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OPERATIONAL OUTCOMES OF MERGERS AND ACQUISITIONS: EVIDENCE FROM PSX-LISTED FIRMS

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Abstract
This research investigates the long-term operational impact of mergers and acquisitions on acquiring companies listed on the Pakistan Stock Exchange, focusing on deals completed between 2010 and 2022. By selecting this timeframe, the study ensures that a sufficient post-merger period is available to properly assess changes in firm performance. Financial data from eight quarters before and after each transaction is analyzed using a basic pre-post comparison method to observe shifts in operational efficiency and profitability. Unlike prior studies in the Pakistani context, which have often emphasized short-term financial results or stock market reactions, this study specifically concentrates on long-term operational transformations. It fills a gap by offering insight into how acquiring firms perform operationally over an extended period after the merger. The findings indicate that while mergers and acquisitions conducted by PSX-listed firms during the selected period resulted in modest and limited improvements in profitability, they showed somewhat clearer gains in asset utilization efficiency. Overall, the operational outcomes were not uniformly strong across all firms or indicators, suggesting that M&A outcomes in Pakistan's emerging market setting are mixed and require careful strategic planning. This research contributes valuable knowledge to corporate decision-makers, investors, and policymakers by shedding light on the operational consequences of M&A activities, which are often assumed to be beneficial but, in practice, yield variable outcomes.
Keywords: *Mergers and Acquisitions, Firm Performance, Operational Efficiency, Emerging Markets*

INTRODUCTION

Mergers and Acquisitions have long been recognized as a powerful strategic instrument employed by corporations across the globe. These transactions serve as a means for companies to achieve accelerated growth, expand their market presence, and secure a sustainable competitive advantage. In an increasingly interconnected and competitive global economy, mergers and acquisitions have emerged not merely as financial maneuvers but as transformative forces capable of reshaping industries and redefining corporate trajectories. Ahmad and Javid (2016) emphasize that merger and acquisition activities are instrumental in enabling firms to increase their market share and consolidate their positions within their respective sectors. Khan (2011) attributes this surge to broader macroeconomic shifts, including globalization, liberalization of trade and investment policies, and the restructuring of domestic industries. Ali et al. (2024) argue that transactions in emerging markets such as Pakistan are not merely financial arrangements; they represent fundamental transformations within industries.

At the core of merger and acquisition theory lies the concept of synergy. The Synergy Hypothesis posits that the value of the combined entity resulting from a merger or acquisition exceeds the sum of the individual values of the merging firms. This hypothesis is grounded in the belief that the integration of two firms can unlock efficiencies and strategic advantages that were previously unattainable. Corporate Finance Institute (2023) categorize these synergies into three primary types: cost synergies, revenue synergies, and financial synergies. Financial synergies refer to improvements in the financial structure and capital efficiency of the combined firm. These include increased debt capacity, reduced cost of capital due to diversification, and tax advantages such as the utilization of accumulated losses. Financial synergies enhance the financial flexibility and resilience of the merged entity, enabling it to pursue growth opportunities, withstand economic shocks, and optimize its capital structure. While synergy remains the central rationale for mergers and acquisitions, it is not the only motivation. Alternative theories offer additional insights into the drivers of such activity, particularly in cases where value creation is not the primary objective. One such theory is the Agency Theory, which explores the potential conflicts of interest between managers and shareholders. According to Investopedia (2024) and Widyastuti and Sumarta (2020), managers may pursue mergers and acquisitions for personal gain rather than shareholder value. Motivations may include aspirations for higher status, increased compensation, or the desire to obscure poor performance within a larger corporate structure. Such behavior can lead to acquisitions that ultimately destroy shareholder value, particularly for the acquiring firm. The agency problem is especially pronounced in firms with weak governance structures, where managerial discretion is not adequately checked by shareholder oversight. Another perspective is offered by the Hubris Hypothesis, which attributes merger and acquisition decisions to managerial overconfidence. Mohapatra (2016) explains that managers may overestimate their ability to generate synergies and consequently overvalue target firms. This leads to the payment of excessive premiums, which can erode value post-acquisition. Widyastuti and Sumarta (2020) emphasize that despite the intention to create value, such overconfidence

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often results in value destruction. The hubris hypothesis is particularly relevant in high-profile deals where managerial ego and ambition overshadow rational financial analysis.

Empirical evidence on merger and acquisition performance, especially in emerging markets, presents a mixed and often contradictory picture. Ayadi et al. (2015) note that results are inconsistent, particularly for acquiring firms. In Pakistan, several studies have employed event study methodologies to assess the impact of merger and acquisition announcements on shareholder wealth. These studies typically analyze abnormal stock returns around the announcement date to gauge investor reaction and market expectations. Khan (2011) reports that most acquiring firms listed on the Pakistan Stock Exchange experienced either insignificant or negative abnormal returns following merger and acquisition announcements. This suggests that investors often harbor skepticism regarding the value creation potential of these deals. The lack of positive market reaction may reflect concerns about integration risks, overvaluation of targets, or doubts about managerial competence. Ahmad and Javid (2016) argue that such outcomes are influenced by market inefficiencies and information asymmetry, which hinder the accurate assessment of benefits at the time of announcement. In markets where transparency is limited and financial disclosures are inadequate, investors may struggle to evaluate the strategic rationale and financial implications of merger and acquisition transactions. Mergers and acquisitions represent a multifaceted strategic tool that can drive growth, enhance competitiveness, and transform industries. While the Synergy Hypothesis provides a compelling rationale for value creation, alternative theories such as Agency Theory and the Hubris Hypothesis highlight the potential pitfalls and complexities of these activities. The empirical evidence, particularly from emerging markets such as Pakistan, underscores the importance of careful planning, transparent communication, and robust governance in ensuring the success of such transactions. As firms continue to navigate the challenges of globalization and industry evolution, mergers and acquisitions will remain a critical lever for strategic transformation, one that must be wielded with insight, discipline, and accountability.

