# THE ROLE OF FINANCIAL LEVERAGE IN SHAPING PROFITABILITY: A STUDY OF PAKISTAN'S NON-FINANCIAL SECTOR

**Abdullah Hammad[1], Tariq Jamil[2], Dr. Usman Ali[3], Dr. Muhammad Saeed Ahmad[4], Afzal Ahmad[5], Akhtar Mahmood[6],**

[1]PhD Scholar, University of Agriculture Faisalabad

abdullahhammad5@gmail.com

[2]PhD Scholar, International Islamic University Islamabad

tariq.jamil2678@gmail.com

[3]Imperial College of Business Studies Lahore

[4]Imperial College of Business Studies Lahore

Saeedahmadkhyal@yahoo.com (corresponding author)

[5]Imperial College of Business Studies Lahore

[6]Imperial College of Business Studies Lahore

**Abstract**

Pakistan's corporate sector, characterized by an emerging economy, shallow equity markets, and concentrated family ownership, remains strongly dependent on debt financing. While borrowing can facilitate expansion, high leverage becomes problematic during economic instability, elevating the risk of financial distress. Current study analyzes how financial leverage influences the performance of non-financial firms listed on the Pakistan Stock Exchange (PSX), with a particular focus on coverage ratios that reflect firms' capacity to service debt rather than relying solely on leverage levels. Using purposive sampling, data were collected for more than 200 firms from major sectors including textiles, cement, chemicals, automobiles, and energy over the period 20002023. To address endogeneity and ensure credible estimates, the analysis employs Random Effects models and the Two-Step Robust System GMM approach. Results show that the Interest Coverage Ratio (ICR) has a positive and significant effect on both Return on Assets (ROA) and Return on Equity (ROE), underscoring the importance of earnings strength in managing debt. In contrast, the Debt Service Coverage Ratio (DSCR) exhibits a significant negative association with firm performance, reflecting the strain of principal repayment commitments. The findings also indicate that COVID-19 and Pakistan's Economic Policy Uncertainty (EPU) intensify the risks tied to high leverage. Overall, the study offers evidence from a volatile emerging market and provides insights for managers seeking to optimize capital structure and for policymakers aiming to enhance corporate stability.

**Keywords:** Financial Leverage, Coverage Ratios, Pakistan Stock Exchange, ROA, ROE, Tobin's Q, Economic Policy Uncertainty, COVID-19.

## 1. INTRODUCTION

The corporate sector in Pakistan represents a critical component of the nation's economy, characterized by a distinct structural composition dominated by family-owned businesses and large conglomerates (Ahmed & Javid, 2019). Unlike more developed markets, Pakistani firms have historically exhibited a strong reliance on bank-based debt financing rather than equity markets,

partly due to underdeveloped capital markets and institutional constraints (Hussain & Safi, 2020). This preference for debt is often driven by its relative accessibility and tax advantages, yet it also exposes firms to significant financial risk, especially in an economy marked by persistent macroeconomic volatility including high inflation, fluctuating interest rates, and political instability (Butt & Rehman, 2021). In such an environment, the use of financial leverage must be carefully managed to avoid financial distress, yet the precise mechanisms through which debt influences firm performance remain underexplored in the Pakistani context.

Financial leverage involves the use of borrowed funds to finance a firm's operations and investments, with the expectation of generating returns that exceed the cost of debt (Adenugba et al., 2016). While debt financing offers benefits such as tax shields and retained ownership control (Frydenberg, 2011; Glen & Pinto, 1994), it also introduces fixed obligations that must be serviced regardless of business conditions. Failure to meet these obligations can lead to severe consequences, including loss of corporate control or bankruptcy (Sahminan, 2021). This is particularly relevant in volatile economies like Pakistan, where external shocks and policy shifts can abruptly affect firms' cash flows and debt-servicing capabilities.

Most prior research on leverage and firm performance in Pakistan and other emerging economies has relied primarily on traditional indicators such as the debt-to-equity and debt-to-assets ratios (Iqbal & Usman, 2018; Ibrahim & Isiaka, 2020). Although these measures indicate the level of debt a firm holds, they do not reveal whether the firm can actually meet its repayment obligations. Recent work highlights the value of coverage ratios such as the Asset Coverage Ratio (ACR), Cash Coverage Ratio (CCR), Interest Coverage Ratio (ICR), and Debt Service Coverage Ratio (DSCR) because they gauge a firm's ability to service debt through earnings, cash flows, or asset bases (Arhinful & Radmehr, 2023). These ratios offer a more accurate assessment of solvency risk and financial resilience, particularly under conditions of economic stress or uncertainty (Ogachi et al., 2020; Okunev, 2022).

The recent period has introduced unprecedented challenges for Pakistani firms, including the global COVID-19 pandemic and severe domestic economic policy uncertainty (EPU). The pandemic disrupted supply chains, reduced consumer demand, and strained liquidity across sectors (Jin et al., 2022; Ahmad et al., 2023). Moreover, Pakistan's own economic policy volatility driven by fiscal imbalances, currency depreciation, and fluctuating monetary policy has further complicated corporate financial planning (Iqbal et al., 2020; Ahmad et al., 2023). These factors underscore the need to examine not only how much debt a firm carries, but also how well it can manage that debt under duress.

This study addresses existing gaps by examining how financial leverage i.e captured through coverage ratios shapes the performance of non-financial firms listed on the Pakistan Stock Exchange. It explores several key questions: How do asset coverage and cash coverage ratios influence firm performance in Pakistan's corporate environment? To what extent do interest coverage and debt service ratios reflect a firm's capacity to manage its debt and its resulting financial outcomes? The study also investigates whether Pakistan's Economic Policy Uncertainty (EPU) alters the leverage performance relationship. Finally, it evaluates how the COVID-19 pandemic and the 2022-2023 economic crisis affected the financial performance of these firms.

The study makes several contributions to the literature. First, it is among the first in Pakistan to employ a comprehensive set of coverage ratios to evaluate leverage, moving beyond traditional debt metrics to incorporate solvency and liquidity dimensions. Second, it integrates recent macroeconomic shocks specifically the COVID-19 pandemic and Pakistan-specific economic policy uncertainty into the analysis of corporate performance, offering timely insights into how external volatility affects leveraged firms. Third, the findings hold practical relevance for corporate managers, investors, and policymakers, providing evidence-based guidance on optimal debt usage and risk management in a highly unstable economic environment.

## 2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

### 2.1. Theoretical Foundation

The foundation of capital structure decisions is primarily grounded in two influential theories: the Pecking Order Theory and the Trade-Off Theory. These frameworks offer distinct perspectives on how firms prioritize debt and equity financing and the resulting effects on financial performance. Financing choices are not solely technical or accounting decisions; they represent strategic considerations shaped by market dynamics, information asymmetries, and broader macroeconomic factors, which are especially pronounced in emerging markets such as Pakistan.

The Pecking Order Theory, proposed by Myers and Majluf (1984), argues that firms follow a financing hierarchy designed to limit the effects of asymmetric information. Internal funds, especially retained earnings, are used first because they avoid the disclosure issues and potential mispricing linked with external financing. If internal resources fall short, firms typically turn to debt, which is less sensitive to information gaps than issuing new equity. Equity is considered the least preferred option, as its issuance can signal possible overvaluation and may lead to negative market reactions. This pattern is especially pronounced in environments where information available to outside investors is incomplete or uneven.

The Pakistani capital market, characterized by a high degree of information opacity, less stringent disclosure requirements, and a dominance of family-owned businesses, presents a classic case where the Pecking Order Theory is highly relevant. Pakistani firms, particularly small and medium-sized enterprises (SMEs) and even larger listed entities, often face significant challenges in conveying their true value to investors. Consequently, they demonstrate a marked preference for internal accruals and, when those are exhausted, bank loans and private debt, to avoid the adverse signals and high transaction costs associated with equity issuance. This reliance on debt financing, while explained by pecking order behavior, has profound implications for their financial leverage and risk profile (Ali & Hassan, 2023; Myers & Majluf, 1984).

The Trade-Off Theory, introduced by Kraus and Litzenberger (1973), describes how firms choose their capital structure by balancing the benefits and drawbacks of using debt. Debt provides a clear advantage through the tax shield, as interest payments reduce taxable income and can increase firm value. This gain, however, must be weighed against the risk of financial distress, which includes direct bankruptcy costs and indirect effects such as agency problems, reduced flexibility, and missed investment opportunities. The theory holds that a firm reaches its optimal leverage when the marginal benefit of additional debt equals its marginal cost. In Pakistan’s case, this balance is particularly relevant because relatively high corporate tax rates make the tax shield an appealing tool for improving after-tax performance.

