# Assessing Nepalese Stock Market Efficiency through P/E Portfolios [1]

Dipendra Karki & Rewan Kumar Dahal

## Abstract

The study uses a systematic price/earnings (P/E) strategy portfolio analysis to test the market efficiency on the Nepal Stock Exchange (NEPSE). It employs a multi-stage quantitative process that permits quarterly portfolio rebalancing through updated metrics. It examines 338 portfolios that existed between July 2014 and April 2025 and found that the P/E strategy generated substantial profits through its investment returns. The investment returns show a range between 2.5% and 40.9% for various holding durations, while the average excess return stands at 16.5% above the market benchmark. The research investigates P/E strategy portfolios through Sharpe and Treynor ratio assessments at the NEPSE. The two ratio results show consistent outcomes, which show that systematic quantitative strategies are capable of identifying price discrepancies and provide proof that contradicts the weak-form Efficient Market Hypothesis (EMH). The research shows that P/E ratios, which the public can access, hold valuable information for decision-making systems that investors should consider when developing their investment portfolios. The study's findings challenge the weak-form EMH while suggesting that behavioral and institutional factors may drive ongoing market anomalies in emerging markets like Nepal.

***Keywords*:** Nepal Stock Exchange, Price-to-earnings strategy, Stock price behaviour

**JEL Codes**: G10, G12, G17

## Introduction

The capital market in Nepal underwent its first significant development when NEPSE opened in 1993 and began its trading operations on January 13, 1994. The

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Nepalese stock market has shown pricing efficiency problems because of increased price volatility, which developed after these market improvements (Dangol, 2012). Researchers study different investment philosophies through their research on market behavior and forecasting techniques (Dahal et al., 2025; Karki, 2017). The Efficient Market Hypothesis (EMH) developed by Fama in 1970 states that past prices do not provide enough information to forecast upcoming prices, which prevents financial analysts from achieving additional profits. Different investment approaches have emerged, which include the P/E hypothesis, and this creates complications for understanding the situation. Jegadeesh and Titman (1993) showed that U.S. market prices follow momentum patterns, which led to discussions about market price efficiency.

The research examines the market efficiency challenge posed by two concepts, which include the "P/E effect" and value momentum. The efficient market theory is refuted by the assertion that a basic investment strategy, which involves purchasing shares with low P/E ratios, generates better results than investing in shares with higher ratios (Basu, 1977). The Nepal stock market has yet to receive adequate attention in exploring these anomalies, prompting this study to investigate the relevance of the P/E hypothesis and value momentum, offering additional insights into the pricing efficiency of the NEPSE (Gurung et al., 2023; Karki, 2020). The study uses basic measurement methods to evaluate the performance of P/E-based portfolios, which investment analysts use to determine portfolio success while they assess various portfolio types. The research aims to measure market efficiency through the development of risk-return models, which Jensen (1978), Sharpe (1966), and Treynor (1965) established.

The main issue, which tests whether the P/E hypothesis proves the EMH wrong, remains a central point of debate in stock pricing studies. Proponents of the P/E ratio argue that firms with low P/E ratios outperform those with high ratios, which leads to an efficient market anomaly and which challenges the efficient market hypothesis. Researchers have studied this anomaly extensively in developed economies, but they have not studied it much in Nepalese research. The study investigates how the P/E hypothesis and market efficiency dimensions impact the Nepali stock market. The current research focuses on two key questions: How do P/E-based stock portfolios perform in the NEPSE, and what is the level of market efficiency in it? Market efficiency testing requires data extraction, data transformation and computation methods, which researchers use alongside traditional econometric methods (Hashem, 2023). This P/E

strategy lens reveals latent information inefficiencies that conventional financial modeling may miss. The study contributes to financial market analysis by demonstrating how stock markets function as information-processing systems. The systems use their data filtering capabilities together with their analytical processing functions and their feedback loop integration to create proof that financial regulation requires during investment decision-making processes.

