



ADVANCE SOCIAL SCIENCE ARCHIVE JOURNAL

Available Online: <https://assajournal.com>

Vol. 05 No. 01. Jan-March 2026. Page#.5667-5677

Print ISSN: [3006-2497](#) Online ISSN: [3006-2500](#)Platform & Workflow by: [Open Journal Systems](#)**Capital Structure and Firm Performance: An Empirical analysis of ROA and ROE****Muhammad Riaz**

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Abstract

The goal of the current study is to clarify the significance of capitalization and its effects on registered businesses in Pakistan's chemical industry (Pakistan stock market) between 2008 and 2018. The study uses a sample of 17 businesses identify the drivers of capital structure using regression, correlation, and a panel data model. Initially, OLS (ordinary least square) regression, matrix correlation, summary statistics, fixed effect, and random effect were used in analyses on panel data from 2008 to 2018. Considerations include depreciation, taxes, returns on equity, and earnings per share. Sales, total assets, total equity, and earnings per share are all positively correlated with profitability. Profitability and depreciation are inversely connected. The trade-off theory's theoretical predictions are supported by the capital structure's substantial positive association with profitability. Only registered manufacturing companies in Pakistan's cement sector are included in the current work. Additionally, this study does not take into account other industry sectors.

Keywords: Capital structure, ROA, ROE, OLS

Introduction

Every single industry that contributes to the manufacturing sector of the economy is an important part of the expansion of the national economy. The economy can be broken down into three distinct sectors: the primary sector, the secondary sector, and the service sector. The agricultural sector is considered to be the primary sector, while the manufacturing sector is considered to be the secondary sector. Every nation's economic growth is being significantly influenced by the contributions of its manufacturing sector. Additionally, Pakistan's manufacturing sector, namely the cement industry, is experiencing quick and significant expansion. The relationship between capital structure and the effect it has on corporate performance is a fundamental concern in finance, and numerous theories attempt to explain it. Cement is the most important raw material that is used in the construction of buildings, roads, and other things. The Pakistani cement sector is stable, with twenty-one different companies listed on the market. In 2015, global cement production was estimated to be somewhere in the neighborhood of 4.1 billion annually. With 57 percent of the world's total cement production, China is by far the most important cement producing country.

In 2015, there was a 2 percent drop in the global usage of cement. Pakistan is currently ranked as the 14th largest cement producing country in the world. The most fundamental method is known as the MM theory, which was developed by Merton in 1958 and postulates that the business value is unaffected by its capitalization. There is the Peking order theory, the MM theory, and the trade-off theory. These are the three primary theories. According to Myers's (1977) trade-off theory, in order to optimize the firm's worth, a business would constantly shift its focus between its assets and its expenses. The objective of the analyst's investigation is to have a better understanding of the factors that have the potential to influence the outcome of the firm in either a favorable or bad way. According to the findings of a number of research on monetary matters, the factors that have the most influence on a company's profitability are its sales, taxes, and depreciation.

Despite its prevalence and visibility, no single theory can comprehensively explain the effect that firm performance and capital management have on one another. The research carried out by Le and Phan in 1979 elucidates a number of vitally important assumption theories, encompassing the actual society, which is extraordinarily intricate and varied. According to the findings of the study conducted by Phan, the community does not always have delightful perspectives; in addition, there is an insufficient number of finance analysts based on the functionalist design. The capital structure theories have stirred up controversy in a variety of different contexts and under a variety of different circumstances. According to the findings of Lagoarde-Segot's (2016) research, the modern-day financial system is susceptible to variation if several models are applied. In historical studies (Sheel 1994), financial companies are described in terms of capital, the profitability of the firm, and the stock price. The primary objective of this study was to investigate the impact that business expansion and capitalization have had on the income of cement producing firms in Pakistan that are listed on the Pakistan Stock Exchange. In order to account for this motive, various factors that anticipated future financial performance as well as actual financial performance were incorporated into an ordinary least square simple regression model. The dependent variable return on assets is calculated by dividing net income (after taxes) by net sales. Annual financial statements of 17 companies in the cement sector from 2008-2018, sourced from data provided by the Pakistan Stock Exchange (PKS) and the primary company websites linked to in the table.

Mess description

An investigation into the financial structure and venture, as well as the financial status, will focus on the cement producing area of Pakistan.

Hypothesis

This study essentially absorbed on following hypothesis testing.

H1: Return on equity affects a positive relationship with profitability.

