Impacts of Cost of Capital on Firm Value and Profitability: Insights from the Cement Industry in Bangladesh.

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ABSTRACT

The assessment of investments made by a company necessitates the consideration of the cost of capital. This study aims to evaluate and scrutinize how individual components of the cost of capital impact both firm value and profitability. The research sample comprises cement companies listed on the Dhaka Stock Exchange (DSE) during the period from 2016 to 2022. All data utilized in this study were sourced from the Bangladesh Bureau of Statistics (BBS), Dhaka Stock Exchange databases, and the annual reports of the selected companies. The analytical methodology encompassed descriptive, correlation, and ordinary least squares regression analyses. Contrary to expectations, the empirical findings of this study indicate that firm value and profitability do not appear to be influenced significantly by the cost of capital. Instead, the Total Debt Ratio (TDR) demonstrates a negative impact on firm profitability and a positive effect on firm value.

Keywords: Cost of Capital, Firm's Value, Tobin's Q, ROA, and Gross Domestic Product

INTRODUCTION

The primary role of the cost of capital is to ensure that a company can expand its operations and continue functioning on a larger scale. This involves critical decision-making across various domains such as managing long-term debts, retained earnings, asset utilization, and capital allocation. Consequently, effectively managing the cost of capital has become a paramount concern for firms, with numerous financial executives endeavoring to pinpoint the optimal level of cost of capital (Sattar, 2015; Mohamad & Saad, 2012). For an investment to be deemed worthwhile, the anticipated returns on capital need to surpass the cost of capital. This expectation stems from the investor's desire to maximize profits or returns from their invested capital in an organization. Therefore, a company should strive to maximize profits to both satisfy its shareholders and enhance the overall value of the firm.

Moreover, effective capital budgeting practices enhance an organization's cash flows, retained earnings, and overall size, consequently contributing to the country's Gross Domestic Product (GDP) and yielding returns for shareholders. The significance of the cost of capital has been extensively discussed in the realm of financial literature. Yet, an examination of previous research demonstrates conflicting findings regarding the impact of the cost of capital on firm value and performance.

Numerous studies, including those conducted by Mohamad and Saad (2012), Akeem et al. (2014), Cheng and Tzeng (2011), and Harahap et al. (2020), provide support for the idea that the cost of capital positively influences firm value. Conversely, Salehi et al. (2020) assert that the cost of debt negatively impacts the

value of financial firms in Tehran. This finding aligns with the results obtained by Ibrahim and Isiaka (2020) in India and Nigeria. Additionally, Kaviani et al. (2014) discovered that the cost of capital alone is inadequate in explaining firm value in Iran. The conflicting empirical evidence presents a research gap that instigates the need for further investigation, particularly in the context of cement companies listed on the Dhaka Stock Exchange (DSE) in Bangladesh, aiming to empirically establish the impact of the cost of capital on firm value and performance within the cement industry.

LITERATURE REVIEW

Investors gauge a company's adeptness in resource management by assessing its overall value (Utami & Hasan, 2021). The weighted average cost of capital (WACC) serves as a metric to gauge firm value by discounting forthcoming cash flows. Maximizing firm value often coincides with minimizing WACC (Chowdhury & Chowdhury, 2010). The company's debt policy significantly influences the Cost of Capital (COC) and consequently affects stock market valuations (Landi et al., 2022). Various empirical studies have demonstrated that substantial reliance on debt financing tends to decrease firm value. This conclusion is supported by research conducted by Chen & Chen (2011), Hang et al. (2021), Caskey et al. (2012), Vo and Ellis (2017), and Demirgüneş (2017).

As per the Trade-off theory, companies gain tax advantages when utilizing debt for financing. However, a surge in debt levels exposes the company to the costs associated with financial distress. The tax benefits accrued from higher debt ratios contribute to an augmentation in the company's owners' wealth. Bandanuji and Khoiruddin (2020), along with Mollik (2018), ascertain that a strategic debt policy can enhance firm value. Additionally, Kaviani et al. (2014) propose that Corporate Strategy (CS), reflected in minimal Cost of Capital (COC), positively impacts firm value. Conversely, Sahabuddin & Hadianto (2019) suggest that CS, represented by the debt-to-equity ratio, exerts a negative influence on firm value.