## Review of Literature

The challenge of portfolio management needs to be solved by different groups, including banks, pension funds, life insurance companies and individual investors who want to achieve the best portfolio performance (Bhandari et al., 2021; Khadka et al., 2024; Poufinas & Siopi, 2024; Moreira et al., 2025; Pant et al., 2022). The stock market shows unpredictable price changes, which require accurate predictions to become essential for successful operation. The method of market forecasting, which carries great danger, demonstrates that strategic asset distribution serves as a fundamental element of portfolio management (Malikel & Rao, 2019). Value investing, which uses the P/E ratio theory, has become one of the most respected investment approaches. The approach states that investors can find profitable opportunities when market behavior reaches irrational levels, which allow them to buy stocks at prices below their actual worth (Barberis & Shleifer, 2003). The P/E ratio serves as an essential instrument that helps investors discover stocks that remain priced below their actual value (Penman & Reggiani, 2018). Dimmock (2016) warns against using the P/E ratio as the only measurement tool, suggesting that investors should include quantitative metrics like momentum, profitability, and quality assessments to handle possible "value traps." Value strategies proved their effectiveness through Hacklin et al.'s (2018) research, which showed that these strategies consistently achieved better performance results than growth strategies throughout an extended timeframe (Lakonishok et al., 1994).

The P/E hypothesis receives more validation through historical research studies. Basu (1977) studied price-to-earnings ratios between 1957 and 1971 and discovered that low P/E portfolios always outperformed high P/E portfolios, which showed market inefficiencies that allowed investors to earn abnormal returns. Banz (1981) discovered that higher P/E ratios for growth stocks produced better risk-adjusted returns, which contradicts this finding. Ibbotson (1986) investigated the stock market by evaluating NYSE companies based on their P/E ratios from 1966 to 1983 and discovered that stocks

with the lowest P/E ratios achieved a compound annual return of 14.08%, which exceeded market performance. Jaffe et al. (1989) extended this research by analyzing firms with negative earnings while demonstrating that both P/E ratios and company size created significant effects, which led to the lowest P/E portfolio generating the highest returns across all size categories. Lakonishok et al. (1994) validated these results through their research, which showed that P/E portfolios with the lowest ratio, special clients and portfolios with the highest ratio showed extreme performance differences. The existence of a permanent relationship between stock market behavior and economic performance leads to the conclusion that low P/E investment strategies achieved exceptional results during the past two decades, but failed to perform well during periods of market instability and economic recessions. The lowest quintile achieved an average annual return of 22.9% while the best quintile produced a return of 11.3%.

The P/E effect has received opposition from Ahmed (2003) and Asri (2002), who present their contrary arguments. The researchers discovered that there is no significant connection between the S&P 500 Index annual returns and P/E ratio values. Asri (2002) researched the Indonesian stock market to demonstrate that the low P/E effect does not exist because of the country's stock market trading restrictions. The researchers Fun and Basana (2012) conducted their research study to investigate how P/E ratios impact stock returns during both short-term and long-term periods. Their research findings opposed the assumptions of Trevino and Robertson (2002) by showing that present P/E ratios assist in predicting long-term stock returns. Still, their relationship with short-term stock returns remains uncertain. The study by Paudel and Koirala (2006) demonstrated that fundamental models, which include Markowitz and Sharpe, continue to deliver optimal portfolio decision-making solutions for the Nepalese equity market. The research study by Adhikari and Jha (2016) developed optimal portfolios through the Markowitz mean-variance approach, which they applied to NEPSE markets despite limited diversification methods available at the time. The study proposes its hypothesis because multiple studies show that low P/E strategies yield effective results.

*H1 - Low P/E stocks outperform high P/E stocks.*

The P/E hypothesis exists because its original proponents established it through their research, which included Williamson's 1970 study that showed lower P/E stocks generate better returns than both higher-P/E stocks and total market performance. The research objective investigates whether P/E-based portfolios can achieve superior results

compared to the Nepalese equity market, which would dispute the Efficient Market Hypothesis (EMH). The research purpose examines how the P/E ratio hypothesis applies to the Nepal Stock Market because previous studies showed inconsistent results across different regions.

Researchers have tested the Efficient Market Hypothesis (EMH), which serves as a basic financial theory, yet their experiments have produced unpredictable results. Fama established three market efficiency types through his 1970 research, which researchers later used to create the Efficient Market Hypothesis (EMH) framework. The 1977 study by Basu demonstrated that low P/E portfolios achieved better risk-adjusted returns, which complicated the understanding of the Efficient Market Hypothesis. Fama's 1991 recognition of the boundaries of the Efficient Market Hypothesis advanced the discussion. The research by Jegadeesh and Titman in 1993 demonstrated short-term momentum, which contradicted the Efficient Market Hypothesis and showed increasing doubt. The research by Shleifer in 2000 and Shiller's 1989 work "Irrational Exuberance" strengthened existing doubts, while Malkiel in 2005 disputed the Efficient Market Hypothesis through his analysis of active fund performance. The research by Wilson and Marashdeh in 2007 aimed to establish a connection between long-term market equilibrium and market efficiency. The research by Yen and Lee in 2008 demonstrated that the Efficient Market Hypothesis still existed, which created a need for researchers to conduct a thorough assessment of the hypothesis's current validity.

