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How to Make Determinants of Capital Structure in the Cement Sector of Pakistan from Educational Perspective

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ABSTRACTS

Capital structure, which in finance states to the ratio of liability to equity, illustrates how the company finances their total operations and how organizational growth requires various sources of funding. In this study, researchers suggested determining the variables that have the maximum impact on capital structure in the Pakistan cement industry, which is recorded on the Karachi Stock Exchange. Growth rate, profitability, tangibility, and business size were acknowledged by the researchers as factors that have an impact on leverage. To gather data, the researchers used a balance sheet study published by the State Bank (SBP) on a sample of 6 major companies out of a total of 21, and they used regression, correlation, and ANOVA to examine the factors influencing capital structuring in the cement industry from 2013 to 2017. The results showed that other than earning, which takes a negative association with leverage in business, all criteria listed have a favorable impact on leverage. The firm will be able to assess its capital structure needs to be based on debts and equity with the use of this research. Additionally, it will enhance students, researchers, and managers' knowledge of capital structuring.

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1. INTRODUCTION

The capital structure is the "Method a business uses to fund their assets through debt, equity, or hybrid securities," according to the definition. It has never been clear how capital structure and value are related. Ideal capital structure is the main topic of discussion. It is one of the delicate subjects in corporate finance and capital structure decisions and is crucial to financial management. From a management perspective, capital structure is a very effective tool for controlling investment costs. The goal is the same for any method of financing an organization's assets—to obtain the best capital structure with the lowest possible cost of capital and to increase value. Firms without debt funding are referred to as unleveled, and firms with debt financing are referred to as levered.

Due to the existence of different schools of thought, one of which supports the ideal capital structure and the other of which is opposed, the financing behavior of enterprises might vary in several aspects. The former thought contends that a combination of debt and equity capital can reduce a firm's total costs and increase value. The decision is thus important. While the school of thought founded by Modigliani and Miller maintains that the choice of funding does not affect the company's worth. According to some hypotheses, they claim that the company's value is unrelated to its asset base. Due to unrealistic statements, it was early work that gave rise to several notions, including "static theory and pecking order." These concepts encompass multiple fund composition facts, although the assumptions are not always supported by empirical data. There are some signs that the company has a capital structure that is more proportionate to debt financing than equity financing. Some financial experts contend that the firm's increased leverage is what caused its market value to rise, but others disagree. Therefore, the question of whether there is an optimal point in the capital structure emerges, and if so, what potential determinants might exist. The value of the company is influenced by investment risk and profitability.

Numerous studies have been conducted on this topic in various countries, and the goal of these studies is to pinpoint the factors that influence various markets and determine whether or not the conclusions drawn from various theoretical and empirical studies are appropriate for developing nations like Pakistan. This research examined how various factors and cost structures relate to one another. Various studies with varying findings about the firm's financing strategy have been conducted.

The goal is to address the topic of corporate finance, which is: How should organizations fund their operations? The industry in Pakistan has its distinct qualities, therefore financial managers have ideas about the ideal capital structure. What influences their decisions? Through an analysis of the many variables, including earnings, growth rate, tangibility, and log of sales, and their effects on leverage, this study is to identify the variables affecting Pakistan's cement industry's financing status.

When an industry makes wise decisions on how to expand its operations, the firm's management considers the capital structure. Many finance managers in the cement industry currently lack some fundamental understanding of capital structure. The cement industries had positive cash flows in the past compared to now. Pakistan's cement industry lost market share in exports to other countries cement industries.

A new capital structure of the organization is a crucial component of its startup. To determine the elements affecting the capital structure of Pakistan's cement industry and to analyses the various elements—earnings, growth rate, tangibility, and sales log—and their effects on leverage. In Pakistan, the costs of producing cement are very high. As a result, gasoline and transportation costs are considerable.

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Pakistan's cement sector imports coal to produce cement, which is an expensive product. The cement industry is exploring fuel alternatives to cut costs. There are issues, but the capital structure's financial decision-making effectiveness is the key one.

The research question is how often the independent factors of profitability, progress rate, physicality, and log size influence the composition of a company's funds in the cement industry.

Research objectives are:

(i) To examine the capital structure's influencing factors
(ii) Choose the firm's capital structure to assess it.
(iii) To interpret the above-mentioned factors' associations with leverage.

This research aims to comprehend the components of finances in a specified order and provide appropriate guidance. The study is important for the financial specialists who work in the cement industry. They can effectively decide on the capital structure by reviewing this research. Additionally, this study is useful for investors who may gain a thorough grasp of the organization's financial operations.