On the other hand, the country's volatile macroeconomic environment marked by high inflation, currency fluctuations, and political instability significantly increases the perceived risk of financial distress. Firms must carefully navigate this landscape; taking on too much debt to exploit tax shields could push them towards financial distress in an uncertain economy, while being too conservative may mean leaving value-creating tax benefits unrealized. This constant balancing act makes the Trade-Off Theory a crucial framework for understanding the capital structure decisions of Pakistani firms, as they weigh the allure of tax savings against the sobering risks of economic volatility (Ahmed et al., 2023; Kraus & Litzenberger, 1973).

### 2.2. Debt Capital Markets in Pakistan

The debt capital market (DCM) in Pakistan, while still developing and relatively shallow compared to its equity counterpart, serves as a critical alternative financing avenue for corporations and the government. The market is primarily dominated by government securities, with Pakistan Investment

Bonds (PIBs) for long-term funding and Treasury Bills (T-Bills) for short-term needs constituting the bulk of outstanding debt securities (State Bank of Pakistan [SBP], 2023). Corporate debt issuance, though growing, remains a smaller segment, often utilized by high-grade blue-chip companies in sectors like energy, telecommunications, and financial services. The legal and regulatory framework governing public debt offerings is primarily administered by the Securities and Exchange Commission of Pakistan (SECP) under the Securities Act, 2015, and the Companies Act, 2017. Corporations seeking to issue debt securities to the public must file a detailed prospectus with the SECP, which requires comprehensive disclosures regarding the issuer's financial health, the terms of the issue, and associated risks, ensuring investor protection and market integrity (SECP, 2023). Furthermore, the SBP plays a pivotal role in regulating debt instruments issued by financial institutions and manages the primary auctions for government securities, which form the benchmark yield curve for the entire DCM.

The architecture of Pakistan's DCM features two primary platforms for trading: the Pakistan Stock Exchange (PSX) and an active Over-the-Counter (OTC) market. While corporate bonds can be listed on the PSX to enhance their liquidity and visibility, the majority of trading, especially in government securities, occurs in the OTC market, which is facilitated by a network of primary dealers (SBP, 2023). A significant structural challenge is the high reliance of corporations on bank financing, a phenomenon consistent with bank-based financial systems in many emerging economies. This has historically constrained the growth of a vibrant corporate bond market, as banks fulfill most long-term lending needs (Khan & Awan, 2022). Recent innovations, such as the introduction of Sukuk (Islamic bonds) and green bonds, have begun to diversify the market. The Government of Pakistan has been a frequent issuer of Sukuk to cater to Islamic financial institutions and investors, broadening the investor base and aligning with religious preferences (Iqbal & Mirakhor, 2023). Despite these advancements, the corporate bond market faces hurdles including a limited investor base (predominantly banks and financial institutions), lack of a liquid secondary market, and macroeconomic volatility which affects interest rate expectations and investor appetite.

The future development of Pakistan's DCM is closely tied to continued regulatory reform and macroeconomic stability. Recent SECP initiatives aimed at simplifying issuance procedures and encouraging private placements for sophisticated investors are steps in the right direction to deepen the market (Haider & Mahmood, 2023). Furthermore, the development of a reliable credit rating culture is paramount; agencies like the Pakistan Credit Rating Agency (PACRA) and VIS Credit Rating Company Ltd. provide essential independent evaluations of credit risk, which are crucial for investor confidence (Javed & Hassan, 2023; Ahmad et al., 2023). Macroeconomic factors, particularly inflation trends and the ensuing monetary policy stance of the SBP, directly influence yield curves and the attractiveness of new debt issuances. For the DCM to mature and provide a viable long-term funding alternative to bank loans, sustained efforts are needed to encourage pension funds and insurance companies to increase their allocation to corporate debt, develop a more dynamic secondary market, and maintain a stable economic environment that mitigates investor risk perceptions (Butt & Saqib, 2023).

### 2.3. Financial Leverage

Financial leverage is a strategic tool that involves the use of borrowed capital to acquire additional assets, with the primary objective of amplifying potential returns to equity shareholders (Adenugba et al., 2016; Demiraj et al., 2023). This mechanism operates on the principle that if the return generated from the leveraged assets exceeds the cost of the debt used to finance them, the surplus accrues to the shareholders, thereby enhancing the firm's profitability and return on equity. The degree of leverage is commonly quantified by ratios such as total debt to total assets, which serves as a critical indicator of a company's borrowing capacity and risk profile. The fundamental appeal of financial leverage lies in its ability to facilitate business expansion and growth without requiring immediate equity dilution, allowing existing shareholders to retain control while potentially

achieving a higher rate of return on their invested capital (Nissim & Penman, 2003). However, this strategy is a double-edged sword; while it can magnify gains, it also exacerbates losses and increases financial risk, particularly if the company cannot generate sufficient returns to cover its fixed financial obligations (Ghosh & Jain, 2000).

The utilization of debt financing offers several distinct advantages, chief among them being the tax deductibility of interest payments, which effectively lowers the company's overall tax liability and reduces its weighted average cost of capital (WACC) in line with Modigliani and Miller's Proposition II (Michalak, 2016; Cole, 2017). This tax shield makes debt a comparatively cheaper source of finance than equity, providing a compelling rationale for its inclusion in the capital structure. Furthermore, debt financing provides predictability through fixed interest and principal repayment schedules, which aids in financial planning and budgeting, especially for firms operating in stable industries with consistent cash flows (Frydenberg, 2011; Glen & Pinto, 1994). Despite these benefits, a significant drawback is the increased financial risk and the potential for financial distress. High leverage imposes mandatory fixed charges, and if a company's earnings are volatile or decline, it may struggle to meet these obligations, potentially leading to bankruptcy or a forced transfer of control to creditors (Sahminan, 2021; Vanacker & Manigart, 2010). This risk is particularly acute in environments with rising interest rates or economic downturns, where operating income may fall short of covering financial costs.

Therefore, the central challenge for corporate managers is to strike an optimal balance in the capital structure leveraging enough debt to benefit from the tax shield and enhanced returns but not so much that it jeopardizes the firm's solvency. The pecking order theory suggests that firms prioritize internal financing, then debt, and issue equity only as a last resort, a behavior often observed in practice (Brealey et al., 2018). The decision on the appropriate level of leverage is not static; it must be continuously evaluated against the company's operational cash flow stability, asset structure, growth prospects, and the prevailing macroeconomic climate. Effective management of financial leverage requires vigilant monitoring of coverage ratios, such as the interest coverage ratio and debt service coverage ratio, to ensure that the firm retains sufficient operational earnings to comfortably meet its financial commitments and avoid the severe costs associated with financial distress (Ferris & Lawless, 1999; Firouzi & Meshkani, 2021).

**2.4. Financial Performance**

Financial performance reflects a company’s overall economic health and its ability to create value from assets and operations over a defined period (Gofwan, 2022). It acts as a key indicator for diverse stakeholders such as investors, creditors, managers, and employees who rely on this information to evaluate profitability, stability, and growth potential. Assessing financial performance goes beyond calculating profits; it also examines how efficiently resources are utilized, how effectively strategic initiatives are implemented, and how well the firm meets both short-term obligations and long-term objectives (Man & Wong, 2013). A thorough evaluation of financial performance, therefore, offers critical insights into management effectiveness, operational efficiency, and the firm’s competitive positioning, serving as a foundation for informed decision-making across stakeholders.

Financial performance is commonly assessed using a variety of indicators, typically categorized into profitability, liquidity, solvency, and market valuation measures. Among these, profitability ratios such as Return on Assets (ROA) and Return on Equity (ROE) are especially important, as they indicate how efficiently a company converts its assets and shareholders’ equity into net income (Bansal, 2014; Wahjudi, 2019). ROA measures the effectiveness of management in generating earnings from the firm’s asset base, while ROE reflects the returns earned on shareholders’ investments, providing a critical gauge for investors. Beyond accounting-based metrics, market-oriented measures like Tobin’s Q offer additional insights by comparing a company’s market value to the replacement cost of its assets. This ratio captures how investors perceive the firm’s growth

prospects and the value of intangible assets relative to tangible ones (Tahir & Razali, 2011; Setyawan, 2011). A Tobin's Q exceeding one generally indicates that the market anticipates strong future performance and values the firm higher than the book value of its physical assets.

A complete assessment of financial performance must extend beyond internal accounting measures to consider the influence of external macroeconomic and non-financial factors. Research indicates that firm outcomes are shaped not only by managerial decisions but also by external shocks, such as the COVID-19 pandemic, which disrupted operations, supply chains, and market demand, as well as economic policy uncertainty (EPU), which can lead firms to delay investments and reduce profitability (Jin et al., 2022; Garcia-Gomez et al., 2022; Iqbal et al., 2020). Moreover, modern evaluations of performance increasingly account for Environmental, Social, and Governance (ESG) criteria, reflecting evidence that companies emphasizing sustainability, ethical management, and social responsibility often achieve stronger long-term resilience and better risk-adjusted returns (Bose et al., 2021). Consequently, understanding financial performance requires a multidimensional perspective that combines traditional financial ratios with broader contextual and forward-looking indicators, offering a more complete picture of both historical results and future growth potential.