The study investigates how the Nepalese equity market operates by testing its efficiency across various emerging market conditions. The research conducted by Gaire (2017), Joshi and Bhattarai (2010), Karki (2020), Pradhan and Upadhyay (2006), and Risal and Koju (2021) examined how market efficiency operates in Nepalese equity markets. The results show mixed outcomes, which create a complicated situation. The findings from previous studies show that the market operates inefficiently because of its weak form of efficiency, which becomes more apparent during periods of low trading activity. The changing dynamics of the Nepalese stock markets require researchers to adopt a different perspective. The study tests a specific hypothesis, which it presents as a research framework.

*H2: Nepal's stock market is efficient in a weak form.*

The research tests the weak-form efficiency of Nepalese stock markets through a systematic examination because previous studies produced different results. The market

shows weak form inefficiency according to Karki (2020) and Risal and Koju (2021) because their research proves this point. The research conducted by Dangol (2012) and Pradhan and Upadhyay (2006) showed that the weak form of the market maintained efficient operations. The research investigates market efficiency levels in the Nepalese equity market through P/E-based investment strategy performance, which serves as the main measurement tool.

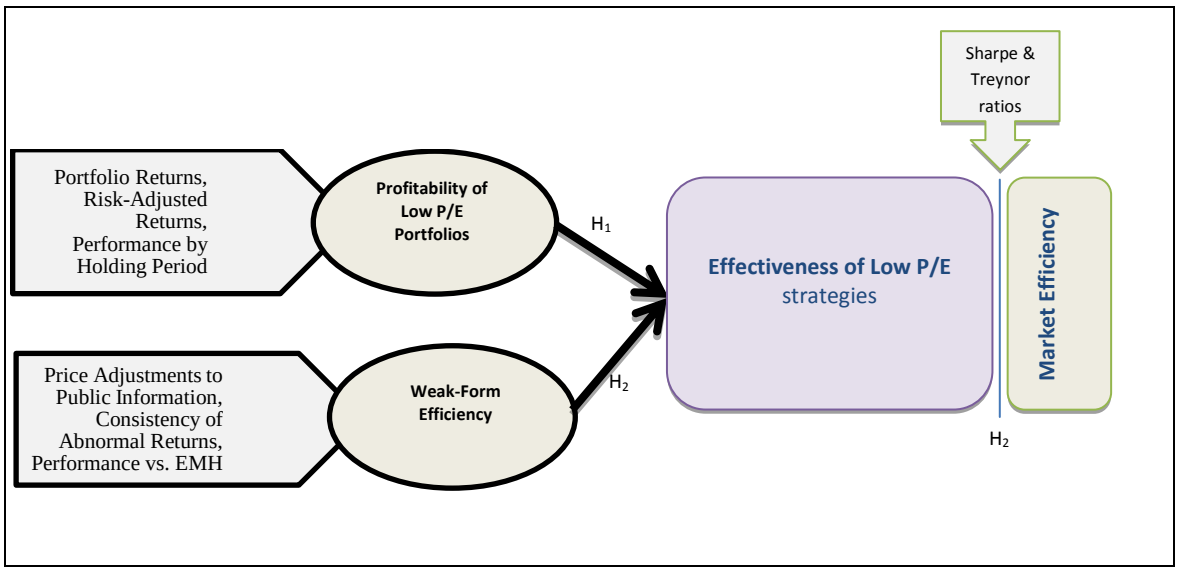
The current research about the NEPSE needs to investigate the P/E hypothesis because it shows how this market tests the EMH. The majority of research conducted to date has studied broad market indices and sectoral indices instead of investigating low P/E strategies during various holding times. Prior studies also have not sufficiently explored the risk-adjusted returns and the impact of varying holding periods on portfolio performance. The earlier studies evaluated P/E effects through standard financial analysis methods, but the current research shows increased use of quantitative finance together with computational techniques.