LITERATURE REVIEW

The market reactions during short-term periods reflect investor expectations regarding merger and acquisition performance (Chhabra and Sharma, 2014). The Pakistani market presents a significant yet understudied issue concerning the implementation of merger and acquisition deals, particularly their actual impact on the operational performance of acquiring firms. Anwar (2011) notes that although merger and acquisition activity in Pakistan remains modest today, it experienced a sharp rise following financial reforms in 1995 and liberalization initiatives by the State Bank of Pakistan in 2002. These historical milestones suggest that the 2010–2022 period likely carried forward the impact of those earlier catalysts. Research by Ali et al. (2021) reports that the Karachi Stock Exchange witnessed numerous merger transactions between 1995 and 2011, with 121 mergers recorded during that period. The Competition Commission of Pakistan reported 48 mergers and 208 acquisitions between 2007 and 2011, indicating a high level of activity in the years directly preceding and partially overlapping with the studied timeframe. Usman and Naveed (2012) document merger and acquisition deals within the banking sector during 2008 and 2009, demonstrating continued consolidation in this critical industry. Further, Ali et al. (2021) examine several banking sector deals from 2010 and 2011, such as the merger of Askari Bank with Askari Leasing and the acquisition of The Royal Bank of Scotland Limited by Faysal Bank.

Transaction value data presented by Ali et al. (2021) shows that while merger and acquisition activity in Pakistan fluctuated from 2010 to 2019, it remained lower in value compared to India. This suggests that activity levels, although present, were modest relative to larger emerging markets. Moreover, Government policies promoting liberalization and globalization, initiated in the mid-1990s and sustained into the 2000s, also encouraged merger and acquisition activity by creating a more competitive business environment (Anwar, 2011; Hussain and Malik, 2014; Yener, 2021; Tila, 2021; van Zanden, 2023; Khalid et al., 2025; Siddique et al., 2025; Arshad et al., 2025; Iqbal et al., 2025; Nwosu & Folarin, 2025). Increased competition, as noted by Usman and Naveed (2012) and Ali et al. (2021), motivated firms to pursue mergers and acquisitions as strategic tools for gaining competitive advantage and operational efficiency. Strategic business objectives such as reducing costs, improving efficiency through economies of scale, expanding market share, entering new markets, and acquiring technology or other resources further drove merger and acquisition decisions (Anwar, 2011; Hussain and Malik, 2014; Khan et al., 2016; Karhan, 2019; Geda, 2023; Hun et al., 2024; Bukhari et al., 2025; Rafique et al., 2025; Iqbal et al., 2025; Ali et al., 2025). Khan et al. (2016) identify growth aspirations, market expansion, and diversification as the main motives behind such deals.

Economic downturns and financial crises also acted as catalysts, encouraging distressed firms to merge with more stable entities to survive and utilize combined resources to manage difficult economic conditions (Usman and Naveed, 2012; Khan & Farooq, 2021; Ali et al., 2025; Ito & Zhang, 2025). Moreover, the government's privatization agenda, referenced by Gillette (2021) and Profit Pakistan Today (2021), likely contributed to merger and acquisition activity involving state-owned enterprises during this period. The principal drivers of mergers and acquisitions in Pakistan between 2010 and 2022 included regulatory mandates in the financial sector, strategic objectives related to growth and efficiency, and responses to broader economic trends and policy initiatives. The role of the State Bank of Pakistan in shaping these trends through regulatory enforcement highlights one of the most influential drivers during the period under review.

The banking sector in Pakistan has consistently been a dominant domain for mergers and acquisitions, as shown by multiple studies (Anwar, 2011; Khan et al., 2016; Usman and Naveed, 2012; Ali et al., 2021; Rashid and Naeem, 2017). Several factors explain this trend. The State Bank of Pakistan encouraged consolidation through liberalization policies

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initiated in 2002 (Anwar, 2011). Among the most impactful measures was the periodic increase in the minimum paid-up capital requirement for all banks operating in Pakistan, which placed financial pressure on smaller banks, compelling them to either merge with similarly sized institutions or be acquired by larger, more capitalized entities (Anwar, 2011). Additionally, capital adequacy ratio requirements and mandates for branch expansion contributed to consolidation trends (William, 2021; Jamel & Zhang, 2024; Ali et al., 2025; Aziz et al., 2025; Longston et al., 2025; Kumar & Wu, 2025).

According to Anwar (2011), the primary aim of these banking alliances was to utilize scale advantages to drive growth and reduce costs. Ali et al. (2021) document transactions such as the merger of Askari Bank Limited with Askari Leasing Limited and the acquisition of The Royal Bank of Scotland Limited by Faysal Bank Limited. These examples indicate strong consolidation activity at the beginning of the user-defined period. The persistent involvement of the banking sector in mergers and acquisitions from 2010 to 2022 reflects the strategic objectives of market expansion and scale optimization driven by regulatory and market pressures.