Hasan et al. (2014) investigated in Bangladesh the adverse impact of increased debt on Return on Assets (ROA) and Earnings Per Share (EPS), which represent aspects of accounting performance. Their findings indicated no correlations between leverage and Return on Equity (ROE) and Tobin's Q. Iavorskyi (2013) similarly discovered analogous outcomes in Ukraine. Likewise, in the Netherlands and China, Schulz (2017) and Shahrani and Zhengge (2016) observed that highly leveraged companies experienced reduced ROA in Small and Medium Enterprises (SMEs).

Salim and Yadav (2012) substantiated the detrimental influence of high leverage on accounting performance. In their study of Malaysian firms, they measured performance through ROA, ROE, and EPS, discovering a negative impact. Additionally, they noted a significant positive relationship between increasing debt and Tobin's Q.

Previous studies on this issue in both developed and developing markets have shown differences in the models employed, variables examined, findings obtained, and conclusions drawn. These variations cannot be universally applied as insights relevant to Bangladesh. Therefore, it is imperative to reconcile these discrepancies in order to comprehend the influence of the cost of capital on the firm's value and performance of cement companies in Bangladesh.

MATERIALS AND METHODS

This study conducted empirical research applicable exclusively to Bangladesh. It relied solely on secondary data, encompassing cement companies listed on the DSE (Dhaka Stock Exchange) during the period from 2016 to 2022. A sample of 7 companies was selected based on data availability. The data mostly derived

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from the annual reports of the selected sample companies and the DSE database.

Table 1. Operational Variables

Variables	**Definition**
Return on Asset (ROA)	Profitability measure calculated by division of operating profit to total assets.
Firm's Value (Tobin's Q)	Sum of market value and shareholders' equity plus book value of debt, divided by the book value of assets.
Total Debt Ratio (TDR)	Total Debt divided by total assets
Weighted Average Cost of Capital (WACC)	Calculated by averaging the rate of all of the company's sources of capital (both debt and equity), weighted by the proportion of each component.
Size	Natural logarithm of total assets.
Inflation (IF)	Inflation rate is determined as the rate of change that takes place in the consumer price index over a time period.

Researchers Scholars extensively examined various published works both domestically and internationally concerning the present study. The literature review facilitated the identification of diverse variables associated with cost of capital, firm value and performance. Subsequently, the study acquired the necessary secondary data from multiple sources, including but not limited to the Bangladesh Bureau of Statistics (BBS), publications from the Dhaka Stock Exchange (DSE), reports from the Bangladesh Bank, annual reports of sampled companies, and the DSE database.

The research utilized Ordinary Least Square (OLS) regression models to examine how the cost of capital influences both firm value and the performance of cement companies in Bangladesh. In conducting panel data analysis, the study employed both Fixed Effects Model (FEM) and Random Effects Model (REM) to explore variations across entities and time periods. To select the most suitable model for the dataset, researchers conducted a Hausman test. This test aimed to ascertain whether individual effects were correlated with the independent variables (a premise of the REM) or not (a premise of the FEM). Within the analysis, two distinct functional relationship models were examined using a multivariate OLS regression technique, structured as follows:

Model 1: $ROA_{it} = \beta_0 + \beta_1 WACC_{it} + \beta_2 TDR_{it} + \beta_3 SIZE_{it} + \beta_4 GDP + \beta_5 INF + e_{it}$

Model 2: $TQ_{it} = \beta_0 + \beta_1 WACC_{it} + \beta_2 TDR_{it} + \beta_3 SIZE_{it} + \beta_4 GDP + \beta_5 INF + e_{it}$

This research is based on the following hypothesis that clearly define the research criterion.

H_a: There is a significant impact of Cost of Capital on Firm Value and Profitability.

