

Efficiency, Capability, and Context: An SEM-Based Analysis of SME Financing in Bangladesh

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Abstract

Purpose: There has always been a difficulty for Small and Medium Enterprises (SMEs) in financing due to institutional deficiencies, limited managerial expertise, and immature financial market in the country. This study attempts to explore the effect of firm-level, managerial, and environmental factors on leverage decision of SMEs using total and long-term debt as proxies for leverage decision.

Design/methodology/approach: A sample of 224 SMEs registered at Bangladesh Small and Cottage Industries Corporation (BSCIC) was selected and their response collected through structured questionnaire form. Structural equation modeling technique was used to explore the simultaneous impact of operating, managerial, and institutional factors on SMEs leverage decisions.

Findings: The findings reveal that operational efficiency and competitiveness have positive impacts on total debt and long-term debt. Profitability and managerial capability have a negative impact on leverage, which supports the pecking order hypothesis that suggests profitable companies are more dependent on internal resources. Conventional factors like firm size, firm age, and asset tangibility do not hold any statistical significance, indicating that institutional forces dilute the explanatory powers of traditional determinants in the emerging market environment. Financing availability has a positive association with long-term debt, but institutional influences show a surprising negative association with leverage.

Originality/value: While previous research concentrated on conventional firm-level factors by means of regression analysis, this study emphasizes the importance of operational efficiency, managerial capability, and institutional influences on financing practices under weak financial institutions.

Practical implications: The results indicate that there should be performance-based loaning schemes, improved financial literacy programs for SMEs, and reforms to help SMEs access formal financing.

Research limitations: The study is constrained by the use of cross-sectional analysis and non-probabilistic sampling technique. Subsequent research could adopt longitudinal analysis and sector-wise analysis of financing behavior of SMEs.

Keywords: Capital structure, Small and medium enterprises (SMEs), Bangladesh, Structural equation modeling (SEM)

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1. Introduction

Small and Medium Enterprises (SMEs) play a crucial role in economic development, job creation, innovation, and poverty alleviation both in developed and developing economies. According to the International Finance Corporation (IFC, 2025), 90 percent and more of firms operate in the economies across the world, contributing heavily to employment generation and economic growth measured in terms of GDP. In the case of Bangladesh, SMEs make up almost 99.97 percent of all business organizations contributing heavily to the country's industrial production and economic growth (Ministry of Industries, 2019). However, despite such economic contributions, SMEs continue to suffer from limited access to finance.

In Bangladesh the lack of financial accessibility is due to various reasons such as underdeveloped system of collateral-based lending, poor development of financial institutions, lack of institutional enforcement, and high level of informational asymmetries between creditors and debtors (Saha et al., 2023; Dhar et al., 2024). Thus, many SMEs struggle to obtain loans despite demonstrating viability and growth opportunities. Previous research shows that financing decisions are affected by various factors including not just traditional features of firms but also manager's behavior and institutional context (Amoa-Gyarteng & Dhliwayo, 2023; Czerwotka & Jaworski, 2021).

This study is primarily based on pecking order theory and institutional theory. According to pecking order theory, SMEs prefer to use internal financing due to the existence of information asymmetry over external financing (Myers & Majluf, 1984), whereas according to institutional theory, weak financial systems, inefficiency of regulatory systems, and lack of access to credit finance affect the financing practices of emerging economies (North, 1990). In countries like Bangladesh, where the regulatory system is inefficient, and there is a weak financial system along with poor credit accessibility, there will be distortion in financing behavior (Beck, 2013; Saha et al., 2023). The study uses trade-off theory and agency theory as secondary theoretical approaches to offer more insight regarding risk balance and decision-making.

Despite the existence of prior studies regarding determinants of capital structure in Bangladesh and other emerging markets, there are a number of gaps that need to be addressed. Firstly, most of the prior studies have concentrated mainly on traditional determinants of capital structure at the firm level, including profitability, firm size, and asset tangibility, while neglecting managerial and institutional determinants of capital structure (Hossain & Ali, 2012; Shil et al., 2019). Secondly, the past studies have employed a methodological approach of regression analysis, which is incapable of addressing complex interrelationships among several determinants.

