

Capital Structure Determinants in Pakistan Textile Industry: An Empirical Examination through the Lens of Pecking Order and Trade-Off Theories.

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A B S T R A C T

Purpose—This study examines capital structure choices of textile firms and investigates the relationship between growth and financing behavior within the theoretical frameworks of the Trade-Off and Pecking Order theories. It specifically aims to highlight significant variations in capital structure decisions influenced by internal financial factors and the broader macroeconomic environment.

Study Design/methodology/approach—Utilizing panel data from 150 listed textile firms over the period 2015–2024, this study employs a regression framework to analyze how firm-specific financial factors like size, profitability, asset tangibility, liquidity, and sales growth, alongside macroeconomic conditions, influence the choice between equity and debt in capital structure decisions.

Findings—The empirical findings reveal that larger firms tend to favor external financing, due to their greater access to capital markets. As noted in the textile industry, high-growth firms prefer internal financing over debt, supporting the Pecking Order Theory and demonstrating risk-averse financing behavior. An increased proportion of tangible assets eases the borrowing of debt equity, reinforcing the Trade-Off Theory because of their ability to serve as collateral. The findings also emphasize that the overall economic environment and sectoral trends have a considerable impact on the decision-making processes concerning capital structure.

Research Practical Implications—The decision makers need to envisage a more universal and pliant financial environment to cater to various capital requirements of the textile industry. This would be through the design of financial instruments, credit policies, and the regulatory environment, and thereby de-risk and capitalize the sector in a way that maximizes its contribution to the national economy.

Originality/value—The originality of this research is that the authors explored the CSCs determinants in Pakistan's textile industry, which is an important but relatively less studied sector, looking through the lens of a frontier economy. By adopting a contextual approach, the research provides fresh insights into how textile firms manage financing choices amid local economic conditions and regulatory challenges.

Keywords: Capital structure, Debt equity, Growth, Financing behaviour, Textile firms

JEL Classification Codes: G30, G31, G32, M16

1 | INTRODUCTION

The concept of Capital Structure (CS) remains a pivotal topic within the scope of corporate finance literature ([Salikin et al., 2024](#); [Zandi et al., 2023](#)). The Capital Structure, defined as the combination of debt and equity financing a firm employ, significantly contributes towards maintaining its financial health, sustainability, and competitiveness ([Rehan et al., 2023](#); [Sutjiatmo et al., 2025](#)). The pursuit of an optimal Capital Structure that maximizes firm value while minimizing the cost of capital is a universal corporate finance doctrine; its defining factors continue to spark dispute ([Al Amosh et al., 2024](#)).

In previous years, Capital Structure has been analyzed by scholars using different theories like [Modigliani and Miller \(1958\)](#), the Pecking Order Theory ([Myers & Majluf, 1984](#)), the Trade-Off Theory, and the Agency Cost Theory. Each of these theories offers different explanations concerning the financing decisions made by firms. The Trade-Off Theory claims that firms attempt to balance the tax advantages of debt with the potential financial distress it may cause. Meanwhile, the Pecking Order Theory suggests a hierarchy of financing sources where firms first turn to internal funds, then debt, and equity last, especially in high information asymmetry and risk-averse environments ([Saeed & Khan, 2024](#)).

The latest research emphasizes the need to consider broader institutional and market contexts, in addition to firm-specific attributes, when making capital structure decisions ([Alabdullah & Mohamed, 2023](#)). Capital markets, as one of the main financial institutions, facilitate the growth of the economy by providing sector-specific financing options, leading firms operating in similar verticals ([Ahmad et al., 2023](#)).

In developing countries like Pakistan, where financial markets are shallow and resources are scarce, Capital Structure decisions are especially challenging and contextually bound. This is particularly true for the capital-intensive, export-oriented sectors like textiles ([Tasrim et al., 2024](#)). Limited empirical investigations from South Asia indicate that these decisions are influenced significantly by factors such as profitability, asset tangibility, firm size, and growth potential ([Ahmed Sheikh & Wang, 2013](#); [Bilal & Tanveer, 2023](#); [Qureshi et al., 2021](#)). Nonetheless, these approaches have divergent results over different sectors and periods, suggesting that capital structure choices are shaped not only by industrial attributes but also by macroeconomic frameworks ([Sultan et al., 2020](#); [ur Rehman, 2016](#)).

Due to high operational costs of the textile industry, the reliance on the foreign market, policy vulnerability, and cyclical demand, the importance of fundraising strategies is increased ([Tasrim et al., 2024](#)). Financing requirement in the textile business requires a huge amount of capital to support investment alignment to meet operational costs, derive business growth, and address technological advancement needs ([Hassan, 2024](#)). Other factors, including inflation, rate of interest, exchange rates, and regulatory environment, will also shape the company's preferred level of gearing and risk profile.

These considerations are of capital structure choice in Pakistan's textile sector, where a research gap is still palpable. Most empirical studies have prioritized this issue in the general manufacturing or services sectors and, at the same time, left this specific behavior and the characteristics of textile companies unexamined ([Al-Haddad et al., 2024](#); [Zandi et al., 2023](#)). Findings reported by previous studies on the related subject matter show inconsistency regarding firm-specific factors such as size, profitability, asset tangibility, and liquidity ([Memon et al., 2012](#); [Sultan et al., 2020](#); [ur Rehman, 2016](#)). This calls for data-driven research within the sector to determine sensitive determinants of capital structure.