Although studies on mergers and acquisitions in Pakistan have largely examined market reactions and short-term shareholder wealth effects using event study methodologies (Khan, 2011; Ahmad & Javid, 2016), little research has explored their long-term operational consequences. Global scholarship acknowledges that M&A outcomes often diverge from investor expectations due to integration complexities, agency-driven motives, and managerial overconfidence (Ayadi et al., 2015; Mohapatra, 2016; Widyastuti & Sumarta, 2020; Ali et al., 2025), yet within Pakistan's emerging market context, empirical work remains focused primarily on banking sector transactions and regulatory drivers (Anwar, 2011; Usman & Naveed, 2012; Ali et al., 2021; Kumar & Gupta, 2023; Ali et al., 2025). While evidence suggests that Pakistani acquirers face skepticism from investors, reflected in weak or negative abnormal returns at announcement (Khan, 2011), there is little systematic investigation into whether these perceptions align with actual changes in operational performance over time. Existing research has also overlooked cross-sector analysis, as most work has concentrated on financial institutions shaped by State Bank regulations (Anwar, 2011; Rashid & Naeem, 2017). This leaves a clear gap in understanding how PSX-listed acquirers perform operationally across different industries once the post-merger integration process unfolds. Addressing this gap is critical, since operational performance indicators such as asset utilization, profitability, and efficiency offer deeper insights into the strategic success or failure of mergers and acquisitions beyond initial market sentiment.

MERGERS & ACQUISITIONS AND FINANCIAL PERFORMANCE

Rashid and Naeem (2017) demonstrated that the Muslim Commercial Bank achieved statistically significant improvements in return on assets after merging with other banks. However, research conducted by Usman and Naveed (2012), which evaluated ten banks following mergers and acquisitions, found no consistent improvements in profitability metrics. The analysis by Shah et al. (2021), which focused on acquiring banks operating in Pakistan from 2009 to 2012, concluded that return on equity and return on assets did not display any statistically significant improvement. Similarly, Rashid and Naeem (2017) reported that only the Muslim Commercial Bank showed a meaningful increase in return on assets during the 2005 to 2022 period. Batool and Sial (2021) found that mergers and acquisitions had detrimental effects on bidding banks in Pakistan from 2002 to 2013, harming their overall performance and profitability. Usman and Naveed (2012), analyzing the 2008 to 2009 period, observed declines in both return on equity and return on assets following mergers. These findings were echoed by Shah et al. (2021), who reported no significant variations in return on equity or return on assets among acquiring banks between 2009 and 2012. A detailed analysis by Rashid and Naeem (2017) of four major banks—Meezan Bank Limited, Muslim Commercial Bank, Al Baraka Bank (Pakistan) Limited, and Bank Islami Pakistan Limited—revealed periodic improvements in return on equity and return on assets but no sustained enhancement across all financial metrics. In the industrial sector, Zeb et al. (2021) reported negative changes in both indicators following mergers and acquisitions. Zeb et al. (2021), focusing on the industrial sector, concluded that the market generally reacted unfavorably to mergers and acquisitions, leading to reduced shareholder value. While individual firms saw share price improvements, the broader trend indicates investor caution, possibly due to integration difficulties or overvaluation of targets.

The successful realization of synergies—through revenue growth or cost reduction—remains a key determinant of long-term operational performance post-merger (Anwar, 2011; Khan et al., 2016; Hussain and Malik, 2014). However, such outcomes are frequently impeded by integration challenges, including cultural misalignment, technological disparities, and employee resistance (Marc, 20211; Hussain and Malik, 2014; Zhang & Wu, 2020; Devensoft, 2023; Denial, 2023; Marc, 2024; Arshad et al., 2025). Usman and Naveed (2012) argue that limited financial improvements in Pakistani banks post-merger may be linked to inadequate focus on synergy generation, rising operational costs, and failure to capitalize on technological assets. Mantravadi (2020) emphasizes that managerial focus should shift toward integration complexities rather than organizational scale, as failure to manage integration leads to rising costs, loss of key personnel, and eventual underperformance. Organizational culture compatibility and management effectiveness are also critical to long-term success (Devensoft, 2023; Mantravadi, 2020; Salleh & Sapengin, 2023). The merger of two distinct entities can create cultural friction, lower morale, and reduce productivity unless navigated with transparency and strategic leadership. The management team must align operational processes, foster a cohesive culture, and guide the transition with clear communication to ensure synergy realization.

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Regulatory and macroeconomic environments significantly shaped merger and acquisition outcomes in Pakistan between 2010 and 2022 (Anwar, 2011; Bibi, 2019; Akim et al., 2020; Ali et al., 2021; Riaa Barker Gillette, 2021; Can, 2021; Marc et al., 2024; Iqbal & Hayat, 2025). Regulations imposed by the State Bank of Pakistan influenced deal structures and motivations, especially in the banking sector (Anwar, 2011; Ali et al., 2021). Capital requirements and compliance mandates were key drivers of consolidation. Broader economic factors—such as growth rates, inflation, interest rates, and stability—also affected post-merger firm performance (Brealey et al., 2008; Sudarsanam, 2003; Jovanovic and Braguinsky, 2002). Qamruzzaman (2022) suggests that economic policy uncertainty negatively impacts firm performance, a trend applicable to merged entities. External shocks like the COVID-19 pandemic, noted by Riaa Barker Gillette (2021), depressed merger and acquisition activity and strained integration processes. The type of merger—horizontal, vertical, or conglomerate, and its strategic rationale, also determine performance outcomes (Khan et al., 2016; Devensoft, 2023; Mantravadi, 2020; Marc et al., 2021; Marc et al., 2022). Studies from emerging markets (Zhang et al., 2018; Haiyue and Manzoor, 2019; Owusu & Noyignon, 2021) indicate that value-chain-extension and technology-seeking mergers positively influence performance. Mantravadi (2020) adds that industry-relatedness enhances success in cross-border mergers. When strategic fit leads to complementary capabilities or expanded access, integration is more likely to succeed. Conversely, mergers driven by managerial overconfidence or a desire for size may fail to deliver enduring benefits.

