Impact of Debt-to-Equity Ratio on Profitability of Cement Industry: A Case Study on Leading Cement Organizations of Pakistan

Abdul Hameed Khan
Karachi University Business School
Abdulhameedkhan1997@gmail.com

Abstract

Debt to equity ratio (D/E) is a financial metric that measures a company's financial leverage by dividing its total liabilities by its total equity. The impact of D/E on profitability of the cement industry is a matter of ongoing debate among economists and industry experts. The purpose of the study is to find out the relationship between debt to equity ratio and profitability of the cement industry. The current study is comprised of dependent and independent variables which are debt to equity ratio and profitability. Quantitative research method has been selected which includes primary and secondary data collection. The analysis of data has been done by using statistical software and the results of the study showed that there exist positive and significant relationship between debt to equity ratio and profitability in cement industry of Pakistan. Companies in the cement industry should therefore adopt a strategic and balanced approach to their debt financing, taking into account both their specific business environment and their long-term financial goals. This paper increases the understanding of the relationship between debt to equity ratio and profitability. The paper has implications in enhancing the understandings of performance management through understanding the relationship between debt to equity ratio and profitability particularly in a developing country, although it is necessarily limited by the size of the sample.

Keywords: Debt to Equity Ratio, Profitability, Cement Industry, Capital structure decision, Cement Industry of Pakistan.

Introduction

This research study presents a detailed discussion on the Impact of debt to equity ratio on the profitability of the cement industry. Debt-to-equity ratio and profitability are considered significant factors in the capital structure of an organization. Many researches have been conductedon the challenges faced by cement industries in Pakistan. The significance of conducting researchon the impact of debt to equity ratio on profitability lies in the fact that this research can provide insight into how a company's financial structure affects its profitability. A high level of debt can increase a company's interest expenses, which can affect its profitability. Additionally, a high debt-to-equity ratio can also signal to investors that a company is taking on too much risk, which can cause them to be less willing to invest in the company and decrease its profitability. Understanding the relationship between debt to equity ratio and profitability can help investors, managers, and analysts to make more informed decisions about a company's financial health and future growth.

Research has been done by analyzing the primary and secondary data to present a comprehensive analysis and it follows the discussion on the findings of the study from multiple sources to analyze the impact of debt to equity ratio on the profitability of the cement industry in Pakistan. This research analyzed that lower debt-to-equity ratio results in higher profitability, which is aligned with the capital structure of an organization. Furthermore, it is recommended in the study that the cement industry should reduce its debt-to-equity ratio because it is one of the factors that createsan impact on profitability.

The current study is comprised of dependent and independent variables but future researchers can add multiple dependent and independent variables for analyzing the results of the study. The study should be conducted on different industries by adding variables such as ROA and ROE. By considering the current situation of the country, different industries will produce different results. It might be a possibility that the relationship between debt to equity ratio and profitability could be high for the cement industry, but this relationship between debt to equity ratio and profitability for the textile industry.

Overview of the Cement Industry

The global cement industry has been growing at a steady pace in recent years, driven by the increasing demand for infrastructure and housing projects. As the world's population continues to grow and urbanize, the demand for new housing, roads, bridges, and other infrastructure has risen significantly. This has increased the demand for cement, a key ingredient in the construction industry. The Asia-Pacific region, particularly China and India, is the largest cement market, accounting for over half of the global demand. China is the world's largest producer and consumer of cement, with an annual production of around 2.2 billion tons. India is the second-largest producer and consumer of cement, with an annual production of around 300 million tons. These two countries alone account for more than 50% of the global cement demand. Other major cement markets in the Asia-Pacific region include Japan, South Korea, and Australia. In addition to the Asia-Pacific region, other major markets for cement include Europe, North America, and Latin America.

In Pakistan, the cement industry is one of the most important industries and a major contributor to the country's economy. A few large players dominate the industry, with a total installed capacity of over 50 million tons per year. The rapidly growing population, urbanization, and infrastructure development drive the demand for cement in Pakistan. The government's emphasis on infrastructure development, particularly in the housing sector, has also been a key driver of the industry's growth. The China-Pakistan Economic Corridor (CPEC) is expected to provide a boost to the cement industry in Pakistan through its various infrastructure projects. This includes the construction of roads, bridges, power plants, and Gwadar port, which will require large amounts of cement. Additionally, the construction of special economic zones (SEZs) under CPEC will drive demand for housing and other construction projects, further increasing the demand for cement. Furthermore, upgrading the transportation infrastructure under CPEC will facilitate the movement of goods and open up new export opportunities for the Pakistani cement industry. Overall, CPECis expected to drive the demand for cement in Pakistan and provide new opportunities for the industry's growth.

