

Capital Structure and Its Determinants: A Case of Cement Sector in Pakistan

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Abstract

The underlying study is regarding the capital structuring of the cement sector companies listed in KSE (Karachi Stock Exchange). The study analyzed 10 out of 20 firms in the cement sector for a data period of 2006-2011 by using panel data. A total of 4 explanatory variables i.e. profitability, tangibility, firm size and growth were used as explanatory variables of the study and to know their relation with leverage. The study results shows that profitability have a significant and negative relationship with the leverage with supports the assumptions of Pecking Order Theory (POT) theory.

INTRODUCTION

In financial management, capital structure is the approach followed by a corporation to finance its long term operations and growth through debt and equity. Debt is the amount of money owed by the borrower for funds and equity represents the difference among the value of assets and liabilities. Capital structure is a measure adopted to evaluate the financial strength of a firm but firms vary with each other in their capital structures which results in the formulation of many theories built by the researchers in this regard.

Modigliani and Miller (1958) stated that firm's market value is based on its ability to earn revenue and the risk of its underlying assets; its financing operations regarding investments or distribution of dividends are independent. In addition, the theory hypothesized perfect market with zero tax, zero transaction cost and bankruptcy cost, equal borrowing cost, same market information and no effect of debt on earnings but real world doesn't hold all of these assumptions.

It is true that this financial theory is based on false assumptions but it provided a financial base for further research. A number of theories and researches have been formulated on determinants of capital structure and on the performance of the firms after Modigliani and Miller. Three remarkable theories came out to investigate the behavioral arrangements made by the firms with respect to their capital structure include Static Trade Theory and Pecking Order Theory etc.

In case of Pakistan, the first attempt conducted in this manner by Shah and Hijazi (2004) on the determinants of capital structure of stock exchange-listed, non financial firms of Pakistan. The centered focus of their research is to measure the determinants of the capital structure of non financial firms. The study neglected those firms that operates in the financial sector and is limited by data based on years i.e. it uses only six years data. However it seems that the availability of some important explanatory variables if exist in the study could enhanced the results of the research. Moreover, the results indicate strong impact of industry on the capital structure.

The study is conducted to analyze the capital structure of the cement industry and explore the factors that determine the capital structure of cement industry of Pakistan with different independent variables and their effect on dependent variable. The cement industry is selected because it is highly capital intensive industry and huge funds requirement for its expansions are needed and thereby also effects its financial decisions.

THEORITICAL FRAMEWORK

Static Trade-Off Theory

The static trade off theory explains the position of a company in order to balance cost and benefits either it prefer to use debt finance or equity finance. Basically it counterbalances the cost of debt against the benefit of debt. It includes taxes, cost of financial distress and agency cost. Moreover, it describes that a firm makes tradeoff in costs and benefits to optimize its market value and financed partly with debt and partly with equity.

Pecking Order Theory

The Pecking order theory explains three sources of firms financing when determined its capital structure. First preference to finance itself is internally that is through retained earnings. If it fails to finance through earnings, it preferred to finance through debt for instance it can apply for a bank loan. Finally issuance of equity is the last resort attempted by the company for financing. The reason behind issuance of equity is asymmetric information between the managers and stake holders. Managers are well informed by the company's strategies, risk and value than stakeholders therefore it will lead to under pricing. Stake holders or investors place a condition that stock will issue only when it is overpriced. As a result there is a drop in the share price of newly issued equity or they

might sell at a discount price. The matter could be solved if the firm chooses to finance internally means by retained earnings.

Myers (1997) explore that firms hesitates to issue equity because they have a fear of wealth transfer to debt holders while Myers and Majluf (1984) suggests that firms are unwilling in issuing equity because of adverse selection problem.

(Goyal, 2005) conducted a survey of corporate debt financing among private firms, small firms and large firms. For the explanation of debt financing taxes, bankruptcy costs, adverse selection and agency conflicts, all these ideas are taken from the static trade off and pecking order theory of leverage. Direct and indirect cost played a vital role in explaining firm decisions regarding debt. The evidence showed that private firms rely on retained earnings and bank debt heavily, small firms goes for equity financing and large firms uses retained earnings and corporate bonds.

