CAPITAL STRUCTURE DETERMINANTS IN A DEVELOPING ECONOMY: EVIDENCE FROM BANGLADESH

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Abstract:

Capital structure decisions are crucial for firms to enhance performance and maximize shareholder wealth. This study investigates the determinants of capital structure in Bangladeshi firms listed on the Chittagong Stock Exchange (CSE) from 2018 to 2022. The research utilises regression analyses to evaluate the relationships between financial leverage and key explanatory variables. By analysing various factors, including firm size, profitability, non-debt tax shields, growth opportunities, liquidity, and tangibility of assets, this research aims to identify the optimal mix of debt and equity financing. Using quantitative analysis, the study finds that several factors significantly influence capital structure decisions. Both fixed and random effects regression models are employed to analyse the data, revealing that profitability, non-debt tax shields, growth opportunities, and liquidity negatively impact financial leverage, while firm size and asset tangibility have positive associations. The Hausman test suggests that the fixed effects model is preferable, given its $\chi2$-value of 93.52 with a p-value of 0.0000. The study concludes that the optimal capital structure is influenced by multiple factors, with no single theory universally applicable. The findings suggest that firms should carefully consider these factors when making capital structure decisions. Excessive debt can lead to financial distress, while appropriate debt levels can enhance performance. Understanding these determinants is essential for firms to optimize their financial strategies and achieve long-term success. This study contributes to the existing literature by providing insights into capital structure decisions in a developing economy like Bangladesh. It highlights the

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importance of considering specific factors and industry dynamics when making financing choices.

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1. Introduction

The primary objectives of corporate finance are to ensure the firm's survival and future growth while avoiding issues such as bankruptcy and external control by creditors. The financing behaviour of corporations significantly affects their profitability and overall value, which in turn impacts shareholder wealth. Two key considerations guide the decision-making process regarding capital structure. The first involves enhancing profitability by using debt at an interest rate lower than the market cost of capital. For this strategy to be effective, the cost of debt must be less than the cost of equity. This approach aims to boost firm profitability and increase shareholder earnings at the expense of creditors. The second consideration focuses on maximising the value of shareholders' equity. This research explores how Bangladeshi companies balance debt and equity to their advantage. No single theory provides a definitive answer on the optimal mix of debt and equity. However, several partial theories offer guidance:

- **Irrelevance Theory**: According to Modigliani and Miller (1958), capital structure does not affect a firm's market value, suggesting that firms need not worry about the optimal combination of debt and equity.
- **Trade-Off Theory**: Miller (1977) argues that firms seek a moderate level of debt to benefit from tax advantages while managing the trade-offs between debt and the potential costs of financial distress.
- **Pecking Order Theory**: Myers and Majluf (1984) propose that firms prefer internal funds for financing and only resort to debt when internal cash flows are insufficient.

Another view posits that the mix of debt and equity might not significantly impact a firm's performance, as suggested by the Irrelevance Theory. Management's critical task is to determine an optimal mix of debt and equity to maximise shareholder wealth. The first consideration suggests acquiring assets that increase profitability, provided the net profit from these assets exceeds their financing cost. The second consideration involves acquiring assets only if they enhance the market value of shareholders' equity. In modern finance, the wealth maximisation approach is particularly important. This approach evaluates whether new financing or investments increase the market value of shares. If a financing decision adds value to the firm, reflected in the share price, it is typically accepted, provided there is no conflict of interest between shareholders and managers. Conversely, if new financing does not enhance share value, it is generally rejected, even

if it appears profitable. Thus, in capital structure decisions, the focus is more on value or wealth maximisation rather than merely on profitability.

Bangladesh has emerged as a promising economy with notable progress in GDP growth and income levels. The GDP has been increasing by over 5.82% annually, and the country's industrial sector is expanding across various domains. Government expenditure has also seen substantial growth, rising from 231 billion BDT in 2005-2006 to 762 billion BDT in 2023-2024. This increase in public spending reflects a significant rise in the income levels of the population. To support and manage this expanding economy, the capital and money markets in Bangladesh are developing rapidly. Business firms now have easier access to these markets for raising capital. Consequently, gross fixed capital has surged from 1,093 billion BDT to 4,842 billion BDT between 2005-2006 and 2023-2024. This rapid growth presents challenges for corporate managers in selecting appropriate financing sources. Different theories of capital structure indicate that an optimal balance of debt and equity is essential for enhancing firm value. Excessive debt or equity can lead to financial distress. As a developing nation, Bangladesh presents significant investment opportunities. Financial managers must consider various factors influencing the capital structure of Bangladeshi firms.

Although some research has investigated the primary determinants of capital structure, there is still confusion and disagreement about the importance of these factors in financial leverage decisions. Factors affecting capital structure in developed countries may not apply in developing contexts due to differing economic conditions. Furthermore, not all relevant factors have been studied, highlighting the need to evaluate their impact on financial leverage and to bridge the gap between existing research and capital structure theory. While numerous studies have explored the relationship between capital structure and firm performance, research specific to Bangladesh is limited. This gap in knowledge makes it difficult to understand the financing behaviour of Bangladeshi firms. Capital structure dynamics may differ between developed and developing countries. It is, therefore, crucial to review past research on developing countries. Findings vary, with some studies showing a positive relationship between financial leverage and firm performance, others indicating a negative relationship, and some presenting mixed results. Additionally, some experts have found no significant link between capital structure or debt levels and firm growth.