Although existing theoretical framework like Agency Theory, Pecking Order Theory, and Trade-Off Theory have been developed to explain how one firm can structures its capital needs ([Alwan & Risman, 2023](#); [Jensen & Meckling, 2019](#); [Ross, 1977](#); [Setyawan, 2011](#)), their use and explanatory power usually vary from one industry to another depending on industry dynamics. Therefore, revisiting these theories within the specific institutional, economic, and structural facts of the textile sector in Pakistan is crucial.

Therefore, this study aims to bridge the existing gap in the corporate finance literature by conducting a comprehensive empirical analysis of capital structure determinants within Pakistan's textile sector. Employing panel data analysis over ten years (2015–2024), the research investigates how firm-specific financial factors such as profitability, asset tangibility, size, liquidity, and sales growth, alongside macroeconomic conditions, influence firms' financing decisions. By situating the analysis within the theoretical frameworks of the Trade-Off and Pecking Order theories, this study seeks to offer deeper insights into the capital structure behavior of textile firms in the context of a frontier economy. The findings are intended to inform financial managers, policymakers, and investors about the strategic financial practices that can enhance firm performance, support sectoral growth, and improve resilience in a competitive and volatile economic environment.

Based on the above discussions, the main objectives of the current research are drafted as follows:

1. To identify and analyze the key determinants influencing capital structure decisions in Pakistan's textile sector.
2. To assess the applicability of the Trade-Off and Pecking Order theories in explaining financing behaviors of textile firms.

By pursuing these objectives, the study aims to enrich the academic understanding of corporate finance while providing practical guidance for stakeholders in Pakistan's textile industry.

2 | LITERATURE REVIEW

The capital structure (CS) of the corporate sector, particularly with reference to capital-intensive industries, has long been a crucial focal point in the field of finance research ([Ahmed Sheikh & Wang, 2013](#); [Akhtar, 2005](#); [Al-Haddad et al., 2024](#)). Although much of the work from a global context has explored capital structure decisions extensively, research focused specifically from Pakistan's textile industry viewpoint remains limited and unanswered, to the best of the researcher's knowledge. This literature review synthesizes key findings from recent studies, emphasizing the factors influencing capital structure decisions in this context.

The capital structure has continued to be among the most debated issues in corporate finance since no universally accepted framework guides an enterprise on the best mixture of debt and equity financing ([Ahmad et al., 2023](#); [Myers, 2001](#)). Normally, enterprises fund their operations and investments with a mix of different sources such as debt, equity, bonds, bank loans, and lease financing. The strategic mix is known as the capital structure because it can significantly enhance firm value, particularly for firms in capital-intensive sectors such as textiles, where investment must be made at large scales ([Saidat et al., 2019](#)).

Throughout the years, researchers have utilized various theoretical frameworks to analyze companies' financing activities. Some of the most impactful include the Modigliani & Miller Theorem (1958), Trade-Off Theory, Pecking Order Theory ([Myers & Majluf, 1984](#)), and Agency Cost Theory ([Meckling & Jensen, 1976](#)).

[Modigliani and Miller \(1958\)](#) groundbreaking research claimed that, in ideal markets, a company's worth is not influenced by its financing mix or shareholders' payout strategy. Nonetheless, their later revisions (1963, 1966) recognized the influence of market imperfections like corporate taxes on decisions regarding capital structure. They emphasized that using debt can improve firm value via tax shields and proposed a positive connection between leverage and financial performance.

These theoretical models have established a basis for comprehending differences in capital structure among sectors and areas, highlighting the significance of contextual elements in influencing funding choices. The Pecking Order Theory, introduced by [Myers and Majluf \(1984\)](#), contests the idea of an ideal capital structure. It suggests that companies choose to fund operations initially with internal resources, followed by debt, and ultimately equity, primarily to reduce the impacts of information asymmetry. [Myers and Majluf \(1984\)](#) observed that information imbalance between managers and outside stakeholders can result in agency conflicts, as managers tend to prioritize the interests of current shareholders.

In frontier markets like Pakistan, companies frequently function in settings marked by information imbalance, restricted access to external funding, and immature capital markets. The Pecking Order Theory ([Myers & Majluf, 1984](#)) proposes that companies prioritize internal funding first, followed by debt, and consider external equity only as a last option. This hierarchy holds significant importance in Pakistan's textile industry because of elevated transaction costs, inadequate investor protection, and market fluctuations. Consequently, companies frequently refrain from issuing equity and prefer to depend on retained earnings or informal debt sources, reflecting the theory's alignment.

While the Trade-Off Theory provides a useful lens for understanding capital structure, its complete application in Pakistan's textile sector is often constrained by institutional weaknesses, financial volatility, and sector-specific risks. Nonetheless, it may still explain behavior in larger or better-capitalized firms that have more stability and access to formal finance channels. Table 1, given below, highlights the brief description of theories relevant to capital structure.

Table 1

Theories of Capital Structure Behavior

Theory	Theoretical Motivation	Strategic Implications for Firms
Modigliani & Miller (MM) Theory of Irrelevance	Based on assumptions of perfect capital markets—no taxes, bankruptcy costs, or information asymmetry.	Under ideal conditions, capital structure has no effect on firm value. Financing decisions are theoretically neutral.
Trade-Off Theory	Firms seek to balance the tax benefits of debt (interest deductibility) with the costs of financial distress.	Firms aim for an optimal capital structure, adjusting debt levels to maximize firm value by trading off risk and return.
Pecking Order Theory	Arises from information asymmetry between insiders (managers) and outsiders (investors); internal funding involves less disclosure and risk.	Firms prioritize internal funds, followed by debt, and issue equity only as a last resort due to signaling concerns.
Agency Cost Theory	Capital structure decisions address conflicts of interest: manager-	Use of debt can reduce agency costs by imposing discipline on

	shareholder (moral hazard) and shareholder-debt-holder (risk-shifting).	management, but increases default risk if mismanaged.
Market Timing Theory	Firms exploit mispricing in capital markets, issuing equity when overvalued and repurchasing when undervalued.	Capital structure reflects historical market conditions, not necessarily a target ratio. Timing behavior explains deviations.