H2: Earning per share affects a positive association with profit.

H3: Depreciation has a negative connection with profit.

H4: Total assets are directly associated with profit.

H5: Sales affect a positive relationship with profitability.

Literature review

Determinants of capitalization and firm growth would be examined by a large number of scholars from a variety of perspectives and in a variety of situations related with the production of corporations. Profitability of a company is measured by its capacity to operate in a realistic manner. Following the subtraction of operations and financial expenses, the remaining excessive amount is followed by other appropriate charges such as tax, depreciation, sales, and earnings per share. The Peking order theory, the marketing timing theory, and the trade-off theory are three of the most well-known approaches to capital management, and each of these theories is discussed in a separate article. The research conducted by Rub (2012) measures the firm performance effect as having a favorable impact on firms. This study discusses the profitability and capital structure of firms operating in developed markets. Sayeed (2011) provides a description of the many ideas of capital management.

In addition, a number of earlier studies demonstrated that there is either a negative or nonexistent association between company performance and capital structure. According to one study (El-Sayed Ebaid 2009), for instance, the capital structure of a company has either a little impact or none at all on the growth of the company. Another study, conducted by Huang and Song in 2006, found no association between leverage and the variable. According to the findings of Zeitun and Tian's study (2007), there is no correlation between a company's capital structure and its performance. In addition, there is a one-to-one connection between using leverage and increasing one's profits (Robb and Robinson 2009). The research conducted in 1967 with 500 different companies explains a high correlation between sales volume and revenue. Another study, this one conducted by Fiegenbaum and Karnani (1991) and Gul (2011), reveals that there is a significant correlation between business size and profitability. The research carried out by Gill et al. (2009) establishes that there is a clear connection between the firm's capital structure and its profitability.

The work of (Yadav 2017) decodes that the Indian selected companies were doing reasonably well with the profitability of Indian Cement companies as the top performers in the study 2012-2017. Yadav's research was conducted between the years 2012 and 2017. According to a survey that was conducted by Kumar (2018), technological and financial model swaps are essential growth elements of cement firms. Using an analysis of regression POLS, Yoon and Jang's work (Yoon and Jang 2005) demonstrates the connection between firm performance, profitability, and firm value in the restaurant industry between the years of 1998 and 2003. In addition, the study (Baker 1973) provided an explanation of the

effect that business performance has on the profitability of an industry. An Indian researcher (Majumdar and Chhibber 1999) decodes a sample from a single country that was used to gauge performance and profitability. In the research carried out by Poyry (2009), a connection between ownership structures and capital management was studied. This connection is explained. It was found that the profitability of a company has no link whatsoever with its performance.

In addition, the research conducted by Ullah (2018) examines the profitability of businesses and their capital structures by using panel data from 2007 to 2015. For the purpose of this research, the data of five different companies were utilized to analyze the OLS method. Another study, titled "The Impact of Financial Leverage on the Profitability of the Firm" and published in 2015 by Ahmad, Salman, and Shamsi, analyzed (eighteen)18 cement companies in Pakistan between the years 2005 and 2010, looking at how financial leverage affected the companies' profits. In the study (Zakaria 2018), the authors outline the factors that determined a company's profitability in the consumer products industry in Malaysia between the years 2006 and 2015. The study by Kumar (2018) explains the profitability analysis of cement firms in Telangana from 2007 to 2017. The time period covered is from 2007 to 2017. According to the literature that is currently accessible on the topic, this research does not find any harmony between profitability and company performance. To clarify, this is the reason why additional work is required. Consequently, our work contributes empirically to the capital indicated above in terms of management practices and outcomes.

Methodology

The current research delves into the link between the size of a company's market capitalization and its level of profitability, focusing on industrial companies that are listed on the Pakistan stock exchange. The work favored a study approach that combined descriptive and causal-comparative methods. There were twenty-one registered industrial firms in Pakistan, but we narrowed it down to seventeen manufacturing organizations. Due to the absence of annual filings on the stock exchange, my research does not include any information regarding four different companies.

Data collection

Due to the fact that these are secondary data from 2008-2018, the present research obtained its data from the official website of Pakistan (the Pakistan stock exchange). Data extraction necessitates using a variety of annual financial reports' statements of financial position.

Sample distribution

For the purpose of this investigation, eleven years' worth of annual data (2008-2018) were utilized. Although there are currently twenty-one firms producing cement that are listed on the (100 indexes) Pakistan stock exchange, I have only included seventeen of those companies in my research. Because my sample lacks certain data, I cannot include four companies in my sample. In this particular study, data were collected for all of the variables from 2008 to 2018.