The article is broken up into important sections. The conceptual framework for the analysis offered in this paper is explained in Section 2. The study's overview of the relevant literature is presented in part 3, and the methodology and variable definition are covered in detail in section 4. The analysis's findings are presented in Section 5, along with comparisons to earlier outcomes. Section 6 concludes the article by summarizing it.

2. LITERATURE REVIEW

Theoretical framework is shown in **Figure 1**. It divided into four components, including earning, growth rate, tangibility, and log of sales.

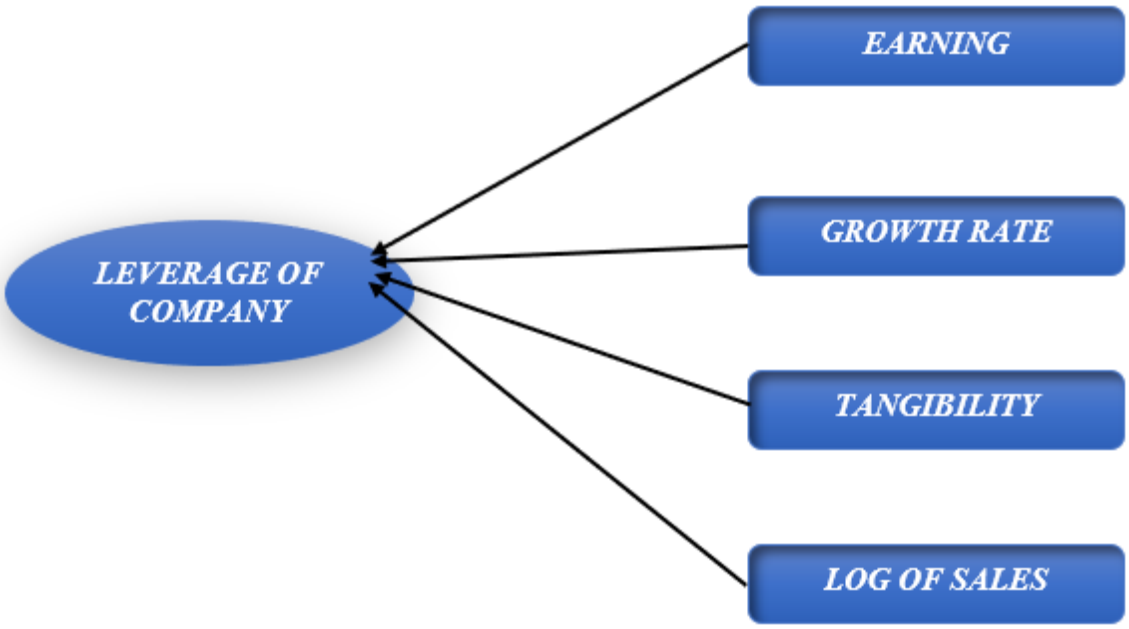

Figure 1. Theoretical Model.

Modigliani and Miller (1958) initiated the analysis of investment structure theory and established company's value is independent of its organizational system. Although their work is regarded as the best in the literature, it cannot be employed in real-world situations since the assumptions they made do not remain valid. Thus, in 1963, they released a corrective to

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their piece titled "A Correction." In that work, it was highlighted how a firm's costs are independent of its capital. They proceeded to explain that while dividend payments are not tax deductible and interest rates are, enterprises must pay taxes on all profits, making equity an expensive source of funding. As a result, this approach motivates corporations to include debt in their capital structure. They serve as the foundation for later discoveries made by other researchers. As a result, several academics created various capital fund theories.

The investment strategy is where the agency costs of the relevant parties are the lowest, claims agency cost theory of capital structure (Jensen & Meckling, 1976). The static trade-off concept made it clear that a corporation with leverage and one without it have different values. When using debt financing, the business can avoid having to pay tax on the interest on the debts. According to this theory, the firm's ideal capital structure, financial hardship, and agency costs are all balanced against one another.

In the Pecking Order Theory, the firm must create an optimal fund structure. He claims that the industry bases its financial projections on its own retained earnings. If the employer requires more investment to keep up with its expansion, it should raise money by issuing debt.

Some researchers investigated the possibility of an establishment issuing capital stocks to raise capital. They believed that the firm should place more emphasis on the profits of the business than on potential investors, and they processed the data using a hypothesis t-test on a random variable. They contend that it is preferable to issue safe securities as opposed to risky ones, managers possess superior knowledge, and once stock is offered as a financial investment, its price would decline.

The conventional capital framework with the alternative pecking order model of trade financing, proving that the power of the test of the trade-off model is essentially zero. They did this using the variables of the net and gross debt issued, scaled by book assets, and the change in debt ratio with the methodology of target adjustment model on the 157 companies in 1971, 1981, and 1989 from Industrial CompStat tapes.