The primary aim of this study is to analyse how various explanatory variables influence the use of debt within the capital structure of Bangladeshi firms. This research seeks to quantify the impact of these variables on the debt ratio and assess their significance in capital structure decisions. Another key objective is to identify the optimal mix of debt and equity that enhances financial performance and maximises firm value. Financial experts have determined that while incorporating debt into a firm's capital structure can add value, this is true only up to a certain point. Beyond this threshold, additional debt increases the cost of capital and diminishes the firm's market value. Therefore, establishing an optimal capital structure is crucial for enhancing firm value. This study explores the capital structure of Bangladeshi firms, focusing on sample companies from leading sectors to examine the influence of specific factors on their

capital structures. The paper aims to uncover practices related to financial leverage in Bangladesh and evaluate the sensitivity of leverage across different industries. It offers guidance for financial managers on designing capital structures that promote financial excellence.

2. Literature Review

2.1 Theory of Capital Structure

There is no universally accepted theory for determining the optimal debt-equity ratio in capital structure. Several partial theories provide guidance on how firms should balance debt and equity. For instance, the trade-off theory suggests that firms should use financial leverage to the extent that the benefits from tax shields exceed the costs associated with debt, such as financial distress. According to this theory, excessive debt can lead to financial problems, so a moderate use of debt is recommended. The pecking order theory posits that firms prefer debt over equity financing when internal funds are insufficient. This theory implies that firms follow a hierarchy of financing, starting with internal funds, then debt, and resorting to equity only when necessary. The free cash flow theory argues that a higher level of debt can enhance a firm's market value, provided that the firm has sufficient cash flow to meet its obligations. This theory suggests that firms are more likely to use debt when they have strong cash flows to handle the associated risks.

Many studies have explored whether an optimal mix of debt and equity exists to maximise firm value and performance. Some research indicates that an appropriate combination of debt and equity can improve firm performance, while other studies find the relationship between capital structure and firm value to be negligible or even irrelevant. For example, Weston and Brigham (1992) found that the combination of debt and equity might not significantly impact wealth maximisation. Hatfield et al. (1994) also failed to find evidence that debt impacts firm value directly. Conversely, Grossman and Hart (1982) identified a positive relationship between debt levels and market value, suggesting that issuing debt can enhance shareholder wealth. Myers and Majluf (1984) highlighted that incorrect use of debt and equity could lead to equity mispricing and negatively affect overall performance.

2.1.1 Irrelevance Theory

The irrelevance theory, developed by Modigliani and Miller (1958), asserts that the choice between debt and equity financing does not influence a firm's market value. According to this theory, any combination of debt and equity is equally effective, assuming perfect capital markets. Proposition 1 of this theory states that the cost of capital remains constant regardless of the firm's debt-equity ratio. However, this theory's assumptions often do not hold in real-world scenarios.

2.1.2 Theory of Tax Advantages

According to the tax advantage theory, firms should use debt if the tax benefits from interest deductions outweigh the costs associated with financial distress, such as

liquidation or bankruptcy. Myers (2001) argued that firms aiming to maximise shareholder wealth should use debt when the risk of financial distress is low. Leland and Toft (1996) suggested that long-term debt offers tax benefits and lowers the probability of financial distress. Miller (1977) proposed that firms should use debt financing if the corporate tax rate is higher than the personal tax rate. He examined various tax mechanisms, noting that while interest payments are tax-deductible at the corporate level, equity income is taxed at the personal level. Thus, tax benefits from debt might not be substantial. DeAngelo and Masulis (1980) pointed out that firms could utilise other mechanisms, such as tax loss carry forwards and depreciation, to achieve tax benefits beyond debt financing.

2.1.3 Theory Related to Bankruptcy and Agency Costs

Modigliani and Miller (1963) noted that firms seeking to maximise shareholder wealth might undertake growth strategies at the expense of debt holders. When managers act in their self-interest, it could attract external investors or debt holders who might take over the firm, jeopardising existing shareholders. This risk can be mitigated by controlling the managers' share in the firm. Debt financing involves bankruptcy and agency costs. Bankruptcy costs include direct costs, such as legal and managerial fees, and indirect costs, like lost sales and inability to secure credit (Warner, 1977). Agency costs arise from conflicts between managers and owners. Jensen and Meckling (1976), Jensen (1986), and Tudso (2012) noted that these costs result from conflicts between shareholders, managers, and debt holders. These costs can be reduced by aligning managerial ownership with firm performance. Myers (1984) indicated that managers benefit from decisions that increase share prices, whereas decisions leading to bankruptcy could hold them accountable. Altman (1984) found that bankruptcy costs could be significant, representing up to 20% of a firm's market value before bankruptcy. Larger firms experience different bankruptcy costs compared to smaller firms. Thus, bankruptcy costs should be considered in capital structure decisions.

2.1.4 Trade-off Theory

The trade-off theory asserts that firms should balance the benefits of tax deductions from debt against the costs of financial distress (Modigliani & Miller, 1963). This theory suggests that firms seek an optimal combination of debt and equity to maximise share value and shareholder wealth. Firms with more tangible assets tend to use more debt, but excessive debt increases risk. Therefore, finding the right mix of debt and equity is crucial for growth. Sheikh and Wang (2011) found a positive relationship between profitability and leverage, as higher profitability encourages firms to use debt to benefit from tax shields.

2.1.5 Pecking Order Theory

The pecking order theory posits that firms prefer internal financing over external sources due to information asymmetry between insiders and outsiders. Firms typically use internal funds first, followed by debt, and issue equity only as a last resort (Champion,

1999). Myers and Majluf (1984) suggested that equity under-pricing results in existing shareholders losing value, as new investors gain from the undervalued shares.

2.1.6 Free Cash Flow Theory

The free cash flow theory, proposed by Myers (2001), suggests that using financial leverage can enhance firm value, although it comes with risks of financial distress. According to this theory, firms with excess cash flow should use it strategically, either paying dividends or reinvesting, based on shareholder and managerial preferences.

