

Determinant of Capital Structure: An Empirical Study of Cement Sector of Pakistan

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ABSTRACT

This research based on determinant of capital structure of cement sector of Pakistan. This sector play important role in the Pakistan economic development. In this research we analyzed the firm independent variables which are firm size growth, tangibility and profitability with the dependent variable which is leverage of the firm. The analysis techniques which are used in this research are pooled regression model. This model was developed by Rajan (1995). This regression model provide clear picture of effect of independent variable on dependent variable. We analyzed four hypotheses in this research for the result. In this study took 20 firms data from the cement sector of Pakistan for the analysis. Data was collected from state bank of Pakistan publications tenure of 2006-2011 and also take help from respective company official websites. In the last of this research found inverse relation between firm growth and firm size. Size of the firm is negatively associated with the firm leverage. This research analysis is not agreed with the static trade off theory.

Keywords: Growth, size, profitability, tangibility, leverage, state bank of Pakistan, static trade off theory and pooled regression model

INTRODUCTION

Capital Structure

Capital structure (CS) is that how much company takes capital from debt and how much takes capital from equity. CS is the mixture of both financing methods (debt & equity), every industry can used different capital structure for their financing. Some industries used most of the capital by taking debt from any financial institution, and some industries financed from equity. There are many CS and they are different from one to another, because every industry wants to make his CS due to his nature or requirement

Capital structure is the most important part of corporate finance for the students as well as academic researcher. They provide help to the researcher in determinant of capital structure of a company. Theories help the researcher in determinants of CS, these theories are TOT, MM theory and ST.

Bradley, MJarrell et al. (1984) provide theory for the CS named as STOT in 1984, POT was presented by MM in 1984 for the determinant of capital structure and the last theory agency cost was provided by Jensen and Meckling (1976).

Any industry wants to maximize our shareholders wealth because when shares holders' wealth increasing so equity of that industry will also go to high and industry wants to success by achieving goals and objectives. For the achievement of these goals and objectives the industry have two option (debt and equity) or take combination of both (debt and equity), so they maximize the return for the company and reduce the risk for the investors.

If the industry wants to increase capital through equity so they issue common stock and who purchase the maximum shares of the industry will be considered as owner and they take dividend or profit on his investment.

When industry wants to increase our capital through debt financing so they take loan from different financial institution to cover up over capital and the industry give fixed interest to the lender and they have no rights on company profit.

For the first time shah researcher can arranged and find the capital structure of SE listed non-financial companies which are working in Pakistan. For the first time the allowing of desert of financial economic topic by Pakistani researchers. The data of six year were used.

Every company wants to increase debt financing because they provide advantage of no tax advantage form the government due to interest payment. According to MM (1962), the company values are depending upon capital structure of the company because the interest payment on debts gives you no tax advantage. On equity financing the tax are applied on the dividend payment.

Cement Industry

In Pakistan there are many industries are working, but cement industry is the most important sector of Pakistan industry. In all over the world Pakistani cement are very famous. Pakistan has a lot of cement raw material. Currently many private plants are producing good quality cement in Pakistan. In the last few years the Government of Pakistan focusing on infrastructure of cement industry. That's why we can say that the era years for the cement industry are the golden period.

In 1947 Pakistan are become independent, so that time two firms are produced cement in the country. During the time passed the cement industry growth very fast because between 1948 - 1956 the cement firms are increased to six. During the Ayub Govt period the economy of the Pakistan started to grow and construction activity are become at boom. From 1958 – 1968 the cement units are increased from 6 to 9. According to “Balance Sheet Analysis of Joint Stock Companies Listed on the KSE Volume II 2006 – 2011” the number of industries in this sector are twenty (20).

LITERATURE REVIEW

Capital Structure's Theories

Miller and Modigliani's Theory

Franco Miller and Merton Modigliani (1958) discussed in his own paper which the company value is not related to its capital structure decision whether get debt or equity. MM based on some strong assumption on has theory such as there are: i) No brokerage cost, ii) No taxes, iii) No bankruptcy costs, iv) All investors have same information. When these assumptions are hold true then according to MM that a company's valve will not affected company's capital structure. If it generates its capital structure all from equity or all from debit or combination of both. Brokerage cost effect the company WCCA when company issues equity to public the brokerage cost are more than debits.