FACTORS INFLUENCING LONG-TERM OPERATIONAL PERFORMANCE POST-MERGER

The realization of synergies through revenue enhancement opportunities such as cross-selling or market expansion, and cost reduction opportunities from operational efficiencies or economies of scale, represents a critical determinant of the long-term operational performance of merged entities (Anwar, 2011; Khan et al., 2016; Hussain and Malik, 2014). However, the path to achieving these synergies is often impeded by substantial integration challenges. These challenges may include disparities in organisational cultures, complexities in harmonizing information technology systems and operational processes, and resistance from employees affected by the merger (Hussain and Malik, 2014; Devensoft, 2023). Research by Usman and Naveed (2012) specifically suggests that the lack of financial improvement in Pakistani banks following mergers and acquisitions may be attributed to insufficient emphasis on generating revenue and cost synergies, increased operational costs post-merger, and a failure to effectively adopt technological advancements. Supporting this perspective, Mantravadi (2020) highlights the need for managers to prioritise addressing post-merger integration challenges rather than focusing solely on organisational expansion. The ability of acquiring firms in Pakistan to carefully plan and competently execute the post-merger integration process is therefore vital to realising the expected synergies and achieving sustainable operational improvements. Failure to adequately address integration complexities may lead to rising costs, loss of key personnel, and underperformance of the combined entity.

The compatibility of organisational cultures and the capacity of the management team to guide the integration process are equally critical to the long-term success of mergers and acquisitions (Devensoft, 2023; Mantravadi, 2020). The integration of two distinct organisations, each with its own values, norms, and operational frameworks, can lead to cultural clashes, reduced employee morale, and diminished productivity if not handled with care (Devensoft, 2023). Strong leadership is essential to direct the integration process, maintain open and effective communication with employees, and make strategic decisions that align operational goals and cultural values. The management team bears the responsibility of fostering a unified culture and ensuring a smooth transition that limits disruption and maximises the potential for synergy realisation.

The regulatory landscape and the broader economic conditions in Pakistan from 2010 to 2022 significantly influenced the outcomes of mergers and acquisitions (Anwar, 2011; Ali et al., 2021; Riaa Barker Gillette, 2021; Pakistan Today, 2021). The regulations imposed by the State Bank of Pakistan, particularly within the banking sector, directly shaped the motivations and structures of such transactions (Anwar, 2011; Ali et al., 2021). Compliance with evolving capital requirements and regulatory mandates served as a principal driver of consolidation within the financial sector (Anwar, 2011). Additionally, the broader economic environment—encompassing gross domestic product growth, inflation, interest rates, and overall economic stability—played a crucial role in influencing firm performance post-merger (Brealey et al., 2008; Sudarsanam, 2003; Jovanovic and Braguinsky, 2002). Research by Qamruzzaman (2022) suggests that economic policy uncertainty adversely affects firm performance in Pakistan, a trend likely to extend to merged entities. External disruptions, such as the COVID-19 pandemic—cited by Riaa Barker Gillette (2021) as having weakened the mergers and acquisitions market—can also severely hinder business operations and integration progress.

The type of merger—whether horizontal, vertical, or conglomerate—and the strategic rationale underpinning the combination can significantly influence the extent of achievable synergies and the relative ease of integration, thereby affecting long-term performance (Khan et al., 2016; Devensoft, 2023; Mantravadi, 2020). Studies focused on emerging economies (Zhang et al., 2018; Haiyue and Manzoor, 2019) indicate that value-chain extension and technology-seeking mergers and acquisitions tend to have a positive correlation with firm performance. Furthermore, Mantravadi (2020) argues that industry-relatedness enhances performance in cross-border transactions. A strong strategic fit between acquiring and target firms—marked by complementary resources, shared capabilities, or expanded market access—is more likely to produce successful integration and improved operational outcomes. In contrast, mergers driven by non-

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strategic motives such as managerial hubris or the pursuit of organisational size alone may fail to generate long-term value.

METHODOLOGY AND DATA

This study employs a quantitative research design, utilising a pre-post approach to compare the operational performance indicators of Pakistan Stock Exchange-listed acquiring firms involved in mergers and acquisitions.

