Impact of Capital Structure on Profitability: An Empirical Analysis of Cement Sector of Pakistan

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Abstract
The purpose of this paper is to examine the impact of capital structure on profitability of cement sector of Pakistan. A panel data of 16 firms listed on the Karachi Stock Exchange was put under study for a period of 6 years (2005-2010). Two major sets of variables are used: to indicate capital structure i.e. Debt/Equity Ratio, Debt Ratio, Interest Coverage Ratio, Short term debt to asset, and Long term debt to assets and for Profitability i.e. Return On Equity. The variables were analyzed using Fixed and Random effect methodology by using STATA 11. The results implied that profitability is significantly related to capital structure. Specifically, profitability was inversely related to the amount of liability in a company's capital structure. Therefore, the more debt a firm incur, the worse its earnings is hurt.
Keywords: Return on equity, Debt, Equity, capital structure

1. INTRODUCTION

Capital structure is critical one among all the aspects of capital investment decisions since firm's performance is affected by such determinations. So while deciding about capital structure proper attention and care must be paid. Capital structure is essent ial component of balance sheet indeed; capital structure is part of financial structure .actually capital structure of an enterprise is combination of long-term debt, equity and preference shares.

Taylor and Venhorn (1996) defined as:

"Capital structure is total sum of outstanding long-term securities of both debt and equity."

Weston and Bingham (1978) stated capital structure is lasting funds used by a firm such as long term debt, preferred stock and net equity. Different views exist about nature of capital structure which is valid from the fact but all the researchers agreed on some common items i.e. long-term debt and total equity which are permanent source of funding. Total equity includes common shares, preference shares, surplus, and reserve. Among the all scholarly topics in fiancé capital structure is important topic because firms' ability to consider their stakeholder's needs is highly associated with capital structure. In finance capital structure is the way firms finances its assets through the mixture of equity, debt, and hybrid securities (Saad 2010).

Among all the financial decision capital structure is complicated because fro m last fifty years lots of research and studies have not reached on valid argument that define a certain proportion of debt and equity in capital structure that increase firm value and performance therefor capital structure is still a puzzle. However Most of studies and empirical finding, conducted in last years, revealed that capital structure decisions have significant impact on firm's value and its performance more than simple importance described by M&M. Strategies used by manger to improve firm performance is based on utilization of debt and equity proportions in firm capital structure (Gleason et al.2000). Hence, most of firms try to achieve optimal capital structure in order to minimize to minimize WACC and maximize firm performance.

Pakistan economy is world 27th largest economy in terms of absolute dollars. Pakistan having semi industrialized economy covers textile, chemical, cement, Food, agricultural and other industries. Since cement industry plays a pivotal role for the socio-economic development so this is very important segment of industrial sector. Cement is very specialized product which requires very specific infrastructure and location. Most of the cement industries are located in mountainous regions which are rich in clay, iron and mineral capacity. Due to the commercial and industrial constructions, cement industry is on the peak in Pakistan economy. Cement industry is sharing 30 billion in national kitty by the way of taxes.

There are more than 150,000 are employed in the cement industry either directly or indirectly and this is very big contribution by the cement industry in providing employment to youth.

The industry had exported 7.716 million tons cement during the year 2007-08 and had earned

$450 million, while is expected to export 11.00 million tons of cement during 2008-09 and earn approximately $700 million.

2. LITERATURE REVIEW

Theories related to capital structure such as Miller and Modigliani (M&), Agency Theory, Pecking Order Theory etc. Capital structure theory was initiated by seminal study of Modigliani
& Miller (1958). All the theories on capital structure work under different situation and these theories

are conditional because the work within the set of their own assumptions. Eldomiaty and Ismail (2009) stated that practically business conditions are changing constantly that results in firms adjust capital structure accordingly that's why firms moving from one theory to another according to circumstances e.g. firms issue debt for tax shields benefits when tax rates are high (TOT), when debt become expensive or less feasible or attractive firms utilizes retained earnings for financing (POT).

Frank and Goyal (2009) investigated the capital structure of American companies from year 1950 to 2003 and discovered consistency with trade off model. US firms use external quality sources for their operations than debt if cost of equity is comparatively low (Huang & Ritter, 2009). It has been found that in developed world most of empirical researches were conducted on capital structure (Mazur, 2007). Margaritis and Psillaki (2007) examined 12,240 firms in New Zealand and discovered that capital structure of these firms consistent with agency cost theory. Financing choice of Polish's firms is followed by TOT (Mazur, 2007). A survey research was conduct in UK on listed firm evidences showing that most of firm supportive with the predictions of Pecking order theory and Tradeoff theory (Beattie et al, 2006). Drobetz and Fix (2005) stated that Switzerland firms also supportive with capital structure theory POT and TOT. A survey was conducted on capital structure of 16 European countries and result supported the prediction of TOT (Bancel & Mitto, 2004). Evidences have shown that Spanish firm's financial choice is supportive with the TOT, POT, and free cash theories (Miguel & Pindado, 2001). Another study was conducted on Japanese firms by Pushner (1995); he investigated capital structure and found consistency of firm's capital structure with Agency cost theory. Japanese firm's financial decisions are consistent with pecking order theory (Allen & Mizuno, 1989).