There for the MM hypothesis works under wonderful market condition, where there is same information, default free rate, no liquidation cost and no taxes.

Modigliani and Miller prepared two situations. The first suggestion was that the worth of a firm is not dependent of company capital structure. The next suggestion declared that the

charge of equity for a debt financing company is the same to the cost of equity for a no debt financing company

Jensen and Macklin's Agency Theory

Jensen and Macklin (1976) stated the theory of agency in which indicates that there is the correlation between shareholder and agent of company's manger.

According to the theory some problem can take place among stockholder and the company's manager the initial problem is between the company and the management the company boss has not a full claim in company's management. Another problem is among shareholder and debt holder for the reason that more favorite is given to shareholder than debt holders.

Therefore Jensen and Macklin said the relationship of agent and managers in company is to keep away from the first problem between company's mangers and company's shareholders the boss should have the authority to make conclusion that maxim the stockholder's benefits as well as must pay some incentives to the agent for the purpose to fulfill their obligation with good interest. The cost which is occurred on this transaction is called agency cost'.

Trade off Theory (TOT)

TOT theory explained the tradeoff among the benefits receive from debt financing and the cost which is paying on debt financing. MM established the tax advantage in their study. This hypothesis agree on that the most vital factor in decision the best possible level of capital structure and the insolvency cost.

Company paying interest on debt financing and company show this interest as expense which is detectable for from tax. Debt financing give tax advantage to company. There for the majority of the company choose for a big level of debt financing for raising their company capital level. At this point the correlation of debt financial and benefits is positive as clear by standing 'trade off theory.'

Protections for debt financing company keep have high level of the tangible assets and give the guarantee to debt holders against those tangible assets. However while the default situation come then company using their tangible assets in order to finish the insolvency cost .generally insolvency risk is high for the smaller companies than for the larger companies

Signaling Theory

According to this theory based on equal information. Equal information flow is not available to all investors at the time of investment and at the equal level. Equal Information outcome in very low assessment of investment plan. This theory stated that financial decisions at the industry level are the signals sent to the investors when have a same information.

When company issuing of debt it gives signal to investors that the company is in a good situation, other than if the debt issuing is become higher than limit this force result in insolvency of the firm. And when company issues shares it give signal to investors that company is not in good position means company is sharing its loss then investors will not buy the company shares.

Pecking Order Theory

According to Mayers and Majluf (1984) study recommend, give prefer to raise equity is the final option of financing. Therefore company utilized firstly its internal source of funding that

is retained earnings, if a company needs additional financing it can issued debt. And when more finance are needed so then it equity which is the last source of financing.

In other word company get finance from alternative factors which was firstly by Donaldson (1961) planned that company more favor to internal financing then external financing. In 1984 MM disagree that if a company maintain its liquid financial resources (mkt securities & cash), and do not issued new securities and then company only use its on hand retained earnings for financing.

Empirical Studies that Support Determinants of Capital Structure

Researcher Miller gives guideline for further researches on CS. Now a day the researchers are penetrating for finding other factors as well as how to accomplish the optimal level for the industry. Same model are not suitable for implementation to all of the firms for CS due to economic and political changing situation, asymmetric information and more other reasons.

Sheikh & Wang (2011), conducted research on the determinant of CS of the 160 firms of Pakistan manufacturing industry tenure five years (2003-2007). The study used panel data techniques. The result of the analysis found profitability, tangibility and liquidity is negatively correlated with leverage while growth opportunity and non-debt tax are not significantly correlated to leverage of the firm.

Capital structure is found difference in public sector and private sector companies. Dewaelheyns & Hulle (2009) vary that in private sector firms the CS is not depend on only internal financing but they take finance from external source so that why the collision on the decision occurred. While the private companies have somehow access to debt financing but the private companies businesses are expend time by time in the world, the private sector companies are follow POT, which recommend that the businesses like internal financing till they have sufficient financing to accomplish our objectives or needs.

Gropp & Heider's, 2009 Heider examine the capital structure of banks building on central outcome from the experiential capital structure journalism for non-financial companies. Their model including holding companies and commercial banks from 16 special countries (US and 15 EU members) from 1991 to 2004. they focused on the major scheduled banks and has taken great care to decrease survivorship bias.