**Conceptual framework**

Based on the identified gaps and the formulated hypotheses, the following conceptual framework, illustrated in Figure 1, guides this study:

**Figure 1**

*Conceptual Framework*



## Research Methodology

The study used both descriptive and analytical methods to explore the basic problems of the P/E strategy applying to the Nepalese context. The system uses multiple data processing stages, which start with NEPSE data acquisition and continue through cash and stock dividend adjustments and P/E based algorithmic portfolio development, and finish with risk-adjusted computational analysis. The quantitative study is methodically followed to track the financial data and verify its accuracy by many verification methods (Kaur & Dharni, 2022). Researchers use causal-comparative research to study how different causes affect particular outcomes (Blumberg et al., 2005). Devkota et al. (2023) proposed a cognitive behavioral model that serves as an alternative model for studying additional research findings.

**Data sources and sampling method**

The study aims to assess how well the P/E hypothesis functions on the Nepal Stock Exchange during the entire duration of the research period. A longitudinal research design enables researchers to track changes over time while establishing cause-and-effect relationships (Collis & Hussey, 2009). The researchers used secondary data collected over multiple years to study all market cycles from July 17, 2014, to April 13, 2025, which enabled them to examine how the P/E strategy operates in different market conditions. The selected time frame strategically marks the period during which the stock exchange transitioned from its semi-automated trading system to digital. This transition was initiated by the introduction of Demat services and the NEPSE Online Trading System (NOTS) in 2018, which enhanced market efficiency and investor participation.

The P/E strategy required researchers to choose nine sample companies from each quarter based on their lowest P/E ratios, which needed to include companies from all market sectors. The research team conducted a performance evaluation of the chosen samples for different holding periods, which included one month, three months, six months, nine months, one year and five years. The researchers conducted an extensive study, which included 338 portfolios that existed from July 17, 2014 (Q4) until April 13, 2025 (Q3). The research team created a single sector to combine manufacturing, investment and trading together with other sectors because they wanted to solve problems that occurred when market segments had few stocks that lacked trading activity. Subsequent sample selection was adjusted accordingly. The research team excluded companies from their sample who did not maintain sufficient stock information at all

times during the study period. The research team selected its sample from companies that had maintained their business operations throughout the entire research period. At the same time, they excluded companies that experienced mergers or acquisitions, bankruptcy or delisting events.

**Basic computation procedures**

The study compares the performance of P/E portfolios to a simple buy-and-hold strategy using average daily returns. The formula below was used to calculate daily returns for each stock:

$$R_t = \frac{P_t}{P_{t-1}} \quad \text{..... (1)}$$

Where $R_t$ denotes the daily return for today, while $P_t$ stands for the stock's closing price today. The average return for an observed period is given by the formula below:

$$\bar{R} = \frac{\sum_{t=1}^{n} R_t}{n} \quad \text{..... (2)}$$

Where, $\bar{R}$ denote the average return, while n indicates the number of days.

***Risk analysis***

Investors need to know both expected returns and the associated risks that they must overcome to obtain those returns. The term risk describes the degree of uncertainty that exists about expected returns together with their associated return fluctuations (Sharpe, 1966). Investors have a desire for higher returns, which come with greater risk, because they view risk as a measure of investment volatility.

***Unsystematic Risk***

Unsystematic risk, also known as diversifiable or idiosyncratic risk, pertains to uncertainties tied to individual businesses or sectors. This type of risk can be mitigated through diversification, which reduces the impact of specific risks on the overall portfolio (Karki et al., 2023; Markowitz, 1952). The standard deviation ($\sigma$) of residual value determines the unsystematic risk, while the standard deviation of a portfolio captures the total risk. A higher standard deviation of a portfolio signifies that the returns of the portfolio are more unstable and riskier, and vice versa (Sharpe, 1966). Standard deviation of the portfolio ($\sigma_p$) was computed as:

$$\sigma_p = \sqrt{\frac{\sum(R_p-\mu)^2}{N}} \quad \text{..... (3)}$$

Where,

$R_i$ denotes the simple return on portfolio p

$\mu$ -represents the mean returns of portfolio p

N -the size of the population

While standard deviation is a conventional risk metric, it may not align with investor preferences, as investors often seek to avoid losses more than they dislike variability. In response, the study introduces another risk measure, beta (β), focusing solely on systematic risk.

***Systematic Risk (Beta)***

The beta coefficient measures the investment's systematic risk or market risk of the portfolio, whereas the standard deviation measures its total risk. Because it only considers non-diversifiable risk, the beta coefficient is a suitable risk measure in an investment portfolio (Treynor, 1965). Beta correlates the returns of a portfolio with those of a market index, thus indicating how sensitive the portfolio is to changes in the broader market (Lintner, 1965). Systematic risk (β) was calculated by using the formula:

$$\beta = \frac{\text{Covariance between portfolio returns and market returns}}{\text{Variance of market returns}} = \frac{\text{COV}(R_p - R_m)}{\text{VAR}(R_m)} \quad \text{..... (4)}$$

Additionally, excess return (ER), representing the difference between the portfolio return (Rp) and market return (Rm), was explored as $\alpha = [R_p - R_m]$.