Therefore, this study develops an integrated SEM model to investigate the impact of operational efficiency, managerial capability, financial accessibility, competitiveness, and institutional environment on SMEs leverage decisions in Bangladesh. The contribution of this study is twofold. First, from the theoretical perspective, the current study extends classical capital structure theories into an institutionalized emerging economy environment. Second, empirically, the current study considers various firm-level, managerial, and environmental factors to explain SME financing behaviors. From the methodology point of view, the research

shows that the SEM technique can be successfully applied to explore complex financing decisions made by SMEs in emerging economies. In terms of practical implications, this study helps to address issues related to performance-based lending and financing, as well as enhance the role of financial literacy and promote institutional reforms to improve the level of financing accessibility for SMEs.

2. Review of the Literature and Hypothesis Formulation

2.1 Theoretical Foundations of Capital Structure

Theories explaining the decisions related to capital structure have been identified by several scholars. Some of the common ones include pecking order theory, trade-off theory, agency theory, and institutional theory. Nonetheless, the application of such theories in SMEs within emerging economies is still a critical discussion.

Pecking order theory was formulated by Myers and Majluf (1984). The theory suggests that the use of internal sources of finance is favored over debt financing due to information asymmetry and transaction costs involved in the use of external sources of funding. In the case of SMEs, they largely depend on retained earnings due to borrowing restrictions, low financial reporting, and lack of access to formal financial markets. Various empirical studies conducted in developing countries support this theory as profitable SMEs avoid external borrowings (Amoa-Gyarteng & Dhliwayo, 2023; Delikanlı & Kılıç, 2021).

According to trade-off theory, companies choose an ideal capital structure by weighing the advantages of debt, including tax shields, against the costs associated with bankruptcy and financial distress (Myers, 1984). Under this framework, bigger firms with asset tangibility are likely to engage in more leverage because they can offer more collateral and have less chances of going bankrupt (Rajan & Zingales, 1995). Nevertheless, studies conducted in developing economies show that institutional constraints reduce the effectiveness of such explanatory variables as firm size and asset tangibility (Czerwonka & Jaworski, 2021).

The agency theory offers an explanation of financing choices based on the interests and conflicts between owners, management, and creditors (Jensen & Meckling, 1976). For small firms, agency problems differ as ownership and management roles coincide in one person. As a result, managerial expertise, financial awareness, and strategic thinking assume much greater importance for small firms' finance than for big organizations (Kontuš, 2021).

In addition, institutional theory explains the behavior of companies regarding their financing by highlighting the importance of external institutional environment factors such as financial infrastructure, regulation, and legal system (North, 1990). Weak institutional structures, collateral-based lending practices, and poor development of financial markets in emerging economies like Bangladesh adversely affect the access of SMEs to formal financing regardless of the firm quality (Beck, 2013; Saha et al., 2023). Thus, institutional theory can be used as one of the contextual explanations for deviation from classic capital structure principles.

In general, the research being conducted in this study mainly applies the concepts of pecking order theory and institutional theory as primary bases for explanations. The above theories will appropriately explain the financing activities of small medium-sized enterprises in

the case of emerging economies that are characterized by weak institutional structures, imperfectness of financial markets, and asymmetric information (Beck, 2013; Czerwonka & Jaworski, 2021; Saha et al., 2023). Other additional theories include trade-off theory and agency theory provides supplementary insights regarding leverage decisions, managerial behavior, and financing risks.

2.2 Firm-Specific Determinants of SME Capital Structure

Company-specific factors continue to be one of the most studied factors of capital structure within small business financing. Profitability has been shown to have a negative association with leverage since profitable firms would rather use their retained earnings for financing than borrow money externally, consistent with the pecking order theory (Frank & Goyal, 2009). According to Grau and Reig (2021), profitability and leverage had significant impacts on financing decisions in European agricultural companies.

The size of a business has been linked to higher leverage as a result of higher credibility in the market, lower information asymmetries, and better access to capital markets (Rajan & Zingales, 1995). According to Ezeoha (2008), firm size positively impacts leverage choices in developing countries. But recent research indicates that institutional impediments could undermine this relationship in emerging markets with constrained access to finance (Czerwonka & Jaworski, 2021).

Tangibility of assets is another critical factor for determining leverage since tangible assets can be used as collateral for debt. In his study, Vengesai (2023) showed that companies with more asset tangibility have high leverage due to the lenders' high level of confidence. However, in poor institutional environments, the availability of collateral may not ensure financial access.

Growth prospects affect financing as well. As mentioned by Awan et al. (2010), rapidly growing companies can either use more debt to finance growth or refrain from leveraging to ensure flexibility. Thus, empirical evidence on the connection between them is inconsistent, especially for SMEs in developing countries.