Rafiq et al (2008), initiate the determinant of CS of chemical industry of Pakistan by taking 26 firms out of 39 firms in a sector. The period of data which were taken for analysis from 1993-2004. By analysis they found profitability of the firm is negatively correlated with leverage of firm at the same time as tangibility of asset, non-tax debt shield and growth is positively correlated with leverage of the firm.

Shah and Khan (2007) had done research on the KSE Listed Firms. Dummy variable regression is used for the analysis in his research. They used the variable of descriptive in his research which are six. Shah and khan used these variables for the analysis besides of leverage ratio and what are the effects on it. There are mainly four variables which are using in the research by researchers but in this research the researcher are add two extra variables which were earning volatility and non-tax protection. The outcomes of this research were just significant for tangibility conventional other factors ineffective to walk off with the outcome of theories. The result of this research were accepted the both hypotheses of firm profitability and firm growth and also this research pass the judgment of AT and POT of capital structure.

Saeed11 (2007) had done research on the energy sector of Pakistan. In this research the researcher are take samples of the Pakistani energy sector forms and done his research on the basis of the application of special theories of capital structure like POT, AG, and TOT. Saeed

researcher used ten variables in his research as dependent variable. The ten variable of this research are the following firm profitability, firm size, owner structure, non-debt tax shield, earning volatility, industry effect, cash holdings, and firm growth. The findings are found with the help of pooled regression model which are passed by POT and TOT.

Hijazi & Tariq (2006) analyzed the determinant of CS of Cement industry of Pakistan in 2006. They used pool regression model. They take 16 firms out of 22 for the analysis. The output of analysis shows that the tangibility of the firm & growth of the firm is positively associated with leverage of the firm and remaining size & profitability is negatively associated with leverage of the firm.

Shah and Hijazi (2004) research on the non-financial firms of Pakistan and they are done on sample. Their research consist of dependent variable and independent variable, dependent variable are only one named as leverage work and independent variables contains firm size, firm growth, firm tangibility and firm profitability. These variables were regressed in opposition to the one dependent variable named as leverage by the research software named SPSS. In this research the data are gathered then used and apply pooled panel data and regression. The outcomes of this research hold up of POT.

METHODOLOGY

Research Objectives

1. Identifying factors associated with capital structure in the cement sector of Pakistan listed in KSE.
2. To determine the effect of independent variables on market structure as dependent variables.
3. Finding the dependency of leverage factor with the selected independent variables.

Sources of Data

What are the sources of data and why to choose secondary data?

Secondary Data

The topic under discussion is related is secondary data is used for analysis. Research data are gathered from the SBP publication which is “Balance Sheet Analysis of Joint Stock Companies Listed on the Karachi Stock Exchange Volume II 2006 – 2011”. Another source of data is through references to the review of ‘different papers’ and appropriate preceding study. We have chosen Cement Sector because this sector is very important for economic development, and it is the largest sector of Pakistan industry. Another source of data from where collected information is specific industry official websites.

Population

Cement industry is the largest production sector of Pakistan in the world. There are twenty (20) cement industries are working in Pakistan.

Sample

There are twenty firms working in Pakistani cement industry. Some firm’s data are incomplete in the annual report. That’s why this research takes 18 firms. Therefore, we do not consider that firms in our research for analysis. Because that firms data may occur problem in our analysis

Limitations of the Research

The limitations of the research are very important. This research is limited to 5 years data (2006-2011). This research contains four independent variables (firm size, growth, profitability and tangibility of asset) and one dependent variable (Firm leverage) which were highlighted by Rajan and Zingales (1996) in his paper.

Methodology

Annual reports of listed companies in KSE were obtained for the analysis of required calculation of dependent variable and independent variable. Listed firms annual reports are taken from publication of SBP of Pakistan which is "Balance sheet analysis of Joint Stock Companies" which is listed in KSE of Pakistan. Both variables (dependent and independent) are taken from literature review of different papers regarding determinants of CS. Our research hypotheses are to be created according to the both variables taken under study. Regression model is used for finding relationship between the variable.

The independent variables of the study are firm tangibility, size, growth and profitability of asset and dependent variable is firm leverage.

The general form of the model is

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

Here

LG = Leverage

TG = Tangibility of assets

SZ = Firm Size determine by Log of sales

GT = Growth

PF = Profitability

Tangibility of Assets (TG)

A company having more physical asset can borrow at cheaper cost of debt capital as evaluate to company which having less physical assets. The tangibility of assets suggests the bargaining power to company. A company having fixed asset in a huge quantity can accept loan of at averagely percentage of interest by bring fixed assets as guarantee.

