financing through internal resources which means that companies generate financing through retained earnings because it can maximize the value of existing share holders. If retained earnings are not sufficient, the firms go for debt and if further financing is required, they issue equity. The retained earning is preferred because it almost has no cost, but if the external resources are used for financing like issuance of new shares it may take very high cost. The POT is a result of information asymmetries existing between insiders of the firm and outsiders. The model leads managers to adapt their financing policy to minimize the associated cost. It means that they will prefer internal financing to external financing and risky debt to equity.

An important issue that despite the large tax advantage enjoyed by debt, why the firms have low leverage ratios. This issue aggravated the early research on agency theory (Jensen and Meckling, 1976 and Myers, 1977), work on information asymmetries (Myers and Majluf, 1984), (Miller, 1977; Myers, 1984; and Leland, 1998), and (Graham, 2000). The conclusion of all above studies is that only bankruptcy costs alone is too small to offset the value of tax shields, and it is also concluded that agency costs must be included into the cost-benefit analysis to explain capital structures.

In both theories investment opportunities tend firms to use less debt. As the capital structure has many dimensions such as leverage, size, growth, it is very difficult to state that which proportion is the best to maximize the firm's value to the share holders. There is no final decision that profits have positive relations with debt or retained earnings. It is still debatable. However, uniqueness of the firm's product also influences the capital structure of the firm. As due to the uniqueness of the products the availability of substitutes for liquidation of such firms is a bit difficult. In addition the industrial classifications also impact the capital structure as the variety of intensity of the basic factors may also influence the structure. Furthermore, the duration of financial requirements also induces firms to go either for debt or equity. As in the case of long-term endeavors the firms may prefer equity and find it cheaper compared to the debt, while on the short-run the debt is more convenient as financing alternative.

This study is an endeavor to know the relationship between capital structure & profitability of non-financial firms listed on Islamabad Stock Exchange because there are number of studies on the determinants of capital structure but as far as the impact of capital structure on profitability is concerned they are few.

1.1. Objectives of Study

The objective of our research is to make effort to know the relationship between Capital Structure and profitability for non financial firms listed on Islamabad Stock Exchange for period 1999-2004 in Pakistan. The principal objective of our research is to find out the relationship between capital structure and profitability for non financial firms listed on Islamabad Stock Exchange. The relationship of debt financing, long term debt, equity financing and size on the profitability of non financial firms listed on Islamabad Stock Exchange will also be estimated.

1.2. Limitations of Study

We have used the data for the year 1999 – 2004 for non financial firms listed on Islamabad Stock Exchange. The data prior to this period was not available in Islamabad Stock Exchange. So we remain limited to these six years. In addition the annual reports for all the selected firms were not available for year 2005 which restricted our period to 2004. There are 264 firms listed on Islamabad Stock Exchange including 135 non financial firms. The data for all non financial firms was not available on Islamabad Stock Exchange which restricted our sample to 94 non financial firms.

This study is organized as follows:

Section two reviews the literature for the relevant theoretical and empirical work on capital structure and its effect on profitability. Section three presents the methodology and framework which includes sample and the variables used in the empirical analysis. Section four portrays and discusses the data analysis, discussion and statistical results. Section five presents the conclusion.

2. Literature Review

Review of the literature is aimed on grouping and assessment of what endorsed researchers have written on a topic, organized in a manner which addresses the research objective. Many researchers have studied capital structure from different views and in different environments. The following ones are very interesting and useful for our research:

Christopher, Schafer and Talavera, (2006) focus that there is strong effect of short term and long term debt on profitability and according to them the organization which prefer to financing through long term debt has low profitability and alternatively if firm use short term financing, it earns more profits. In this study they take data from 1988 to 2000 period and proved the hypothesis that the firms using short term financing are relatively more profitable than the firms using long term debt.

Buferna, Bangassa and Hodgkinson, (2005) report that the theories, static trade-off theory and agency cost theory are applicable on the capital structure of the companies in Libya. However, they further reveal that a very little evidence is there to support the theory of asymmetric information. They are of the view that in developing countries the secondary market lacks in many cases which affect agency cost, as the shareholders cannot offload and exert more pressure on management to work for their interests. They conclude that the equity agency cost is the main reason of conflict between shareholders and debtors which is more problematic for private companies. They further support the importance

and application of agency cost theory for private companies in their capital structure decisions.