Operational efficiency and asset utilization have become important determinants of financing recently. The operational efficiency of a company creates better cash flows, builds lenders' trust in their ability to pay back debts, and provides access to debt financing (Neville & Lucey, 2022). It implies that performance factors may gain more importance than structure-based factors within developing financial markets. Given the theoretical significance of firm-specific determinants of SME capital structure and the inconclusive empirical evidence, the following hypotheses are offered:

- H1:** Profitability is negatively associated with SME leverage.
- H2:** Larger SMEs have higher leverage.
- H3:** Tangibility of assets positively affects leverage.
- H4:** Growth opportunities are negatively related to leverage.
- H5:** Asset utilization is positively associated with leverage.

2.3 Managerial Determinants and Agency Considerations

Attributes of the manager are highly significant in SMEs' financing behaviors due to the fact that financing decisions in SMEs are usually made by owner-managers. In large organizations, financing decision-making is normally distributed among several management tiers; however, financing decisions in SMEs usually rely on the financial know-how, experience, and risk attitude of the owner/managers (Islam et al., 2023).

Recent studies emphasize that efficient management contributes to proper allocation of internal resources and higher operational efficiency. This further leads to reduced need for external borrowings (Ahmad et al., 2024). Further, Mpofu and Sibindi (2022) have pointed out that the efficiency of managers affects the financial decisions made by SMEs in emerging markets. At the same time, managerial conservatism along with risk aversion can be seen as one of the reasons why firms avoid using debt financing despite the presence of opportunities. Financial access also relates to managerial efficiency in dealing with financing issues and preparing financial statements. According to Beck et al. (2005), those firms that are financially knowledgeable and institutionally connected encounter fewer financial constraints. As a result, the following hypotheses are developed:

H6: Managerial capability is negatively associated with leverage.

H7: Access to finance is positively associated with leverage.

2.4 Institutional and Environmental Influences in Emerging Markets

There is no doubt that institutional and environmental factors have a huge impact on the financing behavior of small businesses. According to institutional theory, low efficiency of financial institutions, inefficient regulation and contract enforcement, and low level of financial infrastructure have an effect on the financing behavior of companies beyond traditional explanations (North, 1990). It can be seen from various empirical studies that institutions have a significant role in determining the extent to which small businesses have access to financing. For example, Czerwonka and Jaworski (2021) showed that capital structure decisions made by SMEs operating in Central and Eastern Europe were greatly affected by institutional quality.

However, the financing difficulties faced by SMEs in Bangladesh have been exacerbated by the continued dependence on collateral and bureaucratic processes for loans (Saha et al., 2023). As such, many SMEs have resorted to informal financing methods even when financially sustainable. Competition also impacts financing strategies. SMEs in very competitive sectors often need extra financing to ensure their continued sustainability, market dominance, and growth opportunities (Nunes, & Serrasqueiro, 2012). Thus, the presence of intense competition might lead to increased leverage utilization regardless of the financial risks involved. These findings suggest that environmental and institutional variables must be incorporated alongside traditional firm-level determinants to develop a more comprehensive understanding of SME financing behavior in emerging economies. As a result, the following hypotheses are developed:

H8: Competitiveness positively affects leverage.

H9: Favorable institutional environments increase leverage.

2.5 Summary and Gap Identification

However, there are still many significant gaps in the literature on SMEs' capital structure despite a vast number of studies in this field. Firstly, previous studies mostly concentrated on traditional firm-level factors and ignored managerial and environmental elements. Secondly, empirical researches based on Structural Equation Modeling (SEM) analysis in relation to SMEs' financing issues are insufficient, especially in South Asian countries. Lastly, the role of operational, behavioral, and environmental elements interlinking each other in SMEs' financing decisions is still understudied. Therefore, this study contributes by integrating firm-level, managerial, and environmental determinants into a comprehensive SEM framework within the context of Bangladesh. The novelty of the study lies not in testing isolated relationships individually, but in simultaneously examining how operational, behavioral, and institutional factors interact to shape SME financing behavior under weak institutional conditions.