Numerous factors influence a firm's capital structure, and the organization must aim to find the most suitable mix of financing options. While determining the optimal capital structure may not be complex, a thorough evaluation of these factors helps shape the final structure, which is considered ideal ([Boumlik et al., 2025](#)). In capital structure decisions, a trade-off often occurs between risk and return ([Khan et al., 2024](#)). Increasing debt typically raises the risk in an organization's earnings, but it can also lead to a higher expected return. In general, higher debt can lower stock prices due to increased risk, though the prospect of a greater return can attract investors, which, according to Pecking Order Theory, can theoretically raise the product price ([Lisboa et al., 2025](#)). Furthermore, the most favorable structure balances risk and return, aligning with the ultimate goal of maximizing stock prices. Many authors found that asymmetric information significantly affects the financing decisions ([Ahmad et al., 2023](#)). The adverse effect from the difference between the observed and target changes in leverage on asymmetric information confirms that capital structure changes act as a signal for future profitability and helps the management to lower its level of asymmetric information.

Capital structure is critical to companies, particularly those in the textile industry, since it influences long-term profitability, company value, and investment choices ([Saidat et al., 2019](#)). The study traces the evolution of capital structure research, beginning with [Booth et al. \(2001\)](#), who found that firm characteristics influenced leverage similarly in both developed and developing countries, contradicting [Wald \(1999\)](#). In a more localized context, [Shah et al. \(2004\)](#) analyzed non-financial Pakistani firms and found a negative relationship between leverage and profitability, a finding echoed in several later studies, including [Qureshi and Azid \(2006\)](#), [Shah and Khan \(2007\)](#), and [Ahmad et al. \(2013\)](#). [Akhtar et al. \(2019\)](#) examined 30 textile firms in Pakistan (2007–2016), showing that debt ratio impacts ROA and ROE, but not EPS or equity ratios, while liquidity significantly moderates the relationship between leverage and firm performance. According to [Ullah et al. \(2020\)](#), capital structure decisions in Pakistan are influenced mainly by factors such as profitability, firm size, and growth opportunities. This is particularly relevant in the textile sector, which, despite being one of the most significant contributors to GDP and export earnings, faces limited access to formal financing and remains heavily reliant on bank credit.

Recent research provides conflicting perspectives on these dynamics. [Alwan and Risman \(2023\)](#) discovered that leverage adversely affects firm value when evaluated with Tobin's Q. Likewise, [Boshnak \(2023\)](#) noted that firm size and sales growth positively affect capital structure choices, whereas the impacts of asset tangibility and liquidity were less definitive. These differing outcomes underscore the intricacies of financial decision-making in a frontier economy such as Pakistan.

The textile industry, as a key driver of national economic activity, continues to depend on external funding, primarily from banks, to meet its capital needs, underscoring the importance of understanding sector-specific capital structure determinants ([Ullah et al., 2020](#)). Studies across other emerging economies provide

comparative insights. For instance, [Chang et al. \(2019\)](#) reported a negative relationship between leverage and profitability in Korea, Taiwan, and Hong Kong, while growth showed a positive influence on leverage. [Nguyen and Nguyen \(2020\)](#) found a negative impact of leverage on ROE among Vietnamese firms. [Putri and Rahyuda \(2020\)](#) noted a similar inverse relationship in Indonesian consumer goods firms. Further studies from South Asia also reveal consistent themes, like [Rao et al. \(2019\)](#) (Indian SMEs) identified profitability, firm size, age, growth, and cash flow as core determinants. [Saif-Alyousfi et al. \(2020\)](#) (Malaysian firms) reported negative relationships between leverage and profitability, liquidity, and tax shields. [Rasool et al. \(2021\)](#) (Pakistani firms) confirmed negative associations with earnings volatility but positive ones with size, asset tangibility, and non-debt tax shields. [Uddin et al. \(2022\)](#) (Bangladeshi energy sector) emphasized the role of firm age, size, and liquidity. [Saeed and Khan \(2024\)](#) introduced a revised leverage measure that found profitability unrelated to leverage, challenging traditional findings.

The reviewed literature consistently emphasizes the importance of firm-specific factors such as profitability, size, growth opportunities, liquidity, and asset tangibility as key determinants of capital structure. However, inconsistencies across regions, sectors, and periods suggest that capital structure decisions are context-dependent. In Pakistan, the textile industry remains underexplored in this regard, despite being highly capital-intensive and exposed to both domestic and international financial pressures. Most studies either generalize across sectors or fail to capture the dynamic interplay between firm behavior and macroeconomic conditions. This study aims to fill this gap by offering a sector-specific and empirically grounded analysis of capital structure determinants within Pakistan's textile sector. Using a panel data approach, it examines how firm-specific factors and macroeconomic conditions interact to shape financing behavior. In doing so, the research contributes not only to academic literature but also offers practical insights for policymakers, financial institutions, and corporate managers striving to optimize capital allocation and support long-term industry sustainability.

The given table 2, helps to highlight the major outcomes regarding financial factors employed in many studies to enhance the capital structure decisions of the corporate sector.