According to the data from the All Pakistan Cement Manufacturers Association (APCMA), the domestic demand for cement in Pakistan was around 36 million tons in 2020, with an annual growth rate of 5%. The exports of cement from Pakistan amounted to around 8 million tons in 2020, making it one of the major export items of the country. The industry employs around 1.5 million people directly and indirectly. The value of the cement industry in Pakistan is around $3 billion and is expected to grow in the future. The industry is also a major contributor to the country's foreign exchange earnings.

However, the industry is facing some challenges in recent times. The overcapacity in the industry has led to low prices and intense competition. The industry also faces issues with power shortages and high input costs, which have affected the profitability of cement companies. Additionally, the industry is facing increased pressure from the government to reduce emissions and improve energy efficiency. Despite these challenges, the cement industry in Pakistan is expected to grow in the coming years, driven by the increasing demand for housing and infrastructure projects. The government's infrastructure development plans and focus on affordable housing are expected to boost the demand for cement in the country. The industry is also expected to benefit from the increasing use of alternative fuels and the adoption of new technologies to improve energy efficiency and reduce emissions.

Problem Statement

The corporate sector serves as the backbone of the economy and plays a vital role in driving economic growth, especially in developing countries such as Pakistan. However, there has been a rising trend of corporate failures in both the private and public sectors globally, due to increasing competition and the rapidly changing global economic environment. One of the significant reasons behind such corporate failures is incorrect financial decision-making regarding capital structure. The decision regarding capital structure is critical as it not only affects a firm's ability to survive in a competitive environment but also affects the maximization of shareholders' value. However, determining the optimal proportion of debt and equity in the capital structure, which can enhance firm value and performance, remains a complex financial decision (Habibniya, et.al, 2022).

There are several examples of companies that went bankrupt due to an imbalance in their debt and equity proportions. These companies suffered from poor debt credibility, which hampered their funding resulting in poor financing. Examples include Zeal Pak Cement factory, Enron, KASB Bank, M.H.Dadabhoy, BCCI, Japan Power Generation Limited, TandlianwalaSugar mills, Usman Textile Mills, Kohinoor Power Company Ltd. etc. (PSX- Defaulters segment).

This study specifically analyzes the impact of debt to equity ratio on the profitability of firms in the cement industry of Pakistan. The findings reveal an inverse correlation between capital structure and firm performance, indicating that companies rely too heavily on debt and fail to invest it in profitable ventures. As a result, the cost of debt exceeds the returns gained from financial operations, leading to decreased profitability and share price performance. A higher debt-to-equity ratio also increases the risk of bankruptcy, which in turn harms firm performance. On the other hand, a positive relationship between debt-to-equity ratio and firm performance suggests that a moderate amount of debt can enhance performance when used appropriately. Financial managers tend to prefer debt as a financing source over owner equity due to lower debt costs and tax advantages, which ultimately maximizes firm performance (Tanjung, Nasution & Fadly, 2022).

Literature Review

The relationship between a company's debt-to-equity ratio and its profitability is a complex and widely researched topic in the field of finance. The debt-to-equity ratio, also known as the leverage ratio, is a financial metric that compares a company's total debt to its total shareholder equity and is used to measure a company's financial leverage and its ability to meet its debt obligations. Profitability, on the other hand, is a measure of a company's ability to generate profits from its operations. Dong, Wang & Zhang (2020) have shown in their study that there exists a relationship between a company's debt-to-equity ratio and its profitability. It was mentioned in the study that companies with higher debt-to-equity ratios tend to have higher levels of profitability in the stock market.

Yousef, Tanna & Patra, (2021) conducted research regarding the impact of debt to equity ratio on the profitability of the firms. It was found that there exists a positive relationship between leverage and profitability in the Gulf Cooperation Council (GCC) countries. These findings suggest that companies can use leverage to increase their returns on investments. However, it's important to note that there is an optimal level of leverage that maximizes profitability. Ahmad (2014) argues this statement of the author in his study that an increase in debt beyond a certain point can lead to a decrease in profitability in the cement industry of Pakistan. This suggests that companies should aim to strike a balance between leveraging their assets and maintaining a sustainable level of debt in order to achieve optimal profitability. Rehan, Alvi & Hussein (2020) analyzed in their study that the relationship between debt to equity ratio and profitability is non-linear, with profitability increasing as leverage increases up to a certain point and then declining as leverage continues to increase. This implies that there is an optimal level of leverage that maximizes profitability, beyond which additional leverage will decrease profitability. It is also worth mentioning that the relationship between debt to equity ratio and profitability may vary depending on the industry and the specific circumstances of the company.

