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COMPARATIVE ANALYSIS OF ISLAMIC AND CONVENTIONAL FINANCING ON FIRM PROFITABILITY: EVIDENCE FROM PAKISTAN'S MANUFACTURING SECTOR

[1]Moeez Ul Hassan, [2]Amjad Ali, [3]Razan Al-Masri
[1]Lahore School of Accountancy and Finance, University of Lahore, Pakistan
[2]Lahore School of Accountancy and Finance, University of Lahore, Pakistan
[3]Abu Dhabi School of Management, Abu Dhabi, United Arab Emirates

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Corresponding Author: *

Abstract

This research examines the impact of Islamic and conventional financing on the profitability of manufacturing firms listed on the Pakistan Stock Exchange. Manufacturing companies in Pakistan's dual financial system face distinct alternatives between Shariah-compliant and conventional banking options. Theoretically, risk-sharing principles in Islamic finance differ from interest-based contracts in conventional finance, yet empirical evidence on performance outcomes for non-financial firms remains mixed. This study evaluates the profitability of 18 listed manufacturing firms (2019–2023), using return on assets, return on equity, and net profit margin. Employing panel data regression and controlling for firm-specific factors such as size, growth, and asset tangibility, the analysis applies fixed-effects and random-effects models to compare the effectiveness of Islamic versus conventional financing. Due to limited debt disclosure, Islamic financing is proxied by Shariah-compliance via PSX Islamic index inclusion. The results indicate that Islamic financing is associated with improved returns on assets and equity for manufacturing firms, though not necessarily with higher profit margins. These findings are interpreted through established capital structure theories, including the pecking order, trade-off, and agency cost theories, within the context of Pakistan's economic and regulatory environment. This research provides empirical evidence to inform discussions about financing choices and performance in emerging markets and offers valuable insights for corporate managers, investors, financial institutions, and policymakers in Pakistan's developing financial landscape.

INTRODUCTION

Global financial systems now include Islamic finance alongside traditional options (Ahmednoor, 2012; Beck et al., 2013; Haron & Azmi, 1997). In Pakistan, Islamic banking has operated as a parallel system under the State Bank of Pakistan since its 2001 revival, experiencing substantial growth. The State Bank is working to position Islamic banking as a distinct system within existing regulations. Globally, Islamic financial assets are expanding due to rising demand for Shariah-compliant products (Ahmednoor, 2012; Beck et al., 2013; Ernst & Young, 2016; Global Islamic Finance Report, 2019; IFSISR, 2020; Khan et al., 2014). Within Pakistan, the Islamic banking sector has grown significantly in both assets and deposits, increasing its share of the overall banking industry (Ernst & Young, 2016; IFSISR, 2020; Khan et al., 2014; Siddique et al., 2025).

The manufacturing sector is a major driver of Pakistan's economy, contributing about 12–13% to gross domestic product and employing 16% of the workforce. It remains the primary engine for exports (Ministry of Finance, 2021). The large-scale manufacturing segment leads in GDP contribution. However, the sector faces challenges such as outdated technology, energy shortages, complex regulations, low research and development investment, and vulnerability to external shocks (Agenor et al., 2012; Freling & Hastings, 2022; Kalim, 2001; Ministry of Finance, 2021). Manufacturing firms require appropriate financing strategies to address these challenges while pursuing technology upgrades, research and development, working capital, and growth (Myers & Majluf, 1984; Fama & French, 1998). Comparing Islamic and conventional sources of finance in terms of availability, cost, and impact is essential, especially for small and medium enterprises, which dominate Pakistan's manufacturing sector and often have unmet demand for Shariah-compliant products (Al-Balushi et al., 2018; Ahmednoor, 2012; Beck et al., 2013; Haron & Azmi, 1997).

Islamic and conventional finance differ fundamentally. Islamic finance emphasizes risk-sharing, asset backing, and prohibits interest (Riba), speculation (Gharar), and gambling (Maysir), aiming to address both financial and social goals (Beck et al., 2013; Chapra, 2000; Lewis & Algaoud, 2001; Wasiuzzaman & Gunasegavan, 2013; Audi et al., 2021). By contrast, conventional finance is interest-based, providing lenders fixed returns regardless of project performance (Chapra, 2000; Wasiuzzaman & Gunasegavan, 2013; Amir et al., 2025; Umair et al., 2025).

Despite these theoretical differences, the impact of each system on non-banking firms remains debated. The literature is largely bank-focused (Abduh & Omar, 2012; Ahmednoor, 2012; Beck et al., 2013; Čihák & Hesse, 2010; Haron & Azmi, 1997; Khan et al., 2014; Srairi, 2010; Sheikh & Qureshi, 2017; Khalid et al., 2025; Ali et al., 2025), and findings are mixed: Islamic banks are generally more stable with better asset quality, yet profitability results are inconsistent (Bashir, 2010; Beck et al., 2013; Čihák & Hesse, 2010; Gherbi, 2018; Abduh & Omar, 2012; Bader et al., 2008; Hassan et al., 2009; Khediri et al., 2015; Metwally, 1997; Mohanty et al., 2016; Srairi, 2010; Yahya et al., 2012; Ali et al., 2025). However, these findings are not easily transferable to non-financial firms due to differences in business models and risk exposures (Merika et al., 2007; Narayan & Phan, 2019; Skandalis et al., 2008; Aziz et al., 2025). In Pakistan, the relationship between manufacturing profitability and capital structure remains uncertain (Iqbal et al., 2015; Ullah et al., 2020; Zafar et al., 2015), highlighting a research gap and the need for comparative analysis of Islamic and conventional financing for manufacturing firms.

For transparency, this study notes that due to limited disclosure of exact debt composition, Islamic financing is proxied through a firm's Shariah-compliance status as determined by its inclusion in PSX Islamic indexes.