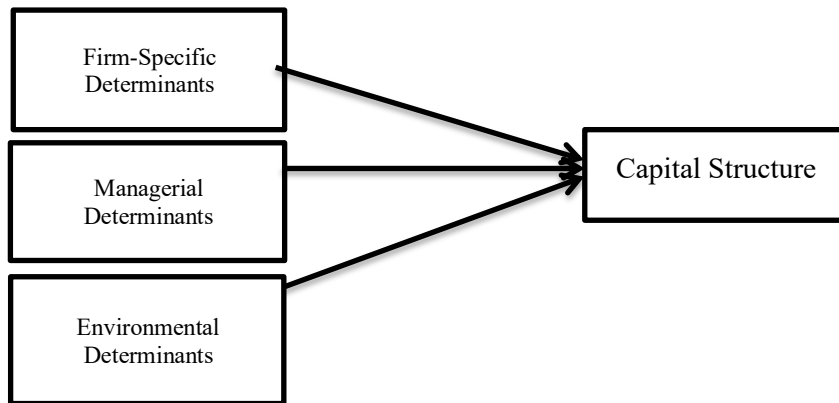


Figure 1: Conceptual Framework

3. Methodology

3.1 Research Design

This study employs an explanatory and quantitative research approach for determining the factors influencing the capital structures of the Small and Medium Enterprises (SMEs) operating in Bangladesh. The study incorporates firm-specific factors, managerial factors, and environmental factors into a single framework in order to analyze their effect on the leverages of the SMEs'. The study is primarily grounded in pecking order theory and institutional theory, which jointly explain SME financing behavior under conditions of information asymmetry and institutional constraints. Trade-off theory and agency theory are incorporated as supplementary theoretical perspectives to support interpretation of financing decisions, managerial behavior, and leverage dynamics. Based on these theoretical perspectives, the study examines how operational efficiency, managerial capability, access to finance, competitiveness, and institutional environment influence firms' leverage decisions.

In this regard, the research makes use of Covariance-Based Structural Equation Modeling (CB-SEM), which is estimated by the Maximum Likelihood (ML) technique in STATA statistical software. While software applications like AMOS and SmartPLS have often been utilized in CB-SEM-based research, STATA has been chosen for this research since it has been proven to be very effective in estimating latent variable models, bootstrapping, and post-estimation diagnostic checks. Earlier literature on SEM has acknowledged that STATA is an excellent statistical software package for CB-SEM estimation (Acock, 2013; Kline, 2016).

3.2 Data Collection, Sampling and Justification

The primary data was gathered using a structured questionnaire distributed among the small and medium enterprises (SMEs) registered under the Bangladesh Small and Cottage Industries Corporation (BSCIC). The research was confined to the SMEs in Dhaka, Khulna, and Barisal Divisions, which are significant economic hubs in Bangladesh. Although the companies were drawn based on their BSCIC registration, the complete sampling frame was not available. Therefore, non-probability sampling methods, particularly convenience sampling and snowball sampling, were used for selecting the participants. This sampling method is quite prevalent in SME research in developing nations, where adequate business directories are either lacking or hard to access (Ting et al., 2025; Islam et al., 2023).

At first, 250 surveys were circulated, out of which 224 responses were received, analyzed, and used in this study. The sample size can be stated to be appropriate in terms of statistical adequacy for SEM analysis. An a priori power analysis was carried out utilizing G*Power, and it was determined that at least 119 respondents were needed (with an assumed effect size of $f^2 = 0.15$, power = 0.95, and $\alpha = 0.05$), which has already been surpassed by the current sample size (Faul et al., 2009). Thus, the final sample size met the recommended criteria. Moreover, the sample size is consistent with the "10-times rule" suggested by Hair et al. (2011) and the inverse square root rule recommended by Kock and Hadaya (2018).

3.3 Variables and Operational Definitions

This study classifies independent variables into three broad categories. They include: firm level factors, management factors and environmental factors. The two dependent variables are Total Debt Ratio and Long-Term Debt Ratio, and they are used to capture SMEs leverage. In this research, leverage is defined as the use of debt financing by SMEs against their asset value. Total Debt Ratio is calculated as total liabilities over total assets, while Long-Term Debt Ratio is calculated as long-term liabilities over total assets. They are common metrics used to measure dependency on external financing in capital structure studies (Frank & Goyal, 2009).

Structured questionnaires with objective and subjective questions were used in data collection process. Perceptual multi-items constructs were evaluated based on a five-point Likert scale of agreement running from 1 (strongly disagree) to 5 (strongly agree). The measurement items have been derived from previous studies that have tested and validated the measures used in the field of SME financing and organization studies.

