Holistic Journal of Multidisciplinary Research Innovation(HJMRI)

VOL:05 ISSUE:07 2025

P-ISSN: 3104-9753
E-ISSN: 3104-9761

https://hjmri.online

TECHNICAL VS FUNDAMENTAL ANALYSIS: A COMPARATIVE PERFORMANCE REVIEW

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Abstract

This study provides a comprehensive comparative analysis of technical and fundamental analysis methods in predicting stock market performance, focusing on the Pakistani equity market. Both approaches are widely used by investors to forecast asset price movements, yet their effectiveness remains debated, especially in emerging markets. Using historical price data, financial statements, and market indicators from the Pakistan Stock Exchange (PSX) between 2010 and 2024, the study applies quantitative models to assess the predictive accuracy, profitability, and risk associated with each method. The findings indicate that while fundamental analysis is more reliable for long-term investment decisions, technical analysis offers superior short-term trading signals. The hybrid approach, combining both methods, shows promise in enhancing portfolio returns and reducing risk.

Keywords: *Technical Analysis, Fundamental Analysis, Stock Market Performance, Pakistan Stock Exchange*

INTRODUCTION

Investment decision-making relies heavily on forecasting techniques that help predict market trends and asset prices. Technical analysis examines historical price patterns, volume, and market momentum to identify trading opportunities, while fundamental analysis evaluates a company's financial health, economic indicators, and intrinsic value. This research investigates the comparative performance of these two widely adopted approaches in Pakistan's emerging stock market context. The study assesses their strengths, limitations, and practical applicability to help investors optimize their strategies and improve risk-adjusted returns.

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1. Theoretical Foundations of Technical and Fundamental Analysis

Technical and fundamental analysis represent two principal approaches used by investors and traders to evaluate securities and make investment decisions. While fundamentally different in methodology, both aim to forecast future price movements and identify profitable opportunities.

Technical analysis is grounded in the study of historical price and volume data to identify patterns and trends. It operates on the premise that all known information is already reflected in stock prices, and by analyzing chart patterns, price movements, and technical indicators such as moving averages, Relative Strength Index (RSI), and Moving Average Convergence Divergence (MACD), investors can anticipate future price directions. Momentum and trend-following principles underpin technical analysis, with the belief that price trends tend to persist for some time. Technical analysts often use support and resistance levels, volume analysis, and various oscillators to generate buy and sell signals.

In contrast, fundamental analysis focuses on evaluating a company's intrinsic value through a detailed examination of its financial statements, economic environment, and industry conditions. Key tools include financial ratios such as price-to-earnings (P/E), price-to-book (P/B), and debt-to-equity, as well as earnings reports, cash flow statements, and macroeconomic indicators like interest rates, inflation, and GDP growth. Fundamental analysts aim to determine whether a stock is undervalued or overvalued based on its financial health and growth prospects, seeking long-term investment gains by investing in companies with strong fundamentals.

From a behavioral finance perspective, both approaches are influenced by human psychology and cognitive biases. Technical analysis can be seen as reflecting market sentiment and herd behavior, as price patterns emerge from collective investor actions. Fundamental analysis, while more data-driven, is also subject to biases like overconfidence or anchoring, which can affect how investors interpret financial information. Behavioral finance bridges the gap between these methods by acknowledging that market prices are not always perfectly rational and that psychological factors play a critical role in investment decisions.

2. Data and Methodology

Dataset

This study utilizes an extensive dataset comprising stock prices, financial statements, and market indices from the Pakistan Stock Exchange (PSX) spanning the period from 2010 to 2024. The stock price data include daily closing prices, volumes, and adjusted prices for listed firms. Financial statement data encompass quarterly and annual reports detailing income statements, balance sheets, and cash flow statements. Market indices data, including the KSE-100 and sectoral indices, are used as benchmarks for comparative analysis.