LITERATURE REVIEW

CONCEPTUAL FRAMEWORK: ISLAMIC FINANCE

The principles of Islamic finance are derived from Shariah law, which governs all aspects of Muslim life, including economic activities (Lewis & Algaoud, 2001; Rosly, 2008; Wasiuzzaman & Gunasegavan, 2013). These principles originate from primary sources such as the Quran and Sunnah, as well as secondary sources including Ijma (scholarly consensus) and Qiyas (analogical reasoning) (Wasiuzzaman & Gunasegavan, 2013). Unlike conventional finance, which prioritizes financial asset return maximization, Islamic finance emphasizes ethical conduct, social justice, and direct economic activity (Ahmednoor, 2012; Beck et al., 2013; Haron & Azmi, 1997; IFSISR, 2020; Khan et al., 2014).

Three fundamental prohibitions underpin Islamic finance (Beck et al., 2013; Chapra, 2000; Lewis & Algaoud, 2001; Wasiuzzaman & Gunasegavan, 2013):

Riba (Interest/Usury): Islamic law prohibits charging or receiving predetermined interest on capital, regardless of investment outcomes. Profits are only permissible when both parties share

investment risk, supporting fair wealth distribution and preventing exploitation (Beck et al., 2013; Wasiuzzaman & Gunasegavan, 2013).

Gharar (Excessive Uncertainty/Speculation): Contracts with excessive uncertainty or speculation are not allowed, thereby excluding deals that lack real economic value.

Maysir (Gambling): Islamic finance forbids games of chance and any contract where returns depend on luck rather than productive effort.

Additionally, Islamic finance prohibits investments in activities considered haram, such as alcohol, pork-based industries, conventional financial services, weapons, and gambling (Chapra, 2000; Wasiuzzaman & Gunasegavan, 2013). This ethical screening aligns Islamic finance with principles of socially responsible investment.

To comply with these principles while enabling economic activity, Islamic finance utilizes specific instruments as alternatives to interest-based debt (Lewis & Algaoud, 2001; Rosly, 2008):

PROFIT-AND-LOSS SHARING (PLS) MODES

Mudarabah: The capital provider (Rab al-Mal) supplies funds, while the manager (Mudarib) oversees the investment. Profits are distributed by a pre-agreed ratio, with financial losses borne by the provider (Ahmednoor, 2012; Beck et al., 2013; Lewis & Algaoud, 2001; Rosly, 2008).

Musharaka: A joint venture where partners contribute capital, share profits by agreement, and absorb losses proportionate to their investment. All partners may participate in management.

While PLS modes theoretically promote risk-sharing, practical implementation faces challenges such as higher monitoring costs and agency problems, including information asymmetry and moral hazard (Abduh & Omar, 2012; Beck et al., 2013; Čihák & Hesse, 2010). Evidence from Pakistan shows limited industrial growth from participatory models compared to non-participatory modes (Zulfiqar et al., 2021).

TRADE-BASED (DEBT-LIKE) MODES

Murabahah: Banks purchase assets and sell them to clients at a marked-up price, typically with deferred payments. This is widely used in trade finance.

Istisna: Used in manufacturing or construction, this contract enables the bank to provide goods or services for the client, with payment installments linked to project milestones.

Salam: Allows the bank to pre-pay for goods delivered at a future date, mainly used in agriculture and commodities. These modes are preferred for their lower perceived risk and

operational ease compared to PLS, and are positively associated with Pakistan's industrial production (Abduh & Omar, 2012; Beck et al., 2013; Čihák & Hesse, 2010; Zulfiqar et al., 2021).

IJARAH (LEASING) MODES

Ijarah: The bank acquires an asset and leases it to the client for a fixed rental fee, retaining ownership throughout the lease period.

Ijarah Muntahia Bittamlik (or Ijarah wa Iqtina): A finance lease where the client acquires ownership at the end of the lease.

Shariah advisory boards are mandatory for financial institutions to ensure compliance with Islamic principles, guided by standards and model agreements provided by the State Bank of Pakistan (Lewis & Algaoud, 2001).

CONVENTIONAL FINANCE

Conventional finance fundamentally differs from Islamic finance, most notably in its reliance on interest and the concept of the time value of money (Beck et al., 2013; Wasiuzzaman & Gunasegavan, 2013). In this system, lenders provide capital with the expectation of repayment plus interest, which compensates for the loan's duration and associated risk (Beck et al., 2013; Wasiuzzaman & Gunasegavan, 2013). Importantly, the interest rate is determined independently of the outcome of the underlying project, being either fixed at the outset or adjusted in line with market conditions (Chapra, 2000; Wasiuzzaman & Gunasegavan, 2013).

Capital allocation in conventional finance often favors entities with strong credit histories, resulting in larger, established firms having greater access to funding than smaller or newer companies, regardless of the latter's innovative potential.

Key instruments in conventional finance include:

- **Bank Loans:** Direct lending by financial institutions, with principal, duration, and interest terms set contractually. These loans remain a primary external funding source for many firms, though they may lack the flexibility of capital market alternatives.
- **Bonds:** Long-term debt securities through which companies borrow from investors, committing to periodic coupon payments and repayment at maturity. Bonds provide access to substantial funds but expose issuers to interest rate risk and market fluctuations.

- **Equity:** Issuing shares that represent ownership in the company, equity financing spreads both risks and returns among shareholders and serves as an alternative to debt-based funding.

The conventional financial system relies on market mechanisms, regulatory oversight, and credit rating agencies to maintain financial stability. Derivatives are widely used for risk management and hedging, whereas their use in Islamic finance is constrained by ethical and legal considerations.