**2.5. Hypothesis Development**

The asset coverage ratio (ACR) serves as a critical barometer of a firm's financial resilience, quantifying its capacity to discharge outstanding debt obligations through the liquidation of its tangible assets (Okunev, 2022). In the context of Pakistan's volatile economic landscape, characterized by inflationary pressures, currency fluctuations, and periodic political instability, the ACR transcends its role as a mere solvency metric. It becomes a vital signal of a firm's ability to withstand external shocks and avoid financial distress (Saleem, 2023). A high ACR indicates a substantial buffer of assets over liabilities, reassuring creditors and investors that even in scenarios of operational underperformance where earnings may be insufficient to service debt the firm possesses the underlying asset base to ensure repayment, thereby mitigating the risk of default (Hernandez-Canovas & Martinez-Solano, 2006; Alessi et al., 2022).

For Pakistani firms, which often operate within a bank-centric financial system where debt is a primary source of external funding, the ACR is meticulously scrutinized by financial institutions (Khan, Siddique, & Hassan, 2023). Lending organizations typically mandate a minimum ACR threshold before extending credit, as it provides a measure of security against loan defaults (Nini, Smith, & Sufi, 2009). A robust ACR can therefore facilitate access to capital at more favorable terms, lowering the overall cost of debt and indirectly enhancing financial performance by reducing interest expenses. This is particularly crucial in Pakistan, where high borrowing costs can significantly erode profitability. Furthermore, a strong asset base can be leveraged to generate earnings; productive assets contribute directly to revenue generation and operational cash flows, which are fundamental drivers of profitability metrics like Return on Assets (ROA) (Bansal, 2014).

Conversely, a low ACR poses a significant threat to a firm's financial health and performance. It signals a thin margin of safety, indicating that the company may be over-leveraged and that its assets are insufficient to cover its debts in a worst-case scenario (Ogachi et al., 2020). In such situations, firms face heightened financial risk, which can lead to a higher cost of capital as creditors demand a risk premium, thereby compressing profit margins (Iqbal, Gan, & Nadeem, 2020). If earnings falter, a low ACR forces a corporation into a precarious position where it may be compelled to liquidate essential operational assets at potentially distressed prices to meet its debt commitments. This asset fire-selling can cripple future revenue-generating capacity, leading to a vicious cycle of declining performance and increasing financial vulnerability (Restianti & Agustina, 2018). This negative relationship between excessive leverage (proxied by a low ACR) and performance has been observed in emerging markets with similar characteristics to Pakistan (Kuncoro & Agustina, 2017; Mesak & Imade, 2019).

Therefore, based on the established theoretical framework that links a strong asset base to reduced financial risk and enhanced creditworthiness, it is hypothesized that the asset coverage ratio will exert a statistically significant influence on the financial performance of firms listed on the Pakistan Stock Exchange. A higher ACR is expected to be associated with superior performance by ensuring operational continuity, securing cheaper financing, and providing a safeguard against insolvency.

**H1: Asset coverage ratio has a statistically significant effect on the financial performance of Pakistani firms.**

The cash coverage ratio (CCR) serves as a paramount indicator of a firm's immediate liquidity health, specifically measuring its capacity to fulfill interest obligations solely from its available cash and cash equivalents, excluding other current assets like receivables and inventory (Berrada, 2022). In the context of Pakistan's economy, which is frequently characterized by liquidity crunches, high inflation, and volatile interest rates, the ability to service debt from liquid reserves becomes a critical determinant of financial stability and performance (Rehman & Khan, 2023). A robust CCR provides a clear signal to creditors and investors that the firm possesses a sufficient buffer of highly liquid assets to withstand short-term operational shocks and meet its fixed financial charges without resorting to fire sales of other assets or emergency financing, which often comes at a prohibitive cost (Faruk & Habib, 2010; Ertugrul & Karakasoglu, 2009).

For Pakistani firms, maintaining a high CCR is particularly crucial due to the country's often unpredictable economic environment. Periods of political instability, currency devaluation, and supply chain disruptions can severely impact operational cash flows. In such scenarios, a strong cash position allows a firm to continue its interest payments uninterrupted, thereby avoiding technical default, preserving its credit rating, and maintaining lender confidence (Siddiqui & Iqbal, 2023). This financial resilience directly translates into sustained performance, as the firm can allocate operational cash flows towards value-creating investments rather than diverting them to crisis management. Furthermore, a high CCR can provide a competitive advantage by enabling firms to capitalize on strategic opportunities, such as acquiring distressed assets or funding innovation during industry downturns, when competitors may be cash-strapped (Miller & Orr, 1966; Stulz, 2000).

Conversely, a low cash coverage ratio exposes Pakistani firms to significant financial risk. It indicates a precarious liquidity position where even a minor downturn in sales or a delay in receivables could trigger a liquidity crisis, forcing the company to seek expensive short-term borrowing or renegotiate terms with creditors under duress (Khan et al., 2023). The costs associated with financial distress including higher interest rates, legal fees, and operational constraints can erode profitability and shareholder value. In extreme cases, persistent inability to cover interest payments from cash reserves can lead to debt restructuring or bankruptcy, causing severe erosion of financial performance metrics like Return on Equity (ROE) and Tobin’s Q (Vanacker & Manigart, 2010). Empirical evidence from emerging markets suggests that during economic contractions, firms with weaker liquidity coverage, as measured by the CCR, experience more pronounced declines in profitability and market valuation (Amnim et al., 2021; Garcia-Gomez et al., 2022). Therefore, given the critical role of immediate liquidity in navigating Pakistan's volatile economic landscape and ensuring uninterrupted debt servicing, it is hypothesized that the cash coverage ratio will exert a statistically significant influence on the financial performance of firms listed on the Pakistan Stock Exchange. A higher CCR is anticipated to be associated with enhanced financial stability and superior performance by mitigating liquidity risk and providing strategic operational flexibility.

**H2: Cash coverage ratio has a statistically significant effect on the financial performance of Pakistani firms.**

The Interest Coverage Ratio (ICR), defined as Earnings Before Interest and Taxes (EBIT) divided by interest expenses, serves as a critical measure of a firm's ability to meet its debt-related obligations from operating earnings (Strahan, 1999). A higher ICR indicates stronger operational profitability and a reduced risk of financial distress, demonstrating that a company can comfortably service its interest commitments. In Pakistan's volatile economic environment, characterized by high interest rates aimed at controlling persistent inflation (State Bank of Pakistan, 2023), ICR is particularly valuable as an indicator of financial resilience. Companies with robust interest coverage are better positioned to absorb macroeconomic shocks, such as monetary policy tightening or weakened consumer demand, without jeopardizing solvency or operational stability (Iqbal et al., 2020; Palomino et al., 2019).

A strong positive relationship between ICR and financial performance is underpinned by several mechanisms specific to Pakistani firms. Firstly, a high ICR reduces the cost of financial distress. Lenders and investors perceive a high ratio as a sign of lower risk, which can lead to improved credit ratings and access to capital at more favorable interest rates (S. Kim et al., 2013). This directly enhances profitability by lowering the interest expense component on the income statement, thereby boosting net income and key performance indicators like Return on Assets (ROA) and Return on Equity (ROE). Secondly, the earnings buffer provided by a high ICR allows management to reinvest operational cash flows into value-creating projects such as expansion, research and development, and technological upgrades rather than allocating them entirely to debt servicing (Myers, 2001; Pham & Nguyen, 2020). This strategic flexibility is crucial for improving long-term growth and competitive advantage in Pakistan's dynamic market.

Conversely, a low ICR poses a severe threat to a firm's financial performance. It indicates that operating earnings are barely sufficient, or even insufficient, to cover interest costs, placing the company on the precipice of financial distress (Jensen, 2019). In such scenarios, firms face a heightened risk of breaching debt covenants, which can trigger punitive actions from creditors, including demands for immediate repayment or the imposition of higher interest rates (Nini et al., 2009). This can force management to divert funds from productive investments to meet debt obligations, initiate costly asset fire sales, or seek emergency financing, all of which erode shareholder value and cripple financial performance. Empirical studies in comparable emerging markets have consistently found a strong positive linkage between interest coverage and profitability metrics, as the ability to service debt from earnings is a fundamental prerequisite for sustainable growth and value creation (Enekwe et al., 2014; Ong & Phing Phing, 2012). Therefore, given that the ICR directly measures the core link between operational efficiency and financial obligation sustainability, it is hypothesized that the interest coverage ratio will have a statistically significant positive effect on the financial performance of firms listed on the Pakistan Stock Exchange. A higher ICR is expected to be associated with superior profitability, greater financial stability, and enhanced market valuation.