The study of explanatory power theories of optimal configuration with the variables productivity, volatility, scope, industry sorting, uniqueness, growing, nondebt tax shields, and the insurance value using data from 1974–1982 gathered from Annual CompStat Industrial Files. According to him, the firm line's uniqueness is negatively correlated with debt levels.

According to Bevan & Danbolt (2002), whereas long-term elements show a positive relationship with tangibility using regression and ratio analysis, short-term factors are adversely connected with tangibility. On the data on British companies, they worked on tangibleness, profitability, capital assets, debt, and log sales.

The aspects of capital structure, size, company risk, progress rate, receipt, bonus, liability, and operating leverage were investigated, utilizing an eight-variable analysis using multiple regression and hypothesis testing in the direction of determining that the scope, progress rate, and receiving rate are statistically significant elements in the capital building.

Regression and ANOVA were used by Awan *et al*. (2011) to demonstrate the capitalization of registered companies in Pakistan's sugar and related industries. They used 33 sugar-related firms from KSE-listed companies to estimate the combined stock company's profit and loss based on factors such as leverage, growth rate, tangibility, firm sales, and earnings.

Analysis of the financial leverage of Libyan enterprises to define the effects of the absence of a lower investment market. With the aid of regression and hypothesis testing on profitability, growth, tangibility, and size with the dependent variable of leverage, they discussed 257 cases for 55 enterprises between 1995 and 1999.

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To examine the elements of the capital group in the chemical sector, the composition of funds in the balance sheet. He also went through how to use regression and hypothesis testing to correlate the dependent variable, leverage, with four other controllable variables. He collected his data from the State Bank (SBP) website and spoke with the listed companies. He concluded that the independent variable's factors had no discernible influence on the dependent variable.

A key factor in the mechanism of disaster is the debt composition of a firm's capital. They used 179 listed businesses on the Jakarta Stock Exchange to demonstrate this by utilizing the databases JSX and ECFIN, mean, median, on the dependent: investment and independent, short-term debt exposure, and long-term liability (1994-2004).

Hijazi and Bin Tariq (2006) established the capital structure of listed companies (2006). Using regression and hypothesis, they researched sixteen firms listed in the cement sector between 1997 and 2001.

Factors of capital formation in the textile trade, tangibility is positively correlated with leverage whereas LN (Sales) is shown to be adversely correlated with leverage. With the aid of multiple linear regression, the hypothesis is tested on four independent variables—growth rate, tangibility, log of sales and earnings, and one dependent variable, leverage—and finds that profitability has a significant and adverse association with debt financing. For the years 2001 through 2009, they worked with 132 filtered companies from the listed companies.

3. METHODS

This section focuses on the data's origin, how the variables were measured, how the variables were explained, and how they were measured.

4. RESULTS AND DISCUSSION

4.1. Foundation of facts

The SBP, the source of statistics used in this essay, disclosed the facts on which it is based. Although 21 cement companies in Pakistan are included in the study's total population, only 6 listed cement companies from the years 2013 to 2017 are included in the sample size and sample frame. We use basic random sampling because of the time limit. Five years' worth of financial statement data were gathered for study purposes. The Central Bank of Pakistan's Stock Exchange publishes yearly reports of corporations, and this study incorporates secondary data from those reports.

4.2. Data analysis methodology

The study is primarily concerned with numerical data and results from the t-test hypothesis. Also handled by SPSS are descriptive statistical analyses like mean and standard deviation as well as correlation matrices like regression and correlation tests.

4.3. Description of variables used

A wide range of various factors has an impact on a company's capital structure. The external elements that have an impact on a company's capital structure include taxes, inflation, and market circumstances. This session discusses microelements, also known as internal factors that affect the wealth structure of the company.

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4.4. Leverage (dependent variable)

Leverage has been applied differently in earlier research. The former liability ratio based on book value tended to consider the corporation's future condition, though the latter replicated earlier scenarios (Frank & Goyal, 2003).

4.5. Earnings (Independent Variable)

There are some conclusions regarding the firm's earnings and leverage. According to Modigliani and Miller's (1963), businesses will benefit more from tax deductions on payments if they raise money through debt. According to Myers and Majluf (1984), more profitable businesses can take on more debt and present less of a risk to the loan holders. While pecking order theory asserted that multinationals with higher profitability prefer core finance to debt financing and there is an inverse association between profitability and capital structure. Corresponding to Baral (2004), the organization's leverage has an inverse relationship.