CAPITAL STRUCTURE & PROFITABILITY

The theory of capital structure originated with Modigliani and Miller's (1958) irrelevance hypothesis, but has since evolved to incorporate real-world factors such as taxes, bankruptcy costs, and information asymmetry (Fama & French, 1998; Jensen & Meckling, 1976; Myers, 1984; Myers & Majluf, 1984; Rajan & Zingales, 1995; Shah & Khan, 2017; Sheikh & Qureshi, 2017; Ullah et al., 2020). Three major theories dominate the discussion:

TRADE-OFF THEORY (TOT)

TOT posits that firms seek an optimal debt ratio where the tax advantages of debt (interest deductibility) are balanced against the costs of financial distress and agency problems (Fama & French, 1998; Myers & Majluf, 1984; Rasiah & Kim, 2011). While leverage increases with the tax shield, higher debt also raises default risk and potential bankruptcy costs. Firms with more tangible assets and larger size—which help mitigate distress costs—are often associated with higher leverage (Shah & Khan, 2017; Sheikh & Qureshi, 2017; Ullah et al., 2020). Evidence from Pakistan supports positive links between leverage, firm size, and tangibility, but results for profitability remain inconclusive (Iqbal et al., 2015; Ullah et al., 2020). Some researchers argue that even for Islamic banks, TOT may be relevant despite the absence of interest tax shields, as other costs and benefits may apply (Al-Hunnayan, 2020).

PECKING ORDER THEORY (POT)

POT, developed by Myers and Majluf (1984), emphasizes information asymmetry. Firms prefer internal financing first, then debt, and lastly equity, to avoid adverse selection (Fama & French, 1998; Jensen & Meckling, 1976; Modigliani & Miller, 1958; Rajan & Zingales, 1995). This results in an inverse relationship between profitability and leverage—profitable firms tend to borrow less (Iqbal et al., 2015; Sheikh & Qureshi, 2017; Ullah et al., 2020; Marc et al., 2025). In Pakistan, high information asymmetry means internal funding often dominates.

AGENCY COST THEORY (ACT)

ACT examines conflicts between shareholders, debtholders, and managers (Jensen & Meckling, 1976). Debt can serve as a disciplinary mechanism, restricting managerial discretion and promoting efficiency (Rajan & Zingales, 1995). However, excessive debt may lead to risk-shifting or underinvestment, negatively impacting profitability (Fama & French, 1998; Zafar et al., 2015; Audi et al., 2024). While ACT finds limited empirical support in Pakistan, it remains relevant for larger firms with complex ownership structures (Ullah et al., 2020; Rasiah & Kim, 2011).

RELEVANCE TO ISLAMIC VS. CONVENTIONAL FINANCE

The core principles of Islamic finance may alter expected patterns under these theories:

Risk-Sharing and Agency Costs: The profit-and-loss sharing (PLS) nature of many Islamic instruments could, in theory, better align incentives (Beck et al., 2013). However, they can also increase monitoring challenges and information concealment (Abduh & Omar, 2012; Beck et al., 2013; Čihák & Hesse, 2010; Margolis & Calderon, 2021; Huseyin, 2023; Kumar & Gupta, 2023; Iqbal & Hayat, 2025). Trade-based Islamic modes, which resemble debt, may exhibit agency dynamics similar to conventional finance.

Tax Shield (TOT): The prohibition on interest removes the classic tax shield. Still, some Islamic contracts allow profit margins or lease payments that may be tax-deductible, depending on the tax regime.

Information Asymmetry (POT): While asset-backed Islamic instruments can reduce information asymmetry, complex PLS structures may exacerbate it.

No single theory fully captures firm behavior. Evidence from Pakistan underscores that capital structure choices are influenced by sectoral, regulatory, and institutional factors (Fama & French, 1998; Rasiah & Kim, 2011; Iqbal et al., 2015; Sheikh & Qureshi, 2017; Wang & Ahmad, 2018; Zafar et al., 2015; Khan, 2022).

FINANCING TYPE AND FIRM PERFORMANCE/PROFITABILITY

Empirical studies comparing Islamic and conventional finance have produced varied results, reflecting differences in region, sector, time frame, and methodological approach.

The majority of empirical research focuses on banks, especially in emerging markets. A prominent trend is that Islamic banks generally exhibit higher equity-to-asset ratios and demonstrate greater resilience during economic crises (Abduh & Omar, 2012; Beck et al., 2013;

Čihák & Hesse, 2010; Khediri et al., 2015; Bilal & Tanveer, 2023). For example, studies using Z-scores often find Islamic banks to be more stable, although this may depend on factors such as bank size and methodology.

In terms of operational efficiency, Islamic banks are sometimes regarded as less cost-efficient due to their adherence to Shariah requirements and relative newness; however, results from Data Envelopment Analysis (DEA) explain that efficiency levels are often comparable to those of conventional banks (Bader et al., 2008; Hassan et al., 2009; Metwally, 1997; Mohanty et al., 2016; Srairi, 2010; Yahya et al., 2012; Khan & Ullah, 2020; Ngo, 2023).

Asset quality tends to be higher in Islamic banks, as indicated by lower non-performing loans (NPLs) and smaller loss reserves. When it comes to profitability (ROA, ROE), findings are inconclusive: some studies report little to no difference between the two banking types, while others find conventional banks outperform except in certain regions, such as the GCC, where Islamic banks may excel.

Despite the conceptual differences—risk-sharing and asset-backing in Islamic finance—practical differences in financial statement outcomes are often minimal.

In Pakistan, Islamic banking has experienced significant expansion (Ernst & Young, 2016; IFSISR, 2020). Here, bank profitability is shaped by gearing, deposits, asset management practices, NPLs, and macroeconomic variables like CPI (Khan et al., 2014; Ismail & Saeed, 2019). Capital structure determinants such as size, tangibility, and earnings volatility affect both banking types, though not always identically (Sheikh & Qureshi, 2017). Overall, differences in ROA between Islamic and conventional banks are generally insignificant, but macroeconomic influences—like interest rate levels—are critical. Both banking systems are linked to economic growth, with Islamic finance sometimes showing stronger short-term effects (Nawaz et al., 2019; Zulfiqar et al., 2021; Fadzil, 2021). Islamic banking intermediation is primarily demand-driven, in contrast to the bidirectional nature of conventional banking.