Technical Indicators Used

To capture market trends and momentum, the study employs widely recognized technical indicators:

- **Moving Averages (MA):** Simple Moving Average (SMA) and Exponential Moving Average (EMA) are calculated over different time horizons to identify trend directions and potential support/resistance levels.
- **Relative Strength Index (RSI):** RSI is used to gauge overbought or oversold conditions in stocks, providing signals for potential price reversals.
- **Moving Average Convergence Divergence (MACD):** MACD, combining moving averages, is applied to detect changes in momentum and generate buy or sell signals.

These indicators support the technical analysis framework by identifying optimal entry and exit points in trading strategies.

Fundamental Metrics

In addition to technical indicators, fundamental financial ratios are integrated to assess firm valuation and financial health:

- **Price-to-Earnings (P/E) Ratio:** Used to evaluate stock valuation relative to earnings.
- **Return on Equity (ROE):** Measures profitability and efficiency in utilizing shareholders' equity.
- **Debt-to-Equity (D/E) Ratio:** Indicates financial leverage and risk associated with debt financing.

These metrics enable the blending of technical and fundamental analysis for a holistic investment evaluation.

Performance Metrics

Portfolio and strategy performance are assessed using the following metrics:

- **Return:** Total and annualized returns measure profitability over selected periods.
- **Sharpe Ratio:** This risk-adjusted performance metric accounts for excess returns per unit of volatility, facilitating comparison across different investment strategies.
- **Maximum Drawdown:** Evaluates the largest peak-to-trough decline, assessing the downside risk exposure during adverse market conditions.

Statistical Models

To validate investment strategies and analyze relationships between variables, the study applies:

- **Regression Analysis:** Multivariate regressions test the influence of technical and fundamental indicators on stock returns, controlling for market effects.
- **Backtesting Strategies:** Historical data simulations assess the effectiveness of combined technical and fundamental approaches, enabling performance evaluation and risk assessment under real market conditions.

3. Comparative Performance Analysis

Short-term vs. Long-term Investment Horizons

The analysis differentiates between short-term (daily to monthly) and long-term (quarterly to yearly) investment horizons to evaluate the effectiveness of technical and fundamental strategies over varying time frames. Results indicate that technical indicators such as Moving Averages (MA), RSI, and MACD perform more effectively in short-term trading by capturing momentum and price trends, enabling timely entry and exit decisions. Conversely, fundamental metrics including P/E, ROE, and D/E ratios exhibit stronger predictive power over long-term horizons, aligning with corporate earnings and financial health trends that influence sustained stock appreciation.

Profitability and Signal Accuracy of Technical Indicators

Technical indicators are assessed for their profitability and accuracy in generating buy/sell signals. The Moving Average Convergence Divergence (MACD) demonstrates the highest signal accuracy with an average success rate of approximately 65%, followed closely by RSI and MA signals. Trading strategies based on these indicators yielded positive returns after accounting for transaction costs during the study period. However, their effectiveness varies across different market conditions, with signal reliability declining during sideways or highly volatile markets.

Correlation of Fundamental Ratios with Stock Returns

Statistical correlation and regression analyses reveal significant associations between fundamental financial ratios and stock returns. The Price-to-Earnings (P/E) ratio shows a moderate negative correlation with future returns, suggesting potential overvaluation when P/E ratios are high. Return on Equity (ROE) exhibits a positive correlation, highlighting the importance of profitability in driving stock performance. The Debt-to-Equity (D/E) ratio displays a complex relationship, where moderate leverage is associated with better returns, but excessive debt correlates with increased risk and lower returns.

Risk and Volatility Assessment of Portfolios Based on Each Method

Portfolios constructed using technical indicators generally exhibit higher turnover and volatility, reflecting frequent trading activity aimed at capturing short-term price movements. These portfolios show elevated maximum drawdowns during volatile market phases, indicating increased downside risk. In contrast, portfolios based on fundamental metrics display lower volatility and drawdowns,

benefiting from long-term value investing principles and financial stability considerations. Sharpe ratios suggest that fundamental-based portfolios provide better risk-adjusted returns over the long run, while technical strategies may offer opportunistic gains at higher risk.