This comprehensive risk analysis took into account investors' propensity for high expected returns ($E[Ri] = \mu_i$) and the compounded annual growth rate (CAGR), as follows:

$$(\text{CAGR}) = \left(\frac{V_f}{V_0}\right)^{\frac{1}{t}} - 1$$

Where, $V_f$ is the final value, $V_0$ is the beginning value, and t is the time in years

***Statistical Test***

The t-test was utilized to validate the effectiveness of the P/E strategy against the buy-and-hold strategy, and a t-value was calculated using the formula:

$$t - value = \frac{[\bar{R}_p - \bar{R}_m]}{\sqrt{\frac{\sigma_p^2}{n_1} + \frac{\sigma_m^2}{n_2}}} \quad \text{..... (5)}$$

Where $R_p$ and $R_m$ represent the mean of the compared samples; portfolio and the market. $\sigma_p^2$ and $\sigma_m^2$ stands for the two sample variances, while $n_1$ and $n_2$ represent the sample size.

The t-test aimed to observe if there is a significant difference between the buy-and-hold strategy and the P/E strategy in different holding periods. The t-test was estimated at the 5 percent and 10 percent significance levels. The critical values observed

are ± 1.96 at 5% and ± 1.645 at a 10% significance level (Aczel & Sounderpandian, 2008). The research method investigates the P/E strategy's ability to exceed market performance while establishing a standard for testing different investment durations.

**Risk-adjusted performance measures**

The research employed established risk-adjusted performance metrics to assess the effectiveness of the P/E strategy through its implementation of the Sharpe ratio ($S$) and Treynor ratio ($T$) as performance metrics. The two measures enable a complete assessment of portfolio returns because they utilize standard deviation ($\sigma$) and market risk beta (β) to measure risk (Modigliani & Modigliani, 1997).

***Sharpe Ratio***

The Sharpe ratio, devised by Nobel laureate William Sharpe, epitomizes risk-adjusted performance (Sharpe, 1966). Investors can increase the return on their capital through asset allocation decisions. However, they can only achieve this by taking on more risk, measured as the standard deviation of returns. According to Coates and Page (2009), the Sharpe ratio is commonly understood to be the excess return per unit of risk and is computed as follows:

$$\text{Sharpe ratio} = \frac{\text{Portfolio's average excess return}}{\text{Standard deviation of portfolio's excess return}} = \frac{(R_p - R_f)}{\sigma_p} \quad \text{..... (6)}$$

Where $R_p$ is the average annual return on the portfolio.

$R_f$ stands for the risk-free rate of return, typically the annual yield on 28-day Treasury bills (for monthly performance) and 90-day Treasury Bills (for quarterly performance). This study used market return as a standard to get a portfolio's excess return.

$\sigma_p$ is the standard deviation for the portfolio's excess return. It reflects the total risk in the investment

$(R_p - R_f)$ measured the excess returns. It is often denoted as alpha ($\alpha$). Excess returns are returns that exceed the return of a proxy. A riskless rate and benchmarks with similar levels of risk to the investment under consideration are two of the most basic return comparisons (Stutzer, 2000). This study subtracted market returns from portfolio returns to get excess returns as a benchmark for baseline comparison.

A positive Sharpe ratio indicates outperformance relative to risk-free investments. Ratios exceeding 1.0 are generally considered favorable, and portfolios that perform exceptionally well achieve ratios of 2.0 or above.

***Treynor ratio***

Developed by Treynor (1965), this ratio assesses portfolio performance in relation to systematic risk, beta (β). The core premise of the Treynor index is that a multi-asset

portfolio diversifies away unsystematic risk, leaving systematic risk as the relevant risk (beta). The Treynor ratio of the portfolio ($Tp$) is calculated as:

$$Tp = \frac{Rp - Rf}{\beta p} \quad \text{..... (7)}$$

Where, $\beta_p$ is the portfolio beta, indicating its sensitivity to market fluctuations. A fund is more volatile than the market if its beta value is larger than one and less volatile if its beta value is lower. The market's Treynor ratio ( $T_m$) serves as a benchmark, computed similarly:

$$T_m = \frac{Rm - Rf}{\beta m} \quad \text{..... (8)}$$

Comparing the portfolio's Treynor ratio (Tp) to the market's ( $T_m$) helps ascertain whether the portfolio outperformed or underperformed relative to market systematic risk.