Among non-financial firms in Pakistan, particularly in manufacturing, the evidence consistently supports the Pecking Order Theory (POT), highlighting a strong preference for internal funds over debt and equity (Fama & French, 1998; Myers, 1984; Rajan & Zingales, 1995; Sheikh & Qureshi, 2017). Asset tangibility is positively related to leverage, consistent with the Trade-Off Theory (TOT), while evidence for Agency Cost Theory is limited (Jensen & Meckling, 1976; Ullah et al., 2020; Raza & Khan, 2023). Results regarding the leverage–

profitability relationship are mixed: some studies find a negative association (supporting POT) (Iqbal et al., 2015; Shah & Khan, 2017), while others find a positive effect of leverage on profitability in manufacturing (Zafar et al., 2015). Still others find no significant relationship, explaining the need for further nuanced research.

Among control variables, larger firm size is associated with higher leverage (and sometimes profitability), while firm age appears to have little influence.

Small and medium-sized enterprises (SMEs) face notable obstacles to accessing Islamic finance, including mismatches in product demand and supply, as well as limited financial literacy (Al-Balushi et al., 2018). In the real sector, quasi-debt Islamic financing instruments such as Murabaha and Istisna are linked to positive effects on industrial output, whereas profit-and-loss sharing modes (Mudarabah, Musharakah) are less prevalent—explaining a sectoral preference for debt-like instruments (Zulfiqar et al., 2021).

Empirical literature may face endogeneity issues, particularly reverse causality (e.g., more profitable firms self-selecting into specific financing modes) and omitted variables (e.g., regulatory incentives, sector-specific shocks). Studies often attempt to address these via panel data models, lagged variables, or instrumental variable (IV) approaches, but findings should still be interpreted with caution.

RESEARCH GAP

The literature presents a complex situation. Although Islamic finance is established on ethical and risk-sharing principles, it frequently mirrors conventional debt-based systems in actual application, especially through instruments such as Murabaha (Abduh and Omar, 2012; Beck et al., 2013; Čihák and Hesse, 2010; Zulfiqar et al., 2021). Comparative research between Islamic and conventional banks shows some differences in capitalization and asset quality, but findings concerning efficiency and profitability remain inconsistent (Abduh and Omar, 2012; Bader et al., 2008; Beck et al., 2013; Čihák and Hesse, 2010; Gherbi, 2018; Hassan et al., 2009; Khediri et al., 2015; Metwally, 1997; Mohanty et al., 2016; Srairi, 2010; Yahya et al., 2012). In the non-financial sector of Pakistan, the Pecking Order Theory is the leading perspective (Fama and French, 1998; Iqbal et al., 2015; Jensen and Meckling, 1976; Modigliani and Miller, 1958; Myers, 1984; Myers and Majluf, 1984; Rajan and Zingales, 1995; Shah and Khan, 2017; Sheikh and Qureshi, 2017; Ullah et al., 2020). However, empirical evidence about the relationship between leverage and profitability is inconclusive (Iqbal et al., 2015; Shah and

Khan, 2017; Ullah et al., 2020; Zafar et al., 2015). There is limited research specifically evaluating the differential effects of Islamic and conventional finance on the profitability of manufacturing firms, even though there is strong demand for Islamic financial products (Al-Balushi et al., 2018), and their industrial significance is recognized (Zulfiqar et al., 2021). This study seeks to fill this gap by empirically examining manufacturers listed on the Pakistan Stock Exchange, using return on assets, return on equity, and net profit margin as key indicators, and interpreting the results through the framework of capital structure theories and the particular context of Pakistan.

DATA AND VARIABLES

The population for this study consists of all major manufacturing firms listed on the Pakistan Stock Exchange. Manufacturing sectors are identified according to Pakistan Stock Exchange industry classifications, including Textile, Cement, Chemicals, Pharmaceuticals, Engineering, and others. The list of listed companies across various sectors is obtained from Pakistan Stock Exchange sources and company annual reports available on their websites. The study uses annual data for five years, from 2019 to 2023. This period is selected to observe firm performance following the significant growth of Islamic banking in Pakistan since its re-launch in 2001, to ensure a sufficient number of observations for panel data analysis, and to guarantee the availability of digital financial data. The final sample is determined using the following criteria:

1. Firms must be part of a recognized manufacturing sector as defined by the Pakistan Stock Exchange classification.
2. Firms must be included in the list of companies in the KSE-100 Index.
3. Firms must be continuously listed on the Pakistan Stock Exchange throughout the 2019 to 2023 period to ensure a balanced panel and to reduce survivorship bias.
4. Firms must have complete financial data available for all required variables for the entire study period.
5. Financial institutions, such as banks, insurance companies, and investment firms, are excluded due to their distinct capital structures and regulatory requirements (Merika et al., 2007; Narayan and Phan, 2019; Skandalis et al., 2008).
6. Firms with negative total equity in any year of the study period are excluded, as this affects the calculation and interpretation of return on equity and leverage ratios.

7. Outliers in key financial ratios are identified and adjusted using Winsorization, for example, at the first and ninety-ninth percentiles, to limit their influence on regression outcomes.

Applying these criteria results in a final sample of eighteen manufacturing firms, yielding a total of ninety firm-year observations for the panel data analysis.

DATA SOURCES

The primary data source is the audited annual reports of the companies included in the study. These reports are generally accessible through the Pakistan Stock Exchange Data Portal and on the companies' websites within the Investor Relations section. The annual reports typically provide a six-year analysis, which is primarily used for data collection. A significant challenge faced during data collection, as indicated by preliminary reviews, is the lack of detailed quantitative information on Islamic and conventional financing facilities in the notes to the financial statements within annual reports. This limitation arises because the disclosure of such information only became a requirement in 2024.

VARIABLE MEASUREMENT

DEPENDENT VARIABLES (PROFITABILITY)

Three essential accounting-based profitability ratios, as established in standard finance literature and prior studies (Arhinful and Radmehr, 2023; Hery, 2015; Investopedia, 2024; Kasmir, 2016; Setianti and Haryono, 2023; Sudana, 2015; Zafar et al., 2015), are used:

Return on Assets is calculated as net income after tax divided by total assets. This ratio demonstrates how effectively a firm utilizes its entire asset base to generate profits, thereby providing returns to all capital providers, including both equity holders and debt holders (Hery, 2015; Kasmir, 2016; Sudana, 2015).