2.2 Past Empirical Studies

Numerous empirical studies have examined the validity of capital structure theories, yet a consensus remains elusive. This lack of agreement may be attributed to the varying assumptions and determinants addressed by different theories. For instance, trade-off theory emphasises tax benefits, free cash flow theory focuses on agency costs, and pecking order theory highlights information asymmetry. Marsh (1982) investigated corporate financing practices, revealing that firms issue long-term debt securities when their current debt levels fall short of the optimal. The study also found that market conditions significantly influence a company's decision to issue debt. Corporations are more likely to issue debt when other firms are also issuing securities. Masulis (1983) observed that corporations experience abnormal returns when issuing debt compared to common shares, with a 14% increase in share returns. Issuing preferred shares instead of common shares results in an 8.3% return. Conversely, issuing common shares rather than preferred shares leads to a -2.6% abnormal return. Debt issuance, relative to common shares, results in a -9.9% return, while preferred shares, compared to debt, yield a -7.7% return. The study highlighted that increased debt levels correlate with higher managerial ownership.

Kinsman and Newman (1998) noted that debt significantly impacts firm performance, affecting profitability and shareholder wealth. They found that short-term debt decreases earnings, while long-term debt tends to increase them. Their research underscored the importance of determining the optimal financial leverage level to enhance firm performance and maximise shareholder wealth. Harris and Raviv (1991) discovered that higher-quality firms tend to use more debt and pay higher dividends. However, these firms face a greater risk of liquidation due to the need to meet debt obligations. Roden and Lewellen (1995) examined the relationship between financial leverage and earnings in U.S. firms from 1981 to 1990. They found a positive relationship between leverage and earnings, highlighting the tax benefits associated with high leverage. Rajan and Zingales (1995) also studied U.S. firms during the same period, finding a negative relationship between debt levels and profitability, with larger firms experiencing a stronger negative impact. Gleason et al. (2000) found that high debt levels negatively affect firm efficiency and profitability. Their study also indicated that high leverage adversely impacts return on assets and sales growth, leading to lower profitability.

Ghosh et al. (2000) examined financial leverage and profitability in developed economies, finding mixed evidence. Research in less developed countries, such as Egypt, indicated that high debt levels are prevalent, exacerbated by inefficient capital markets and heightened information asymmetry. Fama and French (2002) observed a negative link between financial leverage and firm performance, contrary to trade-off theory. Abor (2005) discovered a positive relationship between financial leverage and earnings, noting that short-term debt is less costly and preferred by firms due to its lower interest expenses. Conversely, long-term debt was associated with increased capital costs and lower earnings. Abdullah (2005) highlighted several factors influencing debt financing, including asset structure, liquidity, and growth opportunities. Liquidity negatively affects financial leverage, as firms with higher liquidity use it to meet short-term obligations rather than borrowing. Growth opportunities are positively related to leverage, whereas the relationship with asset tangibility is mixed. Margaritis and Psillaki (2008) studied French companies and found a positive link between financial leverage and firm performance. Their research also indicated that leverage significantly influences efficiency and performance.

Most studies have focused on developed markets, with limited research on emerging economies. Ebaid (2009) highlighted the mixed and contradictory evidence from developed countries regarding capital structure and performance. Chowdhury and Chowdhury (2010) investigated Bangladesh and concluded that an optimal mix of debt and equity maximises firm value. They also found a negative correlation between financial leverage and the cost of capital. Manawaduge et al. (2011) found significant relationships among various performance metrics, including return on assets and total debt. They observed that short-term debt positively impacts profitability, while excessive total debt may lead to bankruptcy and loss of control. Greenwood and Hanson (2013) examined the relationship between financial leverage and credit risk, finding a positive link between debt and firm performance for firms with lower credit quality. Aliakbar et al. (2013) studied the Tehran Stock Exchange and found a positive relationship between financial leverage and performance. Similar results were reported in Bursa Malaysia, where a negative linkage between performance and financial leverage was observed.

Mouamer (2011) investigated Palestinian-listed companies and found a positive link between total debt and asset tangibility. However, no conclusive evidence was found regarding the correlation between long-term and short-term debt and profitability. Booth et al. (2001) highlighted the differences in debt usage across financial markets, noting that while factors influencing debt choice vary, they generally follow similar directional impacts. Abor (2005) found that short-term debt negatively affects profitability, whereas long-term debt has a positive effect. Salim and Yadav (2012) found that financial leverage negatively impacts performance measures like earnings per share and return on assets, though Tobin's Q showed a positive effect. Zeitun and Tian (2007) observed similar results in Jordan. Tianyu (2013) conducted a large-scale study on capital structure's impact on performance, using samples from Germany, Sweden, and China. The study found a negative correlation in China and a positive correlation in Germany and Sweden. Studies by Bowman (1982), Bradley et al. (1984), Long and Malitz (1985), and Kester

(1986) revealed industry-specific variations in debt ratios. Industries such as Food and Electronics use low leverage, while Textiles and Airlines employ higher debt.