***Relationship among performance measures***

Different performance metrics must be assessed through comparison to determine which one produces consistent results for portfolio performance evaluation. According to Modigliani and Modigliani (1997), fund ranking results stay identical whenever different measurement methods use the same benchmark for evaluation. The research evaluated whether Sharpe and Treynor ratios produced identical ranking results when applied to the same benchmark.

**Market efficiency testing**

The NEPSE stock market efficiency test used P/E-based portfolio performance comparison with market returns to evaluate stock pricing efficiency. The study calculated Sharpe and Treynor ratios for each stock portfolio, which functioned as benchmarks to measure market efficiency (Ajadi, 2024; Varamini & Kalash, 2008).

***Statistical analysis and testing***

The study assessed the significance of P/E strategy performance using a two-tailed t-test to compare it to a buy-and-hold strategy with the market return as a benchmark. Portfolios with varied holding periods (ranging from 1 month to 5 years) were formed quarterly from Q4 2013/14 to Q2 2024/25.

**ANOVA Analysis**

The researchers used ANOVA to assess how P/E portfolio performance varied according to different holding periods. ANOVA aids in determining if the means of multiple groups are equal. The presence of significant F values requires post-hoc testing because it enables researchers to examine performance differences between various

holding periods (Hilton & Armstrong, 2006). The method provides a complete assessment of how the P/E strategy performs across different time periods.

## Results and Discussion

The research was based on historical stock prices from the NEPSE. The observations were divided into 12-year periods from 2014 to 2025, with data ranging from July 17, 2014 to April 13 2025. Based on management accounting practices, the price data were converted to adjusted stock prices that account for dividend payouts, rights issues, FPO and stock splits, if any (Dahal et al., 2020). In 2011, NEPSE had 207 firms listed on it. Many of the companies merged or went bankrupt. The study used only the companies that survived the era as an eligible sample. As a result, there were 90 sample companies. Various stock portfolios with different holding periods were constructed using the P/E strategy (having the lowest P/E ratio). This study formed the portfolios of 9 stocks, including the top one (lowest P/E) from each sector. It tested the performance of such 338 portfolios with different holding periods over the study, ranging from July 17, 2014 (2013_14 Q4) to April 13, 2025 (2024_25 Q3).

### Descriptive statistics of price-to-earnings (PE) portfolios' returns

Descriptive statistics summarize central tendencies and patterns within the data, offering insights into the performance of P/E-based portfolios over different holding periods relative to the market benchmark.

**Table 1**

*Descriptive Statistics of Price-to-Earnings (PE) Portfolios' Returns*

| | | | | | 95% Confidence Interval for Mean | | | |
|---|---|---|---|---|---|---|---|---|
| HP | N | Mean ER | Std. Deviation | Std. Error | Lower Bound | Upper Bound | Minimum | Maximum |
| 1M | 44 | 0.025 | 0.062 | 0.009 | 0.006 | 0.044 | -0.182 | 0.219 |
| 3M | 44 | 0.409 | 1.456 | 0.219 | -0.033 | 0.852 | -1.458 | 9.272 |
| 6M | 43 | 0.233 | 0.404 | 0.062 | 0.109 | 0.357 | -0.489 | 1.812 |
| 9M | 42 | 0.200 | 0.308 | 0.048 | 0.104 | 0.296 | -0.203 | 1.484 |
| 1Y | 41 | 0.182 | 0.252 | 0.039 | 0.102 | 0.261 | -0.195 | 1.089 |
| 2Y | 37 | 0.105 | 0.107 | 0.018 | 0.070 | 0.141 | -0.152 | 0.339 |
| 3Y | 33 | 0.076 | 0.075 | 0.013 | 0.049 | 0.102 | -0.036 | 0.214 |
| 4Y | 29 | 0.081 | 0.063 | 0.012 | 0.057 | 0.105 | -0.048 | 0.211 |
| 5Y | 25 | 0.087 | 0.068 | 0.014 | 0.059 | 0.116 | -0.017 | 0.321 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total | 338 | 0.165 | 0.571 | 0.031 | 0.104 | 0.226 | -1.458 | 9.272 |

*Source: Data analysis*

***Follow a similar format***

Table 1 depicts the average value of 338 portfolios formed using a price-to-earnings (PE) strategy for various holding periods starting on July 17, 2014 and ending on April 13, 2025. Excess returns used in the study are annualized excess returns. There are 44 portfolios for the 1-month and 3-month holding periods, followed by 43, 42, 41, 37, 33, 29, and 25 for the 6M, 9M, 1Y, 2Y, 3Y, 4Y, and 5Y holding periods, respectively.