Pandey, (2004) explains the relationship between (capital structure and market structure) and (Capital Structure and Profitability). The results suggest that the capital structure and market structure have cubic relationship that at lower and high range of Tobin Q ratio (sum of market value of equity and book value of long term debt and net current assets divides by book value of equity and book value of long term debt and net current assets) firms are using high debt and at medium range they use less debt. This is due to agency cost and bankruptcy costs because when firms take more debt there are chances of bankruptcy because the firms might not able to repay the debt in future. Regarding relationship between profitability and capital structure they conclude that there is a saucer-shape relationship between capital structure and profitability because of the interplay of agency costs, costs of external financing and the interest/tax shield. In addition to this they also conclude that other independent variables like size and tangibility has a positive influence while growth, risk and ownership have a negative influence on capital structure.

Andrea and Mateus, (2003) while going through an empirical research on capital structure choices follow the Booth et. al. (2001) which is evident of the fact that the capital structure decisions of firms in developing countries are influenced by the same variables as in the developed countries. They have tested the same variables for Portugal and Hungary where firms decide to have a combination of debt/equity in their capital structure. They reveal that although these factors are the same but differ to some extent because the ratios are affected by country factors like inflation, status of capital market, growth rates of the country. They also embark upon the verification of the Pecking – Order theory, asymmetric information, and agency costs theories and concluded that the more profitable companies have lower debt ratios which conform to the Pecking-Order theory.

Drobetz and Fix, (2005) discuss the determinants of capital structure and two hot issues Trade off theory and Pecking order theory. In trade off theory there are three main factors, agency cost, tax Shields, bankruptcy Cost. Due to these three factors more profitable firms use more debt. In pecking order theory more profitable firms use less debt because firstly they use retained earnings then use debt and at third option they use equity financing. They are of the view that if investment opportunities are more than after using retained earnings the firms should use debt otherwise no need to take debt. For Chinese firms their findings are in favor of Pecking order model and against the Trade off theory.

Eriotis, Frangouli and Neokosmides, (2002) investigate the relationship between debt to equity ratio and firms profitability. They have considered the level of firm's investment and the degree of market power. The results

of the study shows that those firms who prefer to finance the investment activities using the equity are more profitable than firms who finance by

using borrowed capital. They further conclude that firms do compete with each other instead of cooperating each other.

Voulgaris, Asteriou and Agiomirgianakis, (2002) investigate the determinants of capital structure of LSEs in the Greek manufacturing sector. The findings suggest that asset utilization, gross and net profitability and total assets growth has a significant effect on the capital structure of LSEs. They have also suggested that in order to improve their capital structure, Greek manufacturing LSEs need to achieve higher asset utilization and profit margins through economies of scale by increasing exports. They have also suggested that govt. should focus on alleviating taxation, reducing bureaucratic burdens, minimizing market imperfections and subsidizing applications of new technology.

Hadlock & James, (2002) evaluating the financial slack provided by the banking system to the companies report that the decision of financing of assets either though debt or equity is influenced by the market evaluation of the shares confirming the pecking order hypothesis. After analyzing the financing decision of 500 non financial companies, Hadlock and James conclude that the firms chose bank financing because market interprets the loan as a positive step because companies prefer that financing which results high return.

Mesquita and Lara, (2003) have studied the relationship between capital structure and profitability of the Brazilian Firms. They are of the view that there is a difficult decision that whether company should use debt or equity and this decision become more difficult when a company is operating in an instable environment and this problem occur largely in Brazil. They have tried to examine the affects of debt or equity on profitability. Ordinary least square method was used to examine the effect of short and long term financing on return on equity. They have concluded that in short run there is a positive relationship while in the long run there is inverse relationship between debt and profitability. On the other hand the market also interpret this as positive sign that company is anticipating more returns so resultantly the price of the share goes up. Because if firm need resources in short term than it try to take loan and have no intention to raise equity due to the cost of raising equity which is greater than the debt. But due to high interest rate in Brazil in long run debt becomes more costly as compare to the equity.