RESULTS AND DISCUSSION

This section of the study is organized into three main analyses: descriptive statistics, correlation analysis, and regression analysis. Table 2 displays the descriptive statistics for all variables involved in the study, showcasing mean values and their corresponding standard deviations. Upon reviewing Table 2, it becomes evident that among the sampled firms, the average Return on Assets (ROA) stands at 0.034. This value suggests a moderate level of profitability within the cement sector in Bangladesh. Tobin's Q, with a mean of 0.576085, notably falls below 1, indicating that the company might not be efficiently utilizing its assets or creating value compared to the replacement cost of those assets. Furthermore, the average total debt ratio of 0.634 for the sample firms signifies that, on average, these companies finance approximately 63.4% of their total assets through debt. This figure highlights the extent to which a company's assets are funded through borrowing in contrast to equity. In terms of the Weighted Average Cost of Capital (WACC), the mean value of 0.257, accompanied by a standard deviation of 0.229, indicates a diverse range among the sampled firms concerning their cost of capital.

Table 2. Descriptive Statistics Results

Variables	Minimum	Maximum	Mean	Standard Deviation
ROA	-0.086	0.153	0.034	0.051
TQ	0.039	2.428	0.576	0.635
TDR	0.240	0.994	0.634	0.193
WACC	0.082	0.871	0.257	0.229
SIZE	18.99	26.42	22.752	1.722
GDPGR	0.034	0.078	0.068	0.014
IF	5.510	7.700	5.844	0.600

Source: Author's calculation

Table 3 displays the pairwise correlations among all variables utilized in this study, encompassing independent variables like weighted average cost of capital (WACC) and total debt ratio (TDR), dependent variables associated with profitability (ROA) and firm's value (Tobin's Q), and control variables such as firm size, GDP growth rate, and inflation. The correlations were assessed at a significance level of 5%. The positive correlation observed between Return on Assets (ROA) and Firm Size suggests that as a company's size or scale of operations increases, there's a tendency for ROA to also increase. This relationship indicates that larger firms often exhibit higher returns relative to their assets, showcasing potential efficiencies or advantages associated with larger operations. Furthermore, the negative and significant correlation found between Return on Assets (ROA) and Total Debt Ratio (TDR) indicates that as the proportion of a company's assets financed through debt rises, there's a tendency for ROA to decrease. This finding aligns with the results observed in the studies by Hermawan, et al. (2023) and Saraswati (2017), affirming that higher debt levels could potentially impact a company's profitability adversely. A negative significant correlation between Total Debt Ratio (TDR) and firm size implies that as a company's size grows, there's a tendency for the proportion of assets financed through debt (TDR) to diminish. This outcome might be

attributed to the fact that larger companies generally have enhanced access to various funding streams, such as equity financing, venture capital, or alternative financial instruments. This increased accessibility potentially results in a lesser reliance on debt for financing purposes.

Table 3. Correlation Test between IVs and *DVs*

Variables	ROA	TQ	WACC	TDR	GDP	IF	Size
ROA	1						
TQ	-.231	1					
WACC	0.226	0.256	1				
TDR	-.724**	.082	-.267	1			
GDP	.070	-.079	.131	-.096	1		
IF	-.076	.295*	-.078	.070	.051	1	
Size	.429**	-.262	-.088	-.445**	-.028	-.082	1

Note: (**) indicates 5% significance level

Source: Author's calculation

Prior to conducting the regression analysis, several assumptions were evaluated, including linearity, normality, homoscedasticity, and independence of errors. The results revealed no issues with linearity, normality, homoscedasticity, or independence of error terms. In other words, it was established that all the necessary statistical assumptions for multivariate statistical techniques were met. The fulfillment of these assumptions ensures the validity and reliability of the obtained results. The significance levels are represented by the denotations of *, **, or *** at 1%, 5%, and 10% respectively. In Table 4, 5, 6, and 7 the Durbin-Watson statistic value around 2 indicates that the residuals of the regression models do not exhibit significant first-order autocorrelation. This supports the assumption of independence of errors, suggesting that the models adequately capture the linear relationship between variables without systematic patterns in the residuals.