Variable's declaration Table 01

Variable	Discription
ROA	Return on assets=NI/TA
ROE	Return on earning=NI/Shareholder,s equity
TA	Total assets=firm size proxy
EPS	Earning per share=Netincome pershare
DEP	Deperciation=Annual depreciation expense
SAL	Sales=Total sales/revenue

Statistical model

$$ROA_{it} = \beta_0 + \beta_1(Ta_{it}) + \beta_3(Eps_{it}) + \beta_4(Dep_{it}) + \beta_5(Sal_{it}) + \epsilon_t$$

$$ROE_{it} = \beta_0 + \beta_1(Ta_{it}) + \beta_3(Eps_{it}) + \beta_4(Dep_{it}) + \beta_5(Sal_{it}) + \epsilon_t$$

I=Firm=time period, ROE (return on equity), TA (total assets), EPS (earning per share), DEP (depreciation), ϵ =error term

Statistical technique

The hypothesis is developed by using of simple regression OLS technique. Dependent and independent variables are numeric(scale); therefore, this technique will be used in this research. In this situation following analyses are used in this study.

OLS, Summary statistic, Correlation, VIF, Random effect, and Housman test analysis.

Results and discussion**Table(II)****Regression analysis**

Variables	estimate	Std error	t	P>t	[95% Conf. Interval]
ROE	0.10	0.02	4.23	0.00	0.05 0.15
Dep	-5.85	2.31	-2.53	-0.01	-1.04 -1.29
Ta	5.46	1.37	3.98	0.00	2.75 8.18
Sal	6.35	2.37	2.68	0.00	1.67 1.10
EPS	0.47	0.08	5.45	0.00	0.30 0.64

R-squared	0.3120
Adj r-squared	0.2928

Table(I) shows the regression result of firm performance variables in the analysis ROA (return on assets) relationship with ROE (return on equity), SAL (sales), TA (total assets), and EPS (earning per share) have a positive relationship, and DEP (depreciation) have negative relation.

(Table II)

Summary statistic

Variables	Observation	Mean	Std. Deviation	Minimum	Maximum
ROA	187	4.438	15.531	39.63	69.68
ROE	187	3.215	49.331	42.05	74.46
DEP	187	1.131	5.410	26.01	3.761
TA	187	2.471	1.041	2.871	8.490
SAL	187	1.260	4.060	19.0	20.071
EPS	187	5.750	12.037	13.14	70.45

The descriptive statistics of this study are summarized in Table (II), which may be seen below. The overall number of enterprises that were observed in the study was 187, with 11 years of debt and 17 listings for cement manufacturing businesses. ROA is found to have a mean of 4.438 and can range anywhere from 39.9 to 69.68, while ROE can go anywhere from 42.2 to 74.46 and has a mean of 3.215. DEP has a mean of 1.131 and can range anywhere from 26.00 to 3.761, while TA can go anywhere from 2.781 to 8.490 and has a mean of 2.471. SAL has a mean of 1.260 and can range anywhere from 19.00

Table (III)

Correlation matrix

Variables	ROA	ROE	SAL	TA	DEP	EPS
ROA	1					
ROE	0.303	1				
SAL	0.157	0.024	1			
TA	0.018	0.493	0.048	1		
DEP	-0.053	-0.08	-0.021	0.588	1	
EPS	0.449	0.361	0.011	0.149	0.094	1

The association between the different factors and the probabilities is presented in table (III). The return on equity (ROE) has a direct and significant association with all of the other variables, with the exception of dep, which has a negative correlation. A considerable positive correlation exists between tax and a number of other variables. Both sales and earnings per share (EPS) are notably and directly connected with all of the other variables.

Table (IV)

Variance Inflation Factor (VIF)

Variables	VIF
ROA	1.31
ROE	1.20
SAL	1.45
TA	2.45
DEP	2.80
EPS	1.94
Mean VIF	1.86

Note: ROA, (return on asset), ROE, (return on equity), SAL (sales), TA (total assets), DEP (depreciation), EPS (earning per share)

Table (IV) shows the VIF (variance inflation factors) test and indicates no multicollinearity between independent variables. Therefore, even though there are relatively high correlations between some variables, in this table 4.4, all variables can be used together for analysis.