**H3: Interest coverage ratio has a statistically significant positive effect on the financial performance of Pakistani firms.**

The debt service coverage ratio (DSCR) is a more comprehensive and stringent indicator of solvency than the interest coverage ratio because it assesses a firm's ability to meet its total debt burden, which includes both principal repayments and interest expenses, using operating income (Delele, 2021; Okunev, 2022). Although moderate debt can enhance firm value, a high DSCR requirement, indicating a heavy load of principal repayment, can significantly undermine financial performance, particularly in an emerging economy such as Pakistan. Strict repayment schedules can restrict the internal cash flows required for daily operations, capital expenditure, and long-term strategic investments. This constraint ultimately reduces profitability and weakens future growth prospects (Jensen, 2019; Firouzi & Meshkani, 2021).

For Pakistani firms, which often operate with thinner profit margins and face volatile cash flows due to economic instability, a high DSCR obligation can be particularly detrimental. The mandatory outflow of cash for debt servicing acts as a significant drain on liquidity, forcing management to forgo positive-net-present-value (NPV) projects, curtail research and development activities, and reduce working capital essential for day-to-day operations (Hussain & Haque, 2023). This phenomenon, often referred to as "debt overhang," implies that the benefits of potential investments accrue primarily to debt holders rather than equity shareholders, discouraging investment and stifling innovation. Consequently, while the firm may remain solvent in the short term, its long-term competitive position and capacity for value creation are severely compromised, negatively impacting performance metrics like Return on Equity (ROE) and Tobin's Q.

Furthermore, a high DSCR burden increases financial risk and can lead to agency costs. The constant pressure to generate sufficient cash flow to cover rigid principal payments heightens the firm's vulnerability to economic downturns, interest rate hikes, or sector-specific shocks. This elevated risk profile can alarm investors and credit rating agencies, leading to a higher cost of capital and a lower market valuation (Bean, 2010; Vishwanath, 2009). As noted by DeAngelo and DeAngelo (2007), excessive debt commitments can also create an agency problem where, after servicing all debt, little to no residual earnings remain for shareholders, potentially leading to conflicts between managers, shareholders, and creditors. Empirical evidence suggests that in developing economies with underdeveloped capital markets, the negative impact of high debt servicing on firm performance is often more pronounced due to limited refinancing options and higher borrowing costs (Yenni et al., 2021; Sahminan, 2021). Therefore, it is hypothesized that the debt service coverage ratio obligation will have a statistically significant negative effect on the financial performance of Pakistani firms. A higher DSCR burden is expected to be associated with constrained operational flexibility, reduced investment capacity, and ultimately, diminished profitability and firm value.

**H4: Debt service coverage ratio has a statistically significant negative effect on the financial performance of Pakistani firms.**

The debt-to-equity ratio is a key measure of a firm’s financial leverage, indicating the relative proportions of debt and equity used to fund its assets. The impact of leverage on performance is not straightforward and depends on factors such as the firm’s operational stability, cash flow generation, and the prevailing economic conditions. In Pakistan, firms face a trade-off between the benefits of debt, such as tax-deductible interest that can enhance shareholder returns, and the potential costs of financial distress that increase with higher leverage (Ali et al., 2023). For financially stable and cash-generating companies, especially in sectors like utilities or fast-moving consumer goods, maintaining a moderate level of debt can strategically boost returns on equity while keeping financial risk at manageable levels.

However, the Pakistani economic landscape, characterized by high inflation, interest rate volatility, and political uncertainty, significantly amplifies the risks associated with high leverage. A high D/E ratio increases financial risk, as it commits the firm to fixed interest and principal payments regardless of its operational performance (Dirman, 2020). During economic downturns or periods of tightened monetary policy common occurrences in Pakistan these fixed obligations can consume a large portion of operating cash flows, leaving little for reinvestment, innovation, or weathering market shocks. This can lead to a dangerous cycle where the firm must take on additional debt to service existing debt, further increasing its risk profile and cost of capital (Ibrahim & Isiaka, 2020). The potential for financial distress and bankruptcy becomes palpable, which can severely erode investor confidence and lead to a lower market valuation, as reflected in a depressed Tobin's Q (Setiyawati et al., 2018).

The ultimate effect of the D/E ratio on a Pakistani firm's performance is therefore not linear but rather curvilinear, often described by the pecking order and trade-off theories. There is likely an

optimal level of leverage that maximizes performance; beyond this point, the costs of debt including agency costs, bankruptcy risk, and financial inflexibility begin to outweigh its benefits (Brealey et al., 2018; Jarallah et al., 2019). This optimal point is likely lower for Pakistani firms compared to their counterparts in more stable economies due to the heightened macroeconomic risks. Consequently, while some leverage is beneficial, the high degree of uncertainty suggests that for a significant portion of firms listed on the Pakistan Stock Exchange, an increasing D/E ratio may be associated with declining financial performance, as the market penalizes excessive risk-taking in an already volatile environment (Welch, 2011; Witkowska et al., 2019).

Therefore, it is hypothesized that the debt-to-equity ratio will have a statistically significant effect on the financial performance of Pakistani firms. The nature of this effect is expected to be complex, potentially non-linear, and heavily influenced by firm-specific factors (such as industry and asset tangibility) and the prevailing macroeconomic conditions in Pakistan.

**H5: The debt-to-equity ratio has a statistically significant impact on the financial performance of firms in Pakistan.**

**Methodology**

The methodological framework of this study is designed to rigorously examine the impact of financial leverage on the financial performance of firms in Pakistan, building upon and extending the approach used by Arhinful and Radmehr (2023) in their analysis of the Tokyo Stock Exchange. A longitudinal research design will be employed, utilizing panel data to capture both cross-sectional differences between firms and time-series variations within firms over an extended period. The study population includes all non-financial firms listed on the Pakistan Stock Exchange (PSX). Financial institutions, such as banks, insurance companies, and microfinance organizations, are excluded from the analysis, following standard practice in capital structure research (Akhtar et al., 2021; Arhinful et al., 2023), because their debt-to-equity ratios and regulatory environments differ substantially from those of non-financial corporations and are not directly comparable.

A purposive sampling technique will be employed to select the final sample. This method is chosen because, as noted in the original study, not all firms have data available for the entire period under review. The sample will be drawn from key industrial sectors that are pivotal to the Pakistani economy and are known to utilize varying degrees of debt financing. These sectors include Textile (the backbone of Pakistan's exports), Cement (a critical indicator of construction and development activity), Chemical (encompassing fertilizers and industrial chemicals), Automobile Assembler (a growing consumer-driven sector), Oil & Gas (a capital-intensive sector), and Power Generation (vital for infrastructure and subject to specific regulatory frameworks). Firms within these sectors will be included only if they have continuous listed data available for the chosen time period, ensuring a balanced panel and mitigating survivorship bias.

The time period for the study spans from 2000 to 2023. This 24-year window is strategically selected for several reasons. Firstly, it provides a sufficiently long horizon to observe trends and relationships between leverage and performance across multiple business cycles. Secondly, and crucially, it encompasses major economic events that likely impacted firm performance and financing decisions in Pakistan. This includes the Global Financial Crisis of 2007-2008, the COVID-19 pandemic (2019-2021), and the recent 2022-2023 economic crisis in Pakistan characterized by high inflation, currency depreciation, and macroeconomic instability. Including these periods allows for an analysis of how financial leverage affects performance during times of both stability and significant economic distress. Data for the study is sourced from Thomson Reuters Eikon DataStream, a reputable and widely used financial database in academic research known for its reliability and accuracy (Amin & Cek, 2023; Mensah & Bein, 202).

**Table 1. Summary of Selected Companies.**

| Sector | Number of Firms | Percentage of Sample | Key Rationale for Inclusion |
|---|---|---|---|
| Textile | 40 | 26.7% | The backbone of Pakistan's manufacturing and exports, heavily reliant on working capital financing and sensitive to economic cycles (Quddus et al., 2022; Iqbal & Usman, 2018). |
| Cement | 15 | 10.0% | A critical sector tied to construction and infrastructure development, requiring significant capital expenditure often financed through debt. |
| Chemical | 20 | 13.3% | Includes fertilizer and industrial chemical companies, which are capital-intensive and have specific debt structures influenced by government policies and commodity prices. |
| Automobile Assembler | 10 | 6.7% | A growing sector sensitive to import policies, consumer finance rates, and economic fluctuations, making its capital structure decisions highly relevant. |
| Oil & Gas | 15 | 10.0% | Highly capital-intensive sector with long project gestation periods, traditionally utilizing high levels of debt for exploration and development. |
| Power Generation | 10 | 6.7% | A vital infrastructure sector with unique regulatory frameworks and reliance on project financing, impacting its debt service capabilities. |
| Total | 110 | 100% | The final sample will be determined by data availability for the entire period (2000-2023) from the chosen data source. |

**Variables (Dependent, Independent, and Control Variables)**

The selection of variables for this study is designed to comprehensively capture the relationship between financial leverage and firm performance within the unique economic landscape of Pakistan. The variables are categorized into dependent, independent, and control variables, each chosen based on established financial theories and prior empirical work, such as the foundational study by Arhinful and Radmehr (2023).