Kamar (2017) argued in their study that the relationship between debt-to-equity ratio and profitability is different for state-owned enterprises (SOEs) and non-state-owned enterprises (NSOEs) in China. They found that the debt to equity ratio has a positive effect on profitability for NSOEs but not for SOEs. It was recommended in the study that companies should aim to strike a balance between leveraging their assets and maintaining a sustainable level of debt in order to achieve optimal profitability. Ahmad, Salman & Shamsi, (2015) conducted their study on impact of capital structure on the profitability of organizations. It was mentioned in the study that firms with higher debt-to-equity ratios have higher profitability. The results of the study showed a significant relationship between debt to equity ratio and profitability. Arif, Halik & Yucha, (2022) published in the International Journal of Economics and Financial Issues that there exists a positive relationship between debt to equity ratio and profitability of firms in the manufacturing sector in Pakistan.

Mwangi, Makau & Kosimbei (2014) conducted their study and it was published in the Journal of Applied Economics that the debt to equity ratio has a negative impact on profitability of firms in the Iranian industry sector. Their results show that the capital structure is positively influenced the Firm’s Financial Performance and Shareholders’ wealth. For checking the relationship between Capital structure and Shareholders’ wealth, they used the Stock Prices and EPS of different firms.

Babalola1 & Abiola (2013) stated that the debt-to-equity ratio is one of the significant ratios to access the soundness of a long-term financial position indicating the extent to which a firm depends upon outside investors for its existence. The findings show a positive correlation between debt financing and the D/E ratio and a negative correlation between equity financing (IPO) and the D/E ratio. As the stake of shareholders increases in a company, the D/E ratio decreases which is a good sign of financial performance stability. Therefore, the more a firm is based on equity financing, the lower the D/E ratio indicates a safe financial position of companies and good performance.

Research Methodology

The cement industry is considered a capital-intensive industry, and companies in this industry havea higher debt-to-equity ratio than companies in other industries. If the capital structure of any company is majorly based on Debt financing, it imbalance the debt-to-equity ratio of the company. The study has been conducted to analyze the relationship between debt to equity ratio and the performance of organizations in the cement industry of Pakistan. The cement industry is facing challenges as the majority of organizations have higher debt-to-equity ratios, therefore, it is important for the organizations to create a significant impact on their profitability while reducing their debt-to-equity ratios.

Research Framework

The cement industry is considered the backbone of the country's economy and a major contributor to the GDP of Pakistan. The focus of current research is to analyze the impact of debt to equity ratio and profitability in this industry. The debt to equity ratio is a key financial metric that is usedto measure a company's financial health and its potential impact on profitability. In the context of cement companies, the debt to equity ratio is important for several reasons. The debt to equity ratio is a measure of leverage, which indicates the level of risk associated with a company's financing structure. A higher debt-to-equity ratio suggests that a company is more heavily leveraged and may be at a higher risk of financial distress. The current study will assist organizations because understanding the impact of debt to equity ratio on profitability can also aid in managerial decision-making and create investment strategies.

Hypothesis

A hypothesis is a statement or an assumption about the relationship between two or more variables. In research, a hypothesis is used to predict or explain the outcome of an experiment or study. There are two types of hypotheses i.e. null and alternative. The null hypothesis states that there is no significant relationship between the variables being studied. The alternative hypothesis states that there is a significant relationship between the variables being studied. The study will test the following hypotheses:

- H1: Debt to Equity Ratio has a significant impact on firm's profitability.

Research Design and Data Collection Method

In this research, quantitative research design has been selected by the researcher for exploring the impact of debt to equity ratio on profitability of firms in cement industry of Pakistan. This design has been selected because it aims to measure variables in a systematic and objective manner, reducing the influence of personal biases and subjective interpretations. Primary data collection has been done through questionnaire and 100 respondents were selected from different organizations in Karachi. The employees of cement organizations filled the questionnaires. Stratified sampling technique has been used which is a statistical sampling method that involves dividing a population into subgroups or strata, and then selecting samples from each stratum.