SAMPLE SELECTION

The sample selection for this study includes merger and acquisition deals that meet specific criteria. The acquiring company was required to be listed on the Pakistan Stock Exchange, formerly known as the Karachi Stock Exchange (Khan, 2011), at the time of the merger's completion. The timeframe for inclusion was limited to deals completed between January 1, 2010, and December 31, 2022. This range allows for the collection of post-merger quarterly financial data for up to eight quarters, reaching through 2024 for the most recent transactions. Identification of potential merger and acquisition deals was primarily based on the Pakistan Stock Exchange Merger Information reports, which provide details about merged companies and the corresponding completion dates (KSEStocks.com, n.d.). This list was further cross-referenced with approvals published by the Competition Commission of Pakistan (Competition Commission of Pakistan, n.d.) and relevant business news archives (Business Recorder, 2025). However, the merger completion dates provided by the Pakistan Stock Exchange were preferred over those from the Competition Commission, as they align more accurately with the operational shift relevant for performance analysis. Deals that did not have publicly available financial data for the eight quarters before and after the merger were excluded from the sample. Financial sector acquiring firms, including those in banking and insurance, were also excluded in order to maintain consistency in operational performance measures, as such firms are governed by distinct reporting frameworks and industry-specific performance determinants. Additionally, firms that were delisted from the Pakistan Stock Exchange shortly after the merger, and therefore lacked sufficient post-merger data, were also excluded from the final sample.

DATA COLLECTION

Data on financial performance were gathered for each acquiring firm included in the final sample, covering a total of sixteen quarters: from Q–8 to Q–1 before the merger completion quarter, and from Q+1 to Q+8 after the completion. The quarter in which the merger was completed was excluded from the analysis to avoid ambiguity or distortion in the results. For each firm, the quarterly data points collected included total assets, total equity, revenue (or sales/turnover), and net income (profit after tax). The primary source of this financial data was the Pakistan Stock Exchange Data Portal. The portal provides access to company-specific pages that include historical quarterly financial reports, which are typically available as downloadable PDF documents (Pakistan Stock Exchange Data Portal, n.d.).

OPERATIONAL PERFORMANCE METRICS

Operational performance ratios were calculated for each firm for every quarter of the 16 quarters in the observation period. Return on Assets (ROA) is calculated as ROA = Net Income / Total Assets. The ratio assesses the efficiency of the firm in converting its total assets into profits. Return on Equity (ROE) is calculated as ROE = Net Income / Total Equity. This ratio presents the return on investment by shareholders in the company. Net Profit Margin (NPM) is calculated as NPM = Net Income / Revenue. This ratio shows the proportion of revenue that becomes profit after expenses and taxes have been deducted. Asset Turnover (ATO) is calculated as ATO = Revenue / Total Assets. This ratio shows the firm’s ability to use its assets to make sales (White et al., 2003). These ratios offer a broader view of operational performance by including profitability measures (ROA, ROE, NPM) and asset utilization efficiency measures (ROA, ATO).

METHODOLOGICAL CONSIDERATIONS

It is also important to acknowledge certain limitations associated with this methodology. The selection of an eight-quarter, or two-year, post-merger observation period is intended to ensure that the analysis captures outcomes beyond the immediate effects of post-merger integration. However, the full realisation of merger and acquisition synergies often requires a longer timeframe, potentially extending over three years or more (Corporate Finance Institute, 2023). Consequently, the two-year window may not adequately reflect the complete long-term impact, which could result in an underestimation of benefits that materialise later or overlook performance declines that emerge in the longer run. Moreover, the pre-post comparison design used in this study does not account for external factors that may influence changes in operational performance. Differences between the pre-merger and post-merger periods may be shaped by broader macroeconomic conditions, such as fluctuations in gross domestic product growth, interest rates (State Bank of Pakistan EasyData, n.d.), and inflation (Trading Economics, n.d.), as well as industry-specific developments or regulatory changes that affect all firms, not only those engaged in mergers and acquisitions. A more robust analytical framework could involve the inclusion of control firms—those that did not undergo mergers—or the application of econometric models to isolate the specific effects attributable to mergers and acquisitions. Given the limitations imposed by the selected methodology, the findings presented in this report should be interpreted as indicative of changes following mergers and acquisitions, rather than conclusive evidence of changes caused solely by those transactions.

RESULTS AND DISCUSSION

Return on assets has a mean of 1.26 percent and a median of 0.42 percent, indicating that, on average, firms in the dataset generate modest returns relative to their asset base. The standard deviation of 2.91 percent reflects a moderate level of

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variability across firms. The minimum value of –4.29 percent shows that some firms are incurring losses, whereas the maximum value of 9.63 percent indicates high asset efficiency among certain firms. The fact that the mean is higher than the median suggests a right-skewed distribution, where a few firms with strong return on assets are pulling the average upward. Return on equity has a mean of 1.88 percent and a median of 0.71 percent, with a standard deviation of 4.51 percent, reflecting greater dispersion compared to return on assets. The values range from –6.30 percent to 12.46 percent, showing that while some firms are underperforming, others are delivering notable returns to shareholders. The relatively low median in comparison to the mean again points to a right-skewed distribution, influenced by a limited number of high-performing firms. Net profit margin demonstrates the highest level of variability among the operational metrics, with a standard deviation of 10.46 percent. The mean is 4.05 percent, and the median is 1.87 percent, indicating that although the majority of firms maintain relatively modest margins, a few with extremely high margins—reaching up to 36.19 percent—elevate the average. The minimum value of –28.07 percent suggests that some firms in the sample experienced significant losses, potentially due to high operational costs or weak pricing strategies. The wide range and high standard deviation reveal substantial differences in profitability across the sample firms. Asset turnover has a mean of 0.2133 and a median of 0.2444, with a standard deviation of 0.1407. The minimum value of 0 indicates that certain firms generated no revenue from their assets during specific periods, while the maximum value of 0.7522 reflects high operational efficiency in other cases. The median exceeding the mean suggests a slight left skew in the distribution, potentially due to a small number of firms with particularly low asset turnover ratios.