**Financial Performance (Dependent Variables)**

To evaluate firms' financial performance, this study employs three dependent variables. The first is Return on Assets (ROA), calculated as (Net Profit After Tax ÷ Average Total Assets) × 100. ROA indicates how effectively a firm uses its asset base to generate earnings, with higher values reflecting stronger operational efficiency. The second measure is Return on Equity (ROE), defined as (Net Profit After Tax ÷ Average Total Equity) × 100. ROE captures the firm's ability to generate returns for its shareholders by showing how well equity capital is being utilized. The third indicator is Tobin's Q (TOB), which compares a firm's market value with the estimated replacement cost of its assets. A Tobin's Q greater than one suggests that the market values the firm's growth prospects or intangible assets more highly than what is reflected in its book value.

**Financial Leverage Proxies (Independent Variables)**

This study uses five measures of financial leverage, extending beyond standard debt ratios to capture a firm's capacity to service its obligations, consistent with earlier empirical work (Omollo et al., 2020). The first measure is the Asset Coverage Ratio (ACR), defined as (EBIT + Depreciation)

÷ Total Interest Expense. ACR reflects the extent to which operating earnings and non-cash charges can cover interest payments, offering insight into solvency and financial stability (Ogachi et al., 2020; Alessi et al., 2022). The second measure is the Cash Coverage Ratio (CCR), calculated as (Tangible Assets – (Current Assets – Short-term Debt)) ÷ Total Debt. CCR provides a stricter assessment of liquidity by examining whether a firm's most tangible and readily available assets are sufficient to meet its total debt obligations, making it particularly informative for lenders (Berrada, 2022; Faruk & Habib, 2010).

The third leverage measure is the Interest Coverage Ratio (ICR), computed as EBIT ÷ Interest Expense. ICR indicates how comfortably a firm can meet its interest payments using operating profits and is widely used as a direct gauge of financial risk and short-term solvency (Strahan, 1999; S. Kim et al., 2013). The fourth measure, the Debt Service Coverage Ratio (DSCR), is calculated as EBIT ÷ (Interest Expense + Current Portion of Long-term Debt + Short-term Debt). DSCR captures a firm's ability to cover both interest and principal obligations from operating income, offering a broad view of overall debt-servicing capacity (Delele, 2021; Firouzi & Meshkani, 2021). The final measure is the Debt-to-Equity Ratio (DEBEQT), defined as Total Debt ÷ Total Equity, which shows the extent to which a firm relies on debt relative to shareholders' equity and remains a widely used indicator of leverage and financial risk (Ofulue et al., 2022; Witkowska et al., 2019).

**Control Variables**

To accurately assess the impact of financial leverage on firm performance, several control variables are included in the analysis. Firm Size (SZE) is measured as the natural logarithm of total assets, accounting for the fact that larger firms may have different risk profiles and access to financing (Detthamrong et al., 2017). Firm Age (AGE) is defined as the number of years since incorporation, recognizing that established firms may exhibit performance patterns distinct from younger companies. A COVID-19 Dummy (COVID19) is incorporated, coded as 1 for the financial years 2020 to 2022 and 0 otherwise, to control for the significant external shock imposed by the pandemic on both global and Pakistani businesses (Jin et al., 2022; Katusiime, 2021; Ahmad et al., 2021b).

Economic Policy Uncertainty in Pakistan (EPUP) is included as a macroeconomic control variable, which can be proxied by the annual volatility (standard deviation) of the KSE-100 index or a composite index of key macroeconomic indicators, such as inflation and interest rates, to capture domestic policy instability (Iqbal et al., 2020; Garcia-Gomez et al., 2022). In addition, the Global Economic Policy Uncertainty Index (GEPU) is incorporated to account for worldwide macroeconomic shocks and uncertainty that can influence firm performance regardless of domestic conditions (Suh & Yang, 2021; Athari, 2021; Ahmad et al., 2021).

**Estimation Approach**

The analysis employed panel data methods to capture both cross-sectional and time-series variation. Random effects models were selected based on the Hausman test, indicating efficiency and consistency relative to fixed effects. To address endogeneity concerns, the two-step Generalized Method of Moments (GMM) was applied. This approach accounts for potential reverse causality and omitted variable bias and is particularly robust when dealing with incomplete panel observations.

**Empirical Results**

The descriptive statistics provide an overview of firm performance, leverage indicators, and control variables for 5,654 firm-year observations. The financial performance measures ROA, ROE, and Tobin's Q show substantial variation across firms. ROA averages 2.75%, with values ranging from –20.50% to 45.20%, indicating that while most firms generate positive returns, some experience significant losses. ROE exhibits a similar pattern, with a mean of 6.10% and a wide spread, reflecting differences in profitability and capital structure efficiency. Tobin's Q has an average value of 0.58, suggesting that market valuations of most firms fall below the replacement cost of

their assets, a feature commonly observed in emerging markets where market inefficiencies and economic uncertainty are pronounced.

The leverage and coverage ratios also show considerable dispersion. ACR, CCR, and ICR have mean values of 1.65, 1.30, and 1.80 respectively, indicating that while many firms can cover interest expenses or debt obligations from earnings or tangible assets, others face liquidity and solvency pressures, as shown by negative minimum values. The DSCR average of 0.70 highlights that, for many firms, operating income is insufficient to fully cover both interest and principal repayments. The Debt-to-Equity ratio averages 1.20, illustrating a relatively high reliance on debt financing in Pakistan's corporate sector. Control variables such as firm age and size reflect a sample dominated by mature and relatively large firms, while the COVID-19 dummy confirms that 13% of observations fall within the pandemic period. The EPU indicators (EPUJ and GEPU) show substantial variability, capturing the volatile economic environment that may influence firms' leverage decisions and financial performance.

**Table 2. Descriptive Statistics.**

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| ROA (%) | 5,654 | 2.75 | 3.90 | -20.50 | 45.20 |
| ROE (%) | 5,654 | 6.10 | 5.10 | -10.00 | 28.00 |
| Tobin's Q | 5,654 | 0.58 | 0.45 | 0.10 | 2.70 |
| ACR | 5,654 | 1.65 | 0.90 | 0.40 | 4.00 |
| CCR | 5,654 | 1.30 | 0.75 | -2.00 | 4.50 |
| ICR | 5,654 | 1.80 | 1.20 | -1.50 | 8.00 |
| DSCR | 5,654 | 0.70 | 0.55 | -3.00 | 3.50 |
| DEBEQT | 5,654 | 1.20 | 0.95 | 0.30 | 4.20 |
| AGE | 5,654 | 55.00 | 20.00 | 2 | 140 |
| SZE (ln Assets) | 5,654 | 7.50 | 0.80 | 5.80 | 11.00 |
| COVID19 (dummy) | 5,654 | 0.13 | 0.34 | 0 | 1 |
| EPUJ (%) | 5,654 | 95.00 | 25.00 | 50.00 | 150.00 |
| GEPU (%) | 5,654 | 130.00 | 50.00 | 60.00 | 300.00 |

The results show that ROA and ROE indicate moderate average profitability, although performance varies widely across firms. Tobin's Q values below 1 suggest that many firms are undervalued in the market relative to their assets. The ACR, CCR, and ICR values reflect adequate capacity to meet interest-related obligations, whereas a DSCR below 1 point to possible challenges in covering total debt payments. A high DEBEQT ratio reveals a strong dependence on debt financing. Additionally, the control variables account for differences in firm age and size, the impact of the COVID-19 pandemic, and broader macroeconomic uncertainties.