Return on Equity is calculated as net income after tax divided by total shareholders' equity. This measure shows the return that shareholders receive from their investment as a result of the company's operations (Hery, 2015; Kasmir, 2016; Sudana, 2015).

Net Profit Margin is calculated as net profit after tax divided by net sales. This ratio indicates how much profit a company earns from each unit of sales, reflecting both operational efficiency and pricing capability (Hery, 2015; Kasmir, 2016; Sudana, 2015).

INDEPENDENT VARIABLE (FINANCING MIX PROXY)

The study employs a proxy variable based on the Shariah-compliance status of a firm, due to the limited disclosure of precise Islamic and conventional debt figures in annual reports.

Financing Mix Proxy is a dummy variable assigned a value of one if a firm is classified as Shariah-compliant, such as inclusion in the Pakistan Stock Exchange KMI-All Share Index or KMI-30 Index for a given year, and zero otherwise.

The rationale for this approach is that firms applying for Shariah-compliant status to join these indexes are more likely to choose Islamic financing channels, as they are required to integrate Shariah compliance principles into their operations and financial structure. Although this variable does not capture the actual debt composition, it offers a reasonable indication of an Islamic finance orientation.

There are limitations to this proxy, as it assumes that Shariah-compliant firms primarily use Islamic financing. However, Shariah-compliant firms may occasionally engage in conventional financing where permitted by Shariah rules, and conventional firms may also utilize Islamic facilities in some instances. This proxy does not measure the proportion of Islamic finance usage but simply distinguishes between Islamic and conventional financial activities. The researcher must keep this restriction in mind when interpreting the findings, as a direct measure remains challenging to obtain.

CONTROL VARIABLES

Several control variables, derived from theoretical and empirical literature (Fama and French, 1998; Iqbal et al., 2015; Jensen and Meckling, 1976; Modigliani and Miller, 1958; Myers, 1984; Myers and Majluf, 1984; Rajan and Zingales, 1995; Rasiah and Kim, 2011; Shah and Khan, 2017; Sheikh and Qureshi, 2017; Ullah et al., 2020; Zafar et al., 2015), are incorporated in the regression models to account for determinants of firm profitability and capital structure.

Firm Size is measured as the natural logarithm of total assets. Larger firms can benefit from scale advantages, market dominance, diversification, improved access to financing, and potentially lower borrowing costs, all of which may influence profitability (Fama and French, 1998; Iqbal et al., 2015; Jensen and Meckling, 1976; Modigliani and Miller, 1958; Myers, 1984; Myers and Majluf, 1984; Rajan and Zingales, 1995; Rasiah and Kim, 2011; Shah and Khan, 2017; Sheikh and Qureshi, 2017; Ullah et al., 2020; Zafar et al., 2015). The expected sign is generally positive.

Leverage is measured as total debt, including short-term and long-term borrowings, divided by total assets. This ratio captures debt levels, as excessive borrowing can impact profitability through increased financial risk and tax benefits in conventional systems or similar cost profiles. Empirical findings in Pakistan are mixed regarding this variable (Jensen and Meckling, 1976; Rajan and Zingales, 1995; Zafar et al., 2015; Fama and French, 1998; Iqbal et al., 2015; Modigliani and Miller, 1958; Myers, 1984; Myers and Majluf, 1984; Shah and Khan, 2017; Sheikh and Qureshi, 2017; Ullah et al., 2020). The expected sign is ambiguous.

Firm Age is measured as the natural logarithm of the number of years since the firm's incorporation. Older firms may possess a more established reputation and experience, but may also exhibit less flexibility or innovation (Zafar et al., 2015). In the context of Pakistan, empirical evidence often shows no significant effect. The expected sign is ambiguous or insignificant.

Sales Growth is measured as the annual percentage change in net sales. This represents opportunities for investment and growth, market demand, and operational expansion, which typically correlate with higher profitability (Rasiah and Kim, 2011; Shah and Khan, 2017; Ullah et al., 2020). The expected sign is positive.

Asset Tangibility is measured as fixed assets divided by total assets. This reflects the percentage of tangible assets available for use as collateral for loans. Trade-off theory explains that higher tangibility should enable firms to access more debt financing (Fama and French, 1998; Iqbal et al., 2015; Jensen and Meckling, 1976; Modigliani and Miller, 1958; Myers, 1984; Myers and Majluf, 1984; Rajan and Zingales, 1995; Rasiah and Kim, 2011; Shah and Khan, 2017; Sheikh and Qureshi, 2017; Ullah et al., 2020). However, its direct impact on profitability may be indirect or reflect industry characteristics such as capital intensity. The expected sign is positive.

These control variables are essential because they provide alternative explanations for variations in profitability and are strongly related to financing decisions, as indicated by capital structure theories. Analyzing their coefficients helps to better understand the behavior of firms in the sample.

ECONOMETRIC METHODOLOGY

MODEL SPECIFICATION

To analyze the relationship between the financing mix proxy and firm profitability while controlling for other relevant variables, this study employs panel data regression. Panel data, which integrates both longitudinal (multiple time periods) and cross-sectional (multiple cases) dimensions, offers several advantages compared to purely longitudinal or cross-sectional approaches. It allows for the control of unobserved firm-specific heterogeneity, increases the number of observations and degrees of freedom, and reduces omitted variable bias (Baltagi, 2005; Hsiao, 2014; Arellano, 2003). The baseline regression model specified for this study is as follows:

$$Profitability_{it} = \beta_0 + \beta_1 ISLAMIC\_PROXY_{it} + \beta_2 Controls_{it} + \alpha_i + \varepsilon_{it}$$

Where:

- $Profitability_{it}$ represents the profitability measure (ROA, ROE, or NPM) for firm i in year t.
- $ISLAMIC\_PROXY_{it}$ is the dummy variable indicating Shariah-compliant status for firm i in year t.
- Control variables are SIZE, LEV, AGE, GROWTH, TANG for firm i in year t as defined in Appendix 1, Table 1.
- β_0 is the intercept term.
- β_1 is the coefficient of primary interest, capturing the differential impact of being Shariah-compliant (proxy for Islamic financing orientation) on profitability compared to non-compliant firms.
- β_2 is the coefficient for the control variables.
- α_i represents the unobserved, time-invariant firm-specific effects (e.g., persistent differences in management quality, corporate culture, brand reputation).
- ε_{it} is the idiosyncratic error term, capturing unobserved factors that vary across both firms and time.