Table 4. OLS Regression Result – ROA as Dependent Variable

Model 1: $ROA_{it} = \beta_0 + \beta_1 WACC_{it} + \beta_2 TDR_{it} + \beta_3 SIZE_{it} + \beta_4 GDP + \beta_5 INF + e_{it}$						
Variable	**Coeff.**	**Std. Error**	**t**	**Sig.**	**Tolerance**	**VIF**
C	0.041	0.113	0.365	0.71		
WACC	0.014	0.024	0.603	0.54	.862	1.160
TDR	-0.168	0.032	-5.183	0.00*	.703	1.423
SIZE	0.004	0.003	1.258	0.21	.972	1.028
GDP	0.019	0.373	0.052	0.95	.982	1.018
IF	-0.001	0.008	-0.132	0.89	.750	1.333
R^2	0.542432					
Adj. R^2	0.489227					
F	10.19504					
P (F-statistic)	0.000002					
Durbin-Watson stat	1.844					

Source: Author's calculation

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According to Table 4, the absence of a significant relationship between Weighted Average Cost of Capital (WACC) and Return on Assets (ROA) may be attributable to the specific dataset or sample utilized for analysis. It's plausible that, within this particular context or time frame, the statistical connection between WACC and ROA does not appear.

In contrast, a noteworthy finding from the study is the substantial and negative impact of Total Debt Ratio (TDR) on firm profitability, particularly Return on Assets (ROA). This suggests that higher levels of debt concerning a company's assets tend to correlate with reduced profitability. Similar findings have been observed in studies conducted by Susilawati et al. (2022) in Indonesia, Schulz (2017) in the Netherlands, Shahrani and Zhengge (2016) in China, and Salim and Yadav (2012) in Malaysia. These consistent findings across various studies conducted in different countries support the notion that elevated levels of debt in relation to a company's assets generally correspond to diminished profitability, signifying a trend that holds across multiple geographical contexts.

Table 5. Regression Result of Fixed Effect and Random Effect- ROA as Dependent Variable

	FEM				**REM**			
Variables	Coef.	Std. E.	t	**Sig.**	Coef.	Std. E.	t	**Sig.**
C	0.007	0.142	0.051	0.95	0.024	0.119	0.208	0.83
WACC	0.030	0.026	1.129	0.26	0.022	0.024	0.890	0.37
TDR	-0.304	0.104	-2.916	0.00*	-0.170	0.038	-4.446	0.00*
SIZE	0.009	0.005	1.650	0.10***	0.005	0.003	1.294	0.20
GDP	-0.177	0.379	-0.467	0.64	0.001	0.359	0.005	0.99
IF	0.002	0.008	0.227	0.82	-0.003	0.008	-0.044	0.96
R^2	0.638024				0.443468			
Adj. R^2	0.530409				0.378755			
F	5.928784				6.852852			
Prob. of F	0.000018				0.000088			
Durbin-Watson stat	1.85				1.71			
Hausman Test	4.305555							
Prob.	0.5063							

Source: Author's calculation

In Table 4, the R-squared ratio is 0.54, indicating a moderate level and demonstrating that the regression model accounts for a substantial portion of the variability in this ratio based on the selected independent variables. Table 5 showcases the R-squared outcomes of Fixed Effects Model (FEM) and Random Effects Model (REM) at 0.63 and 0.44, respectively, indicating a moderate level of explanatory power in both models. The results of the Hausman test suggest that the Random Effects Model (FEM) is preferred, given the probability value of 0.5063. This outcome suggests that the Random Effects Model is more suitable, indicating that the chosen model is better suited for the analysis compared to the Fixed Effects Model in this

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context.

Table 6. OLS Regression Result – TQ as Dependent Variable

Model 2: $TQ_{it} = \beta_0 + \beta_1 WACC_{it} + \beta_2 TDR_{it} + \beta_3 SIZE_{it} + \beta_4 GDP + \beta_5 INF + e_{it}$						
Variable	Coefficient	Std. Error	t-Statistic	**Sig.**	**Tolerance**	**VIF**
C	-1.031	1.680	-0.613	0.543		
WACC	0.157	0.315	0.500	0.620	.862	1.160
TDR	3.777	1.232	3.064	0.004**	.703	1.423
SIZE	-0.069	0.066	-1.035	0.307	.972	1.028
GDP	0.552	4.488	0.123	0.902	.982	1.018
IF	0.121	0.104	1.161	0.252	.750	1.333
R^2	0.672612					
Adjusted R^2	0.575280					
F	6.910515					
Prob. of F	0.000004					
Durbin-Watson stat	1.76					