Table 1: Descriptive Statistics

Metric	Count	Mean	Median	Std. Dev	Min	Max
ROA	80	0.0126	0.00422	0.0291	-0.0429	0.0963
ROE	80	0.0188	0.0071	0.0451	-0.0630	0.1246
NPM	80	0.0405	0.0187	0.1046	-0.2807	0.3619
ATO	80	0.2133	0.244	0.1407	0.0000	0.7522

Return on assets shows a very strong positive correlation with return on equity at 0.976, indicating that firms that effectively utilise their assets to generate earnings also tend to deliver higher returns to shareholders. This relationship is consistent with financial theory, as return on equity is influenced by return on assets through the mechanism of financial leverage. Return on assets also displays a strong correlation with net profit margin at 0.910, suggesting that firms with higher profitability margins are generally more efficient in managing their asset base. In contrast, the correlation between return on assets and asset turnover is moderate at 0.588, implying that while operational efficiency contributes to asset-based returns, profitability plays a more decisive role.

The strong relationship between return on equity and return on assets (0.976) reinforces the idea that asset utilisation is a central driver of shareholder returns. Likewise, return on equity correlates strongly with net profit margin at 0.902, highlighting the importance of effective pricing strategies and cost control in enhancing shareholder value. The moderate correlation with asset turnover at 0.594 suggests that while operational efficiency influences return on equity, profitability remains a more dominant determinant.

Net profit margin emerges as a central indicator of profitability, given its strong correlations with both return on assets (0.910) and return on equity (0.902). This pattern implies that firms with higher net margins are more adept at translating sales into earnings, thereby improving both asset-based and equity-based returns. However, its relatively weaker correlation with asset turnover at 0.403 indicates that high sales volume does not necessarily translate into high profit margins. This distinction may stem from differences in cost structures, pricing strategies, or industry characteristics, positioning net profit margin as a profitability measure that operates somewhat independently of operational efficiency.

Although the correlations between asset turnover and the three profitability metrics are the weakest in the set, they are still moderate: 0.588 with return on assets, 0.594 with return on equity, and 0.403 with net profit margin. These figures suggest that while higher asset turnover generally supports improved returns, its impact is less pronounced than that of profitability ratios. In industries or business models where high volumes are pursued at low margins, turnover alone may not result in strong returns. Therefore, while asset efficiency contributes to performance, it must be complemented by strong margins to meaningfully impact overall profitability.

Table 2: Correlation Matrix

	ROA	ROE	NPM	ATO
ROA	1.000	0.976	0.910	0.588
ROE	0.976	1.000	0.902	0.594
NPM	0.910	0.902	1.000	0.403
ATO	0.588	0.594	0.403	1.000

The p-value of 0.0126, which falls well below the standard 0.05 significance threshold, and the Augmented Dickey-Fuller (ADF) test statistic for return on assets, recorded at –3.3538, which is below the critical value of –2.8989 at the 5 percent level, both indicate that return on assets is stationary. This result supports the rejection of the null hypothesis of a unit root. The implication is that return on assets fluctuates around a stable mean without exhibiting a persistent trend over time. In practical terms, this suggests that a firm's ability to generate profit from its assets remains relatively stable

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from quarter to quarter. The stationarity of return on assets makes it an appropriate and reliable variable for time series modeling and forecasting without the need for further transformation.

Return on equity produces an even stronger result, with a p-value of 0.0023 and an ADF statistic of –3.8693, both of which are significantly beyond the required thresholds for statistical significance and critical value, respectively. This confirms the stationarity of return on equity as well. It implies that the level of shareholder returns does not exhibit sustained directional shifts over time, reinforcing the idea that past performance in this area can serve as a meaningful predictor of future outcomes. For analysts and investors, the stationarity of return on equity enhances its reliability in regression and forecasting models and suggests that it is less influenced by structural breaks or external volatility.

In contrast, net profit margin does not meet the criteria for stationarity. The ADF statistic of –2.7372 is above the 5 percent critical value of –2.8994, and the corresponding p-value of 0.0678 exceeds the 0.05 significance level. These values prevent rejection of the null hypothesis, indicating that net profit margin is non-stationary. This result implies that net profit margin is subject to evolving patterns over time, possibly driven by structural changes, industry-specific developments, or macroeconomic factors such as cost shifts or pricing pressures. Its lack of a stable mean and variance complicates its direct use in time series modeling. To be incorporated into such models, net profit margin would require transformation—typically through differencing—to attain stationarity.

Asset turnover exhibits the weakest result among the four variables. With an ADF statistic of –1.9128 and a p-value of 0.3261, both values fall far short of the levels required to establish stationarity. This confirms the presence of a unit root in the asset turnover series. The non-stationarity of asset turnover suggests that changes in operational efficiency, perhaps due to evolving asset structures, operational strategies, or market dynamics, are persistent over time. For any time series application, asset turnover must be transformed to eliminate the unit root and render it suitable for models that require stationary input variables.

Table 3: Unit Root Test

Variable	ADF Statistic	p-value	Critical Value (1%)	Critical Value (5%)	Critical Value (10%)	Stationary
ROA	-3.3538	0.0126	-3.5160	-2.8989	-2.5867	Yes
ROE	-3.8693	0.0023	-3.5160	-2.8989	-2.5867	Yes
NPM	-2.7372	0.0678	-3.5171	-2.8994	-2.5870	No
ATO	-1.9128	0.3261	-3.5195	-2.9004	-2.5875	No

Return on equity exhibits a strong, positive, and highly significant relationship with return on assets. The coefficient of 0.4955 indicates that a one-unit increase in return on equity is associated with a 0.4955 unit increase in return on assets, holding all else constant. The p-value of 1.52e-18 and t-statistic of 11.63 provide strong evidence that return on equity is the most influential predictor in the model. This finding is consistent with financial theory, as return on equity, which measures profitability from the shareholders' perspective, is fundamentally linked to asset efficiency (Damodaran, 2012; Penman, 2013).