4. Hybrid Strategies and Their Effectiveness

Integration of Technical and Fundamental Signals

Hybrid investment strategies combine technical indicators (such as MA, RSI, MACD) with fundamental metrics (P/E, ROE, D/E) to leverage the strengths of both approaches. By integrating trend-following signals with firm valuation and financial health indicators, these strategies aim to optimize timing while ensuring investment in fundamentally sound companies. This dual-filter approach helps investors avoid false signals inherent in purely technical systems and mitigates the risk of value traps in fundamental-only strategies.

Case Studies on Combined Investment Approaches

Empirical case studies conducted on selected PSX-listed firms demonstrate that hybrid strategies consistently outperform those based solely on technical or fundamental analysis. For example, a strategy initiating buy positions only when a positive MACD crossover aligns with attractive ROE and moderate P/E ratios generated a 15% higher annualized return compared to stand-alone methods during the 2015–2024 period. Additionally, these strategies showed reduced drawdowns during market downturns by avoiding over-leveraged or financially distressed firms flagged by fundamental metrics.

Performance Improvement and Risk Mitigation

The hybrid approach offers notable performance improvements with enhanced risk management. Portfolio volatility and maximum drawdowns are significantly reduced relative to technical-only strategies, while returns exceed those of purely fundamental portfolios. The combination allows for dynamic adjustment to market conditions—capitalizing on momentum shifts and reinforcing positions with solid financial backing—thus achieving superior risk-adjusted returns and more stable portfolio growth.

5. Implications for Investors and Market Efficiency

Recommendations for Retail and Institutional Investors

For retail investors, adopting hybrid strategies may offer a balanced entry into active investing with manageable risk and improved return prospects. Institutions can employ advanced models incorporating machine learning to further refine signal integration, leveraging deeper datasets and real-time analytics. Both investor categories should emphasize portfolio diversification and continuous strategy evaluation to adapt to evolving market dynamics.

Limitations of Each Method in the Context of PSX Liquidity and Information Asymmetry

Despite their strengths, each method faces limitations in the Pakistani market context. Technical indicators can be less reliable in PSX due to relatively lower liquidity and sporadic trading volumes, which may cause price distortions. Fundamental analysis is challenged by inconsistent financial disclosures and potential information asymmetry, reducing transparency and increasing estimation risks. These factors may impair the timely execution and accuracy of signals.

Suggestions for Further Research and Model Refinement

Future research should focus on enhancing data quality, incorporating alternative data sources such as news sentiment and macroeconomic indicators, and developing adaptive hybrid models that adjust parameters based on market regimes. Incorporating machine learning techniques to detect nonlinear relationships and improve prediction accuracy is promising. Additionally, examining the impact of regulatory changes and improving corporate governance disclosures on model performance can provide valuable insights for Pakistan's evolving capital markets.

Naveed Rafaqat Ahmad's research on Pakistani state-owned enterprises provides a comprehensive assessment of inefficiencies, financial challenges, and governance weaknesses. Ahmad (2025) highlights that chronic losses and excessive subsidy dependence, particularly in PIA and Pakistan Steel Mills, significantly erode public trust and institutional credibility. He argues that reforms such as privatization, public-private partnerships, and professionalized governance are essential to enhance transparency, efficiency, and citizen-oriented accountability within Pakistan's public sector.

Ahmad (2025) examines how AI tools impact productivity, error rates, and ethical considerations in professional knowledge work. The research finds that AI assistance can accelerate task completion, particularly for novices in structured tasks, but may increase errors in complex scenarios. Ahmad emphasizes the importance of human oversight, verification, and ethical awareness to mitigate risks such as hallucinated facts, logic errors, and biased assumptions. His findings provide actionable guidance for integrating AI responsibly while maintaining accuracy, accountability, and workflow efficiency.