A business having large proportion of fixed asset is await to acquire more as measure to a business whose high borrowing cost due to small amount of fixed asset of a business. So researchers are presuming a positive relationship among leverage and tangibility of the firm. The researcher can find out the firm tangibility of asset by the formula of asset ratio / by total asset. The researchers were taken amount of gross balance as a numerator where by fixed asset gross amount of net asset depreciated.

Size (SZ)

Size can be another important determinant of capital structure. There are variance point of view regarding the connection among leverage and size of a firm. Primary, vast businesses don't believe on the straight cost of bankruptcy as a vigorous variable in selection of the leverage level as these costs are predetermined by charter Larger company are more diversified, have less default risk, and lower cost of financial suffering. Superior company diversification advantage reduces (Titman and Wessels 1988). Firstly one can expect a positive relationship between firm leverage and size. Secondly, conflicting to firstly, Rajan and Zingales (1995) diverge that here is a lesser amount of similar information concerning

the better business, on new equity issuing the probability of undervaluation become declining, persuade the vast business to utilize equity financing not debt financing. This means that here is a negative connection among leverage and size. We determine size of the business by the attractive the formula which is “log of the sales” this calculation smoothens the dissimilarity in the shape over the tenure passed.

Growth (GTH)

Growth can be a good independent variable and derived from pecking order theory and trade-off theory. There are disagreeing views found in theories of corporate capital structure about the relationship between growth and leverage of the company. According to pecking order theory the company first finances its projects by internal financing (Ross et al 2008) that may not enough in the condition of growth. So the company should increase its leverage during growth period. It means pecking order theory point out the positive relationship between growth and leverage. Tong and Green (2005) find significant positive relationship between growth and leverage.

Profitability (PFT)

Profitability can be main independent variable that determines capital structure and represent pecking order and trade-off theories fairly clearly. As stated in literature review that trade-off theory says company recognize the target debt ratio by comparing benefit from and cost of leverage. Any decrease (increase) in cost (benefit) allows the company to readjust target leverage by attractive debt. Profitable company are less risky with common cash flow from business decreasing the cost of financial distress such as bankruptcy cost. It is commonly recognized that more profitability in world of tax with more leverage can save more tax for shareholder showing benefit from leverage. More benefit from leverage will upset cost benefit relationship thus allocates the company to borrow more. Frank and Goyal (2009) argue that expected cost of financial suffering is low for profitable company thus finding tax protect more valuable. This reflects the positive relationship between Leverage and profitability.

Techniques

We will use the following techniques for to analyze capital structure of cement sector of Pakistan.

- I. Descriptive statistics
- II. Correlation
- III. Regression

RESULTS & DISCUSSION

This research is conducted for the determinant of CS of cement industry which is listed in KSE. In this study we used regression model showing the effect of independent variable on the dependent variable. The independent variables of this research are

1. Firm growth
2. Firm tangibility of asset
3. Firm profitability
4. Firm size

The dependent variable for this research is only Leverage variable.

For the actual result we find the following techniques:

- I. Descriptive statistics, II. Regression model, III. Relationship among both variables

Table 1. Descriptive Statistics (5 Year Summary)

	<i>N</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>Std. Deviation</i>
Leverage	80	0.16	2.011	0.7014	0.47201
Tangibility	80	0.62	2.591	1.1901	0.42007
Size	80	2.14	8.28	6.9001	1.29104
Profitability	80	-0.31	0.25	-0.0497	0.11580

From above Table it is clear that the maximum correlation significance among two variables is -0.548 which clear that “a case of multiple regression in which the predictor variables are they highly correlated multi-collinearity” trouble is not here with the chosen independent variables.

In the above table we can analyzed that the firm profitability and firm growth are negatively relationship among them, and positive relationship with the firm size. There is negatively relationship found among firm size and firm growth. The analysis of relation clears that in Pakistani cement industry, the asset rising is inconsequential. Pakistan cement industry when growth occurred i.e. they increase production through new installation of plant and asset for manufacturing. When new plant is become installed so the increase in asset remains torpid. On the further hand through rising proficiency utilization formation and sales increase and the asset's worth decreases due to depreciation. As a result we derive that there is a negative correlation among firm size and firm growth.