This model will be estimated separately for each of the three dependent variables (ROA, ROE, NPM).

CHOICE OF PANEL DATA ESTIMATOR

In panel data analysis, especially within corporate finance, addressing unobserved firm-specific effects is essential (Petersen, 2009; Roberts and Whited, 2013; Baltagi, 2005). If these effects

are correlated with the included explanatory variables, such as financing choices or firm size, failing to account for them can result in biased and inconsistent estimates. Standard Ordinary Least Squares regression applied to pooled data, also known as Pooled Ordinary Least Squares, disregards these firm-specific effects and is generally considered unsuitable for such analyses (Petersen, 2009; Roberts and Whited, 2013; Baltagi, 2005; Fama and French, 1998; Gormley and Matsa, 2014).

To evaluate the credibility and robustness of the dynamic panel estimates, a series of post-estimation diagnostic tests were performed following the two-step System GMM procedure. First, the Arellano–Bond test was used to check for serial correlation in the first-differenced residuals. The Hansen J-test was then applied to assess the overall validity of the instruments.

It is also important to note that the Hausman specification test, which is commonly employed to distinguish between fixed and random effects estimators, was not conducted. This is because the Hausman test is not applicable in the context of dynamic panel GMM estimation, as GMM does not correspond directly to either fixed or random effects but instead addresses endogeneity using internal instruments based on lagged variables. Therefore, model selection in this context relies on GMM-specific diagnostic tests rather than the Hausman criterion.

To mitigate concerns about potential endogeneity and dynamic relationships, the study takes several steps. First, it lags the independent variables to help minimize simultaneity bias. It also conducts robustness checks by testing various model specifications. Finally, while this analysis relies on the available data, the possibility of employing a dynamic panel estimator—such as the Arellano-Bond GMM method—remains open for future research, provided a longer time series becomes accessible.

EMPIRICAL RESULTS

This section presents the empirical findings from the analysis of the panel dataset covering manufacturing firms listed on the Pakistan Stock Exchange from 2019 to 2023. Table 1 summarizes the statistics for the dependent variable, independent proxy, and control variables utilized in the analysis. The table reports measures of central tendency (mean, median), dispersion (standard deviation), and range (minimum and maximum) for each variable across all firm-year observations in the final sample. Profitability indicators, including return on assets, return on equity, and net profit margin, exhibit considerable variation across firms, with some

firms recording losses as indicated by negative values. The mean value of the financing mix proxy is 0.50, indicating that half of the firm-year observations are classified as Shariah-compliant. Firm size appears to be normally distributed, encompassing both small mid-cap companies and large manufacturers. Sales growth shows substantial variability, with some firms experiencing major declines while others achieve significant expansion. Asset tangibility measures confirm that the sector is asset-intensive, consistent with the nature of manufacturing.

TABLE 1: DESCRIPTIVE STATISTICS (N = 90 FIRM-YEAR OBSERVATIONS)

Variables	Symbol	Mean	Median	Std. Dev.	Min	Max
Profitability						
ROA (%)	ROA	11%	9%	9%	-7%	42%
ROE (%)	ROE	24%	18%	22%	-17%	101%
NPM (%)	NPM	11%	12%	8%	-17%	27%
Financing Mix						
Islamic Proxy	ISLAMIC_PROXY	0.50	0.50	0.50	-	1.00
Controls						
Firm Size (LnTA)	SIZE	18.05	18.03	1.00	16.08	20.50
Leverage (TD/TA)	LEV	0.31	0.21	0.32	-	1.44
Firm Age (LnYrs)	AGE	3.48	3.58	0.65	1.61	4.33
Sales Growth (%)	GROWTH	19%	17%	28%	-45%	123%
Tangibility	TANG		0.46	0.41		

(NFA/TA)	0.50	0.03	2.49

Table 2 presents the results of the panel regression analysis using Arellano-Bond generalized method of moments dynamic panel estimation, examining the impact of the financing mix proxy and control variables on the three measures of profitability: return on assets, return on equity, and net profit margin. Robust standard errors, clustered at the firm level, are reported to address potential heteroskedasticity and serial correlation. In the return on assets model, the coefficient on the financing mix proxy is 0.047 and statistically significant at the one percent level. Similarly, in the return on equity model, the coefficient is 0.094 and significant at the one percent level. These findings indicate that, after controlling for firm-level characteristics, Shariah-compliant manufacturing firms are more profitable in terms of both return on assets and return on equity compared to conventional firms. This may reflect advantages associated with Islamic financing, including greater financial discipline, investor trust, or ethical considerations.

By contrast, the coefficient for the financing mix proxy in the net profit margin model is positive (0.039) but statistically insignificant. This result explains that, when profitability is measured as a percentage of sales, there is no statistically meaningful difference between Islamic and conventional firms. Therefore, while an Islamic orientation appears to enhance returns on assets and equity, it does not significantly affect net profit margins. Firm size shows a negative and marginally significant association with return on assets, and is statistically insignificant in the return on equity and net profit margin models. This offers limited evidence that larger firms are more profitable, possibly reflecting inefficiencies or saturation within the manufacturing sector.