The market benchmark was surpassed by different constructed portfolios which Table 1, through its various holding period categories. The one-month portfolio showed a 2.5% performance advantage, while the three-month portfolio achieved a 40.9% performance advantage. The six-month portfolio produced an excess return of 23.3%, which continued the earlier pattern. The holding period lengthened the excess returns, which started at nine months with 20.0% and decreased to one year at 18.2%, two years at 10.5%, three years at 7.6%, four years at 8.1% and five years at 8.7%. The three-month portfolio delivered the highest return, which created an unusual trend showing that shorter-term investments produced better returns while extended investments resulted in lower returns.

**Risk-adjusted performance analysis**

The performance assessment of 338 price-to-earnings (P/E) based investment portfolios, which were established during the period from July 17, 2014, to April 13, 2025, is presented in Table 2 through different holding period evaluations. The portfolio consists of stock from each sector that has the lowest price-to-earnings ratio, resulting in a total of nine stocks that the company selects every three months.

**Table 2**

*Statistical Significance of Price to Earnings (PE) Strategies*

| HP | N | Portfolio Ret. ($P_0$) | Market Ret. ($M_0$) | Excess Ret. ($\alpha$) | SD of ER ($\sigma_\alpha$) | SEM | Sharpe Ratio($S$) | Beta($\beta$) | Treynor Ratio($T$) | t- stat. | p-value (p) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 44 | 0.044 | 0.019 | 0.025 | 0.082 | 0.012 | 0.301 | -1.805 | -0.014 | 1.996 | 0.05232 |
| 3M | 44 | 0.747 | 0.338 | 0.409 | 0.093 | 0.014 | 4.391 | 6.495 | 0.063 | 29.124 | 0.00000 |
| 6M | 43 | 0.521 | 0.288 | 0.233 | 0.094 | 0.014 | 2.467 | 6.483 | 0.036 | 16.175 | 0.00000 |
| 9M | 42 | 0.476 | 0.276 | 0.200 | 0.094 | 0.015 | 2.117 | 6.530 | 0.031 | 13.721 | 0.00000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1Y | 41 | 0.450 | 0.268 | 0.182 | 0.096 | 0.015 | 1.894 | 6.637 | 0.027 | 12.127 | 0.00000 |
| 2Y | 37 | 0.333 | 0.228 | 0.105 | 0.098 | 0.016 | 1.074 | 6.936 | 0.015 | 6.531 | 0.00000 |
| 3Y | 33 | 0.269 | 0.193 | 0.076 | 0.098 | 0.017 | 0.775 | 7.062 | 0.011 | 4.453 | 0.00010 |
| 4Y | 29 | 0.256 | 0.175 | 0.081 | 0.100 | 0.018 | 0.812 | 7.221 | 0.011 | 4.374 | 0.00015 |
| 5Y | 25 | 0.254 | 0.166 | 0.087 | 0.102 | 0.020 | 0.859 | 7.415 | 0.012 | 4.293 | 0.00025 |
| Tot | 338 | 0.372 | 0.217 | 0.165 | 0.570 | 0.039 | 0.290 | 0.566 | 0.292 | 4.277 | 0.15072 |

Source: Data analysis

The analysis of Table 2 shows that all portfolios maintained positive Sharpe ratios, which exceeded one during three-month, six-month, nine-month, one-year, and two-year evaluation periods. The Sharpe ratios achieved their highest value of 4.391 during the three-month holding period, which later decreased to 0.301 at one month. The Treynor ratios showed positive results for all periods except the one-month holding period. The three-month portfolio exhibited the highest Treynor value of 0.063, while the one-month portfolio had the lowest value of -0.014. The relationship between Sharpe and Treynor ratios demonstrates that the P/E strategy produces stable performance results across these two assessment methods. The beta values established a connection between risk and return characteristics. The five-year holding period portfolio displayed the highest beta (7.415), whereas the six-month and three-month portfolios both showed the lowest positive beta values (6.483 and 6.495, respectively). The short-term portfolios, which included 3 to 6-month periods, achieved better returns than all other holding periods while maintaining lower risk levels. The strategy delivered double-digit excess returns for two years but experienced a gradual decline in returns during extended holding periods. The three-month holding period (0.409) emerged as the optimal timeframe for portfolio performance. The present research shows that low P/E portfolios produce better risk-adjusted returns according to established studies (Basu, 1977; Fun & Basana, 2012). The research confirmed that the PE hypothesis maintained its validity. The result accepts hypothesis H1, which states that portfolio returns from Low PE stocks outperform market returns.