Long and Malitz (1985), Marsh (1982), Titman and Wessels (1988), and Kester (1986) reported that financial leverage is positively related to growth opportunities and asset tangibility but negatively related to research and development, earnings volatility, and bankruptcy probability. DeAngelo and DeAngelo (1985), Dann and DeAngelo (1988), and Amihud and Travlos (1990) found a positive link between debt and managerial equity ownership. Palepu (1986) observed that debt affects takeover possibilities by reducing outside investors' chances. Gonedes and Dopuch (1988) and Friend and Lang (1988) found that firms with dispersed ownership use less leverage. Ross (1977) and Brealey et al. (1977) pioneered research on how capital structure conveys inside information to investors. Myers and Majluf (1984) explored asymmetric information's impact on firm decisions. Korajczyk and Levy (2003) found that revealing financial highlights reduces equity mispricing. Bharath et al. (2009) confirmed that larger equity issuances mitigate information effects on equity prices, consistent with the pecking order theory. Harris and Raviv (1988) and Stulz (1988) examined how capital structure impacts corporate control and takeover contests. Taggart Jr (1985) observed that financial leverage usage has varied over time, with less emphasis compared to pre-World War II levels.

2.3 Theoretical Framework

Firm size is a critical determinant in capital structure decisions. Previous studies, such as Rajan and Zingales (1995), show that larger firms are often more diversified and thus less vulnerable to financial distress. Their diversified operations across sectors reduce bankruptcy risks, allowing them to manage debt obligations more effectively. Larger firms also benefit from smoother cash flows and easier access to capital markets. According to the trade-off theory, larger firms can handle more debt due to their capacity to leverage tax deductions on interest payments. Conversely, the pecking order theory suggests that larger firms may rely less on debt since they face lower information asymmetry and can issue equity at fair prices. Empirical evidence presents mixed findings: Chen (2004) and Marsh (1982) found varying correlations, with some studies like Wald (1999) showing positive links between firm size and debt in countries such as Japan, the UK, France, and the USA, while others report negative or insignificant relationships in Germany. So, it can be hypothesised that firm size (FS) is positively correlated with the use of debt in the capital structure (*H₁*).

Non-debt tax shields, such as depreciation, investment tax credits, and research and development expenses, can significantly influence a firm's capital structure decisions. These tax benefits can reduce a firm's overall tax burden without the risks associated with debt financing. By strategically managing non-debt tax shields, firms can enhance their financial flexibility and reduce their reliance on debt. These credits can provide significant tax benefits without incurring the costs associated with debt financing. By effectively utilizing non-debt tax shields, firms can improve their financial performance and reduce their need for debt financing. This can enhance their financial flexibility, reduce their risk exposure, and potentially increase their overall value.

Empirical evidence on the relationship between non-debt tax shields and financial leverage is mixed. Bradley et al. (1984) found that financial leverage can lead to increased non-debt tax shields, suggesting a positive relationship. However, Titman and Wessels (1988) observed no significant effect, indicating that the relationship may be more complex. Wald (1999) and Viviani (2008) reported a negative correlation between non-debt tax shields and debt levels. This suggests that firms may prioritize non-debt tax shields as a means of reducing their overall tax burden, thereby reducing their need for debt financing. So, it can be hypothesised that non-debt tax shields (NTS) have a negative impact on the use of debt in the capital structure (**H₂**).

Profitability, a measure of a firm's ability to generate earnings after deducting expenses, is a crucial factor influencing capital structure decisions. The trade-off theory suggests that profitable firms can leverage debt to benefit from tax deductions on interest payments, enhancing shareholder returns. This is because profitable firms have stronger cash flows to service debt obligations and reduce the risk of financial distress. Rajan and Zingales (1995) support this view, arguing that profitable firms are more capable of managing debt. However, the pecking order theory offers a contrasting perspective. Firms with high profitability may prefer to use retained earnings for financing, rather than relying on external debt. This avoids diluting ownership and reduces the information asymmetry associated with equity issuance. Empirical studies have provided mixed evidence on the relationship between profitability and financial leverage. Long and Malitz (1985) and Kester (1986) found a positive correlation, suggesting that profitable firms are more likely to use debt financing. However, other studies, such as Titman and Wessels (1988) and Booth et al. (2001), reported a negative relationship, indicating that firms with high profitability may prioritize internal financing. So, it can be hypothesised that profitability (Prf) is negatively correlated with the use of debt in the capital structure (**H₃**).

Growth opportunities significantly influence a firm's capital structure decisions. Firms with high growth prospects often prefer equity financing over debt to avoid the risks associated with debt, such as financial distress and agency costs. Equity financing allows firms to maintain control and avoid potential conflicts between managers and shareholders. Jung et al. (1996) and Jensen (1986) support this view, suggesting that firms with high growth potential are more likely to opt for equity to avoid the risks and costs associated with debt. Berger and Udell (1998) and Rajan and Zingales (1995) provide further evidence for this relationship, demonstrating that firms with strong growth opportunities are more likely to use equity financing. However, some studies have found contrasting results. Kester (1986) suggested that firms with high growth opportunities might use more debt to finance their expansion. This could be attributed to the need for additional capital to support growth initiatives, which may outweigh the risks associated with debt. So, it can be hypothesized that growth opportunity (GO) is negatively correlated with the use of debt in the capital structure (**H₄**).

Liquidity, a measure of a firm's ability to meet short-term financial obligations, can significantly influence capital structure decisions. The trade-off theory suggests that firms with high liquidity can safely employ more debt due to their financial stability. This

allows them to meet interest payments and other debt obligations without facing undue financial distress. Conversely, the pecking order theory argues that firms with ample liquidity may prefer to use internal funds for financing, rather than relying on external debt. This preference stems from the desire to avoid the information asymmetry and potential undervaluation associated with issuing new equity. Empirical evidence supports both perspectives. Viviani (2008) and Mazur (2007) found a negative correlation between liquidity and debt usage, suggesting that firms with high liquidity may opt for internal financing. However, other studies might find a positive correlation, especially in situations where firms can effectively manage their debt obligations due to strong liquidity. So, it can be hypothesised that liquidity (Lqd) is negatively correlated with the use of debt in the capital structure (*H₅*).