Table 1: Operational variables

Variables	Theory	Expected Relationship	Justification
A. Firm-Specific Determinants			
Profitability	Pecking Order	Negative	Firms prefer internal financing when profitable (Myers & Majluf, 1984; Frank & Goyal, 2009; Titman & Wessels, 1988)
Firm Size	Trade-off, Signaling	Positive	Larger firms have better access to credit (Rajan & Zingales, 1995; Abor & Biekpe 2009);
Asset Tangibility	Trade-off	Positive	Tangible assets serve as collateral (Rajan & Zingales, 1995; Titman & Wessels, 1988)
Growth Opportunities	Pecking Order	Negative	Growth firms avoid debt to retain flexibility (Myers, 1977; Fama & French, 2002)
Asset Utilization	Trade-off	Positive	Higher operational efficiency attracts lenders (Booth et al., 2001; Deesomsak et al. 2004)
B. Managerial Determinants			
Managerial Capability	Agency Theory	Negative	Skilled managers use less external finance (Fama & Jensen, 1983)
Access to Finance	Institutional Theory	Positive	Better financial accessibility increases firms' ability to utilize external financing (Beck et al., 2005; Love & Mylenko, 2003)
C. Environmental Determinants			
Competitiveness	Trade-off	Positive	Competitive pressures increase leverage (Nunes, & Serrasqueiro, 2012)
Institutional Environment	Institutional Theory	Positive	Better environments enable more borrowing (Berger & Udell, 1998)

3.4 SEM Model Specifications

The study utilizes Covariance-Based Structural Equation Modeling (CB-SEM) with Maximum Likelihood (ML) estimation method via STATA software. The choice of CB-SEM technique was guided by the need to test a hypothesis and measure the goodness of fit of the proposed model instead of predicting the outcome. The method is well suited for the study as it analyzes complicated interactions among both latent and manifest variables taking into account the error terms (Hair et al., 2010; Kline, 2016). The SEM approach involves two parts: measurement model and structural model. The former focuses on the interrelations of latent concepts with their manifest indicators, while the latter focuses on the causality of latent concepts. In the current study, managerial capacity, competitiveness, financial resource availability, and institutional setting were considered as latent constructs represented by several indicators. The structural model evaluates the relationships between the independent variables and two leverage measures: Total Debt Ratio and Long-Term Debt Ratio. Separate structural models were estimated for each dependent variable.

The structural equation is represented as follows:

$$Y_i = \beta_0 + \sum_{j=1}^{10} \beta_j X_{ij} + \varepsilon_i \quad eq. 1$$

Where Y_i denotes the dependent variable for firm i , which represents either total debt ratio or long-term debt ratio in separate models, X_{ij} are the independent variables as listed above, β_j are the regression coefficients representing the effect sizes of each predictor, β_0 is the intercept, and ε_i is the error term capturing unexplained variance.

Although mediation effects may exist among operational efficiency, access to finance, and leverage decisions, the present study primarily focuses on direct theoretical relationships in order to maintain model parsimony and theoretical clarity. Future research may extend the framework by incorporating mediating or moderating mechanisms. Model adequacy was assessed using several widely accepted goodness-of-fit indices, including the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Chi-square/degrees of freedom ratio (χ^2/df). To ensure robustness and parameter stability, bootstrapping with 5,000 replications was additionally performed.

3.5 Ethical Considerations

The study ensured anonymity and confidentiality of all respondents throughout the data collection and analysis process. Participation was voluntary, and informed consent was obtained prior to questionnaire administration. The research complied with relevant ethical standards and data protection guidelines applicable to SME-related survey research in Bangladesh.

4. Results and Discussion

4.1 Descriptive Statistics

The average total debt ratio is 29.4%, whereas the average long-term debt ratio is only 9.6% of the total assets, which indicates the existence of short-term financing practices. As per Table 2, it can be seen that the average age of SMEs is approximately 13 years, having a high standard deviation, indicating that SMEs in general are still not matured and developed concerning the development phase and growth model. It is significant to note that asset tangibility and usage and managerial capability and proficiency exhibit moderate averages, suggesting that operational capacity is moderate, but its use is inadequate in long-term financing. From the descriptive statistics above, it can be stated that the base statistics also support the existence of financing risks in SMEs in Bangladesh (Mpofu & Sibindi, 2022).