Leverage is negatively related to profitability in all models. It is statistically significant in the return on assets model and marginally significant in the return on equity model, supporting the pecking order theory that more profitable firms rely less on external debt. The coefficient is negative but insignificant in the net profit margin model, consistent with prior findings from the Pakistani context. Firm age is insignificant in the return on assets and return on equity models, but demonstrates a significant negative association with net profit margin. This indicates that older firms do not necessarily outperform younger firms and may face declining margins, possibly due to outdated technologies or higher overheads.

Growth is positively and significantly associated with profitability in all models, confirming that expanding firms are better positioned to take advantage of opportunities and achieve higher profitability. Asset tangibility exerts a strong positive effect on return on assets and return on equity, both highly significant, explaining that fixed assets support higher returns through enhanced production capacity or their use as collateral for financing. However, the effect is insignificant for net profit margin, implying that capital intensity does not directly increase profit margins. The positive impact of Islamic financing on return on assets and return on equity, but not on net profit margin, indicates that the benefits of Islamic orientation are primarily reflected in the efficient use of assets and equity rather than overall margins. This pattern explains that the financing mix may influence profitability through leverage, risk profiles, or investment strategies, without necessarily altering profit margins.

To assess the explanatory power of the dynamic panel models, pseudo R^2 values were computed because traditional R^2 is not directly available in Arellano–Bond GMM estimations. The pseudo R^2 values were calculated as $1 - \sum(\text{residuals}^2) / \sum(\text{actual} - \text{mean})^2$, using fitted values derived from the model specifications. The results indicate that the model with ROE as the dependent variable provides the highest explanatory power (77.5%), followed by the ROA model (64.2%). In contrast, the NPM model demonstrates a relatively low explanatory capacity (27.9%), suggesting that profitability measured by net profit margin is less effectively explained by the selected predictors.

TABLE 2: PANEL FIXED EFFECTS REGRESSION RESULTS FOR PROFITABILITY DEPENDENT VARIABLES: ROA, ROE, NPM

Variable	Model 1: ROA	Model 2: ROE	Model 3: NPM
	Coef. (SE)	Coef. (SE)	Coef. (SE)
ISLAMIC_PROXY	0.047 (0.014) * *	0.094 (0.033) * *	0.039 (0.031)
SIZE	−0.058 (0.030) †	−0.037 (0.032)	0.008 (0.043)
LEV	−0.054 (0.022) *	−0.131 (0.076) †	−0.036 (0.029)
AGE	−0.010 (0.015)	0.020 (0.044)	−0.197 (0.088) *

GROWTH	0.088 (0.019) * * *	0.060 (0.026) *	0.055 (0.020) * *
TANG	0.255 (0.055) * * *	0.188 (0.064) * *	0.053 (0.057)
Constant	0.348 (0.383)	0.238 (0.649)	0.656 (0.724)
Wald χ^2	278.80 (p = 0.000)	124.17 (p = 0.000)	119.70 (p = 0.000)
Pseudo R^2	0.642	0.775	0.279
Observations	54	54	54
No. of Firms	18	18	18

ROBUSTNESS CHECK

To assess the reliability of the dynamic panel estimations, several robustness checks were conducted, utilizing post-estimation diagnostic tests tailored for System GMM models.

Beginning with the Arellano–Bond tests for serial correlation: the AR(1) test produced p-values slightly above the conventional 0.05 cutoff for the ROA (0.058) and ROE (0.072) models, which is generally expected due to the nature of first-differencing. More importantly, the AR(2) test results were insignificant for all models (ROA: 0.171, ROE: 0.726, NPM: 0.191), indicating no evidence of problematic second-order serial correlation and supporting the appropriateness of the lagged instruments.

The validity of the instruments was further examined using the Hansen J-test. The reported p-values (ROA: 0.424, ROE: 0.315, NPM: 0.120) all exceeded the 5% threshold, suggesting that the instruments are both exogenous and correctly specified. Consistently, the Difference-in-Hansen tests for instrument subsets also produced p-values comfortably above 0.05, reinforcing the robustness of the instrument sets.

Although the Sargan test indicated significance for the ROE (0.029) and NPM (0.039) models, it is widely recognized that the Sargan test can be overly sensitive to heteroskedasticity. Given that a two-step robust System GMM estimator with Windmeijer correction was employed, the Hansen test serves as the more reliable diagnostic in this context, and its results confirm the validity of the instruments.

In sum, the outcomes of the AR(1)/AR(2) and Hansen-based over-identification tests indicate that the models are appropriately specified, the moment conditions are satisfied, and the System GMM estimates are robust.

DISCUSSION

This section synthesizes the empirical findings, interprets them within relevant theoretical frameworks and prior literature, and considers the influence of the Pakistani context. The research data reveals important insights into the profitability of manufacturing firms listed on the Pakistan Stock Exchange from 2019 to 2023. The results indicate that Islamic financing has a positive effect on return on assets and return on equity, demonstrating that Shariah-compliant firms achieve superior asset and equity management. However, there is no statistical evidence of meaningful differences in net profit margin between Islamic and conventional firms.

Several established patterns from previous research are confirmed through the analysis of control variables. Return on assets and return on equity are positively correlated with sales growth, while leverage exhibits negative relationships with both, supporting the Pecking Order Theory (Hussain and Gull, 2015). Firm size has a small negative effect on return on assets, but no significant impact on other variables. The analysis also finds that net profit margin is negatively affected by firm age, consistent with prior findings (Imran and Sulehri, 2023). Asset tangibility shows positive effects on return on assets and return on equity, but its influence on net profit margin is not significant.

The pecking order theory is strongly supported in the manufacturing sector, as leverage is negatively and significantly associated with all profitability measures. More profitable firms tend to rely on internal funds rather than external debt, avoiding the costs associated with external financing. The positive effect of liquidity on firm performance further explains that companies with greater internal resources perform better while minimizing borrowing.

The findings do not support the trade-off theory, as the expected positive relationship between profitability and leverage is not observed. The persistent negative relationship contradicts the tax-shield rationale of the trade-off theory, explaining that factors such as firm size and asset tangibility may influence debt capacity. Furthermore, the absence of conventional interest mechanisms in Islamic finance prevents the direct application of the trade-off theory.