The Sharpe and Treynor ratios demonstrate that the PE strategy provides superior performance in the Nepalese stock market. The P/E strategy indicates strong performance because it generated double-digit excess returns during two-year holding periods. The results showed a gradual decline in performance when the holding period was extended. The P/E strategy revealed three-month holding periods as the most effective duration when compared to multiple time frames tested in the research. The

results show that Fama's efficient market hypothesis (1970) fails to prove that the P/E strategy only achieved market returns. The result shows that hypothesis H2 works against itself because it declares that the Nepalese stock market operates with weak-form efficiency. The research shows that previous studies (Bhatta, 2010; GC, 2010; Karki et al., 2025; Pradhan & Upadhyay, 2006; Risal & Koju, 2021) established that the market operates with weak form inefficiency because past price movements can be used to predict future price movements. The Sharpe and Treynor ratios maintain their consistent alignment, which makes them effective risk assessment metrics for continuous market evaluation. The metrics enable portfolio managers and regulators to detect operational problems that exceed their established threshold limits. The development of market monitoring dashboards and algorithmic trading systems for NEPSE can benefit from this insight.

**ANOVA Analysis**

The research used ANOVA analysis as its main statistical method to evaluate Price-to-Earnings (PE) portfolio performance during different holding periods. The research results from Table 3 demonstrated that the P/E strategy produced consistent returns across different investment periods.

**Table 3**

*ANOVA Testing on Different Holding Periods of PE Strategies*

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between-Groups | 4.506 | 8 | 0.563 | 1.759 | 0.084 |
| Within-Groups | 105.377 | 329 | 0.320 | | |
| Total | 109.884 | 337 | | | |

Source: Data analysis

The analysis in Table 3 shows that the PE strategy does not produce different returns during various holding periods. The F-value of 1.759, together with a p-value of 0.084, shows that there are no significant performance differences. The PE strategy shows consistent returns across different investment periods because there were no significant results that required further testing. The outperformance of the PE strategy helps investors make better portfolio management decisions (Karki et al., 2024).

## Conclusion

The market experienced substantial excess returns through all low P/E portfolios. The portfolios with the lowest P/E ratio across one-months to five-year holding periods

achieved an average annual excess return of 16.5%, outperforming the market. The three-month holding period produced the highest return of 40.9%, which then decreased with all extended holding periods. The PE strategy generated strong returns, which reached statistical significance throughout all examined periods according to both Sharpe and Treynor ratios. The study results demonstrate that the P/E hypothesis proves true because portfolios with low P/E stocks generate better returns than benchmark returns. The study results demonstrate that NEPSE operates inefficiently at weak form efficiency, which shows evidence that supports the P/E strategy. The P/E strategy shows validation because evidence exists for every market condition, which includes low- or high-interest periods, volatile economic environments and slow economic growth times.

The P/E trading strategy achieved its highest performance results when investors maintained their positions for short periods during both rising and falling market times. The research showed multiple risk-based explanations through empirical results that proved the P/E hypothesis functioned as an important factor in the Nepalese equity market. The comparison between the Sharpe and Treynor ratios revealed an interesting aspect to study. The study found that the two metrics established a proportional connection, which resulted in the portfolios maintaining equivalent performance rankings through different evaluation methods that used the same benchmark (Modigliani & Modigliani, 1997). The evaluation process gains additional interest through the complete assessment package, which verifies that all chosen evaluation methods remain effective. The results demonstrate how the Nepalese stock market performs, which creates investment chances through P/E strategy implementation that delivers better returns during short investment periods. This study confirms the P/E hypothesis while establishing a basis for data-based financial decision-making research, which demonstrates how quantitative systems improve transparency and investor knowledge in emerging market economies. The study results supply valuable information to investors and market participants who want to understand how Nepalese equity markets operate during the 21st century. From a policy perspective, these results highlight an opportunity in emerging stock markets to reduce the informational inefficiency through enhanced market transparency and investor education.

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