Table 2

Major Outcomes from the Literature Review About Capital Structure Determinants

Determinant	Impact on Leverage	Observed In
Profitability	Negative —Profitable firms favor internal financing over debt (Pecking Order Theory). Therefore, they mainly opt for equity financing options.	Chang et al. (2019) ; Rasool et al. (2021) ; Saif-Alyousfi et al. (2020) .
Firm Size	Positive — Larger firms take more steady cash flows and better credit access. This is why large firms go for debt financing.	Rao et al. (2019) ; Saif-Alyousfi et al. (2020) ; Rasool et al. (2021) .
Liquidity	Mixed/Moderating Role — High liquidity reduces debt needs but can also enhance debt capacity. Therefore, high liquidity enhances access to both internal and external funds.	Akhtar et al. (2019) ; Uddin et al. (2022) .
Asset Tangibility	Positive — Tangible assets serve as collateral, reducing the risk for lenders. Therefore, high asset tangibility enhances access to debt financing.	Uddin et al. (2022) ; Rasool et al. (2021)

Firm Age	Positive or Negative – Older firms may have more retained earnings or better credit standing. So, more debt financing.	Saif-Alyousfi et al. (2020) ; Uddin et al. (2022)
Non-debt Tax Shield	Mixed – Additional for debt-related tax benefits	Rao et al. (2019) ; Rasool et al. (2021)
Economic Growth	Positive – Increases investment opportunities, encouraging debt usage.	Thach and Oanh (2017) ; Goel (2019) ; Chang et al. (2019) ; (Rao et al., 2019)
Inflation	Positive or Neutral – Higher inflation may reduce real debt burden but increase borrowing costs.	Goel (2019)
Interest Rates	Negative – Higher rates increase the cost of debt.	Goel (2019)
Stock Market Development	Often Negative - Equity markets offer an alternative to debt	Thach and Oanh (2017)
Credit and Bond Markets	Positive – Developed markets improve access to debt.	Thach and Oanh (2017)

The conceptual model of the current investigation integrates theoretical frameworks like Pecking Order Theory and Trade-Off Theory to explain the textile industry's capital structure dynamics in Pakistan. A variety of firm-specific and macroeconomic factors shape capital structure decisions. Grounded in the Pecking Order Theory and the Trade-Off Theory, the following hypotheses are developed to empirically test how these factors influence the financing behavior of firms in Pakistan's textile sector.

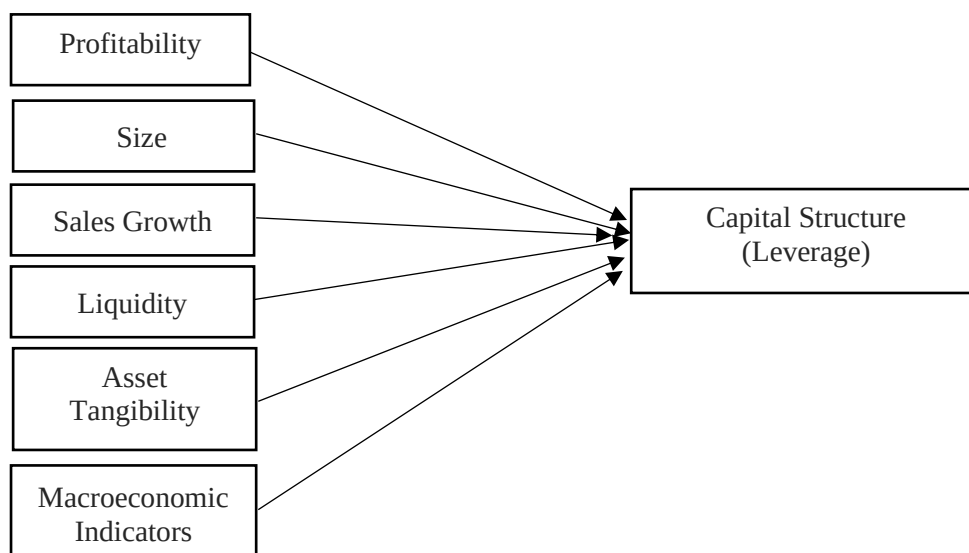
2.1 | Profitability and Leverage

According to the Pecking Order Theory, more profitable firms prefer to finance investments using retained earnings, thus relying less on debt. Conversely, Trade-Off Theory posits that profitable firms may take on more debt to benefit from tax shields, balancing bankruptcy costs against tax advantages.

H1: *Profitability is negatively associated with leverage, consistent with the Pecking Order Theory.*

Figure 1

Conceptual Framework



2.2 | Firm Size and Leverage

Larger firms typically have more stable cash flows, greater access to credit markets, and lower default risk. Under the Trade-Off Theory, larger firms can tolerate higher leverage due to lower perceived risk. At the same time, under Pecking Order Theory, larger firms may prefer debt over equity after exhausting internal funds, due to better creditworthiness.

H2: *Firm size is positively associated with leverage, supporting both Trade-Off and Pecking Order Theories.*

2.3 | Asset Tangibility and Leverage

Trade-Off Theory suggests that firms with more tangible assets can offer collateral, reducing lender risk and increasing borrowing capacity. From the Pecking Order Theory perspective, firms with more fixed assets are also better able to support debt financing over equity.

H3: *Asset tangibility is positively associated with leverage, as predicted by the Trade-Off Theory.*

2.4 | Sales Growth and Leverage

Pecking Order Theory argues that high-growth firms are more likely to face internal financing deficits and thus follow a hierarchy of financing, starting with internal funds, then debt, and finally equity. However, growth firms may avoid debt to preserve flexibility, especially in volatile environments like Pakistan.

H4: *Sales growth is negatively associated with leverage, supporting the Pecking Order Theory.*

2.5 | Liquidity and Leverage

Highly liquid firms may rely more on internal resources for funding, aligning with Pecking Order Theory. However, Trade-Off Theory argues that firms with more liquidity are better able to service debt, and Pecking Order Theory allows for higher leverage.