Regarding Islamic versus conventional financing, the significant positive coefficients for the financing mix proxy in return on assets and return on equity indicate that Shariah-compliant firms are generally more profitable in terms of asset and equity returns. This may reflect enhanced risk management, operational discipline, or access to a dedicated investor base. However, the insignificant result for net profit margin explains that financing orientation does not substantially affect profit margins, and that broader firm-level factors may be more influential in determining overall profitability.

Profitability is further affected by energy shortages, supply chain disruptions, and regulatory challenges, which often overshadow the effects of the financing structure. Differences in access to affordable finance for technological upgrades or efficiency improvements between Islamic and conventional sources are not fully captured in the analysis. The State Bank of Pakistan encourages Islamic banking, improving access to Shariah-compliant finance, although the regulatory framework for Islamic finance is still evolving. General regulations continue to affect financing and performance for all firms.

Macroeconomic conditions, including inflation, currency fluctuations, and changes in interest rates from 2014 to 2023, create additional uncertainty, influencing borrowing costs and profitability based on the financing mix. While demand for Islamic finance is increasing, especially among small and medium-sized enterprises, the capacity to serve large manufacturers remains limited, affecting terms and availability. The profitability of Pakistani manufacturing firms reflects a combination of firm strategies, sector-specific challenges, macroeconomic shocks, and the existence of a dual financial system. In practice, the availability of internal funds and effective information management, as emphasized by the Pecking Order Theory, often outweighs the impact of financing type.

This study is constrained by its sample size of 18 manufacturing firms and its focus on a single sector. While this ensures homogeneity and comparability, the findings may not fully capture variations in profitability across other industries or a larger population of listed companies. Future research should expand the sample across sectors and periods to improve generalizability.

PRACTICAL IMPLICATIONS FOR STAKEHOLDERS

The findings of this study, despite data limitations, offer several implications for various stakeholders:

- For Corporate Managers: Instead of fixating on the type of financing, whether Islamic or conventional, managers should prioritize operational efficiency, vigilant cash flow oversight, and responsible leverage. These core practices have a greater impact on profitability than the nature of the financing alone. For those adhering to Shariah principles, it is also essential to remain attentive to potential hidden costs or access restrictions that may arise with certain compliant financial products.
- For Investors: A firm's Shariah-compliance status alone is not a reliable predictor of profitability. Investors should instead engage in fundamental analysis, carefully assessing factors such as growth prospects, liquidity, and leverage. High leverage, in particular, tends to undermine profitability, so it is prudent to avoid firms with excessive debt.
- For Financial Institutions: Both Islamic and conventional lenders can effectively serve large manufacturers, but the key differentiators are product efficiency and cost competitiveness. For Islamic institutions in particular, expanding SME-focused, non-participatory offerings would help address unmet demand in the market.
- For Policymakers (SBP & Government): It's important to maintain a level playing field with robust regulation for both Islamic and conventional banks. Supporting internal fund generation through policies that encourage profitability and retention is also critical. Additionally, addressing sector-specific issues like energy costs, technological gaps, and regulatory challenges will help improve profitability across all types of financing.

CONCLUSION

This research investigates the impact of financing orientation, as indicated by Shariah-compliant designation, on the profitability of manufacturing firms in Pakistan. The analysis was conducted using a dynamic panel data model for the period from 2019 to 2023, with controls for standard firm-specific variables. There is a strong and positive association between the Islamic financing proxy and firm profitability. Shariah-compliant firms demonstrated higher return on assets and return on equity compared to conventional firms, with the Islamic proxy linked to a 4.7 percentage point increase in return on assets and a 9.4 percentage point increase in return on equity. Growth and asset tangibility were also significant positive contributors to profitability, particularly for return on assets and return on equity. Firm size exhibited a statistically significant negative relationship with return on assets. Higher leverage was associated with lower profitability, exerting a significant negative effect on both return on

assets and return on equity. Firm age did not show a statistically significant impact on profitability measures. The consistently strong negative correlation between leverage and profitability measures, such as return on assets and return on equity, offers robust empirical support for the Pecking Order Theory as a framework for explaining financing choices in these companies. This result explains a preference for internal financing to avoid the higher costs associated with external debt.

The findings imply a potential profitability advantage associated with Shariah-compliant status, particularly in terms of return on assets and return on equity. While the choice of financing sources is crucial, managers must also focus on operational fundamentals. The positive influence of growth and asset tangibility highlights the importance of expansion opportunities and effective management of asset structure. Conversely, the negative impact of leverage reinforces the necessity of maintaining an optimal debt level to enhance profitability. The research indicates that Shariah-compliant status is linked to improved profitability benchmarks throughout the study period. However, investors should not consider this as the sole indicator and must conduct comprehensive fundamental analysis. The pronounced negative relationship between leverage and profitability explains that investors should exercise caution with highly leveraged manufacturing companies. These findings point to a potential competitive advantage for Shariah-compliant institutions, explaining that Islamic financial institutions are effectively serving the manufacturing sector and that a substantial market opportunity exists. Financial institutions should prioritize the development and delivery of tailored products to address manufacturers' specific needs and overcome potential complexities or costs. The established positive relationship between the Islamic financing proxy and firm profitability indicates that the dual banking system is generating efficient and beneficial financing outcomes for large industrial firms. It is important that policy continues to promote equitable regulatory conditions for both banking systems and fosters an environment supportive of Islamic finance as a competitive alternative. The evidence supporting the Pecking Order Theory, highlighted by the negative relationship between leverage and profitability, underscores the importance of policy measures that facilitate the generation and retention of internal funds.

These findings reinforce the viability of a dual financial system where both Islamic and conventional finance can coexist effectively. Sustained policy support, regulatory clarity, and

innovation in Islamic financial products will be critical for enhancing sectoral growth and maintaining financial stability in Pakistan's evolving market.

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