(Li-Ju Chen, 2009) analyze the capital structure through Pecking Order theory. The objective of the study is to find out the most important determinants affecting the capital structure of the firms through pecking order theory. In analysis, hierarchical regression model is applied to investigate the decisions in debt determinants, carryout for 305 Taiwan electronic companies listed in Taiwan Stock exchange. Three determinants of capital structure explore which are profitability, growth and size as a mediator variable. The results specify negative effect of profitability on capital structure means that firms use earnings to finance business activities and rely rarely on debt capital where as growth affects capital structure positively which means that large number of growth opportunities leads to more capital based external funds, and more growth. Size of firm's acts as a midway path in between tax rate and capital structure thus showed that tax rate affect positively leverage. Large firms due to lower asymmetry information take advantage of tax deductibility of debt and in turn lift up their capital through formal institution hence get more diversified with lower risk.

(Atiyet, 2012) attempted to investigate the capital structure theory and compared the explanatory power of the Pecking Order Theory and Static trade-off theory. The study use panel data consist of period 1999-2005 of French firms established in the stock exchange. The empirical evidence conducted for the financial structure of the French companies' supports pecking order theory while static trade off theory fails to explain the issuance of debt in French companies. Moreover, the most important determinant to explain the issuance of debt from the pecking order theory is the internal fund deficit. The evidence from the target adjustment model explains the deviations of the current ratio from the target through making changes in the debt ratio.

(Ghazouani, 2013) conducted to investigate the capital structure of Tunisian firms with the implication of trade-off theory. The purpose of the study is to explain the capital structure of the firms and their behavior under the light of trade-off theory. The study applies two models which are not mutually exclusive but complementary; these are static and dynamic model to test the relationship between five independent (Profitability, size, risk, guarantee, growth) and one dependent variable (debt). The results of the static model reveal that profitability and asset structure act as an important explanatory variable for the leverage level of the Tunisian companies. While in case of dynamic order, the results revealed that due to the adjustments of the variables the level of transaction costs are high which means that Taiwan companies are going at a slow rate to reach their optimal ratio.

Both the theories played equal role in the determination of capital structure of firms but pecking order theory is observed to be used most widely used in determining optimal capital structure that a firm desired to achieve.

Research Methodology

This portion highlights the source of data, measuring the magnitude of variables, discussion upon variables and their measurement.

Data source

The study used the six year data from 2006 to 2011, obtained from the "FINANCIAL STATEMENTS ANALYSIS OF COMPANIES LISTED AT KARACHI STOCK EXCHANGE", published by state bank of Pakistan, (2006-2011).

Sampling

The study looks at the cement sector, all the 20 firms data are available but the study only utilizing the 10 firms because of the missing figures of the 10 firms, that is why the study dropped the 10 firms and only conducted analysis upon the remaining 10 firms. So the sample size appearing in this paper is 10, i.e. n=10. The nature of the data is panel, as it incorporate both time series and cross sectional i.e. combination of both.

Dependent variables and Independent variables

The study uses four independent variables, i.e. Profitability, Firm size, Tangibility and Growth of the firm and

one dependent variable “The Leverage”. This portion highlights the descriptive statistics of the variables, their measuring techniques, interpretation and finally compares the obtained results with past studies conducted.

Data Analysis

The study regress the Dependent variable on Independent variables using “Hausman Test” (Random effect model and fixed effect model).

Leverage (Dependent Variable)

Leverage is also some time called debt to equity ratio and is defined as the asset which is financed by debt i.e. debt financing. From this leverage we can assess the capital structure of the firms, greater value of leverage means the firm rely on large amount of debts to finance their expenses while the opposite will be the case for small leverage value. Past studies used different methods for leverage. Frnk and Goyal in 2003 say that difference b/w book value and market value is that the farmer one rely on past situations while the later one is on future situations. Shah and Hijazi in 2005 state that if firms confront with financial distress and become bankruptcy then the book value of the debt will be considered not the market value.

Tangibility (independent variable)

Tangible assets are those assets that can be touched, or simply it is called physical assets, like buildings, machineries, lands, vehicles and so on. In other words those assets that depreciates over time. The opposite of tangible assets are intangible assets like goodwill, patents etc whose amortization is made possible. Firms having large amount of tangible assets have easy access to debts relatively at low rates. It can be calculated as the ratio of fixed assets to total assets. Firms have high ratio of tangible assets can easily obtain loans relatively at low cost so we expect a positive r/ship b/w leverage and tangibility. On the other hand when firms having high ratio of tangible assets they can issue their equity to stockholder for expanding their investment and therefore rely on less debts, so the study expect here a negative r/ship b/w leverage and tangibility.