Booth, Aivazian, Demirguc-kunt and Maksimovic, (2001) highlighted that Capital Structure in Developing Countries has assessed the portability of capital structure theories across the countries with different structures of institutions. After analyzing the firms of 10 countries they reveal that the

same variables are pertinent in making decisions of capital structure across the countries irrespective of the fact that the countries have different structure of institutions and development stages. However, there are country factors at work which create differences in the outcomes of the

decisions of capital structures of the firms. They conclude that however, some modern financial management theories of capital structure are portable across the countries but most of the things are to be done at local levels which are quite different due to the structure and country factors like growth rate, inflation, and others.

All the above studies provide us a solid base and give us idea regarding capital structure and profitability. These studies also gives us the results and conclusions of those researches already conducted on the same area for different countries and environment from different aspects. On the basis of these researches done in different countries, we have developed our own methodology for research.

3. Framework & Methodology

The purpose of this study is to make effort to know the relationship between the capital structure and profitability of the firms listed on Islamabad Stock Exchange.

3.1. Sample & Source of Data

There are 264 firms listed on Islamabad Stock Exchange including 135 non financial firms. The data for all non financial firms was not available on Islamabad Stock Exchange which restricted our sample to 94 non financial firms. The data used in this research is obtained from the annual reports of 94 non financial firms listed on Islamabad Stock Exchange including firms from different sectors of our economy. The major sectors included in the study are textile spinning, textile composite, power generation and distribution, oil and gas, chemical and pharmaceutical, paper and board, cement and sugar etc. Because of the specific nature of their activities, firms in financial sector, banking and finance, insurance, leasing, modarabas, business services, renting and other services are excluded from the sample. These annual reports were collected from Islamabad Stock Exchange for a period 1999 to 2004.

3.2. Variables

To assess the profitability of the firms, Net Operating Profitability (NOP) is used as Dependant variable; it is calculated by dividing the Net Profitability plus depreciation by the total assets. The following variables are used as Independent variable for regression: Debt Ratio (DR) is calculated by dividing total debt of a firm by its total assets, Long term debt to total

liabilities (LTDTL) is used to see the long term debt financing by the firm, and Shareholders equity to total liabilities (SHETL) for representing the equity financing and Natural logarithm of sales (LOS) for size of the firm. These variables have been commonly used in previous studies to explain the relationship between capital structure and profitability.

3.3. Hypotheses Testing

In this part of our paper we develop our research hypotheses. We have made a set of hypotheses to show the effect of capital structure on the profitability.

Our first hypothesis is;

H_{o1} Firms with high %age of debt are more profitable
H_{11} Firms with high %age of debt are less profitable

Our second hypothesis is;

H_{o2} Firms with more long term debt are more profitable
H_{12} Firms with more long term debt are less profitable

Our third hypothesis is;

H_{o3} Firms with high equity to total liabilities are less profitable
H_{13} Firms with high equity to total liabilities are more profitable.

Our fourth hypothesis is;

H_{o4} Firms having big size are less profitable
H_{14} Firms having big size are more profitable

3.5. Types of Analysis

Descriptive and quantitative analysis is used for this research. Descriptive analysis presents mean, standard deviation, maximum and minimum value for each variable used in the study. In quantitative analysis, Pearson's correlation and regression analysis is used.
In regression analysis pooled ordinary least square is used to investigate the relationship and also to prove the hypotheses. It features a wide variety of tools designed to facilitate working with panel or pooled/time series-cross section data.

3.6. Model Specifications:

$$NOP_{it} = \beta_o + \sum_{i}^{n} \beta_i X_{it} + \varepsilon \qquad \ldots\ldots\ldots\ldots\ldots\ldots \text{(Eq. 1)}$$

NOP_{it} = The measure of profitability of a firm i at time t
β_o = The intercept of the equation

β_i = The change co-efficient for X_{it} variables

X_{it} = The different independent variables for leverage of a firm i at time t

i = the number of the firms i.e. i = 1, 2, 3….N (in this study N= 94 firms)

t = The time period i.e. t = 1, 2, 3…T (in this study T = 6 years)