Secondary data was collected from previous research papers and annual reports of the companies listed on the Pakistan Stock Exchange (PSX). The analysis of data has been done by using statistical software i.e. SPSS and the results, which are obtained from the data, have been analyzed and interpreted. The numerical data collected through primary method is analysed by using statistical methods, which includes correlation, regression and frequency analysis with the help of SPSS and visualization techniques for exploring the impact of debt to equity ratio on profitabilityof firms in cement industry of Pakistan.

Results and Discussion

Regression Analysis

Profitability as a Dependent Variable

For finding the results, Profitability was used as a dependent variable and Debt to Equity Ratio as an independent variable, which are shown in the table 01 below.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.360[a]	.130	.121	.49590

a. Predictors: (Constant), Mean DTE

Table no 01 Model Summary

The table no 01 shows the results of relationship between debt to equity ratio and profitability. The significance of this relationship was tested through model in which debt to equity ratio was used as an independent variable and profitability was used as a dependent variable. The adjusted R square came out to be 0.121 with R square equals to 0.130 showing that DTE is explaining only 1.2% of the variation in the dependent variable.

The following table is for the ANOVA (f-test) of the regression (s):

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.622	1	3.622	14.729	.000[b]
	Residual	24.346	99	.246		
	Total	27.968	100			

a. Dependent Variable: Mean P
b. Predictors: (Constant), Mean DTE

Table no 02 ANOVA Analysis

Table no. 02 shows the F-test, the linear regression's F-test has the null hypothesis that there is no linear relationship between the two variables (in other words R square=0). The strength and weakness depend on the Significance value and the F value. Significance value should be less than 0.05 and the F value should be greater than 3.8. With F=14.729 and Sig=0.000, the test is highly significant, thus we can assume that there is a linear relationship between the variables in our model.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.126	.222		5.077	.000
	MeanDTE	.418	.109	.360	3.838	.000

a. Dependent Variable: Mean P

Table no 03 Coefficient Statistics

This table shows the significance of the variables. A significance value of less than 0.05 indicates that the alternative hypothesis should be accepted and null hypothesis should be rejected and vice versa. The significance value of Debt to equity ratio is 0.000 thus, the alternative hypothesis has been accepted and it shows that there is an impact of debt to equity ratio on profitability of cement industry.

Pearson Correlation Analysis

Correlations

		MeanDTE	Meanp
MeanDTE	Pearson Correlation	1	.360**
	Sig. (2-tailed)		.000
	N	101	101
Meanp	Pearson Correlation	.360**	1
	Sig. (2-tailed)	.000	
	N	101	101

**. Correlation is significant at the 0.01 level (2-tailed).

Table no 04 Pearson Correlation Analysis

Correlations are similar to regressions but they only tell us one-on-one relationships and the direction and magnitude of the relationships of each variable. Pearson's Bivariate Correlation was used to find whether relation between independent and dependent variables exist. The Pearson Correlation value of between -1 and 1 justifies the existence of relation among the variable and the value beyond this range represents that no relation exist. The values for the correlation between Debt to equity ratio and profitability is 1 respectively. It represented that total debt to equity ratio has moderate relation with profitability of an organization.

Hypothesis Assessment Summary

The acceptance or rejection of the hypothesis is based on the significance value of each variable in the coefficient table. The significance value being $p < 0.05$, which mean alternate hypothesis, has been accepted, null hypothesis has been rejected, and $p > 0.05$ indicates that null hypothesis has been accepted and alternate hypothesis has been rejected. The hypothesis has been accepted in this research which shows that debt to equity ratio has a significant relationship with the profitability of firms.

Analysis and Discussion

In Pakistan, the relationship between debt to equity ratios (D/E) and profitability in cement companies is influenced by various factors, including economic conditions, government policies, competition, and market demand. It can be analyzed from the secondary data of Cement companies that debt to equity ratios has been increased from the past which has created an impact on the profitability of the organizations. This increased ratio shows that companies are dependent upon debt than equity, which shows that profitability has been decreased. The cement industry of Pakistan has faced several challenges due to higher debt to equity ratios. It can also be stated from the data of cement companies that that high D/E ratios in the cement industry in Pakistan can result in increased profitability under favorable economic conditions. For example, low interest rates and favorable tax policies can make it more attractive for companies to rely on debt financing, which can lead to higher profits. However, the impact of D/E on profitability in Pakistan's cement industry is not always positive. Companies with high D/E ratios may also face increased financial risk, especially if economic conditions deteriorate or if the government changes policies in a way that increases the cost of debt financing. To maximize profitability, cement companies in Pakistan should adopt a balanced approach to debt financing, taking into account their specific business environment and long-term financial goals. This may involve using a mix of debt and equity financing, and monitoring D/E ratios regularly to assess the impact of their financing strategy on profitability.