Table 2: Descriptive statistics

Variable	Obs	Mean	Std. Dev.
Total Debt	224	0.293878	0.337588
Long Term Debt	224	0.095927	0.155849
Size	224	841956.3	852745.8
Asset Utilization	224	0.567847	0.494732
Age	224	12.92411	12.24483
Managerial Capabilities	224	5.821429	1.967057
Access to finance	224	2.816964	0.713406
Competitiveness	224	3.116071	0.833659
Environment	224	3.508929	1.16754
Tangibility	224	6.401786	2.059474
Growth Opportunities	224	3.397321	1.155293
Profitability	224	3.334821	1.208877

4.2 Measurement Model Validation

Reliability and validity of the measurement model were assessed using Cronbach's alpha, Composite Reliability (CR), Average Variance Extracted (AVE), and standardized factor loadings. All standardized factor loadings exceeded the recommended threshold of 0.50, indicating satisfactory indicator reliability (Hair et al., 2010). Composite Reliability values were above 0.70, confirming internal consistency among latent constructs. Furthermore, AVE values exceeded the minimum threshold of 0.50, supporting convergent validity. Cronbach's alpha coefficients for tangibility and managerial capability were 0.67 and 0.63 respectively, exceeding the acceptable threshold for exploratory research. Overall, the measurement model demonstrates satisfactory reliability and constructs validity. The measurement model demonstrated satisfactory goodness-of-fit with CFI = 0.98, TLI = 0.96, RMSEA = 0.03, and $\chi^2/df = 1.84$, all of which satisfy the recommended SEM threshold values (Hair et al., 2010).

4.3 Structural Model Estimation

Table 3 presents the outcome of the SEM. Total variance explained by the model is 56.0 percent in total debt, while 36.2 percent in long-term debt. This indicates moderate explanatory power.

Table 3: SEM estimation

Response of (Exogenous)	Response to (Endogenous)	
	Total Debt	Long Term Debt
	$\beta (\sigma_{\bar{x}})$	$\beta (\sigma_{\bar{x}})$
Size	0.000 (0.000)	0.000 (0.000)
Asset utilization	0.446 *** (0.031)	0.130 *** (0.017)
Age	-0.001 (0.001)	-0.001 (0.001)
Managerial capabilities	-0.039 *** (0.010)	-0.008 (0.005)
Access to finance	0.023 (0.029)	0.028 * (0.016)
Competitiveness	0.067 *** (0.021)	0.076 *** (0.012)
Environment	-0.061 *** (0.016)	-0.015 * (0.009)
Tangibility	0.002 (0.010)	-0.004 (0.005)
Growth opportunities	0.078 *** (0.021)	0.016 (0.012)
Profitability	-0.067 *** (0.015)	-0.017 ** (0.008)
Constant	0.175 * (0.092)	-0.140 *** (0.051)
Estimation method	ml	ml
Log likelihood	-6661.452	-6529.668
Variance	0.050	0.015
Std. Error	0.005	0.001
R ²	0.560	0.362

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

4.4 Discussion

4.4.1 Firm-Level efficiency and capital structure

The results indicate that asset utilization has a very significant positive impact on both total leverage and long-term leverage for SMEs in Bangladesh. It appears that operational efficiency has a major influence on financing decisions. The higher the degree of asset utilization by SMEs, the more reliable cash flows and repayment capacity they will be able to maintain, resulting in increased creditor confidence and funding opportunities. In institutionally challenged settings like Bangladesh, creditors may give more importance to operational efficiency than traditional factors like company size or collateral security. These results align with the arguments made by Neville and Lucey (2022), who found that operational efficiency, had a significant impact on leverage choices in low-trust economies.

However, profitability shows an equally significant negative correlation with leverage, supporting the concept of pecking order theory (Myers & Majluf, 1984). The outcome indicates that profit-making SMEs prefer to raise finances internally rather than borrow externally to evade costs related to raising funds externally, the cost of surveillance imposed by lenders, and the cumbersome process involved. Such financial practices are more prevalent in developing countries, where external sources of capital may not be readily available due to stringent borrowing conditions. According to the findings by Basu (2024) and Delikanlı & Kılıç (2021), profit-making SMEs tend to avoid debt financing because internal funding sources are considered flexible and relatively safe.

Interestingly, factors traditionally used to determine credit availability such as the firm's size, age, and asset tangibility proved statistically irrelevant. This finding is at odds with most of the empirical evidence from advanced economies where firms of larger sizes and assets are known to have better access to credit due to their higher levels of security (Rajan & Zingales, 1995). Such findings may suggest that in cases of less efficient institutions, traditional measures of corporate health may become ineffective because lenders would be uncertain about their environment, have little or no enforcement mechanism, and incomplete information. Such findings have been echoed by Czerwonka & Jaworski (2021).