H5: *Liquidity is negatively associated with leverage, consistent with the Pecking Order Theory.*

2.6 | Macroeconomic Conditions and Leverage

Fluctuations in the macroeconomic environment can significantly impact firms' financing choices. Under the Trade-Off Theory, during stable periods, firms might increase debt to benefit from tax shields. In contrast, during uncertainty, firms may reduce leverage to mitigate financial distress risk, aligning with risk-averse behavior observed in developing economies.

H6: *Adverse macroeconomic conditions are negatively associated with leverage, reflecting risk-averse behavior consistent with Trade-Off Theory.*

3 | METHODOLOGY & DESIGN

The current study's goal is to investigate the key elements that influence capital structure in Pakistan's textile industry. Further, the study also shed some light to show what impact the firms' specific determinants have on the capital structure. Following Pecking Order Theory and Trade-Off Theory, the study focuses on the following research objective:

“To ascertain the prospective firm-specific financial and macroeconomic factors that affect the Capital Structure decisions of textile firms in Pakistan”

The population data for the current analysis is taken from the textile sector of Pakistan. The study mainly focuses on firms that have complete data availability regarding study variables for ten years to be included in the sample. The sample firms were selected on the following filtering criteria:

- i. Firms must belong to the textile sector of Pakistan.
- ii. The firms remain listed on the stock exchange throughout the study period.
- iii. Firms must be operational throughout the study period (2015-2024) for a period of 10 years.
- iv. Firms must possess data to calculate the necessary variables.

After applying filtering criteria and examining the availability of selected variables data for each firm, 150 listed textile firms are qualified to be included as the sample of the study. The reasons behind the selection of the textile sector are that the textile sector is a major contributor to countries' GDP, employment, and exports. The period of 2015-2024 provides a substantial timeframe to observe changes, patterns, and trends in the textile industry of Pakistan. This timeframe includes data before, during, and after the COVID-19 pandemic, offering a unique opportunity to study the impact of this global event on the textile sector in terms of production disruptions, labor shortages, shifts in consumer demand, and supply chain bottlenecks. The outliers of the study were identified using Z-score and boxplot techniques. The outliers are either winzorized or excluded from the data if they were found due to data entry errors. The current study is quantitative, and data for the selected variables have been collected using secondary data sources from the State Bank of Pakistan website, Pakistan Stock Exchange (PSX), and from World Development Indicators. As the current investigation is using multiple periods and cross-sectional (entity) data, therefore, the study will provide useful insight, keeping in view balanced panel data analysis.

Data analysis is conducted using STATA software due to its robust support for panel data econometrics and ease of implementation for Fixed and Random Effects models, as well as diagnostic tests such as the Hausman test and tests for heteroskedasticity and serial correlation. The Fixed Effects Model (FEM) is used to control for unobserved heterogeneity across entities that may correlate with the independent variables. Unlike the Random Effects Model, FEM allows for correlation between the unobserved effects and regressors, making it more appropriate in this context where omitted variable bias is a concern. The choice of the Fixed Effects Model is justified by the results of the Hausman test. Thus, FEM provides more consistent and unbiased estimates of the parameters and is incorporated into this study.

This study was conducted using a panel data regression model. After including our variable in the general form of the model, the equation was tested. The following model was used for analysis:

$$LEV = f (FS, TA, PFT, SG, LIQ, GDP).$$

We can write the research model in the following way:

$$LEV = \alpha + \beta_1 FS_{it} + \beta_2 TA_{it} + \beta_3 PFT_{it} + \beta_4 SG_{it} + \beta_5 LIQ_{it} + \beta_6 GDP_{it} + \varepsilon_0$$

Where LEV denotes firms' leverage (dependent variable), FS shows firms' size, TA represents tangibility, and PFT shows profitability, SG explains sales growth, LIQ shows liquidity, and GDP represents gross domestic product. While ε stands for the error term. α and β show model parameters, i shows firms or cross sections, and t shows the time period.

For analysis and research findings, this study included five independent variables: size, tangible assets, liquidity, sales growth, and profitability.

Table 3

Variables, Symbols, Measurement, and Expected Effect

Variable Name	Symbol	Measurement	Expected Relation with Dependent
Dependent Variable			
Leverage	LEV	Long-term debt/ Equity ratio	
Independent Variables			
Firm size	FS	Log (Total Asset)	-
Tangible Asset	TA	Fixed Asset Ratio	-
Sales Growth	SG	(Salest-Salest-1)/ Salest-1	-
Profitability	PFT	Net Profit Ratio	-
Liquidity	LIQ	Liquid Assets/Total Assets	-
Gross Domestic	GDP	Gross Domestic Product	-

The trade-off argument states that highly profitable companies typically issue more debt to lower their tax burden. According to this theory, leverage and business profitability should be positively correlated. Conversely, the pecking order hypothesis explains why leverage and business profitability are negatively correlated. Profitable businesses have sufficient earnings according to the Pecking Order Theory. The company will not use debt financing since it will choose to finance its new projects using internally generated money, or retained earnings ([Myers & Majluf, 1984](#)). As per the Pecking Order Theory, a negative connection between a firm's leverage and profitability is to be expected. From the perspective of several capital structure theories done by [Shah et al. \(2004\)](#), the relationship between profitability and leverage is completely contrary.