**Table 3. Correlation Matrix**

| Variable | ROA | ROE | TOB | ACR | CCR | ICR | DSCR | DEBEQT | AGE | SZE | COVID19 | EPUJ | GEPU |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ROA | 1.00 | | | | | | | | | | | | |
| ROE | 0.72 | 1.00 | | | | | | | | | | | |
| TOB | 0.30 | 0.28 | 1.00 | | | | | | | | | | |
| ACR | 0.18 | 0.05 | 0.35 | 1.00 | | | | | | | | | |
| CCR | 0.45 | 0.40 | 0.25 | 0.55 | 1.00 | | | | | | | | |
| ICR | 0.50 | 0.46 | 0.32 | 0.48 | 0.60 | 1.00 | | | | | | | |
| DSCR | 0.12 | 0.03 | 0.20 | 0.40 | 0.45 | 0.50 | 1.00 | | | | | | |
| DEBEQT | -0.20 | -0.15 | -0.35 | -0.60 | -0.55 | -0.50 | -0.45 | 1.00 | | | | | |
| AGE | 0.04 | 0.09 | 0.02 | 0.03 | 0.10 | 0.12 | 0.08 | -0.05 | 1.00 | | | | |
| SZE | 0.10 | 0.14 | 0.12 | -0.10 | 0.04 | 0.02 | -0.05 | 0.12 | 0.36 | 1.00 | | | |
| COVID19 | 0.06 | 0.05 | 0.02 | 0.10 | 0.18 | 0.20 | 0.08 | -0.15 | 0.22 | 0.05 | 1.00 | | |
| EPUJ | -0.04 | -0.08 | -0.14 | 0.03 | 0.02 | -0.05 | -0.01 | -0.03 | 0.10 | 0.02 | 0.10 | 1.00 | |
| GEPU | 0.12 | 0.10 | 0.05 | 0.15 | 0.25 | 0.20 | 0.18 | -0.20 | 0.30 | 0.07 | 0.55 | 0.40 | 1.00 |

Table 3 presents the correlation matrix for all variables used in the analysis. ROA and ROE show a strong positive correlation of 0.754, which aligns with theoretical expectations since both metrics reflect firm profitability, albeit from slightly different perspectives. Tobin's Q, as a market-based performance measure, shows moderate positive correlations with ROA (0.320) and ROE (0.322), indicating that higher accounting-based profitability is generally associated with better market valuation, though the relationship is not perfectly linear.

Debt-related ratios, including the Asset Coverage Ratio (ACR), Cash Coverage Ratio (CCR), Interest Coverage Ratio (ICR), Debt Service Coverage Ratio (DSCR), and Debt-to-Equity Ratio (DEBEQT), exhibit moderate correlations among themselves, all below 0.70. This suggests that while these metrics are related, each captures a distinct dimension of financial leverage or debt-servicing capacity, reducing concerns about multicollinearity in the regression models. Specifically, coverage ratios (ACR, CCR, ICR, DSCR) reflect the firm's ability to meet debt obligations through earnings or cash, whereas DEBEQT measures the overall debt proportion relative to equity, providing complementary information on capital structure.

Control variables such as firm Age (AGE), Size (SZE), COVID-19 (COVID19), Economic Policy Uncertainty (EPUJ), and Global Economic Policy Uncertainty (GEPU) generally show weak-to-moderate correlations with the main independent variables. For example, firm size shows a modest positive correlation with ROA (0.101) and ROE (0.151), suggesting larger firms may be slightly more profitable, while COVID-19 has small correlations with profitability measures, reflecting the idiosyncratic impacts of the pandemic. The moderate correlations between macroeconomic uncertainty indices (EPUJ and GEPU) and leverage ratios highlight that broader economic conditions influence financial decisions without introducing excessive overlap.

Overall, the correlation matrix indicates that the variables are sufficiently distinct, supporting the reliability of subsequent regression analyses. The moderate correlations among leverage measures allow for a nuanced exploration of each debt-related factor's impact on financial performance, while the control variables contribute meaningful, independent explanatory power. This structure ensures that the regression models are well-specified, with minimal risk of multicollinearity bias, thereby enhancing the validity of empirical inferences.

**Table 4. Variance Inflation Factor**

| Variable | VIF | 1/VIF |
|---|---|---|
| CCR | 4.8 | 0.208 |
| ICR | 4.6 | 0.217 |
| ACR | 3.5 | 0.286 |
| GEPU | 3.4 | 0.294 |
| COVID19 | 2.9 | 0.345 |
| DEBEQT | 2.7 | 0.370 |
| EPUJ | 1.9 | 0.526 |
| DSCR | 1.8 | 0.556 |
| AGE | 1.5 | 0.667 |
| SZE | 1.3 | 0.769 |
| Mean VIF | 2.96 | — |

The Variance Inflation Factor (VIF) values for all independent variables are below 10, indicating that multicollinearity is not a problem in the model. This suggests that the predictors do not overly correlate with each other in explaining changes in the dependent variable. Moreover, tolerance values exceed 0.10 for all variables, showing that each independent variable contributes unique information to the analysis. Together, these results confirm that the data meet the necessary assumptions for valid and reliable regression analysis.

**Table 5. Cross Sectional Dependence Test**

| Variable | CD Test | p-Value | Corr | Abs(Corr) |
|---|---|---|---|---|
| ROA | 36.50 | 0.000 | 0.160 | 0.160 |
| ROE | 38.10 | 0.000 | 0.165 | 0.165 |
| TOB | 110.25 | 0.000 | 0.480 | 0.480 |
| ACR | 150.80 | 0.000 | 0.750 | 0.750 |

| | | | | |
|---|---|---|---|---|
| CCR | 120.40 | 0.000 | 0.550 | 0.550 |
| ICR | 115.00 | 0.000 | 0.525 | 0.525 |
| DSCR | 95.20 | 0.000 | 0.410 | 0.410 |
| DEBEQT | 140.00 | 0.000 | 0.680 | 0.680 |
| AGE | 200.70 | 0.000 | 0.970 | 0.970 |
| SZE | 190.50 | 0.000 | 0.940 | 0.940 |

There is significant cross-sectional dependence among the firms in the sample, likely driven by common macroeconomic shocks, industry-wide trends, and policy changes that simultaneously impact multiple companies. Such dependence implies that the assumption of independent error terms across firms is violated, which, if ignored, could lead to biased standard errors and unreliable statistical inference in traditional panel regressions. The presence of cross-sectional correlation highlights that firms do not operate in isolation; their performance is influenced by shared economic conditions, such as fluctuations in interest rates, changes in domestic and global economic policy, and market-wide shocks like the COVID-19 pandemic. This finding justifies the use of advanced estimation techniques, such as robust two-step Generalized Method of Moments (GMM), which accounts for endogeneity, unobserved heterogeneity, and cross-sectional dependence. By applying robust GMM estimators, the analysis mitigates potential biases and ensures that the estimated effects of financial leverage on firm performance are both consistent and statistically reliable, providing a more accurate understanding of the underlying economic relationships.

## DISCUSSION

This study provides empirical evidence on the relationship between financial leverage and firm performance in the context of Pakistani non-financial firms, using a comprehensive dataset spanning 2000–2023. By incorporating coverage ratios alongside traditional leverage metrics, the analysis captures not only the level of indebtedness but also the firm's capacity to service its debt, offering a more nuanced understanding of financial health.

The results indicate that the Interest Coverage Ratio (ICR) positively and significantly affects both Return on Assets (ROA) and Return on Equity (ROE). This finding aligns with theoretical expectations: firms with higher operating earnings relative to interest obligations are better positioned to meet debt commitments without sacrificing operational flexibility. In the Pakistani context, where high-interest rates and macroeconomic volatility are common, a strong ICR serves as a buffer against financial distress, enabling firms to maintain profitability and investor confidence.

In contrast, the Debt Service Coverage Ratio (DSCR) exhibits a negative and significant relationship with firm performance. This highlights the financial strain imposed by principal repayment obligations, particularly in an environment where firms face liquidity constraints or sudden economic shocks. The negative effect of DSCR suggests that firms with high debt repayment commitments may compromise on reinvestment, operational efficiency, or strategic initiatives, leading to lower overall performance.

The study further demonstrates the moderating effects of the COVID-19 pandemic and Pakistan-specific Economic Policy Uncertainty (EPU). During periods of pandemic-induced disruption, firms experienced heightened operational risks, supply chain constraints, and reduced demand, which amplified the adverse effects of high leverage. Similarly, EPU intensified performance pressures, as firms responded to policy uncertainty by delaying investment, hoarding cash, or reducing leverage capacity. These findings underscore the sensitivity of leveraged firms to exogenous shocks in

emerging economies, where financial systems and corporate governance mechanisms may be less resilient.

The study also highlights that while traditional debt ratios such as Debt-to-Equity (DEBEQT) provide insight into capital structure, coverage ratios like ICR and DSCR are more informative for predicting firm performance. This is particularly relevant for Pakistani firms, where family-controlled businesses dominate and decision-making may prioritize ownership control over debt optimization. Firms with a strong ability to service debt are more likely to maintain sustainable growth and investor trust, emphasizing the need for strategic financial management.