Tangibility, the ratio of fixed assets to total assets, is a crucial factor in capital structure decisions. Firms with substantial tangible assets can leverage these assets as collateral to secure debt financing. This reduces the lender's risk, making it more likely for firms to obtain debt at favourable terms. By using tangible assets as collateral, firms can demonstrate their ability to repay the loan in case of financial difficulties. This enhances their creditworthiness and reduces the lender's perceived risk, leading to lower interest rates and more favourable loan terms. Moreover, tangible assets can provide a stable cash flow stream, which can be used to service debt obligations. This reduces the financial risk associated with debt financing and increases the likelihood of successful debt repayment. By demonstrating their ability to generate consistent cash flows from tangible assets, firms can reassure lenders and improve their access to debt financing. Myers and Majluf (1984) further emphasize the role of tangible assets as collateral, arguing that they can facilitate debt financing. However, some research suggests that excessive leverage can result from high tangibility. Booth et al. (2001) and Bauer (2004) found evidence of this negative relationship, indicating that firms with high tangibility may be more prone to over-reliance on debt. So, it can be hypothesised that the tangibility of assets (ToA) is positively correlated with the use of debt in the capital structure (*H₆*).

3. Material and Methods

This research employs a quantitative approach, utilising secondary data. The objective is to quantify the effects of selected explanatory variables on debt utilisation within Bangladeshi firms listed on the Chittagong Stock Exchange (CSE). The study relies on numerical and quantifiable data for statistical analysis, employing fixed and random effects regression to measure these impacts. Quantitative research allows for generalisation of numerical results across populations. The variables selected for this study are based on factors influencing capital structure decisions identified in prior literature. This approach ensures that the research findings can be compared with existing studies. The dependent variable in this study is the debt ratio of firms. The independent variables include firm size, non-debt tax shields, profitability, growth opportunities, tangibility, and liquidity.

Table 1: Definition of the Constructs

Variables	Definition	Reference(s)
Size of Firms (FS)	Natural logarithm of sales	Rajan & Zingales (1995); Marsh (1982); Wald (1999); Bauer (2004); Deesomsak et al. (2004); Eriotis et al. (2007)
Profitability (Prf)	Ratio of profit before taxes to total assets	Rajan & Zingales (1995); Myers (1984); Myers & Majluf (1984); Kester (1986); Friend & Lang (1988); Titman & Wessels (1988); Booth et al. (2001); Cassar & Holmes (2003)
Non-debt Tax Shields (NTS)	Ratio of depreciation expenses to total assets	DeAngelo & Masulis (1980); Bradley et al. (1984); Titman & Wessels (1988); Wald (1999); Bauer (2004); Deesomsak et al. (2004); Viviani (2008)
Tangibility of Assets (ToA)	Ratio of net fixed assets to total assets	Titman & Wessels (1988); Harris & Raviv (1991); Myers & Majluf (1984); Jensen & Meckling (1976); Long & Malitz (1985); Friend & Lang (1988); Rajan & Zingales (1995); Ferri & Jones (1979); Karadeniz et al. (2009)
Growth Opportunity (GO)	Ratio of sales growth to total assets growth	Jung et al. (1996); Jensen (1986); Stulz (1990); Berens & Cuny (1995); Rajan & Zingales (1995); Smith & Watts (1992); Kester (1986); Kim & Sorensen (1986)
Liquidity (Lqd)	Ratio of current assets to current liabilities	Deesomsak et al. (2004); Mazur (2007); Viviani (2008)
Debt Ratio of Firms (FDR)	Ratio of total financial leverage employed to total assets	

This study analyses variables affecting financial leverage decisions to determine the optimal level of debt for maximising firm value. Data is collected from the financial statements of Bangladeshi companies listed on the Chittagong Stock Exchange (CSE). Only listed companies are included due to the inadequacy of financial data from other organisations. Annual reports are obtained from the companies' websites. The research uses the CSE's industry classification to avoid confusion in sector categorisation. The sectors include Banks, Financial Institutions, Insurance, Food and Allied, Fuel and Power, Textile, Pharmaceuticals and Chemicals, Paper and Printings, Real Estate and Services, Ceramics, Cement, Information Technology, Telecom, and Miscellaneous. The study excludes banks and financial institutions due to their distinct regulatory environments and debt characteristics, as noted by previous studies (Akhtar, 2005; Mazur, 2007).

Table 2: Sample Selection at a Glance

Industry	No. of Firms Selected	No. of Year Observed	Total Observation
Cement	02	05	10
Ceramic	01	05	05
Food and Allied	04	05	20
Fuel and Power	08	05	40
Insurance	07	05	35
IT	02	05	10
Jute	02	05	10
Pharmaceuticals & Chemicals	05	05	25
Real estate and services	02	05	10
Textile	07	05	35
Travel & Leisure	01	05	05
Engineering	06	05	30
Total	**47**		**235**

The sample comprises 47 listed Bangladeshi companies from 2018 to 2022, resulting in a total of 235 observations. Data for this study is collected from annual reports and subsequently transformed to fit the defined variables. The debt ratio, used as an estimate of financial leverage, is calculated as the book value of total debt divided by the book value of total assets. Total debt includes both short-term and long-term debt, reflecting the significant role of short-term debt in Bangladeshi firms' capital structures. This approach aligns with findings by Demirgüç-Kunt & Maksimovic (1999), who noted the high utilisation of short-term debt in developing countries. Fixed and random effects regressions are employed to assess the impact of independent variables on the leverage ratio of selected firms. Panel data methodology is used due to its advantages over cross-sectional and time-series data, such as controlling for heterogeneity and reducing multicollinearity (Sogorb-Mira, 2005). The research uses the cross-sectional random effects model to estimate p-values efficiently. Two regression models are utilised:

The Pooled OLS Model:

$$FDR_{jt} = \beta_0 + \beta_1 Prf_{jt} + \beta_2 FS_{jt} + \beta_3 NTS_{jt} + \beta_4 ToA_{jt} + \beta_5 GO_{jt} + \beta_6 Lqd_{jt} + \varepsilon_{jt}$$

The Fixed Effects Model:

$$FDR_{jt} = \beta_{0j} + \beta_1 Prf_{jt} + \beta_2 FS_{jt} + \beta_3 NTS_{jt} + \beta_4 ToA_{jt} + \beta_5 GO_{jt} + \beta_6 Lqd_{jt} + \mu_{jt}$$

The Random Effects Model:

$$DR_{jt} = \beta_0 + \beta_1 Prf_{jt} + \beta_2 FS_{jt} + \beta_3 NTS_{jt} + \beta_4 ToA_{jt} + \beta_5 GO_{jt} + \beta_6 Lqd_{jt} + \varepsilon_{jt} + \mu_{jt}$$

Where,
FDR_{jt} = Ratio of debt to total assets of firm J at time period t,
Prf_{jt} = Profitability of firm J at time period t,
FS_{jt} = Size of the firm J at time period t,
NTS_{jt} = Non − debt tax shields of firm J at time period t,
ToA_{jt} = Tangibility of firm J at time period t,
GO_{jt} = Growth opportunity of firm J at time period t,
Lqd_{jt} = Liquidity of firm J at time period t,
β_0 = Common y intercept,
$\beta_1 − \beta_6$ = Coefficients of the concerned independent variables,
β_{0j} = Y intercept of firm J,
ε_{jt} = Stochastic error term of firm J at time period t,
μ_{jt} = Error term of firm J at time period t,
ε_j = Cross − sectional error component.

This study uses the total debt to total assets ratio as the measure of financial leverage, a definition that may vary across studies. Challenges included obtaining reliable financial statements from some firms due to inadequate web presence. Banks and

financial institutions are excluded due to their unique debt characteristics and regulatory frameworks. Additional variables such as managerial preferences, firm age, and uniqueness could enhance the study. Conducting a structured survey with decision-makers regarding capital structure preferences would also provide more comprehensive insights, as individual traits influence debt and equity choices.

4. Results and Discussion

This section presents the results of regression analyses that explore the relationship between financial leverage and the explanatory variables. Prior to these analyses, the study assessed multicollinearity among the explanatory variables using the Pearson correlation test. According to standard practice, if the correlation coefficient is below -0.7 or above 0.7, it indicates significant multicollinearity, rendering the variables unsuitable for regression analysis (Lind et al., 2010). The Pearson correlation results, shown in **Table 3**, reveal that the highest correlation is between profitability and size, with a coefficient of 0.2373. This indicates that severe multicollinearity is not present among the variables used in this study, making them suitable for regression analysis. This study utilises fixed and random effects regression analyses to assess the relationship between explanatory variables and financial leverage. The results, detailed in Table 4, reveal that profitability, non-debt tax shields, growth opportunities, and liquidity have significant negative effects on financial leverage, with a significance level of 5%. Conversely, the size of the firms and asset tangibility are positively associated with financial leverage among Bangladeshi firms listed on the Chittagong Stock Exchange. The high adjusted R^2 values from both fixed and random effects models indicate substantial variation in the debt ratios of the firms. Furthermore, the validity of the regression models is supported by the t-statistics.

Table 3: Result of Correlational Analysis and Multicollinearity Analysis

	FDR	Prf	FS	NTS	ToA	GO	Lqd	VIF	1/VIF
FDR	1.0000								
Prf	-0.3271	1.0000						1.17	0.896679
FS	0.2080	0.2373	1.0000					1.12	0.821160
NTS	-0.3771	0.2419	0.0112	1.0000				1.15	0.942665
ToA	-0.2152	0.1128	0.2076	0.3235	1.0000			1.06	0.956586
GO	0.4265	0.2956	0.1285	0.2019	0.3798	1.0000		1.09	0.936099
Lqd	-0.5341	0.1638	-0.1434	0.2132	0.3126	0.1542	1.0000	1.10	0.911660

Note: FDR = Debt ratio of Firm; Prf = Profitability; FS = Size of Firms; NTS = Non-debt Tax Shields; ToA = Tangibility of Assets; GO = Growth Opportunity; Lqd = Liquidity

This study uses panel data from various companies over time, which may introduce cross-sectional effects on individual firms or groups of firms. To address these potential cross-sectional effects, the study employs both fixed and random effects models. The results of these models are shown in Table 4. Under both the fixed and random effects models, profitability, firm size, and liquidity significantly impact the debt ratio of firms. Non-debt tax shields are significant only in the random effects model, while they are not

significant in the fixed effects model. Tangibility is significant in the fixed effects model but not in the random effects model. Growth opportunity is insignificant in both models. The high adjusted R^2 values for both models indicate that the regression estimates fit the observed data well. This suggests that there is variability in the debt ratios among the firms in the data set. Model 1 in Table 4 shows the effects of profitability, size, non-debt tax shields, tangibility, growth opportunity, and liquidity on the debt ratio. Under the fixed effects regression, profitability and liquidity have significant negative impacts on the debt ratio. Conversely, firm size and asset tangibility have significant positive impacts. Non-debt tax shields and growth opportunity are not significant in the fixed effects model.