Table 4*Hypothesized Relations of Study Variables*

Hypotheses	Variable	Expected Sign	Operationalization	Tested Through
H1: Firm size → leverage	Size	+	Log of Total Assets	Panel Regression
H2: Profitability → leverage	Profitability	–	Return on Assets	Same
H3: Tangibility → leverage	Tangibility	+	Fixed assets / Total assets	Same
H4: Growth → leverage	Growth	–	Change in total Sales	Same
H5: Liquidity → leverage	Liquidity	–	Liquid assets ratio	Same
H6: GDP → leverage	GDP	–	Gross Domestic Product	Same

Each hypothesis is tested using the coefficient estimates from the regression output. Significance is determined using t-statistics and p-values, and robustness checks are conducted using alternative specifications where needed.

4 | RESULTS AND ANALYSIS

The data analysis contains four sections. The first section explains Descriptive Analysis, while the second section illustrates the relationship between variables (Correlation Analysis), the third section explains significance to determine the strength and character of the relationship between the dependent variable through multiple regression, fourth section explains the ANOVA analysis and Profitable businesses have sufficient earnings according to the Pecking Order Theory.

Table 5*Descriptive Analysis*

	LEV (%)	FS	TA (%)	SG (%)	PFT (%)	LIQ (%)	GDP
Mean	0.0219	6.5485	0.8747	6.5657	0.0783	2.7983	4.7330
Standard Dev.	0.0270	0.6212	0.6026	0.7126	0.0676	0.4250	0.3625
Range	0.2624	3.8077	8.1555	4.3681	0.6499	0.2652	3.4560
Minimum	0.0104	4.3307	0.0007	3.6955	0.0061	0.0152	0.2563
Maximum	0.2728	8.1384	8.1562	8.0636	0.6560	3.5263	4.5632
Kurtosis	3.3893	0.5346	89.9289	2.9569	1.3896	0.2365	03120
Skewness	6.0842	-0.0287	7.7508	-1.3002	3.0207	1.2396	2.5623
Count	1500	1500	1500	1500	1500	1500	1500

The above table 5 shows the statistical summaries for all variables (LEV, FS, TA, SG, PFT, LIQ, and GDP) based on a sample of 1500 observations for each. The analysis data consisted of 1500 observations from 2015-2024. Here is an analysis of each variable's key descriptive statistics, suggesting that the mean value of leverage is 0.0219 while the mean values of FS, TA, SG, PFT, LIQ, and GDP are 6.54, 0.87, 6.56, 0.078, 2.79, and 4.73.

All variables were examined for normality using skewness and kurtosis statistics. Variables such as TA and PFT exhibited non-normal distributions, with kurtosis exceeding 10 and skewness above 2. To address this, log transformations were applied for highly skewed variables and winsorization at the 1st and 99th

percentiles where appropriate. These steps align with standard practices in financial econometrics to reduce bias and improve estimation reliability.

Table 6

Correlation Analysis

	LEV	FS	TA	SG	PFT	LIQ	GDP
LEV	1						
FS	-0.1429**	1					
TA	-0.1353**	-0.3718**	1				
SG	-0.1196***	0.7065**	-0.0994**	1			
PFT	-0.1721*	0.1101**	-0.1441*	0.0532**	1		
LIQ	-0.2556**	0.1253*	0.1478*	-0.1145**	-0.256**	1	
GDP	-0.3265**	0.2550*	0.1256*	0.3214*	0.3256**	0.4226*	1

*Shows sig. @, 1%, ** shows sig. @5%, *** shows sig @10%

To assess multi-collinearity among the independent variables, both the correlation matrix and the Variance Inflation Factor (VIF) analysis were conducted. In the correlation table 6, this study analyzes that the diagonal value of 1 for LEV represents the correlation of LEV with itself, as expected. The correlation between LEV and FS is -0.1429, which is a weak negative correlation. This suggests that as firm size (FS) increases, leverage (LEV) might slightly decrease, though the relationship is weak. The correlation between LEV and TA is also found to have a negative magnitude (-0.1353). This indicates the existence of an indirect relation between leverage and Trade-Off Theory assets. Further, the relation of leverage and sales growth, profitability, liquidity, and GDP is also found to have a negative direction. This means that with the increase in sales growth, profitability, and liquidity, the leverage decreases. Further, the bad macroeconomic conditions tend to force firms to have high leverage. While some correlations (FS and TA) appeared to be moderately high, all VIF values were found to be below the critical threshold of 5, indicating the existence of no severe multicollinearity. Therefore, the variables included in the regression model are not expected to distort estimation reliability due to multicollinearity concerns. In order to address the multicollinearity and heteroscedasticity issues, the HAC test was applied to normalize the data.

As given in table 7, the predictive power of the model is explained to be 53.08% which means that the proposed model can explain 53% variations in the dependent variable.

Table 7

Regression Estimates

R Squared	0.530	Adjusted R Squared			0.522
Stand. Error	0.492	Observations			1500
ANOVA	Df	SS	MS	F	Sig. F
Regression	4	64.4171	16.1042	66.4498	1.5553E-37
Residual	235	56.9527	0.24235		
Total	239	121.3699			

The ANOVA results suggest that the regression model is highly statistically significant, meaning that at least one of the predictor variables has a significant relationship with the dependent variable. The high F-statistic and extremely low p-value support the model's overall significance. However, while the model explains a significant portion of the variance, there remains some unexplained variability, as seen in the residual SS.

To accurately estimate the relationship between capital structure and its determinants in Pakistan's textile sector, it is essential to select the most appropriate panel data regression model. Given the panel nature of the dataset (multiple firms over multiple years), three econometric models are generally considered: Pooled Ordinary Least Squares (OLS), Fixed Effects Model (FEM), and Random Effects Model (REM). Model selection was guided through diagnostic tests, including the F-test, Breusch-Pagan Lagrange Multiplier (LM) test, and the Hausman test. Pooled OLS assumes homogeneity across all firms and time periods, disregarding firm-specific effects. While, Fixed Effects Model (FEM) controls for time-invariant firm-level heterogeneity, assuming that individual firm effects correlate with independent variables. Random Effects Model (REM) assumes firm-specific effects are random and uncorrelated with explanatory variables, making it more efficient if the assumption holds.