The relationship between capital structure and corporate strategies regarding liquidity and growth with profitability of firm was examined and results shows there is no significant relationship between liquidity strategy and corporate profitability and performance. However, significant association exists between capital structure and profitability. Where, ROE used as performance indicator (Su and VO, 2010)

There is a relationship between capital structure ratios and profitability ratios. Firms using short term debt have more shareholder value and market value while those firms using long term debt decreases profitability (Mesquita & Lara, 2008).

Many researchers found that there is significant negative relationship between capital struct ure and firm performance indicators (Zeitun and Tian, 2007). Financial leverage has negative impact on performance of firm (Majumdar and Chhibber, 1997; Rao and Syed, 2007).

Profitability has significant negative relation with leverage and short run financ ing when only the external financing is source and dividends are fixed, profitability changes negatively with the change in leverage level (Rajan & Zingales, 1995). Many researches have pointed that there is negative association between leverage and firm performance. There is a negative relationship between debt to equity ratio and ROE (Krishnan and Moyer, 1997). Firm should identify the proper blend of debt and equity and maintain this optimal capital structure according to requirement (Harris and Raviv, 1991)..

4. RESEARCH METHODOLOGY

This study includes all cement manufacturing firms listed in Karachi Stock Exchange. There were total 21 companies listed under cement sector of Pakistan in KSE. In this research 16 companies were used. Data from year 2005 to 2010 for six years was collected from financial statement of companies. Companies that are not included in sample because of non- availability of data, newly listed in stock exchange.

This study only works on secondary data which was obtained from different resources. Mainly data collected from State Bank of Pakistan publication for balance sheet analysis of companies listed in Karachi stock exchange and data also obtained from the Annual Audited Reports of companies. Data of Return on assets, Return on equity, debt to equity, debt to assets obtained from State Bank of Pakistan. ICR coverage ratio is calculated using the annual reports of companies. Data was collected from year 2005 to 2010 for 6 years.

4.1 Problem Statement

It's pertinent to analyze the impact of capital structure decisions on firm's performance and profitability because of lack of consensus about optimal capital structure. This study will explore the extent to which capital structure decisions influences the profitability of cement industry firms listed in Karachi stock exchange..

4.2 Research Questions

This study attempted to provide answers to the following questions:
1. Is a firm's profitability significantly related with its capital structure?
2. Is there an optimal capital structure in listed cement firms?
3. What is the trend of capital structure being practiced by listed cement firms in Pakistan?

4.3 Objective of Study

Grounded on previous discussions this study aimed at following major objectives. Firstly tried to find empirical evidence whether firms capital structure decisions affects its profitability or not. Secondly to find

out the existing optimal capital structure in listed firms in cement sector Of Karachi Stock Exchange. Finally this study analyzes the existing optimal capital structure trends.

Capital Structure Variables (Independent)
  I.   Debt to Equity Ratio = Total Debt / Total Equity
  II.   Debt Ratio (Dr) = Total Liabilities / Total Assets
  III.   Interest coverage ratio (ICR) = (Earnings Before Tax+ Interest Expense) /Interest Expenses
  IV.   Short Term Debt to Assets (STDA) = Short Term Debt / Total Assets
  V.   Long Term Debt to Assets (LTDA) = Long Term Debt / Total Assets

 Profitability Variable   (Dependent)
I.   Return on Equity (Roe) = Net Income / Total Shareholder Funds

4.4 Regression Model

$$ROE_{i,t} = \beta_0 + \beta_1 DER_{i,t} + \beta_2 DR_{i,t} + \beta_4 LTD_{i,t} + \beta_5 STD_{i,t} + \beta_6 ICR_{i,t} + e_{i,t}$$

ROE: Return on equity

β_0: Intercept, β_1: coefficient of DER, β_2: coefficient of DR , β_3: coefficient of LTD

β_4: coefficient of STD, β_5: Coefficient of ICR, e: error term i: entity (firm)

Hypothesis

H_{1a}: DER is not significantly related to the firm return on equity. H_{1b}: DR is not significantly related to the firm return on equity. H_{1c}: ICR is not significantly related to return on equity.