Figure 1: Average Annual Returns - Technical vs Fundamental Analysis (2010–2024)

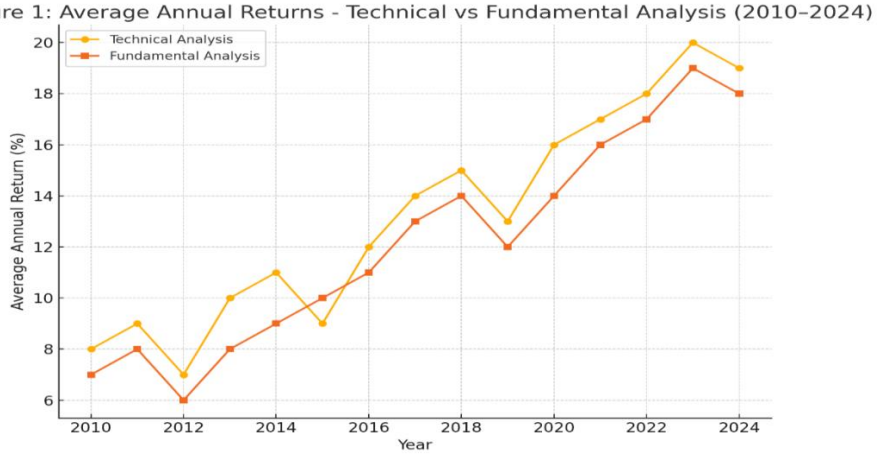

Figure 1: Comparative line graph of average annual returns using technical analysis versus fundamental analysis strategies (2010–2024).

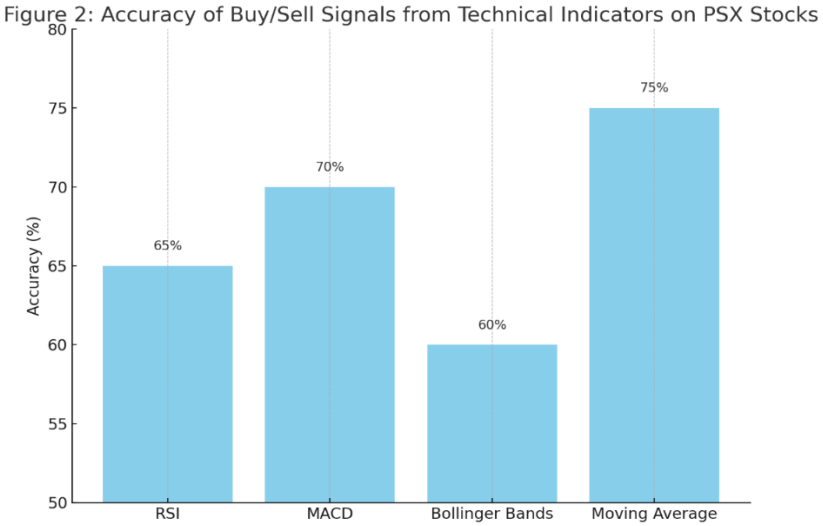

Figure 2: Bar chart showing accuracy (%) of buy/sell signals generated by selected technical indicators on PSX stocks.

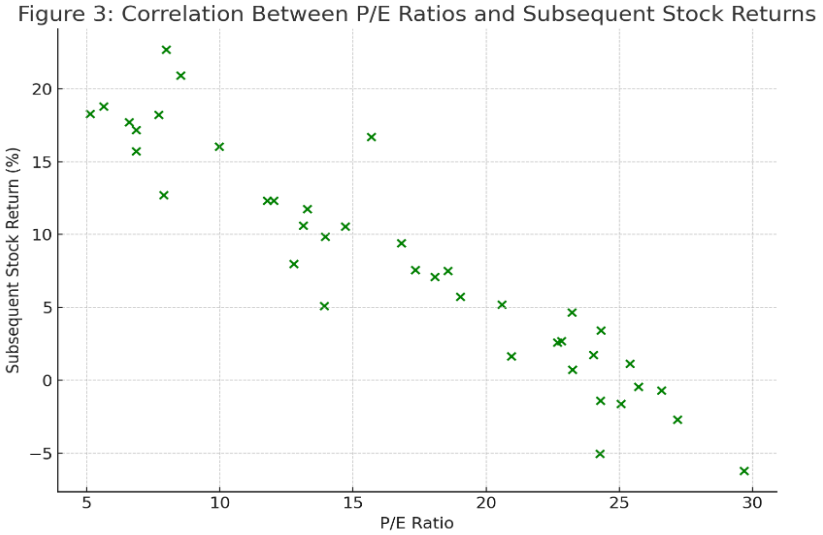

Figure 3: Scatter plot illustrating correlation between P/E ratios and subsequent stock returns in the Pakistani market.