4.6. Growth rate (independent variable)

A liability provided by the firm has a negative relationship with its growth opportunity based on upcoming opportunities. He also suggested that if the company financed its operations with risky securities, it would be leaving behind some valuable opportunities. Growth and leverage are likely to be adversely correlated.

Studies have been conducted on this link between leverage and expansion rate have been somewhat contradictory. All researchers found negative correlations; however, others found no evidence of the predicted negative link between the two variables. The pecking theory points out that depending on how a corporation behaves, growth can be both beneficial and detrimental.

4.7. Tangibility (independent variable)

Tangible properties are physical presence, such as land, buildings, equipment, cars, plants, etc. also, and those assets that lose value with time. Intangible assets, which are those that may be amortized, are the reverse of tangible assets and include things like goodwill, patents, copyrights, logos, etc. Businesses with a lot of real assets can easily retrieve debts including cheap interest rates. It is calculable as the relationship between fixed and total properties. We anticipate a favorable association between leverage and tangibility since companies with a large ratio of physical assets can easily get financing comparably at a low rate.

4.8. Size of the Firm (Independent Variable)

Many authors make observations about the relationship between organizational size and leverage, arguing that it should be favorable. Low liquidation costs, huge organizations, and more lending are not advantaging of the trade-off theory of organization. Large companies may also have low agency costs due to their uneven cash flow and simple access to the capital market, it demonstrates the connection between business size and leverage ratio is positive.

4.9. Analytical technique

Regression is carried out in the analysis using panel data, which is multivariate data made up of both time series data and cross-sectional data. After excluding their effects, the company's cross-sectional data is mixed with time series data in the column. Because our research is centered on statistical analysis, we used hypothesis, regression, and correlation as analysis tools for our study.

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4.10. Hypothesis

Hypotheses are in the following:

(i) **Ho**: The GRT does not affect significantly LEV.
HI: The GRT affects significantly LEV.
(ii) **Ho**: The TNG does not affect significantly LEV.
HI: The TNG effects significantly to LEV.
(iii) **Ho**: The SZ does not affect significantly LEV.
HI: The SZ effects significantly to LEV.
(iv) **Ho**: The EAR does not affect significantly LEV.
HI: The EAR effects significantly to LEV.

4.11. Regression Model

The observed regression measure with equation 1:

$$LG = \beta_0 + \beta_1 (EAR) + \beta_2 (GR) + \beta_3 (TG) + \beta_4 (SZ) + \varepsilon \quad (1)$$

where LG is the leverage, EAR is the earning, GRT is the growth rate, TNG is the tangibility, SZ is the size of the firm, and ε is the error term.

4.12. Interpretation

There is a correlation between the factors in **Table 1**. The significant method of linear bonding between variables is concluded by the coefficient of correlation. The correlation coefficient has a range of -1 to +1. The rate of "R" will be closed to +1 if there is a powerful direct association between the variables. The rate of "R" will be closed to -1 if there is an undesired direct link amongst the variables. The rate of "R" is zero if there is no bonding between the variables. Leverage and earnings have an unfavorable linear connection, as indicated by the -0.54 correlation between them that is close to -1. Following the correlation of 0.116 between tangibility and leverage is a solidly constructed linear relationship. Leverage ranges between 0.008 and 0.202, and the relationship between firm size and growth rate is similarly favorable.

Table 1. Correlation.

CORRELATION					
	Leverage	**Earning**	**Tangibility**	**Size of firm**	**Growth rate**
Leverage	1				
Earning	-0.543307282	1			
Tangibility	0.11697022	0.570367145	1		
Size of firm	0.008616298	0.141769279	-0.151984	1	
Growth rate	0.202246874	0.273370135	0.32460716	0.219440498	1

R is 0.8161 in the summary table (see **Table 2**), indicating a partial link between the predictors and the dependent variable (leverage) (Earning, Development rate, tangibility, and size of firm). While "R Square" (coefficient of determination) demonstrates that 66.6% of the variation in leverage is caused by independent factors, "Adjusted R Square" specifies self-determining variables are also accountable for 61.2% deviation when interpretation and forecasted variable numbers are taken into account. The study has a 90.6% degree of confidence.

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Table 2. Prototype Review.

Regression Statistics	
Multiple R	0.816127799
R Square	0.666064585
Adjusted R Square	0.612634919
Standard Error	0.104093102
Observations	30.00000000

4.13. Analysis of variation (ANOVA)

The ANOVA method evaluates a model summary's acceptability and fits (see **Table 3**). The residual data indicates divergence that is not taken into account by the model summary whereas the regression provided evidence about the deviation taken into account by the model.