4.4.2 Managerial capability and financial decision-making

The results show that managerial ability is negatively correlated with total leverage, indicating that managers who are highly skilled and knowledgeable in finance will use fewer funds from external sources. This finding corroborates the agency theory, which holds that managers who are competent in finance will be better at managing resources internally. It also suggests that managerial ability is an essential internal control tool in SMEs (Jensen & Meckling, 1976).

The findings also indicate that more experienced managers may have more cautious financing approaches in uncertain financial conditions. Instead of relying on high levels of leverage, they may choose to retain financial flexibility and freedom of operation to avoid financial risks and pressures from outside oversight. This explanation fits well with earlier findings obtained in emerging economies, where manager quality was positively related to conservative financing structures (Basu, 2024; Khan et al., 2023).

Yet, the capacity of the management team does not affect long-term leverage. Such results suggest that the managerial ability is not enough to break through the structure and institutional barriers existing in the Bangladeshi financial system. Long-term borrowings will be restricted due to

the need for collateral, conservative lending policies, and a lack of SME-friendly financial instruments. As Beck et al. (2005) pointed out; structural and institutional barriers can hinder the ability of SMEs to access long-term finance despite their managerial abilities. Consequently, even capable managers cannot enhance access to long-term finance under institutional weakness.

4.4.3 Market dynamics and institutional environment

The competitiveness factor positively influences total leverage as well as long-run leverage, suggesting that small firms competing in a competitive environment will find it necessary to rely on outside sources of capital. In competitive business environments, it will be important for firms to finance their activities with sufficient funds in order to compete effectively, retain market shares, and expand operations. It would thus imply that leverage can be used as a tool for growing businesses and maintaining competitiveness in the market place. This result is similar to the findings of Nunes, & Serrasqueiro, (2012), which indicate that competitive pressures lead firms to leverage themselves to remain competitive.

The positive relationship between leverage and competitiveness is also supported by the trade-off theory, where corporations borrow when the gains from borrowing exceed its costs (Myers, 1984). The high level of competition in an industry might lead to the conclusion that financing is essential for small enterprises to survive and operate sustainably.

Access to finance is another variable that exhibits a positive association with leverage, even if the results are insignificant only marginally. This result corroborates the institutional theory in its argument that access to finance improves a firm's capability of making use of the finance externally (Love & Mylenko, 2003). Nevertheless, it must be pointed out that because of the insignificance, access alone might not necessarily ensure borrowing for SMEs. There might still be other elements like financial illiteracy, fear of refusal of the loan, complex procedures, and lack of knowledge of financing options.

One of the most intriguing results of the study is the negative correlation between the institutional environment and leverage, contrary to what institutional theory would have predicted. Based on institutional theory, better institutional environments will lead to improved access to external financing since the risks are lower, and financial intermediation is more effective (North, 1990). Nevertheless, the results indicate that smaller enterprises that operate under relatively positive institutional conditions can have a reduced tendency towards using debt financing. One reason could be that companies that benefit from more institutional assistance will have better access to other sources of financing, such as retained earnings, informal business associations, or government aid.

This finding highlights the complexity of SME financing behavior in emerging economies and suggests that institutional reforms should be complemented by lender-level reforms, simplified credit procedures, and stronger confidence-building initiatives in order to improve SMEs' access to formal finance. Similar concerns regarding institutional and structural financing barriers in developing economies were raised by Beck (2013) and Saha et al. (2023).

4.4.4 Theoretical and contextual reflection

In general, the results indicate that classical capital structure theory needs some adjustment before being applied to SMEs in an environment that has institutional constraints. Although there is substantial

evidence for pecking order theory in the form of a negative correlation between profitability and leverage, the lack of significance among other variables shows that financial practices in developing countries are entirely different from those in developed nations.

The findings further show that operational efficiency, managerial ability, and competitiveness impact the decision-making process of the leverage choice of SMEs more than traditional structural indicators. Institutional theory thus becomes very relevant in explaining the financing choice in less regulated and financially developed economies. In such cases, where there is lack of trust among the lenders and high level of information asymmetry, performance-based measures seem more relevant than traditional ones such as size and collateral (Czerwinka & Jaworski, 2021; Beck, 2013).