Profitability (independent variable)

Here two schools of thoughts come in action, one is the Pecking Order Theories (POT) and the other is Static Order Theories (SST). According to POT when the profitability of the firm rises they rely less on debts and uses its retained earnings to finance their expenses and minimize the deficit so negative r/ship is expecting here while on the contrary, according to SST when firm get more profitable then it will be easy for him to issue debts and secure himself from huge tax burdens, so here positive r/ship is exacted in case of SST.

Growth

In 1995 Rajan & Zingales suggest that negative r/ship would be expected b/w Growth and the level of leverage. This r/ship is consistent with Jensen & Mekling (1976) the theoretical predictions which is stood upon **The Agency Theory** and **Myers’s work** (1977), argue that companies with high growth facing positive NPV (net present value) investment opportunities. So therefore Myers argue that companies with high investment opportunities also known as Growth rely less on leverage or debt ratio i.e. low debt ratio / leverage.

Empirical studies regarding this r/ship between leverage and growth are rather mixed. In 1988, Titman & Wessels, Barclay, et al. (1995), Rajan & Zigales in 1995 and in 2004 Shah & Hijazi came with negative correlation while in 1986 Kester did not find any evidence about the predicted negative r/ship between these two variables i.e. Growth and gearing or Leverage. So the relationship observed here is insignificant between leverage and Growth and is similar to the Kester (1986) finding i.e. no r/ship at all.

According to POT point of view the sign of this variable i.e. Growth may be positive or negative depending on the firm behavior. Firms with high growth rate tends to reduce the debt issuance so as to control their credit capacity (negative relationship), while on the contrary firms having high growth require investment so they rely on new debts issuance, (positive impact). The following table shows the obtained statistics and their significance level. All the paremeters are significant at 10% level of significance except the growth which obeys Kester findings (1986), i.e. no significant impact.

Analytical Technique

The study applies panel data for the purpose of regression analysis. Panel data is a multidimensional data which comprises both time series data and cross sectional data. The cross sectional data of company is combined along with time series data in a column after neglecting their effects. As the data is panel, so Hausman Specification test is applied first to check the correspondence of statistical model towards data. Secondly to distinguish between fixed effect model and random effects model. In this case, under the null hypothesis Random effects model is choose due to its higher efficiency while under the alternative hypothesis Fixed effect model is favored due to its consistency.

Regression Model

The observed regression model therefore, will be:

$$LG = \beta_0 + \beta_1(TG) + \beta_2(SZ) + \beta_3(GT) + \beta_4(PF) + e$$

Where

LG = Leverage

TG = Tangibility of Assets

SZ = Size of firms

GT = Growth

PF = Profitability

e = Error term

3. Results and Analysis:

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	8.778853	4	0.0669

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
FIRMSIZE	-0.630481	-0.361849	0.013625	0.0214
GROWTH	0.075391	-0.245251	0.043347	0.1235
PROFITABILITY	-0.022325	-0.037233	0.000053	0.0408
TANGIBILITY	-1.547081	0.318689	0.857008	0.0439

In order to check whether fixed effect model or random effect model is appropriate Hausman test was used. The results of the Hausman test indicated insignificant results at 5% significance level. This mean we cannot reject the null hypothesis or the random effect model is appropriate.

The result of the random effect model shows a significant and negative relationship of profitability with the leverage as the value of beta is negative which supports the assumptions of POT theory and the previous research done by Myers and Mujluf (198). Similarly, the beta value of Growth also show a negative, although insignificant, relationship with the leverage which supports POT theory. The insignificant result may be due to the less number of observations covered. Another explanatory variable; tangibility has a positive relationship with the leverage which is concur with the assumptions STT and POT theories; although its value is insignificant which might be due to aforementioned reason.

Conclusion

The research studied the capital structure determinants as of taking cement sector. For the analysis, it used panel regression through Hausman for fixed effect model and random effect model appropriateness. By keeping in view its statistical results we can conclude that capital structure determinants can play a pivotal role in determining their financing decisions as the study done by taking into account the factors of profitability, tangibility, growth and size of the firm which bring into account by firms in order to meet their financial obligations through debt financing and leverages. Among other variables, the study found that profitability have a significant and negative relationship with the leverage which supports the assumptions of POT and which can also be used as a policy recommendation by the cement industry in Pakistan.

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