In the random effects regression, all explanatory variables are significant at the 5% level. Both fixed and random effects models have a *p*-value of 0.000, indicating significant influences on the debt ratio and confirming the appropriateness of both models. The Hausman test yields a χ^2-value of 93.52 with a *p*-value of 0.0000, suggesting that the fixed effects approach is preferable for explaining the impact of independent variables on the debt ratio. The coefficients show the following impacts: a 1% increase in profitability results in a 0.2414% decrease in the debt ratio; a 1% increase in firm size leads to a 0.0570% increase in the debt ratio; a 1% increase in asset tangibility results in a 0.0812% increase in the debt ratio; and a 1% increase in liquidity causes a 0.0201% decrease in the debt ratio. The R^2-value of 0.2443 indicates that 24.43% of the variation in the use of debt among Bangladeshi firms is explained by the independent variables.

Model 2 in Table 4 includes profitability, non-debt tax shields, and liquidity as independent variables. The results show that profitability and non-debt tax shields have insignificant effects on the debt ratio under the fixed effects model, while liquidity is significant. In the random effects model, all three variables—profitability, non-debt tax shields, and liquidity—are significant at the 5% level. Both fixed and random effects models have a *p*-value of 0.000, indicating significant impacts on the debt ratio and confirming the appropriateness of both models. The Hausman test yields a χ^2-value of 49.77 with a *p*-value of 0.0000, suggesting that the fixed effects model better explains the impacts of the independent variables on the debt ratio. The beta coefficient for liquidity is -0.0187, indicating that a 1% increase in liquid assets results in a 0.0187% decrease in the debt ratio. The R^2-value is 0.4263, meaning that 42.63% of the variation in the debt ratio of firms listed on the Chittagong Stock Exchange is explained by the independent variables.

Table 4: Summarized Output of Regression Analyses

	Model 1	Model 2	Model 3	Model 4
Fixed effects				
Prf	-0.2415456 (0.041)	-0.1971537 (0.089)	-0.1482387 (0.235)	-0.1487704 (0.198)
FS	.0570116 (0.025)			
NTS	-0.0693078 (0.499)	-0.0797330 (0.295)	-0.043739 (0.514)	-0.0496763 (0.541)
ToA	0.0812350 (0.039)		0.0588263 (0.147)	
GO	-0.7646661 (0.415)			
Lqd	-0.0201272 (0.001)	-0.038664 (0.000)		
Cons-	-0.637539 (0.228)	0.5489583 (0.000)	0.4853657 (0.000)	0.4907119 (0.000)
Overall R^2	0.2443	0.4263	0.1824	0.2089
Model p value	0.0000	0.000	0.0000	0.0000
Random effects				
Prf	-0.3351962 (0.003)	-0.2853886 (0.014)	-0.2374320 (0.061)	-0.244637 (0.046)
FS	0.0397358 (0.003)			
NTS	-0.1866773 (0.004)	-0.1719951 (0.010)	-0.1193854 (0.072)	-0.1276746 (0.088)
ToA	0.073907 (0.045)		.0579354 (0.163)	
GO	-0.0538474 (0.041)			
Lqd	-0.0232445 (0.001)	-0.0243620 (0.000)		
Cons-	-0.2371404 (0.421)	0.6252463 (0.001)	0.5342726 (0.000)	0.5316710 (0.001)
Overall R^2	0.4160	.4452	0.2088	0.2125
Model p value	0.0000	0.0000	0.0000	0.0253
Hausman test				
Chi-square	93.52 (0.0000)	49.76 (0.0000)	16.54 (0.0005)	18.85 (0.0001)

Note: FDR = Debt ratio of Firm; Prf = Profitability; FS = Size of Firms; NTS = Non-debt Tax Shields; ToA = Tangibility of Assets; GO = Growth Opportunity; Lqd = Liquidity

Model 3 in Table 4 uses profitability, non-debt tax shields, and tangibility as independent variables. The results reveal that both profitability and non-debt tax shields have negative effects on the debt ratio, while tangibility has a positive effect. The p-values for both fixed and random effects models are 0.000, indicating significant impacts on the debt ratio and validating the use of both models. The Hausman test yields a χ^2-value of 17.54 with a p-value of 0.0005, suggesting that the fixed effects model provides a better explanation of the impacts of the independent variables on the debt ratio. The coefficient for profitability

is -0.1391, which means a 1% increase in profitability results in a 0.1391% decrease in the debt ratio. For non-debt tax shields, a 1% increase leads to a 0.0537% reduction in debt. The beta coefficient for tangibility is 0.0588, indicating that a 1% increase in tangible assets results in a 0.0588% increase in the debt ratio. The R^2-value of 0.1824 shows that 18.24% of the variation in the debt ratio of firms listed on the Chittagong Stock Exchange is explained by these variables.

Model 4 in Table 4 examines the effects of profitability and non-debt tax shields on the debt ratio. The results indicate that both profitability and non-debt tax shields have negative effects on the debt ratio in both fixed and random effects models. The p-values are 0.0000 for the fixed effects model and 0.0253 for the random effects model, signifying significant impacts at the 5% level and validating the use of both models. The Hausman test provides a χ^2-value of 18.60 with a p-value of 0.0001, suggesting that the fixed effects model is more suitable for explaining the impact of these variables on debt. The coefficient for profitability is -0.15897, meaning a 1% increase in profitability leads to a 0.15897% decrease in the debt ratio. For non-debt tax shields, a 1% increase results in a 0.04958% reduction in debt. The R^2-value is 0.2125, indicating that 21.25% of the variation in the debt ratio of firms listed on the Chittagong Stock Exchange is explained by these variables.