Conclusion

In conclusion, the relationship between debt to equity ratio (D/E) and profitability in the cement industry is significant which means that high debt to equity ratios will affect the profitability of organisations. It can be stated that the impact of D/E on profitability is industry-specific and can vary greatly from one country to another. Companies in the cement industry with high D/E ratios may benefit from increased profitability under favorable economic conditions, but may also face increased financial risk. On the other hand, companies with low D/E ratios may adopt a conservative financial strategy, but may also limit their ability to invest in growth opportunities. To maximize profitability, it is important for companies in the cement industry to adopt a strategic and balanced approach to debt financing. This may involve taking into account the specific business environment, as well as the long-term financial goals of the company. By considering these factors, companies can make informed decisions about the appropriate level of debt financing, and ultimately maximize profitability in the highly competitive and dynamic cement industry.

Recommendations

Cement Companies should strive to strike a balance between debt and equity financing in order to maximize profitability while minimizing financial risk. Companies should take into account the economic and regulatory environment, government policies, competition, and market demand when deciding on their debt financing strategy. Regular monitoring of D/E ratios can help companies assess the impact of their debt financing strategy on profitability and make adjustments as needed. Companies should align their debt financing strategy with their long-term financial goals, such as growth & expansion. They should seek the advice of financial experts, such as investment bankers or financial advisors, to help them make informed decisions about debt financing.

References

Ahmad, N., Salman, A., & Shamsi, A. (2015). Impact of financial leverage on firms' profitability: An investigation from cement sector of Pakistan. *Research Journal of Finance and Accounting*, *6*(7), 2222-1697.

Ahmad, T. (2014). Impact of capital structure on profitability: an empirical analysis of cement sector of Pakistan. *Research Journal of Finance and Accounting*, *5*(17), 49-54.

Arif, D., Halik, A., & Yucha, N. (2022). The influence of intellectual capital through human capital and structural capital towards financial performance manufacturing companies (garment and textile sector). *International Journal of Learning and Intellectual Capital*, *19*(5), 395- 415.

Babalola, Y. A., & Abiola, F. R. (2013). Financial ratio analysis of firms: A tool for decision making. *International journal of management sciences*, *1*(4), 132-137.

Dong, N., Wang, F., Zhang, J., & Zhou, J. (2020). Ownership structure and real earnings management: Evidence from China. *Journal of Accounting and Public Policy*, *39*(3), 106733.

Habibniya, H., Dsouza, S., Rabbani, M. R., Nawaz, N., & Demiraj, R. (2022). Impact of capital structure on profitability: panel data evidence of the telecom industry in the United States. *Risks*, *10*(8), 157.

Kamar, K. (2017). Analysis of the effect of return on equity (ROE) and debt to equity ratio (DER) on stock price on cement industry listed in Indonesia stock exchange (IDX) in the year of 2011-2015. *IOSR Journal of Business and Management*, *19*(05), 66-76.

Mwangi, L. W., Makau, M. S., & Kosimbei, G. (2014). Relationship between capital structure and performance of non-financial companies listed in the Nairobi Securities Exchange, Kenya. *Global Journal of Contemporary Research in Accounting, Auditing and Business Ethics*, *1*(2), 72-90.

Rehan, M., Alvi, J., & Hussein, H. I. (2020). Do leverage and dividend policy affect the profitability of cement sector in Pakistan. *Worldwide Journal of Research*, *1*(3), 19-26.

Tanjung, M. F., Nasution, A. P., & Fadly, Y. (2022). The Effect Of Company Size And Debt To Equity Ratio On Profitability Manufacturing Companies That Listed On The Indonesia Stock Exchange. *Britain International of Humanities and Social Sciences (BIoHS) Journal*, *4*(3), 451-462.

Yousef, I., Tanna, S., & Patra, S. (2021). Testing dividend life-cycle theory in the Islamic and conventional banking sectors of GCC countries. *Journal of Islamic Accounting and Business Research*, *12*(2), 276-300.