In summary, the results obtained in the study are consistent with the assertion that SME finance behavior in developing countries can be analyzed using a combination of theories where pecking order theory and institutional theory form the primary base for analysis, and trade-off and agency theories are used as supplemental bases for analysis. The study adds value to existing literature by shedding light on the role of contextual, institutional, and behavioral factors in explaining the SME capital structure decisions within emerging countries (Amoa-Gyarteng & Dhliwayo, 2023; Saha et al., 2023).

4.5 Bootstrapping Results

A bootstrapped SEM with 5,000 replications indicated that the significant structural relationships remained stable across repeated estimations, supporting the robustness and reliability of the model estimates (Table 4).

Table 4: Bootstrap SEM estimation

Response of (Exogenous)	Response to (Endogenous)	
	Total Debt	Long Term Debt
	$\beta (\sigma_{\hat{\epsilon}})$	$\beta (\sigma_{\hat{\epsilon}})$
Size	0.000*** (0.000)	0.000*** (0.000)
Asset Utilization	0.446** (0.046)	0.130** (0.027)
Age	-0.001*** (0.001)	-0.001*** (0.001)
Managerial Capabilities	-0.039** (0.011)	-0.008*** (0.006)
Access to finance	0.023** (0.036)	0.028** (0.018)
Competitiveness	0.067** (0.023)	0.076** (0.017)
Environment	-0.061** (0.019)	-0.015*** (0.008)
Tangibility	0.002** (0.010)	-0.004*** (0.005)
Growth Opportunities	0.078** (0.026)	0.016** (0.015)
Profitability	-0.067** (0.013)	-0.017** (0.011)
Constant	0.175* (0.087)	-0.140** (0.044)
Estimation method	ml	ml
Replications	5000	5000
Log likelihood	-6661.452	-6529.668
Variance	0.050	0.015
Std. Error	0.006	0.002
R ²	0.560	0.362

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

4.6 Theoretical and Empirical Contributions

This study contributes to capital structure literature by validating and contextualizing classical theories within an emerging market setting. Consistent with pecking order theory is the negative influence of profitability, while asset utilization plays an essential role in supporting trade-off theory. On the other hand, the lack of statistical significance of firm size and tangibility undermines traditional theoretical postulates as it shows that institutions can impede the prediction of the impact of such traditional determinants. The findings also highlight the growing importance of operational efficiency and managerial capability, offering a behavioral extension to agency theory. The study also contributes methodologically by demonstrating the applicability of CB-SEM in examining multidimensional SME financing behavior within emerging market contexts.

5. Conclusion

This study investigates the factors affecting the capital structure of SMEs in Bangladesh by employing survey data from 224 firms using SEM analysis. The result obtained is that operational efficiency and competitiveness contribute significantly to SME debt, whereas profitability and managerial skill decrease their dependence on outside financing. Conversely, other factors like size of the firm, tangibility of assets, and firm age were found to be statistically insignificant, implying that the traditional capital structure theories might not apply in an institutional setting.

The study offers contributions at the theoretical level by building on the pecking order theory and institutional approaches in the setting of emerging markets. The results show that the financing approach adopted by SMEs depends to a larger extent on their operational performance, managerial effectiveness, and the institutional environment rather than on their traditional structural attributes. From a practical perspective, the findings suggest that policymakers and financial institutions should move beyond collateral-based lending practices and promote performance-oriented financing mechanisms, SME credit guarantee schemes, and financial literacy programs. The results also emphasize the importance of operational efficiency and informed financial management for SME sustainability and financing accessibility.

Despite the above findings, there are still some limitations associated with this study. First, the choice of the cross-sectional design used in the study does not allow for a comprehensive understanding of the dynamics of SMEs' financing behavior. Second, the convenience and snowball sampling approaches adopted in this study may reduce the generalizability of the findings. Third, the study examined the behavior of SMEs that are officially registered in particular areas in Bangladesh. Future research may therefore employ longitudinal data, probability-based sampling techniques, and comparative sectoral analysis to provide broader insights into SME financing behavior. Further studies may also incorporate mediating and moderating mechanisms to better understand the complex relationships among institutional, managerial, and operational determinants of leverage decisions.

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Declaration of Conflicting Interests

The authors declare that there are no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Data Availability Statement

The data that support the findings of this study were collected through a structured survey of Small and Medium Enterprises (SMEs) registered under the Bangladesh Small and Cottage Industries Corporation (BSCIC). Due to confidentiality agreements with participants and organizational restrictions, the raw data cannot be made publicly available. However, the datasets can be provided by the corresponding author as an electronic supplementary file upon reasonable request.

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