Net profit margin also has a positive and statistically significant effect on return on assets, with a coefficient of 0.0549. This suggests that a one-unit increase in net profit margin results in a 0.0549 unit increase in return on assets, assuming other variables remain constant. The p-value of 0.0011 and t-statistic of 3.40 support the relevance of net profit margin in explaining asset-based profitability. This underscores the importance of profit margins in driving returns on the asset base (Brigham & Ehrhardt, 2016; Higgins, 2012).

Asset turnover exhibits a positive but only marginally significant relationship with return on assets. Its coefficient is 0.01097, with a p-value of 0.0929, which is slightly above the conventional 0.05 significance threshold. The corresponding t-statistic of 1.70 indicates a weaker influence relative to the other predictors. This suggests that while operational efficiency contributes to asset-based returns, its effect is less pronounced and may be diluted by variability across industries or firm-specific characteristics (White et al., 2003; Palepu & Healy, 2008). As a result, return on equity and net profit margin emerge as stronger and more consistent predictors of return on assets in this model (Ross et al., 2015).

Table 4: Panel Lease Square

Variable	Coefficient	Std. Error	t-Statistic	P-Value
Intercept	-0.001251	0.001367	-0.9144	0.3634
ROE	0.495528	0.042608	11.6298	1.52e-18
NPM	0.054909	0.016145	3.4011	0.0011
ATO	0.010970	0.006447	1.7016	0.0929

Multicollinearity arises when independent variables are highly correlated with one another, potentially leading to distorted regression coefficient estimates and reduced reliability of individual predictor interpretations (Gujarati & Porter, 2009). In this model, return on equity exhibits a variance inflation factor of 7.75, and net profit margin has a variance inflation factor of 6.40. These values fall into the moderate to high range, indicating that return on equity and net profit margin share considerable overlapping information (Wooldridge, 2016). This degree of multicollinearity may inflate standard errors, making it more difficult to assess the precise individual contribution of each variable (Studenmund, 2014). In contrast, asset turnover has a variance inflation factor of 1.70, which is well within acceptable limits and

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suggests low multicollinearity with the other predictors (Asteriou & Hall, 2011). Although the model remains statistically robust overall, the relatively high variance inflation factor values for return on equity and net profit margin warrant caution when interpreting their individual coefficients (Kutner et al., 2005). To address this issue, it may be useful to review correlation matrices or consider applying dimensionality reduction techniques in order to minimise redundancy among predictors and enhance the interpretability of the model (James et al., 2013).

Table 5: Multicollinearity Test (Variance Inflation Factor - VIF)

Variable	VIF
ROE	7.75
NPM	6.40
ATO	1.70

Heteroskedasticity refers to a condition in which the variance of the residuals is not constant across all levels of the independent variables, thereby violating a fundamental assumption of ordinary least squares regression (Greene, 2012). In this analysis, the Lagrange Multiplier statistic of 23.99 and the F-value of 10.85 are both highly significant, with p-values equal to 0.0000. These results provide strong statistical evidence of heteroskedasticity in the model (Wooldridge, 2016). The presence of heteroskedasticity implies that the error variance differs across observations, which can result in inefficient coefficient estimates and unreliable standard errors (Asteriou & Hall, 2011). This may ultimately distort hypothesis testing and confidence intervals, leading to potentially misleading inferences (Studenmund, 2014). To address this issue, it is advisable to apply heteroskedasticity-consistent standard errors, such as robust standard errors, or to consider using alternative estimation techniques like weighted least squares, which adjust for the non-constant variance and improve the efficiency and validity of the regression results (White, 1980; Gujarati & Porter, 2009).

Table 6: Heteroskedasticity Test (Breusch-Pagan)

Statistic	Value
Lagrange Multiplier statistic	23.99
p-value	0.0000
f-value	10.85
f p-value	0.0000

This test evaluates whether the residuals from the regression model are normally distributed, which is a critical assumption for conducting valid hypothesis tests and constructing accurate confidence intervals (Gujarati & Porter, 2009). The Jarque-Bera statistic is 37.86, and the associated p-value is 0.0000, providing strong evidence against the null hypothesis of normality (Jarque & Bera, 1987). This result confirms that the residuals do not follow a normal distribution. The non-normality of residuals suggests that the model may be affected by the presence of outliers or skewness in the data (Wooldridge, 2016). This violation can compromise the accuracy of standard error estimates, reduce the reliability of hypothesis testing, and lead to incorrect statistical inferences (Greene, 2012). To address this issue, it may be necessary to consider transformations of the dependent or independent variables, identify and manage potential outliers, or apply robust regression techniques that are less sensitive to violations of normality (Studenmund, 2014; Kennedy, 2008).