The negative impact of profitability on debt usage among firms listed on the Chittagong Stock Exchange (CSE) aligns with the pecking order theory. This finding suggests that more profitable firms prefer using internally generated funds rather than incurring debt. Debt is only utilised when internal funds are insufficient. Consequently, highly profitable firms tend to finance their operations with their own funds, minimising their reliance on debt. This result is consistent with the studies of Abdullah (2005), Sheikh and Wang (2011), and Rajan and Zingales (1995). Regarding firm size, larger firms listed on the CSE are more likely to use debt. This may be because larger firms generally have more stable and substantial cash flows, making it easier to manage debt obligations. Additionally, larger firms might prefer debt over equity due to the lower cost of debt financing. The study also reveals a significant negative relationship between non-debt tax shields and financial leverage. This suggests that firms on the CSE do not typically use non-debt tax shields as a substitute for debt tax shields. Instead, these firms often opt for debt to benefit from interest tax shields.

A significant positive relationship between asset tangibility and the debt ratio is observed. Firms with substantial fixed assets on the CSE are more likely to use these assets as collateral to secure external loans. Lenders view firms with high fixed assets as less risky, and thus, Bangladeshi firms tend to rely on fixed assets when making financial leverage decisions. This finding supports the work of Abdullah (2005) and Sheikh and Wang (2011). The study also finds a significant positive relationship between growth opportunities and financial leverage. Firms listed on the CSE with higher growth potential are more inclined to issue debt rather than equity. This may be due to imperfections in the Bangladeshi capital market, where the costs of debt and equity are not equal. Additionally, accessing debt markets may be easier compared to equity markets. This result aligns with the research of Titman and Wessels (1988), Abdullah

(2005), and Ferri and Jones (1979). Finally, liquidity is a significant factor in this study. The negative impact of liquidity on debt usage indicates that firms with higher liquidity levels are likely to avoid using debt. Firms with abundant liquid assets can finance their needs internally and generally have stable cash flows, enabling them to rely on internal funds for both short-term and long-term financing. This finding supports the pecking order theory, which posits that firms with higher liquidity use less debt. This observation is consistent with the findings of Sheikh and Wang (2011), Abor (2005), and Deesomsak et al. (2004).

5. Recommendations

To deepen our understanding of capital structure, future research could explore the interplay between capital structure and corporate governance. Investigating how different governance mechanisms influence capital structure decisions and firm performance would provide valuable insights. Additionally, examining the impact of industry-specific factors on capital structure could reveal unique patterns and challenges within particular sectors. Furthermore, the role of institutional investors in capital structure decisions warrants exploration, as their influence can significantly impact firms' financing choices. Firms should carefully consider their specific circumstances and industry dynamics when making capital structure decisions. Regular monitoring and evaluation of capital structure are essential to ensure it remains optimal. Developing contingency plans to address potential financial distress scenarios is prudent. Moreover, financial managers should possess a deep understanding of capital structure theory and its implications to make informed decisions. Longitudinal studies tracking changes in capital structure over time could provide valuable insights.

Comparative analysis across different countries and regions could shed light on cultural and institutional influences. Investigating the impact of technological advancements on capital structure would be particularly relevant in today's rapidly evolving business environment. Leveraging machine learning techniques to predict optimal capital structure could enhance decision-making. Developing innovative financial instruments and strategies tailored to specific industries or market conditions could provide firms with more flexible and efficient capital structure options. Capital structure decisions have significant implications for stakeholders, including employees, customers, and communities. Excessive debt can lead to financial distress, job losses, and economic instability. Therefore, sustainable capital structures that balance financial performance with social and environmental considerations are becoming increasingly important. Addressing these social and cultural impacts requires careful consideration and responsible decision-making by corporate leaders. By adopting a holistic approach that considers the broader implications of capital structure decisions, firms can contribute to a more sustainable and equitable business environment.

6. Conclusion

Determining the optimal balance of debt and equity in a company's capital structure is a crucial concern for financial managers. Effective capital structure decisions can significantly enhance a firm's performance. Various determinants influence the choice of debt, and three prominent theories provide guidance on how to balance debt and equity. This study explores how these factors affect debt usage among Bangladeshi firms. The analysis includes financial statements from 47 companies listed on the Chittagong Stock Exchange (CSE) from 2018 to 2022, using least squares regression to assess the impact of these determinants on debt financing. The findings indicate that debt usage can improve firm performance and increase shareholder earnings. Financial leverage lowers the overall cost of capital, as debt financing is generally cheaper than equity financing. Consequently, using debt can boost profitability and enhance shareholder wealth. However, if firms report lower income, their profitability declines. Firms with high profitability tend to use less debt, consistent with the pecking order theory. Thus, profitability and financial leverage are related in both positive and negative directions. Non-debt tax shields have mixed effects on debt usage. While debt financing benefits from tax deductibility of interest and depreciation, firms with insufficient income may not fully realise these tax advantages.

High growth opportunities negatively impact debt levels, as firms with strong growth potential are likely to use less debt. Excessive debt can lead to bankruptcy, agency costs, and potential loss of control to creditors. Tangibility of assets positively influences financial leverage. Firms with substantial tangible assets can use these as collateral to secure loans, facilitating business expansion and increasing firm value. Larger firms are generally more capable of handling debt due to their diversified operations, which mitigate financial distress risks. However, some results suggest that larger firms may also use less debt. Liquidity's impact on debt financing is ambiguous. Firms with high liquidity might prefer using internal funds instead of debt. Conversely, high liquidity can also indicate financial strength, enabling firms to handle debt obligations more effectively. In conclusion, there is no single theory that universally dictates the optimal capital structure. The effects of various determinants on debt financing can vary based on individual firm characteristics and economic conditions. While debt financing can enhance firm performance, it must be managed carefully to avoid financial distress. Firms should consider these factors to determine the optimal mix of debt and equity, ensuring long-term success and growth.

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