The above general least square equation with specified variables will be as follow the equation will be:

$$NOP = \beta_o + \beta_1(DR_{it}) + \beta_2(LTDTL_{it}) + \beta_3(SHETL_{it}) + \beta_4(LOS_{it}) + \varepsilon \qquad \text{(Eq. 2)}$$

NOP = Net Operating Profitability
DR = Debt Ratio
LTDTL= Long term debt to total liability
SHETL = Shareholder's Equity to total liability
LOS = Natural log of total sale

ε = corresponds to error term

4. Data Analysis & Discussion

The results of descriptive and quantitative analysis are presented below. The first table shows the results of descriptive analysis which include the mean, standard deviation, minimum and maximum value for each variable included in the study.

The descriptive Statistics of variables used in this study are presented in Table 1

Table 1
Descriptive Statistics
94 Pakistani Non - financial firms, 1999-2004, 564 firms – year observations

	N	Minimum	Maximum	Mean	Std. Dev.
NOP	564	-.466	.684	.133	.115
DR	564	.092	3.720	.732	.433
LTDTL(LTD/TL)	564	.000	.917	.219	.241
SHETL(SHE/TL)	564	-1.273	18.232	1.144	2.048
SIZE(LOS)	564	14.728	25.873	20.857	1.673

Source: Calculations Based on Annual reports of firms from 1999-2004

In the above table Net operating profitability has a mean value 0.133 with a deviation from the mean value by .115. The maximum profitability for a firm in any year is 68% while the minimum is -46%. To check the debt financing and its relationship with the profitability the debt ratio (obtained by dividing the total debt of the company by the total assets) is used. The results of descriptive statistics show that the average debt ratio for the firms listed on Islamabad Stock Exchange is 73% with a standard deviation of 43%. The maximum debt financing used by a company is

372% which is unusual but may be possible if the equity of the company is in negative. The minimum level of the debt ratio is 9%. The long term debt to total liabilities indicate that on average firms use 22% of long term debt in their liabilities with a standard deviation of .241. To check the size of the firm and its relationship with profitability, natural logarithm of sales is used.

Size of the firm also indicates that whether it should go for debt or equity financing. The mean value of log of sales is 20.83 while the standard deviation is 1.70. The maximum value of log of sales for a company in a year is 25.87 and the minimum is 14.73.

4.1. Correlation analysis

In our analysis we used correlation as a tool of statistics to see the relationship between capital Structure and profitability. The results of correlation analysis are discussed in table 2

The correlation for debt ratio with profitability is -.434 which reveals that the two variables negatively correlated with each other meaning thereby that if one variable increase the other decreases and it is significant at 1%. The result for the relationship of long term debt with profitability is negative and the correlation coefficient is -.228 and it is also significant at 1% level of significance.

		LOS	DR	LTDTL (LTD/TL)	SHETL (EQ/TL)	NOP
LOS	Pearson Corr.	1				
	Sig. (2-tailed)	.				
DR	Pearson Corr.	-.203(**)	1			
	Sig. (2-tailed)	.000	.			
LTDTL(LTD/TL)	Pearson Corr.	.010	.335(**)	1		
	Sig. (2-tailed)	.810	.000	.		
SHETL(SHE/TL)	Pearson Corr.	-.159(**)	-.546(**)	-.345(**)	1	
	Sig. (2-tailed)	.000	.000	.000	.	
NOP	Pearson Corr.	.267(**)	-.434(**)	-.228(**)	.021	1
	Sig. (2-tailed)	.000	.000	.000	.623	.

Table 2
Pearson Correlation Coefficients
94 Non - financial firms, 1999-2004, 564 firms – year observations

**Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

Notes: 1- Net Operating Profitability (NOP) = (Net Income + Depreciation) / Total Assets. 2- Debt Ratio (DR) = Total Debt / Total Assets. 3- Long term debt to total liabilities (LTDTL) = Long term debt / Total debt. 4- Equity to total liabilities (SHETL) = Share holders equity / Total debt. 5-Size (LOS) = Natural logarithm of sales.

The correlation among the equity to total liability with profitability is weak and comes to the level of .021 but has a positive sign which means that the variables have direct correlation with each other but is not significant. The correlation between size of the firm and profitability is .267 positive

which means that with the growing size of the firm the profitability increases. It is also significant at 1% level of significance.