Table 2. Regression Model Summary

<i>R</i>	<i>R²</i>	<i>Adjusted R²</i>	<i>Std. Error of the Estimate</i>
0.821	0.701	0.687	0.21718

In the above table they are showing the clear picture of the regression model analysis. In the analysis, the value of R-square ($R^2 = 0.701$) presenting the four variables i.e. (firm size, firm growth, firm profitability and firm tangibility of asset) illuminate that 70% of difference in the response of leverage. From the analysis clear that the choice of CS is regularly recognize by these four variables in the Pakistan cement sector. In the above table Adjusted R^2 is to a little how a smaller amount than the R^2 . Since the worth of the F-statistic, they clear that we are capable to observe so as to the model is important on the 1% level of significance.

Table 3. Expected & Observed Relationship

<i>Determinant (Independent Variable)</i>	<i>Expected Relationship</i>	<i>Observed Relationship</i>
Tangibility (Total Fixed Assets / Total Assets)	Positive	Positive
Size (Log of Sales)	Negative	Negative
Growth (% change in Total Assets)	Positive	Positive
Profitability (EBT / Total Assets)	Negative	Negative

Tangibility

Physical assets contain both fixed assets, such as buildings and land machinery, and current assets, such as cash inventory. The opposed of a physical asset is an intangible asset. Nonphysical assets, such as trademarks, patents, goodwill and brand recognition, copyrights, are all examples of Nonphysical assets. The findings which are showing in table clear that the leverage and tangibility of asset of the firm are positive relationship among them, so therefore the findings pass the hypothesis of tangibility of asset, and they are support the following theory (TOT).

Size

In this research we find the result of, 'leverage' of the company and 'size' of the company has negative correlation among both variable. From findings, it is prove that cement industry of the Pakistan listed in KSE which is get more financing from equity and use small portion from debt for financing. This type of findings supports the theory of insolvency cost. These findings pass judgment of our hypothesis about size of the firm.

Rajan and Zingales have disagreed view which said that less same information is delivered to the large company declining the possibility of undervaluation of the company. STT states that debt financing is powerfully affected by the size, the purpose which insolvency cost disturb the small company more and constitute little to the smaller companies. When debt financing rise there is more probabilities of insolvency therefore small companies should have less debt financing and our findings support the pecking order theory'.

Growth

The findings which are showing in table clear that the leverage and growth of the firm are positive relationship means one variable become increase or decrease so same the second variable. The findings by regression indicate pass judgment of the hypothesis developed. The above findings indicates that the cement industry most of the firms starting new project then they prefer to debt than equity. One main point is this that when the firms start new projects so they required huge capital at the starting. Debt financing are very fast financing way to collect capital. For the growing of firms they do not accept the equity financing but they lead their decision to go for debt financing. The positive relationship result accept the 'pecking order theory' (POT) but they rejects the static theory and 'agency cost theory' (ACT).

Profitability

Before going to explain profitability, what is profit? 'A financial profit which is recognized when the amount of revenue receive from a business activity exceeds the expenses, costs and taxes needed to stand the activity. Any profit that is gained goes to the business's owners, who may or may not choose to spend it on the businesses.

This research is conducted is to see what are the reactions of dependent variable (leverage) by changes occur in independent variables (size, growth, profit and tangibility of asset). In above analysis it provides a clear picture which profitability of the company is negative relationship to the 'leverage of the company'. When firm generate more and more profit so that company financed by equity, because in equity financing there are less risk present other than debt financing. 'The results support POT'. These analyses pass judgment of our hypothesis about profitability of the firm. The similar outcome was observed by Shah and Hijazi (2005).

CONCLUSION

This study is conducted for the determinants of CS of Pakistan cement industry. Data are collected of tenure of 2004-2009. In this study we analyzed sixteen sample firms for the analysis. The technique which is used for to determinants of CS is regression model and expected relationship among both variables. The findings of this research are expected.

When we analyzed both variables with each other for the relationship, we found inverse relation among firm growth and firm size. This result shows Pakistani cement sector firms showing different result other than previous result. Size of the firm is negatively associated with the firm leverage so when larger the firm size so that firms utilized less amount of debt. This research findings are not agreed with the STOT, because that theory tells us the relation between firm leverage and firm size are positive associated with each other.

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