Table 7

Regression Estimates

Test	Null Hypothesis (H_0)	Result	Decision
F-test (Pooled OLS vs. FEM)	Pooled OLS is adequate	$p < 0.05$	Reject $H_0 \rightarrow$ Fixed
Breusch-Pagan LM (Pooled vs. REM)	No panel effect; Pooled OLS is adequate	$p < 0.05$	Reject $H_0 \rightarrow$ Random Effects preferred
Hausman Test (FEM vs. REM)	REM is appropriate (no correlation with regressors)	$p < 0.05$	Reject $H_0 \rightarrow$ Fixed Effects selected

Based on the results of the above diagnostic tests, the F-test indicated that Fixed Effects is superior to Pooled OLS. The LM test confirmed that panel effects are present, validating the need for a panel-specific model. The Hausman test showed that firm-specific effects correlate with the independent variables, violating the assumptions of the Random Effects Model. Therefore, the Fixed Effects Model (FEM) is selected as the most appropriate specification for this study. This model controls for unobserved heterogeneity across firms, such as managerial practices, ownership structure, or internal policies that may influence capital structure decisions. By employing the Fixed Effects Model, the study ensures more accurate estimation of the impact of firm-specific and macroeconomic factors on leverage. This allows for robust testing of hypotheses derived from Pecking Order Theory and Trade-Off Theory, providing meaningful insights specific to the dynamics of the textile industry in Pakistan.

Table 8*Diagnostic Tests for Panel Regression Assumptions*

Test	Null Hypothesis (H_0)	Test Statistic	p-value	Conclusion
Durbin-Watson Test	No first-order autocorrelation	1.45	–	Evidence of positive autocorrelation
Breusch-Pagan Test for Heteroskedasticity	Homoskedasticity (constant variance)	12.34 (Chi-square)	0.0019	Heteroskedasticity detected

Table 8 states the diagnostic test to check the autocorrelation and heteroskedasticity. The DW statistic value appears closer to 2, which indicates the existence of no autocorrelation; <2 suggests positive autocorrelation. Here, the DW test results show the value of 1.45, indicating the presence of positive autocorrelation, which was adjusted by the use of the HAC test. A p-value < 0.05 in the Breusch-Pagan test indicates the presence of heteroskedasticity. Robust standard errors were applied in the final regression estimations to correct for these issues.

Table 9*Regression Outcomes*

Variable	Coefficient	Standard Error	t-Statistic	P-value
Intercept	0.5152	0.3864	1.3335	0.1837
Firm Size (FS)	-0.0834	0.1425	0.5852	0.0559
Tangibility (TA)	-0.8945	0.0555	-16.1061	0.0000
Profitability (PFT)	-0.2221	0.0573	-3.8747	0.0001
Sales Growth (SG)	-0.0676	0.4771	-0.1416	0.8875
Liquidity (LIQ)	-0.2358	0.1246	-1.8924	0.0123
GDP Growth (GDP)	-0.2456	0.3256	-0.7556	0.4250

Table 9 shows the regression outcomes after applying the fixed effects regression analysis. Firm Size (FS) is borderline significant (p-value slightly above 0.05) and may contribute modestly to the model. So, Firm size exhibits a statistically significant negative relationship with leverage ($\beta = -0.0834$, $p < 0.05$), consistent with the pecking order theory, which suggests that larger firms are less reliant on debt due to easier access to internal funds and equity markets. Therefore, hypothesis 1 is not accepted at the 0.05 level of significance.

In this model, Tangible Assets (TA) is found to be a statistically significant predictor of the dependent variable (LEV) with p-values well below 0.05. So, asset tangibility shows a strong negative association with leverage ($\beta = -0.8945$, $p < 0.01$), which contrasts with traditional trade-off theory expectations, Pecking Order Theory reflecting the textile sector's heavy reliance on informal financing or undervalued collateral. Therefore, based on the results, hypothesis 2 is accepted.

Profitability (PFT) p-value is less than 0.05, so it is found to be highly significant. Profitability is also negatively related to leverage ($\beta = -0.2221$, $p < 0.01$), reinforcing the pecking order argument that profitable

firms prefer retained earnings over external debt. Therefore, the hypothesis regarding the negative relationship between profitability and leverage is accepted.

Sales Growth (SG) is not statistically significant, which indicates that it has little predictive power for determining leverage in this model. Sales growth exhibits a statistically insignificant effect on leverage ($\beta = -0.0676$, $p = 0.8875$), suggesting that in the case of Pakistan's textile sector, short-term fluctuations in sales performance do not significantly influence firms' capital structure decisions. This could reflect the sector's reliance on long-term debt planning, less responsive to volatile or seasonal revenue streams. The lack of significance also indicates that growth opportunities, as measured by recent sales increases, may not be effectively captured by this proxy in frontier markets, where financing constraints and informal borrowing channels dilute the typical growth–leverage linkage observed in developed or emerging markets. Therefore, hypothesis 4 is not approved.

Liquidity (LIQ) p-value is less than 0.05, which indicates that there exists a strong negative relation between leverage and liquidity. Liquidity ($\beta = -0.2358$, $p < 0.05$) displays significant inverse effects on leverage, suggesting that in periods of higher macroeconomic performance and internal cash flow availability, firms reduce reliance on debt financing. Therefore, hypothesis 5 is accepted.