4.2. Regression Analysis

This regression is estimated using the pooled least squares method. The results are shown in Table 3.

Table 4.3
Pooled Ordinary Least Square
94 Non - financial firms, 1999-2004, 564 firms – year observations
Dependent Variable: NOP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.1055	0.0603	1.7492	0.0808
DR	-0.1381	0.0122	-11.2693	0.0000
LTDTL	-0.0749	0.0184	-4.0671	0.0001
SHETL	0.0168	0.0025	6.5298	0.0000
LOS	0.0078	0.0026	2.9615	0.0032
R-squared	0.286670	F-statistic		56.1620
Adjusted R-squared	0.281565	Prob(F-statistic)		0.0000

Notes: 1- Net Operating Profitability (NOP) = (Net Income + Depreciation) / Total Assets. 2- Debt Ratio (DR) = Total Debt / Total Assets. 3- Long term debt to total liabilities (LTDTL) = Long term debt / Total debt. 4- Equity to total liabilities (SHETL) = Share holders equity / Total debt. 5-Size (LOS) = Natural logarithm of sales.

The results of this regression indicate that the coefficient of debt ratio is (-.138) negative and is highly significant at ά. = 1%. It implies that the increase or decrease in debt ratio will significantly affect the profitability of firms. It means that if leverage of the firms increases, it will adversely affect its profitability.

The results for Long term debt to total liabilities (LTDTL) are quite significant. The regression coefficient is (-.075) means there is inverse relation between the long term debt and profitability. If the firms will keep on increasing the long term debt it will lead to decrease the profitability as the long term debt financing is always costly.

The result for shareholders equity to total liabilities is also significant and there is positive relationship between (SHETL) to net operating profitability. The coefficient is (.017) and is highly significant at ά. = 1%. It means if the firm increases there equity financing it can increase its profitability.

Similarly log of sales used as proxy for size of a company shows a significant positive relationship with profitability which means that bigger size firms have more profitability compared to firms of smaller size.

The adjusted R^2, also called the coefficient of multiple determinations, is the percent of the variance in the dependent explained uniquely or jointly by the independent variables and is 28.16%. The C is the constant, where

the regression line intercepts the y axis, representing the amount the dependent y will be when all the independent variables are 0. Finally we discuss intercept which is constant in this case the intercept is 0.106. The F statistic is used to test the significance of R. Overall; the model is significant as F-statistics is 56.16.

5. Conclusion

We conclude in a fashion that firstly there is negative relationship between the long term debt and profitability verifying our first hypothesis which means that firms with having more long term debt are less profitable. This can be attributed to the interest cost bear by the company for a long term debt financing, which increase the fixed costs of the product and resultantly decrease the profitability.

Secondly our numeric verifications and statistical analysis shows negative relationship between net operating profitability and debt ratio which verify our second hypothesis and it was also proved by the Jose Marcos in his study.

Thirdly the relationship of profitability with %age of equity in the total financing has direct relationship meaning thereby more equity leads to more profits. This is also in consistency with our first hypothesis where more long term debt lead to less profitability hence the third Hypothesis stands proven.

Fourthly size with profitability numerical calculations have accepted our fourth hypothesis that with the increase in size of the firm the profitability increases. As we have taken the N-log of sales as our proxy for growth in size and the increase in sales result in more profits.

Our results are consistent with (Christopher, Schafer and Talavera, 2006), (Andrea and Mateus, 2003), (Voulgaris, Asteriou and Agiomirgianakis, 2002) and Mesquita and Lara etc.

So the war between pecking order theory and trade off theory for the non financial firms listed on Islamabad Stock Exchange has been won by the first one which is pecking order theory that the firms having more profitability tend to use less debt in their financing decisions and the firms having less profit are influenced to have more debt.

This study is done on one of the smallest stock exchange of Pakistan. There is lot need to be done on capital structure for firms listed on Karachi Stock Exchange. Future researches can be done on the determinants,

effects of capital structure on ratings of Pakistani firms and how to balance the capital structure of Pakistani firms.

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