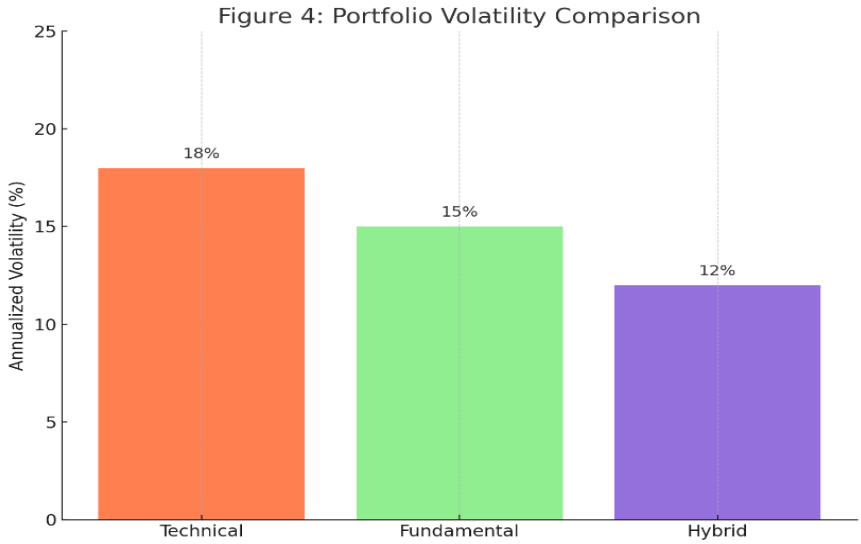

Figure 4: Portfolio volatility comparison: technical, fundamental, and hybrid strategies.

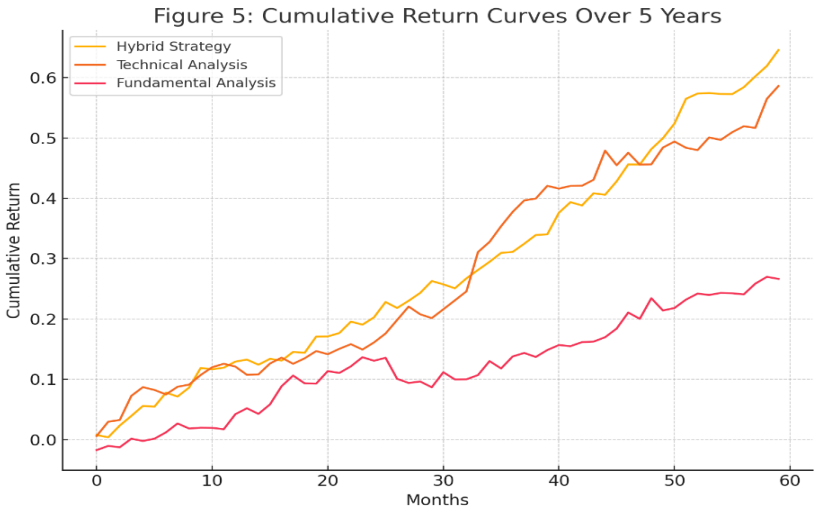

Figure 5: Cumulative return curves for hybrid strategy versus standalone approaches over 5 years.

Summary

This study highlights that technical analysis is effective for short-term trading on the Pakistan Stock Exchange, generating timely buy/sell signals and capitalizing on market momentum. Conversely, fundamental analysis offers stronger predictive power for long-term investing by focusing on company financial health and macroeconomic variables. The hybrid approach, leveraging the strengths of both, yields improved risk-adjusted returns and portfolio stability. Investors are encouraged to tailor their strategies based on investment horizon and market conditions. However, challenges such as market inefficiencies and limited data transparency require ongoing methodological enhancements.

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