Table (V)

Random effect

Variables	Coefficient	Standard- Error	T-Statistic	Probability
ROE	0.105	0.025	4.190	0.000
SAL	6.351	2.390	2.657	0.008
TA	5.460	1.391	3.944	0.000
EPS	0.470	0.087	5.400	0.000
DEP	-5.850	2.331	-2.508	0.013
C	-0.100	1.164	-0.086	0.931

Table (V) provided an explanation for the relationship between all of the variables and the capitalization and growth of enterprises as assessed by ROA. This association was estimated by the Random effect estimator. The results of the statistics are derived from annual data collected between 2008 and 2018. ROE is for return on equity, SAL stands for sales, , EPS stands for earnings per share, and DEP stands for depreciation. There are five control variables. Given the data presented above, if the p-value for the return on equity (0.000), sales (0.008), tax (0.000), earning per share (0.000), and depreciation (0.013) is less than 0.05, then the factors are deemed to have a significant result in the process of explaining the variant of the dependent variable.

HAUSMAN TEST

Table (VI)

SUMMARY

T. Summary	Chi-Sq. Sta	Chi-Sq. D.f.	Prob
Period random	5.633001	5	0.3436

Table (VI) provides an explanation of the outcome that Hausman obtained, which is the prob-value (0.343). This value is superior to the value of 0.05. In this particular instance, rather than coming to the conclusion that the null hypothesis is false, we come to the conclusion that the null hypothesis is

correct. Given that the random effect model is suitable, we carried out an estimate of the random effect analysis. The results of the random effect analysis are presented in table 4.6.2.

Table (VII)

Random effects test collation

Variables	Fixed	Random	variation	probability
ROE	0.105571	0.105623	0.000030	0.9925
SAL	0.000000	0.000000	0.000000	0.1532
TA	0.000000	0.000000	0.000000	0.1699
EPS	0.499194	0.470981	0.000374	0.1448
DEP	-0.000000	-0.000000	0.000000	0.0788

Above the mentioned results explained the comparisons between RF and RE. ROE (return on equity), SAL (sales), TA (total assets).EPS (earning per share), DEP (depreciation).

Conclusion

Within the context of Pakistan's cement sector, this study explicates the connection that exists between profitability and a variety of other business performance indicators. It was postulated that there is an apparent pragmatic connection between profitability and the firm growth indicators, with the exception of depreciation, which has a negative association, according to the statistical results presented in table (4.1). The findings of this study are in line with the findings of the study that came before it (Larry and Stulz 1996). He identified what appears to be a pragmatic connection between profitability and leverage, and some other earlier research (TITMAN and WESSELS 1988; Wald 1999) have also been undertaken. According to the findings of the research conducted by Varun Dawar in 2014, there is a positive correlation between the firm's capital structure and its rate of growth in some Indian evidence from the years 2003 to 2012. In addition, (Ahmed Sheikh and Wang 2011) found that profitability and liquidity have a negative correlation with debt ratio from 2003 to 2007 when utilizing the data from SBP. Capitalization and firm growth evidence from Nepalese industrial enterprises was examined. According to the findings presented by (Bhattarai 2016), a statistically rare association exists between a company's financial structure and its performance. In the study that was done by Zakaria (2018) on the factors that determine a company's revenue in the consumer goods sectors from 2006-2015, there were no notable results. Empirical analysis of Bangladesh's registered firms (Ullah 2018) using panel data collected on the firm's profitability and capital structure from the reports of DSE-listed IT companies from 2007 to 2015. The data was acquired using the years 2007 to 2015. The findings demonstrated that ROA has a significantly positive link with volume of the firm having a significantly negative association with ROA. There was discovered to be a positive relationship between ROA and leverage, factors which had no meaningful impact on profitability.

Limitations and future scope

The findings of this investigation provided an explanation for some of the constraints. Only registered industrial businesses in the cement sector in Pakistan were the focus of this work. Therefore, in order to determine whether or not the findings are applicable across a wider scope, the subsequent research

will concentrate on the many other industries in Pakistan. In this investigation, freehold categories are not taken into consideration at all. As a result, further emphasis was put into inspecting the Freehold kinds in Pakistan.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Acknowledgements

Not applicable.

Authors' contributions

MR reviewed the literature, analyzed, interpreted and discussed the results. He is the only contributor in writing the manuscript. The author read and approved the final manuscript.

Funding

There is no source of funding.

Availability of data and materials

The datasets generated and/or analyzed during the current study are available in the Pakistan stock exchange (PKE). <https://www.psx.com.pk/>

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