H_{1d}: STD is not significantly related to return on equity

H_{1e}: LTD is not significantly related to return on equity

5. RESULTS & DISCUSSION

Decision Criteria for the selection of fix and random model is shown below in figure.
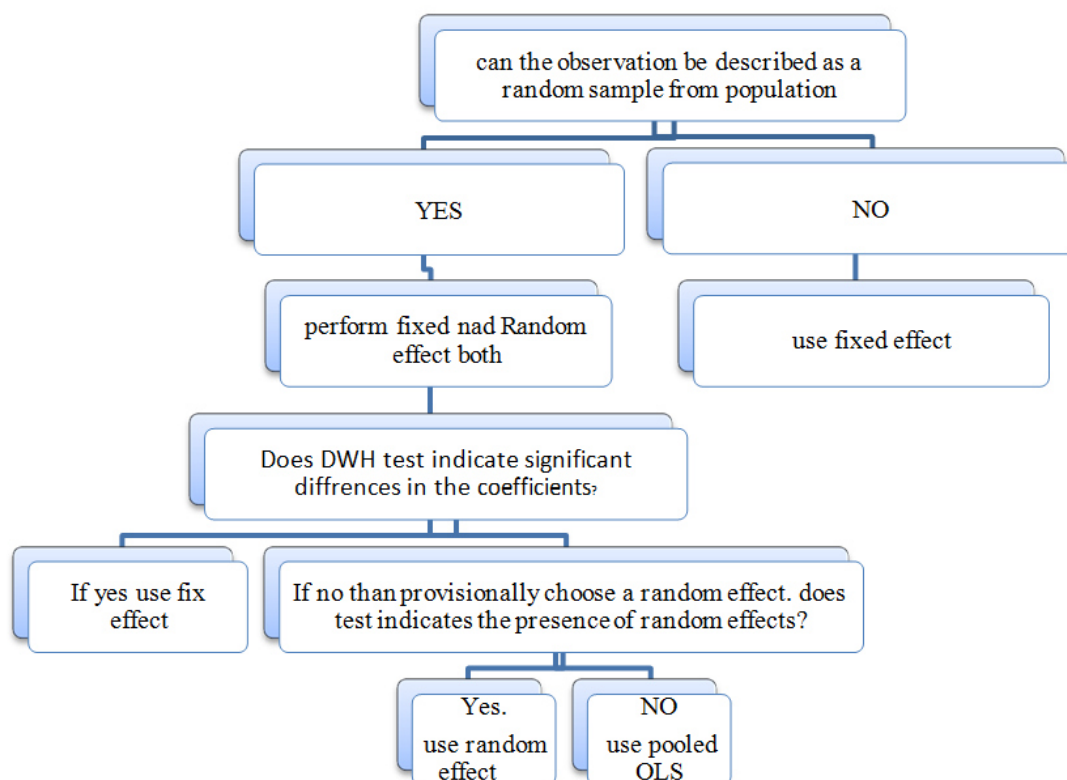
Decision criteria for the selection of fix and random model.

Source: *Adapted from Dougherty (2011)*

The model explains the relationship between dependent variable is Return on Equity and independent variable DER, DR, FLR, ICR, STD, LTD.

5.1 Fixed effect

Table 1

ROE	Coefficients	Std. Err.	t value	P>|t|
DER	-1.844143	.2729654	-6.76	0.000*
DR	-1.58e-06	2.18e-06	-0.73	0.470
ICR	.0407371	.0731897	0.56	0.580
STD	60.97118	60.04846	1.02	0.313
LTD	-19.37993	46.16628	-3.42	0.0376*

ROE is dependent variable proxy for profitability.

R-sq.: within = 0.4224 F (6, 69) = 28.52

Between = 0.3988 Prob > F = 0.0000

Overall = 0.5263

In the regression statistics table value of R square show the percentage change in dependent variable profitability caused by the independent variable (capital structure) and intercept. So, in given model statistic shows R value within 42% and overall 52.63%. It means that independent variables are creating 69% change in dependent variable. Moreover value of F statistic is 28.52 between 6 and 69 at probability at 0.00 % which indicates model is good fit. DER is significantly negatively associated with ROE. The coefficient is -1.844143 and significant at level of 1%. The reason behind the negative association is excessive usage of debts by cement industry. DR has negative coefficient with value -1.58e-06 but it's not significantly related. LTD is significantly negatively related with ROE having coefficient -19.37993. LTD has negative impacts on return on equity because cement sector using large amount of debts. Therefore due to excessive interest payment decreasing the return for owners. STD mostly used by industries because low interest charges that's why significantly positively related to ROE having coefficient value 3006.893. These results are supported by Abor (2005), Wang (2010) for LTD and Mesquita and Lara (2003) for STD. some studies found the negative association between capital structure and profitability, "(Friend and Lang, 1988; Barton et al., 1989; Shyam-Sunder and Myers, 1999; Van de Wijst and Thurik, 1993; Chittenden et al., 1996; Jordan et al.,