From a policy perspective, these findings suggest that regulators and financial institutions should focus not only on the level of debt in firms but also on their capacity to service it. Encouraging transparency in debt obligations, promoting prudent borrowing, and supporting mechanisms to mitigate economic policy uncertainty can help stabilize firm performance. For managers, optimizing the mix of debt and equity and maintaining sufficient coverage ratios is essential to navigate periods of economic volatility and sustain long-term profitability.

**Theoretical Contribution**

This study advances capital structure theory in several ways. First, it extends the traditional trade-off theory by emphasizing not only the level of debt but also the firm's ability to service debt, using coverage ratios such as ICR and DSCR. This provides a more nuanced understanding of how leverage affects performance in emerging economies. Second, it highlights the role of macroeconomic shocks COVID-19 and Economic Policy Uncertainty (EPU) as moderating factors, illustrating that the effects of financial leverage are context-dependent. Finally, by incorporating multiple proxies for financial performance (ROA, ROE, Tobin's Q), the study contributes to a multi-dimensional perspective on firm value, combining both accounting-based and market-based measures.

**Practical Contribution**

The findings offer actionable insights for managers, investors, and policymakers. Firms are encouraged to monitor not just debt levels but also their coverage capacity, ensuring sufficient earnings and cash flow to meet interest and principal obligations. For policymakers and regulators, the results underline the importance of stabilizing economic policy and promoting financial transparency, particularly during crises, to reduce systemic risk. Financial institutions may also benefit from using coverage ratios in credit assessment, going beyond traditional leverage ratios to evaluate a firm's solvency and repayment capacity.

**Limitations, Recommendations, and Future Research**

This study has several limitations that provide context for interpreting the results. First, the sample is limited to non-financial firms listed on the Pakistan Stock Exchange, which restricts the generalizability of the findings to financial institutions or firms in other emerging markets. Additionally, the analysis relies on coverage ratios, which require detailed financial data; inconsistencies or missing data may introduce bias. While macroeconomic controls such as EPU and GEPU were included, other relevant variables, including exchange rate volatility and inflation shocks, were not fully captured. The COVID-19 dummy variable represents a broad period and may not reflect sector-specific or firm-level variations in the pandemic's impact. These limitations suggest that while the results are informative, they should be interpreted within the specific context of Pakistani non-financial firms.

Based on the findings, several practical and research-oriented recommendations emerge. Managers are encouraged to maintain adequate coverage ratios and ensure sufficient liquidity to mitigate risks from high leverage and macroeconomic shocks. Policymakers should develop frameworks to monitor corporate leverage and promote transparent reporting, while financial institutions can

incorporate coverage ratios alongside traditional debt metrics to more accurately assess repayment capacity. Future research can build on this study by exploring sector-specific leverage effects, integrating dynamic macroeconomic indicators, examining the role of ESG practices, and employing advanced econometric techniques such as dynamic panel threshold models to capture non-linear effects of leverage under varying economic conditions. These extensions can provide a deeper and more nuanced understanding of the interplay between financial leverage, firm performance, and external shocks.

## CONCLUSION

This study provides robust evidence that financial leverage influences firm performance in Pakistan, with coverage ratios offering superior predictive power compared to traditional debt measures. High Interest Coverage Ratios are associated with better ROA and ROE, whereas high Debt Service Coverage Ratios signal potential financial strain. The COVID-19 pandemic and Economic Policy Uncertainty amplify the risks associated with high leverage, highlighting the critical role of macroeconomic stability. These findings underscore the importance of prudent debt management, strategic financial planning, and context-sensitive policy interventions in emerging markets. Overall, the study enriches the literature by offering a comprehensive and multi-dimensional perspective on how leverage, debt-servicing capacity, and external shocks jointly affect corporate performance.

## References


1. Adenugba, A. A., Ige, A. A., & Kesimo, O. R. (2016). Financial leverage and firms' value: A study of selected firms in Nigeria. *European Journal of Research and Reflection in Management Sciences*, *4*(1), 14.
2. Ahmad, M. S., Khan, M. M., & Iqbal, N. (2021b). Career satisfaction and innovative behavior. *Journal of ISOSS*, *7*(2), 99-124.
3. Ahmad, M. S., Khan, M. M., Mehmood, A., Ali, U., & Iqbal, M. N. (2021). Impact of employee perception shaped by despotic leadership on the job performance of employees: investigating the mediating role of work engagement and the moderating role of social climate of friendship groups. *Journal of Management and Research*, *8*(2), 62-97.
4. Ahmad, S., Ashraf, H. A., Iqbal, J., Munir, W., Iqbal, Y., & Ali, U. (2023). Silenced by despotic leadership: investigating the mediating effect of job tensions and moderating influence of PsyCap on employee silence. *Russian Law Journal*, *11*(1), 173-193.
5. Ahmad, S., Ashraf, H. A., Iqbal, J., Munir, W., Iqbal, Y., & Ali, U. (2023). Silenced by despotic leadership: investigating the mediating effect of job tensions and moderating influence of PsyCap on employee silence. *Russian Law Journal*, *11*(1), 173-193.
6. Ahmad, S., Ashraf, H. A., Islam, A., Ahmad, A., & Ali, U. (2023). Understanding Workplace Dehumanization: Combined Effects of Tyrannical Leadership and Trait anxiety on Employee Ostracism and Burnout. *International Research Journal of Management and Social Sciences*, *4*(4), 517-547.
7. Ahmed, R., & Javid, A. Y. (2019). Dynamics of ownership structure and firm performance: Evidence from Pakistan. *Pakistan Development Review*, 58(2), 153–172.
8. Ahmed, R., Mahmood, T., & Saeed, A. (2023). Capital structure dynamics in a volatile economy: Evidence from Pakistan. *Journal of Asian Economics*, 84, 101-137.
9. Akhtar, M., Yusheng, K., Haris, M., Ain, Q. U., & Javaid, H. M. (2021). Impact of financial leverage on sustainable growth, market performance, and profitability. *Economic Change and Restructuring*, 55, 737–774.
10. Alessi, L., Bruno, B., Carletti, E., Neugebauer, K., & Wolfskell, I. (2022). Cover your assets: Non-performing loans and coverage ratios in Europe. *Economic Policy, 36*(108), 685–733.

11. Ali, S., & Hassan, A. (2023). Information asymmetry and financing choices: Evidence from Karachi Stock Exchange. *Pakistan Journal of Commerce and Social Sciences, 17*(2), 450–468.
12. Ali, S., & Rehman, A. U. (2023). Macroeconomic volatility and corporate financial resilience: The role of asset coverage in Pakistan. *Emerging Markets Review, 54,* 77-93.
13. Amin, H. I. M., & Cek, K. (2023). The effect of golden ratio-based capital structure on firm's financial performance. *Sustainability, 15*(9), 7424.
14. Arhinful, R., & Radmehr, M. (2023). The effect of financial leverage on financial performance: Evidence from non-financial institutions listed on the Tokyo stock market. *Journal of Capital Markets Studies*, 7, 53–71.
15. Arhinful, R., Mensah, L., & Owusu-Sarfo, J. S. (2023). The impact of capital structure on the financial performance of financial institutions in Ghana. *International Journal of Finance and Banking Research*, 9, 19.
16. Athari, S. A. (2021). Domestic political risk, global economic policy uncertainty, and banks' profitability: Evidence from Ukrainian banks. *Post-Communist Economics, 33*(4), 458–483.
17. Bansal, R. (2014). A comparative analysis of the financial ratios of selected banks in the India for the period of 2011-2014. *Research Journal of Finance and Accounting, 5*(19), 153-167.
18. Berrada, A. (2022). Financial and economic modeling of large-scale gravity energy storage system. *Renewable Energy, 192*, 405–419.
19. Bose, S., Shams, S., Ali, M. J., & Mihret, D. (2021). COVID-19 impact, sustainability performance and firm value: International evidence. *Accounting and Finance, 62*(1), 597-643.
20. Brealey, R. A., Myers, S. C., Allen, F., & Mohanty, P. (2018). *Principles of corporate finance* (12th ed.). McGraw-Hill Education.
21. Butt, A. A., & Saqib, N. (2023). Institutional investors and the development of corporate bond markets in emerging economies: A case of Pakistan. *Journal of Asian Economics, 85*, 101-124.
22. Butt, A., & Rehman, H. (2021). Macroeconomic volatility and corporate leverage: Evidence from Pakistan. *Journal of Asian Economics*, 74, 101303.
23. Cole, A. (2017). Interest deductibility: Issues and reforms. *Tax Foundation Fiscal Fact, 548*.
24. Delele, M. (2021). *The determinants of financial distress: An empirical study on construction companies in Amhara region* [Doctoral dissertation].
25. Demiraj, R., Demiraj, E., & Dsouza, S. (2023). Impact of financial leverage on the performance of tourism firms in the Mena region. *PressAcademia Procedia, 16*(1), 156–161.
26. Detthamrong, U., Chancharat, N., & Vithessonthi, C. (2017). Corporate governance, capital structure and firm performance: Evidence from Thailand. *Research in International Business and Finance, 42*, 689–709.
27. Faruk, H., & Habib, A. (2010). *Performance evaluation and ratio analysis of Pharmaceutical Company in Bangladesh* [Master's thesis].
28. Ferris, S. P., & Lawless, R. M. (1999). The expenses of financial distress: The direct costs of Chapter 11. *University of Pittsburgh Law Review, 61*, 629.
29. Firouzi, A., & Meshkani, A. (2021). Risk-based optimization of the debt service schedule in renewable energy project finance. *Utilities Policy, 70*, 101197.
30. Frydenberg, S. (2011). Theory of capital structure: A review. In G. Arntzen, L. Fallan, & O. Gustafsson (Eds.), *Frihet og mangfold, Festskrift til odd* (pp. 87–92). Tapir Academic Press.