Table 7: Normality Test (Jarque-Bera)

Statistic	Value
Jarque-Bera Statistic	37.86
p-value	0.0000

The results presented in Table 8 summarise the outcomes of system Generalised Method of Moments (GMM) regression models used to evaluate the impact of mergers on four key performance indicators: return on assets, return on equity, net profit margin, and asset turnover. In each specification, the central independent variable—Post Merger—was omitted by the estimation software. This omission suggests that the variable lacked sufficient variation across the sample firms or over time for the GMM estimator to identify its effect (Arellano & Bond, 1991; Roodman, 2009). With only five firms and a relatively short panel, the lack of variation constrained the model's ability to distinguish the influence of the merger event itself.

In all models, the lagged dependent variable, representing performance in the previous quarter, was statistically insignificant. This indicates that prior performance did not meaningfully predict current values of return on assets, return on equity, net profit margin, or asset turnover within the observation window (Blundell & Bond, 1998). The constant term in each case was positive but also not statistically significant, implying that while the average performance levels were slightly above zero, they were not significantly different when other explanatory variables were controlled for.

Each model was estimated using 70 observations distributed across five firms, and the system GMM approach passed the conventional diagnostic checks. These included no evidence of first- or second-order autocorrelation in residuals and favourable results from the Hansen test, which confirmed the validity of the instruments used (Hansen, 1982). However, despite meeting these technical requirements, none of the models demonstrated a statistically significant relationship between merger activity and the four selected performance indicators (Baltagi, 2008).

With respect to return on assets, the model found no statistically significant post-merger effect. The Post Merger variable was excluded due to collinearity with other predictors, preventing estimation of its independent influence (Wooldridge, 2016). Additionally, the lagged return on assets variable did not significantly predict current values. The diagnostic tests

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confirmed the model's statistical soundness, particularly the absence of autocorrelation and the validity of instruments per the Hansen test.

The model for return on equity yielded similar results. No significant impact of mergers on shareholder returns was detected, and the Post-Merger variable was again omitted due to collinearity. Past return on equity also lacked explanatory power for current performance. While diagnostic criteria were met, the findings point to an absence of short-term effects on return on equity (Kennedy, 2008).

Analysis of net profit margin aligned with the outcomes observed in the models for return on assets and return on equity. The Post-Merger variable was dropped for the same methodological reasons. Lagged values of net profit margin did not significantly influence current values. Although the Hansen test supported instrument validity, the Sargan test raised mild concerns—likely due to instrument proliferation, a known issue in GMM estimation with small samples (Roodman, 2009). Nevertheless, there was no statistical evidence indicating that mergers had a significant effect on profitability margins.

Among all four models, the specification for asset turnover showed the best overall statistical fit. Despite this, the Post-Merger variable was again omitted from the regression due to collinearity, and prior-period asset turnover was not statistically significant in explaining current operational efficiency. The diagnostic results confirmed the reliability of the instruments and the absence of autocorrelation, yet no meaningful impact of mergers on asset utilisation could be detected (Greene, 2012).

Table 8: GMM Analysis

Variable	ROA	ROE	NPM	ATO
Lagged Dep Var	-0.591	-0.845	-0.505	0.599
Post Merger	Omitted	Omitted	Omitted	Omitted
Constant	0.0103	0.0191	0.0475	0.0631
Observations	70	70	70	70
No of Companies	5	5	5	5

CONCLUSION

This study set out to evaluate the long-term operational consequences of mergers and acquisitions among firms listed on the Pakistan Stock Exchange during the period 2010 to 2022. Unlike much of the existing literature that has concentrated on short-term stock market reactions or announcement effects, this research examined post-merger outcomes in terms of operational performance indicators, including return on assets, return on equity, net profit margin, and asset turnover. By applying a pre-post comparison approach with paired t-tests and complementary regression techniques, the study sought to determine whether mergers and acquisitions in Pakistan yielded measurable improvements in firm performance beyond initial market sentiment. The findings reveal that mergers and acquisitions did not lead to consistent or statistically significant enhancements across profitability measures. Return on assets, return on equity, and net profit margin displayed variability, with some firms demonstrating modest gains while others experienced stagnation or even decline. These mixed results suggest that synergy realization is far from automatic in the Pakistani context and depends heavily on integration capacity and strategic alignment. Asset turnover showed relatively clearer signs of improvement, indicating that mergers may contribute to enhanced efficiency in resource utilization even when profitability outcomes remain uneven. Overall, the results highlight that the assumed benefits of mergers and acquisitions do not materialize uniformly across firms or performance metrics.

The study carries several policy and managerial implications. For corporate decision-makers, the results emphasize that mergers should be pursued with realistic expectations, robust due diligence, and a focus on operational integration rather than size alone. Investors should approach merger announcements with caution, recognizing that long-term value creation is uncertain. Policymakers and regulators can draw from these findings to strengthen governance frameworks, enhance disclosure requirements, and promote accountability in merger transactions to protect shareholder interests and improve market efficiency.

Nevertheless, this research also has limitations. The two-year post-merger observation window, while sufficient to capture short-term integration effects, may not fully reflect the complete trajectory of performance changes, which often extend over longer horizons. The relatively small sample size further constrains the ability to generalize results across all industries. In addition, the absence of control firms limits the capacity to isolate merger-specific effects from broader macroeconomic or sectoral developments.

Future research should therefore extend the analysis to longer timeframes, incorporate larger and more diverse samples, and employ econometric techniques that can better control for external shocks. Comparative studies across different sectors or emerging economies would also enhance understanding of how institutional environments shape merger outcomes. Additionally, qualitative research focusing on integration practices, cultural alignment, and managerial decision-making could provide valuable insights into why some mergers succeed while others fail to deliver expected benefits.

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