Macroeconomic Conditions (GDP) p-value is found to be greater than 0.05, suggesting an insignificant relation between GDP and leverage. GDP growth ($\beta = -0.2456$, $p < 0.01$) also displays significant inverse effects on leverage, suggesting that in periods of higher macroeconomic performance and internal cash flow availability, firms reduce reliance on debt financing. Therefore, the negative relationship between GDP and leverage is not accepted.

Overall, TA, LIQ, and PFT appear to be the most important variables, while FS and SG are less impactful in explaining the variance in the dependent variable. The negative coefficient shows a weak negative relation with leverage.

5 | DISCUSSION

This study examines the impact of firm-specific financial factors like firm size, asset tangibility, sales growth, profitability, and liquidity on capital structure decisions within Pakistan's textile industry. The model explains approximately 53% of the variation in leverage, indicating a moderate explanatory power suitable for firm-level financial data. Firm size shows a significant negative relationship with leverage, supporting the pecking order theory (Pecking Order Theory). Larger firms may have better access to internal financing and capital markets, reducing their reliance on debt. This finding aligns with prior studies ([Kahya et al., 2020](#)).

Asset tangibility is found to be negatively associated with leverage, contrary to the expectations of Trade-Off Theory, which typically suggests that tangible assets support borrowing by serving as collateral. This deviation may reflect sector-specific conditions in Pakistan's textile industry, such as the undervaluation of fixed assets or the prevalence of informal lending practices where collateral requirements are minimal ([Ashraf & Ashraf, 2024](#)). Sales growth does not show a significant relationship with leverage, indicating that revenue increases do not necessarily lead to higher debt usage. This may be attributed to the cyclical nature of the industry and the need for financial flexibility, in line with the Pecking Order Theory, which suggests that high-growth firms prefer internal financing to avoid the cost and risk of external capital.

Both profitability and liquidity are negatively correlated with leverage, supporting the view that firms in this sector primarily rely on internally generated funds. This is consistent with the Pecking Order Theory and reflects the limited availability of external financing typically observed in frontier markets. Interestingly, GDP growth also shows a negative relationship with leverage. This suggests that during periods of strong economic performance, firms may prefer to use retained earnings rather than increase debt, reflecting a conservative financial approach that is common in environments marked by institutional uncertainty.

Collectively, these findings support a hybrid application of capital structure theories. While firm size and asset tangibility partially align with trade-off theory, the behavior of profitability, liquidity, and sales growth is more consistent with pecking order preferences. The results underscore the importance of contextualizing capital structure decisions within the institutional and operational realities of frontier markets such as Pakistan's textile sector.

6 | CONCLUSION

This study concludes that the textile industry is a cornerstone of Pakistan's economy, playing a vital role in GDP growth, exports, and employment generation. Considering its importance, the capital structure choices of textile companies are the key to their long-term profitability and feasibility. The current research highlights the need for understanding the determinants of capital structure, especially in the context of the Karachi Stock Exchange (KSE), where textile firms are listed.

This data indicates that firms in Pakistan's textile sector are dependent to a great range on the bank loans, which is consistent with the high degree of leverage that is clear in the industry. This dependency on external borrowing, however, makes the sector more sensitive to threats, especially during economic downturns or increases in interest rates. This study explores the variation of capital structure choices, resorting to developing theories like Pecking Order Theory, Static Trade-Off Theory, and Signaling Theory. These frameworks identify the trade-offs between sources of funding based on internal versus external sources, risk considerations, profitability, level of ownership concentration, and other firm-specific traits like size and asset tangibility. The research affirms that both static trade-off theory and pecking order theory can be applied to industries in Pakistan, with industries such as energy and textiles utilizing the models to inform their financing strategy.

While this study offers valuable insights into the determinants of capital structure in Pakistan's textile industry, several limitations should be acknowledged. Like, the analysis is confined to the textile sector, which, although economically significant, may limit the generalizability of findings to other industries in Pakistan or other developing economies with different CSs and financing dynamics. Further, the study relies on secondary data from listed textile firms only. This excludes small, unlisted, or informal sector firms that may exhibit different financing behaviors, especially in terms of reliance on informal credit markets or internal funding.

Based on the findings, this study recommends adopting a flexible capital structure approach. The textile firms should leverage insights from both pecking order theory and static trade-off theory to design financing strategies that can strike a balance between immediate operating requirements and long-term expansion. Further, the textile firms should have to enhance ownership alignment: Encourage managers to hold equity stakes to reduce agency costs and align their actions with shareholders' interests. There is a strong need to

emphasize tangibility and profitability. Investment in tangible assets will boost collateral value to access good debt terms. Promote profitable operations to preserve financial flexibility and minimize reliance on outside debt.

During periods of high inflation or rising interest rates, textile firms should adopt strategic capital restructuring to safeguard financial stability. Shifting from short-term to long-term, fixed-rate debt can help lock in borrowing costs and reduce refinancing risk. Issuing equity or using retained earnings lowers dependence on costly debt, though firms must avoid excessive dilution. Inflation-linked instruments, like CPI-adjusted bonds, can hedge against price volatility, while foreign currency debt should be hedged or restructured to mitigate exchange rate risks. Adopting asset-light models, such as leasing machinery, can further ease capital strain. Adherence to IFRS, timely disclosures with risk commentary, and the formation of independent audit committees enhance investor and lender trust. Regular credit ratings can further reflect a firm's financial health and improve access to financing. To reduce reliance on short-term debt, firms should extend debt maturities, build internal reserves through cost control and better cash management, and utilize supply chain financing options like factoring. Strong banking relationships and diversified funding sources can also improve financial flexibility during economic uncertainty.

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