Source: Author's calculation

An observed significant positive correlation between Tobin's Q, serving as a firm's value indicator, and Total Debt Ratio (TDR) implies a potential scenario where higher debt levels might positively impact the perceived value of the firm. This could occur if investors interpret the company's strategic use of leverage favorably or if the debt is efficiently employed to generate amplified returns. This positive relationship aligns with various studies supporting the notion that leverage has a constructive and statistically significant effect on firm value. This evidence is reflected in research conducted by Jiraporn and Liu (2018), Mollik (2008), Shahnia et al. (2020), Khan et al. (2021), and Jihadi et al. (2021). These studies bolster the understanding that, in certain contexts, higher levels of debt might contribute positively to a firm's perceived value, emphasizing the potential benefits of leveraging strategies when executed effectively and generating higher returns for investors.

Table 7. Regression Result of Fixed Effect and Random Effect- TQ as Dependent Variable

	FEM				**REM**			
Variables	Coef.	Std. E.	t	**Sig.**	Coef.	Std. E.	t	**Sig.**
C	-1.03	1.680	-0.613	0.54	0.47	1.289	0.371	0.71
WACC	0.15	0.315	0.500	0.62	0.80	0.280	2.855	0.00*
TDR	3.77	1.232	3.064	0.00*	0.11	0.368	0.325	0.74
SIZE	-0.06	0.066	-1.035	0.30	-0.07	0.040	-1.830	0.07***
GDP	0.55	4.488	0.123	0.90	-5.95	4.226	-1.409	0.16
IF	0.12	0.104	1.161	0.25	0.32	0.100	3.220	0.00*
R^2	0.672612				0.229864			
Adj. R^2	0.575280				0.140313			

F	6.910515	2.566859
Prob. of F	0.000004	0.040553
Durbin-Watson stat	1.74	1.63
Hausman Test	48.880126*	
Prob.	0.0000	

Source: Author's calculation

In Table 6, the R-squared value is 0.67, indicating a considerably high level, signifying that the regression model effectively explains a significant portion of the variability in this ratio based on the chosen independent variables. Table 7 presents the R-squared results of both the Fixed Effects Model (FEM) and the Random Effects Model (REM) at 0.67 and 0.22, respectively. These figures suggest that the Fixed Effects Model (FEM) demonstrates a notably high. The results derived from the Hausman test reinforce the superiority of the Fixed Effects Model (FEM) over the Random Effects Model (REM), as indicated by the probability value of 0.000.

To assess the overall significance of the estimated regression models, this study has opted to employ an F-test with a P-value at the significance level of 0.05. The results provide sufficient evidence to conclude that at least one of the βi coefficients, where i=1,2,3,4,5, is not equal to zero at a significance level of 0.05. This finding confirms that both the models as a whole is statistically significant.

CONCLUSION

The objective of this paper is to assess how cost of capital influences the firm's value and financial performance of cement companies in Bangladesh. This study utilizes a dataset comprising 7 companies over a 7-year period from 2016 to 2022. Through descriptive analysis, correlation matrix and multiple regression analysis, the study scrutinizes the data.

The study's empirical results suggest that the cost of capital does not have a substantial influence on either firm value or profitability. However, the Total Debt Ratio (TDR) exhibits a negative correlation with firm profitability, indicating that higher debt levels might decrease a firm's profitability. Conversely, the TDR shows a positive association with firm value, implying that increased debt ratios may enhance the perceived value of the firm.

Future research avenues could delve deeper into understanding the nuanced relationships between different components of the cost of capital and firm performance indicators. Additionally, exploring how various industries or economic conditions might influence the impact of debt ratios on firm profitability and value could offer valuable insights. Moreover, investigating the interplay between cost of capital dynamics and managerial decisions, particularly in different market contexts or during economic fluctuations, could provide a more comprehensive understanding of their effects on firms.

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