1998; Mishra and McConaughy, 1999; Michaelas et al., 1999)." The regression analysis of model 1 has shown significantly positive relationship between STD and ROE because of less expensive source of financing for companies comparative to Long term debt. "These results are supported by Miller (1977), Fama and French (1998), Graham (2000) and Booth et al. (2001)."

5.2 Random Effect:

Table 2

ROE	Coefficients	Std. Err.	z value	P>|t|
DER	-1.647153	.251385	-6.55	0.000*
DR	3.54e-08	1.36e-06	0.03	0.979
ICR	.0617481	.06276	0.98	0.325
STD	46.40013	39.30521	1.18	0.238
LTD	-25.47141	32.46032	-2.78	0.0373*

ROE used as proxy for dependent variable.

R-sq.: within   = 0.3928 Wald chi2 (6) = 54.61

Between = 0.4630 Prob > chi2 = 0.0000

Overall = 0.3969

5.3 Haussmann Fixed Random

Table 3

	(b) Fixed	(B) Random	(b-B) Difference
DER	-1.844143	-1.647153	-.1969905
DR	-1.58e-06	3.54e-08	-1.62e-06
FLR	-4.03241	-.2712565	-3.761153
ICR	.0407371	.0617481	-.021011
STD	-60.97118	-46.40013	-14.57106
LTD	19.37993	-25.47141	44.85134

chi2 (5) = 8.33   Prob>chi2 = 0.1391*

Breusch and Pagan Lagrangian Multiplier Test for Random Effects

Roe [company, t] = Xb + u [company] + e [company, t]

Estimated results:

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Table 4

	Var.	sd = Sqrt (Var)
roe	2700.603	51.96733
E	1725.063	41.53387
U	0	0

chi2 (1) =   0.3   Prob > chi2 =   0.04756

      Table 4.3, 4.4 shows the regression result with fix and random model. In order to decide about the fix and random effect Haussmann test is applied and result shown in the table 4.5. P > chi 2 = 0.1391 value is greater than 0.05 so we Haussmann test show the random effect should be used. After deciding between fixed and random effect as we found random effect is suitable now next to find that whether random effect is suitable for regression analysis or pooled regression. Breusch and Pagan Lagrangian Multiplier Test for Random Effects are used In order to decide between random effect and pooled regression the LM is used. The H0 in LM test is Variances across entities are 0 and there is no significant difference across units. LM test shows that Prob > chi2 =   0.04756 significant at 5% so Ho accepted random effect is suitable.

      Regression result shows that debt ratios long term and short has negative impact on the profitability of cement sector. Therefore, cement sector of Pakistan should reduce dependency on the debt and use more equity sources for financing. Finding from the regression supported the pecking order theory. Large firms in cement sector like FFC, Askari, DG khan cement should follow the static trade off theory. Result indicates that cement sector should utilize more equity sources because debt has negative impact return on equity and long term debts has negative impact on assets.

6. CONCLUSION

This study examined the relationship between capital structure and profitability of cement manufacturing firm listed in Karachi Stock Exchange during the 6 year period 2005-

      2010. The study has shown positive relation between short term debt and return on equity and negative relationship between long term debt and return on equity. Therefore suggesting that cement sector utilize more short term debt because of low interest expenses and most of cement firm suffer losses because utilizing excessive long term debt and large amount of financial cost. Thus cement firm utilize debt but more portion of financing should be through short term debt and LDC in less proportion.

7. RECOMMENDATION

Cement sector of Pakistan is capital intensive industry and financed by debt. The result of study has shown negative impact of debt on profitability of cement manufacturing firms. The recommendations for cement sector are use more equity resources instead of debt because their cash flow streams are not able to meet the obligation arising from debt. The proportion of debt should less in their financing more rely on equity. These all recommendations are for current scenario when cement sector is continuously facing the losses and debt obligations are increasing their cost of doing business ultimate results in more burden and losses. Currently, government in order to boost this sector should provide incentive and develop such policies to provide debt financing on low interest rates. If firms are using debt than they should offset the cost arise from the usage of debt with the advantages that will also impact their profitability positively.

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