If F > 0.05 is present in the ANOVA table, the model is not valid, and the deviation that the model verifies is due to chance. F 0.05, on the other hand, indicates that the model is satisfactory and that any deviations observed are not merely coincidental.

Table 3. ANOVA.

ANOVA					
	df	**SS**	**MS**	**F**	**Significance F**
Regression	4.000E+00	5.403E-01	1.351E-01	1.247E+01	1.036E-05
Residual	2.500E+01	2.709E-01	1.084E-02		
Total	2.900E+01	8.112E-01			

4.14. Coefficient analysis

Coefficient analysis shown in **Table 4**. When all predictors (Growth, Profitability, Tangibility of Assets, and Size) are fixed to zero, the coefficient table's first row displays the constant, which is the second column of the first row 0.3098 (30.98%). This indicates that the amount of leverage is 0.3098.

Leverage is significantly impacted by the first slope, Earning, which has a significance of 3.79 and a P-value more than 0.05 (P>0.05). The equation of relation is in equation (2).

$$\text{Leverage} = 0.309 + (-0.01)\ \text{EAR} \quad (2)$$

where EAR is Earning.

The significance of the second slope, Tangibility, is P = 0.0002, which is less than 0.05 (P0.05), and t = 4.21, which shows that tangibility significantly affects leverage. The beta value is 0.45, indicating that a change in the tangibility of one million will result in a change in leverage of one million and a half. The equation of relationship is in equation (3).

$$\text{Leverage} = 0.309 + (0.45)\ \text{TNG} \quad (3)$$

where TNG is Tangibility.

The third slope has a considerable value of P=0.12, which is more than 0.05 (P>0.05), and t = 1.58, and it is the size of a corporation. The size's beta value is 0.027, indicating that a change in the size of 1 million will result in a change in leverage of 0.027 million. The equation of relation is in equation (4).

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Leverage = 0.309 + (0.027) SZ (4)

where SZ is the Size of the firm.

Growth is the final slope, and it has a substantial value of P = 0.09, which is higher than 0.05 (P > 0.05). It has no bearing on leverage. Growth's beta value is 0.36, indicating that a change in the growth of one million will result in a change in leverage of 0.36. The equation of relation is in equation (5).

Leverage = 0.309 + (0.36) GRT (5)

where GRT is Growth.

Table 4. Coefficients.

	Coefficients	Standard Error	t Stat	P-value
Intercept	0.309862113	0.154827762	2.001334316	0.056323089
Earning	-0.011159437	0.001635829	-6.82188308	3.769205E-07
Tangibility	0.450544814	0.106827363	4.217503865	0.000282923
Size of firm	0.027509536	0.017402832	1.580750514	0.126505643
Growth rate	0.360474804	0.207038748	1.741098258	0.093961400

Dependent variable: leverage.

4.15. Limitations and upcoming work

Due to time constraints, there are numerous limitations:

(i) Lack of time is the main obstacle to this survey's potential.
(ii) Research failed to collect records from several sectors and collect data from one sector(cement).
(iii) In this research, we just selected five listed companies from the overall sector of cement due to the limitation of the period.
(iv) Due to limited time, the method is restricted to five years of data, or 2013–2017. As a result, a thorough analysis encompassing a broad period that might produce different conclusions cannot be made.
(v) In this research, we use simple random sampling due to time constraints.

These findings suggest other aspects that can be considered in addition to the topic under study, some of which are listed below:

(i) More independent variables like; tax, and volatility; are used to check the impact on the dependent variable; leverage.
(ii) The behavior of determining leverage behavior of non-listed firms or listed firms of Lahore stock exchange etc.

5. CONCLUSION

With reference, this review reveals the factors that influence cooperative capital construction. The final sample for the years 2013 to 2017 was chosen from six large cement companies. Leverage is determined for the investigation's purposes by dividing total liabilities by total resources. Profitability, tangibility, growth rate, and firm size were chosen as the four independent variables to test the theory forecasts of static hypothesis, pecking order model, and trade-off philosophy. Six-panel unit root tests have been used to verify the data's stationery to guard against the production of misleading regression findings. The model's findings show that earning has a big, bad impact on leverage, supporting the Pecking order philosophy. Leverage-approving Trade-off theory positively connected with tangibility, and

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this association was statistically significant. By accepting Trade-off empirical predictions, the size was determined by taking LN (sales), which is found to be positively associated with leverage, but its effect is close to zero. Finally, it was discovered that growth and leverage were positively correlated, contradicting the agency cost theory. Long-term debt is often chosen by larger organizations, and as a result, it eventually affects the profitability ratio since, as we discovered through our test, the capital structure has a big influence on the company's worth.

6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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