31. Garcia-Gomez, C. D., Demir, E., Chen, M. H., & Diez-Esteban, J. M. (2022). Understanding the effects of economic policy uncertainty on US tourism firms' performance. *Tourism Economics, 28*(5), 1174–1192.
32. Ghosh, A., & Jain, P. C. (2000). Financial leverage changes associated with corporate mergers. *Journal of Corporate Finance, 6*(4), 377–402.
33. Glen, J. D., & Pinto, B. (1994). *Debt or equity? How firms in developing countries choose* (Vol. 63). World Bank Publications.
34. Gofwan, H. (2022). Effect of accounting information system on financial performance of firms: A review of literature. *IOSR Journal of Business and Management, 2*(1), 39–49.
35. Haider, Z., & Mahmood, F. (2023). *Regulatory innovations and the evolution of debt capital markets: Evidence from Pakistan*. Emerging Markets Review, 52, 101023.
36. Hussain, M., & Safi, A. (2020). Corporate financing patterns in Pakistan: Does market timing theory hold? *Journal of Economics and Business*, 108, 105889.
37. Ibrahim, U. A., & Isiaka, A. (2020). Effect of financial leverage on firm value: Evidence from selected firms quoted on the Nigerian stock exchange. *Open Journal of Business and Management*, 12(3), 124–135.
38. Iqbal, U., & Usman, M. (2018). Impact of financial leverage on firm performance: Textile composite companies of Pakistan. *SEISENSE Journal of Management, 1*(2), 70–78.
39. Iqbal, U., Gan, C., & Nadeem, M. (2020). Economic policy uncertainty and firm performance. *Applied Economics Letters, 27*(10), 765–770.
40. Iqbal, Z., & Mirakhor, A. (2023). *Islamic finance and the development of debt capital markets: The case of Pakistan*. In S. Nazim Ali (Ed.), *Islamic Capital Markets* (pp. 245-267). Edward Elgar Publishing.
41. Javed, A., & Hassan, A. (2023). *The role of credit rating agencies in the development of Pakistan's debt market*. Pakistan Journal of Commerce and Social Sciences, 18(1), 45-67.
42. Jin, G., Xu, J., Liu, F., Haris, M., & Wegar, F. (2022). Does R&D investment moderate the relationship between the COVID-19 pandemic and firm performance in China's high-tech industries? Based on DuPont components. *Technology Analysis & Strategic Management, 34*(12), 1464–1478.
43. Katusiime, L. (2021). COVID 19 and bank profitability in low income countries: The case of Uganda. *Journal of Risk and Financial Management, 14*(12), 588.
44. Khan, M. A., Siddique, M., & Hassan, M. U. (2023). *Liquidity risk and firm performance in emerging economies: The moderating role of corporate governance in Pakistan*. Journal of Asian Business Strategy, 13(1), 45-62.
45. Khan, M. A., Siddique, M., & Hassan, M. U. (2023). *The evolving structure of corporate financing and the persistent role of banks in Pakistan*. South Asian Journal of Business Studies, 14(1), 22-41.
46. Khan, M. I., & Awan, S. (2022). *Bank dominance and the stunted growth of corporate bond markets in South Asia*. South Asian Journal of Finance, 2(1), 78-95.
47. Kim, S., Kraft, P., & Ryan, S. G. (2013). Financial statement comparability and credit risk. *Review of Accounting Studies, 18*(3), 783–823.
48. Kraus, A., & Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. *The Journal of Finance*, 28(4), 911–922.
49. Man, C. K., & Wong, B. (2013). Corporate governance and earnings management: A survey of literature. *Journal of Applied Business Research, 29*(2), 391–418.

50. Mensah, L., & Bein, M. A. (2023). Sound corporate governance and financial performance: Is there a link? Evidence from manufacturing companies in South Africa, Nigeria, and Ghana. *Sustainability*, *15*(12), 9263.
51. Michalak, A. (2016). The cost of capital in the effectiveness assessment of financial management in a company. *Oeconomica Copernicana, 7*(2), 317–329.
52. Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*(2), 187–221.
53. Nissim, D., & Penman, S. H. (2003). Financial statement analysis of leverage and how it informs about profitability and price-to-book ratios. *Review of Accounting Studies, 8*(4), 531–560.
54. Ofulue, I., Ezeagba, C. E., Annahalu, N. N., & Obi, J. C. (2022). Financial leverage and financial performance of quoted industrial goods firms in Nigeria. *KASU Journal of Management Science, 4*, 172–181.
55. Ogachi, D., Ndege, R., Gaturu, P., & Zoltan, Z. (2020). Corporate bankruptcy prediction model, a special focus on listed companies in Kenya. *Journal of Risk and Financial Management, 13*(3), 47.
56. Okunev, R. (2022). Financial ratios. In *Analytics for retail: A step-by-step guide to the statistics behind a successful retail business* (pp. 53–63). Apress.
57. Omollo, B. A., Muturi, W. M., & Wanjare, J. (2020). Effect of short-term debt on financial growth of non-financial firms listed at Nairobi securities exchange. *Research Journal of Finance and Accounting, 9*(10), 150–164.
58. Quddus, A., Pavelkova, D., Hussain, S., & Pham, T. P. (2022). The impact of investment decisions on firm financial performance moderated by economic policy uncertainty: Evidence from the manufacturing sector of Pakistan. *Asian Economic and Financial Review, 12*(11), 969–981.
59. Rehman, A. U., & Khan, A. R. (2023). *Macroeconomic volatility and corporate liquidity management: Evidence from the non-financial sector in Pakistan*. Pakistan Journal of Commerce and Social Sciences, 19(1), 88-112.
60. Sahminan, S. (2021). *Impacts of global financial conditions on non-financial corporate leverage in Indonesia* (Working Paper No. 14/2021). Bank Indonesia.
61. Saleem, F. (2023). *Firm-specific and macroeconomic determinants of financial distress: A comparison of pre and post-financial crisis periods in Pakistan*. International Journal of Financial Studies, 12(1), 15.
62. Securities and Exchange Commission of Pakistan (SECP). (2023). Annual Report 2022-2023.
63. Setyawan, I. R. (2011). An empirical study on market timing theory of capital structure. *International Research Journal of Business Studies, 4*(2), 103–119.
64. Siddiqui, D. A., & Iqbal, J. (2023). *The impact of monetary policy shocks on corporate liquidity and investment: Evidence from Pakistan*. International Journal of Finance & Economics, 29(2), 1542-1561.
65. State Bank of Pakistan (SBP). (2023). *Financial Stability Review – First Half FY24*.
66. Strahan, P. E. (1999). Borrower risk and the price and nonprice terms of bank loans. *FRB of New York Staff Report, (90)*.
67. Suh, H., & Yang, J. Y. (2021). Global uncertainty and global economic policy uncertainty: Different implications for firm investment. *Economics Letters, 200*, 109767.

68. Tahir, I. M., & Razali, A. R. (2011). The relationship between enterprise risk management (ERM) and firm value: Evidence from Malaysian public listed companies. *International Journal of Economics and Management Sciences, 1*(2), 32–41.
69. Vanacker, T. R., & Manigart, S. (2010). Pecking order and debt capacity considerations for high-growth companies seeking financing. *Small Business Economics, 35*(1), 53–69.
70. Wahjudi, E. (2019). Factors affecting dividend policy in manufacturing companies in Indonesia stock exchange. *The Journal of Management Development, 39*, 4–17.
71. Witkowska, D., Kompa, K., & Mentel, G. (2019). The effect of government decisions on the efficiency of the investment funds market in Poland. *Journal of Business Economics and Management, 20*(3), 573–594.