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## Investors' Overreaction And Underreaction: Evidence From The Indian Stock Market

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**Abstract:** The behaviour of investors has an important role in determining the movement of stock prices. Traditional financial theories assume that investors make rational decisions and that market prices quickly reflect available information. However, actual market behaviour often shows that investors do not always respond to information in a rational manner. Two important behavioural patterns associated with this issue are overreaction and underreaction. Overreaction occurs when investors respond too strongly to new information, while underreaction refers to a delayed or insufficient response.

Overreaction occurs when investors respond too strongly to new information. This can push stock prices away from their actual value and may lead to a later fall in prices. Underreaction is different. It occurs when investors respond slowly to new information, which may allow the price movement to continue for some time. This study examines evidence of overreaction and underreaction in selected Indian stocks of Sensex using a winner-loser portfolio approach. Weekly closing prices of 15 selected companies are used for the analysis. The five companies with the highest cumulative abnormal returns (CAR) are classified as winners, while the five companies with the lowest CAR are classified as losers. The BSE Sensex is used as the market benchmark. Abnormal returns are calculated using the market-adjusted return method. Average abnormal return (AAR) and cumulative average abnormal return (CAAR) are then used to examine the performance of the winner and loser portfolios. Five formation and testing periods are considered. These periods cover short, medium and long-term horizons. One-sample t-tests, paired-sample t-tests and Wilcoxon signed-rank tests are used to examine the significance of the results. The findings show mixed evidence. Negative Winner-Loser CAARs are found in three of the five testing periods. This shows that past winners performed worse than past losers in these periods and provides some evidence of overreaction. The strongest reversal is found in the medium-term period, with a Winner-Loser CAAR of -5.6658%. However, positive CAARs are found in the long-term period and one short-term period. These results suggest continuation and are consistent with possible underreaction. The findings therefore suggest that investor behaviour varies across investment horizons. The evidence of reversal and continuation indicates that both overreaction and underreaction may occur in the Indian stock market, but their presence is not consistent across all periods.

**Keywords:** Investor Behaviour; Overreaction; Underreaction; Behavioural Finance; Indian Stock Market; Investment Decision-Making, Price Reversal, Winner-Loser Effect.

## 1. INTRODUCTION

Financial markets are expected to reflect available information in security prices. This idea is central to the Efficient Market Hypothesis (Fama, 1970). If markets are fully efficient, past price movements should not provide a reliable way to earn abnormal returns. However, many studies have reported patterns that are difficult to explain through market efficiency alone. Overreaction and underreaction are two important examples (Barberis et al., 1998; Fabozzi et al., 2013; Jegadeesh & Titman, 1993).

Overreaction occurs when investors respond too strongly to new information. Prices may move beyond their fundamental values. A later correction can then create a return reversal. De Bondt & Thaler, (1985) provided the classical evidence for this view. They found that stocks with poor past performance could outperform past winners in the following period. This result became an important foundation for winner–loser portfolio studies.

Behavioural finance provides possible explanations for these patterns. Investors may rely on simple rules when making decisions. Representativeness can cause recent outcomes to receive too much weight. Anchoring can slow the adjustment of beliefs. Barberis et al. (1998) and Daniel et al. (1998) show how such behavioural biases can produce underreaction, overreaction and return continuation.

The direction of the return pattern also matters. Momentum reflects continuation. Prior winners continue to perform well. Reversal reflects the opposite pattern. Prior losers outperform prior winners. Earlier studies suggest that continuation and reversal can occur at different horizons. This makes the length of the formation and testing period important (Ali et al., 2011).

The Indian market provides an interesting setting for this issue. Previous studies have reported both momentum and contrarian effects. Michaely et al. (1995) found short-term contrarian profits but momentum over some longer horizons. They also reported differences across firm size and trading volume. Other Indian studies have reported long-term reversal, while some have found stronger momentum. The evidence is therefore not uniform (Naik & Pramod, 2020).

Maher & Parikh (2011) examined market reactions to information shocks in India. Their results showed different responses across market segments. Medium- and small-cap indices showed evidence of underreaction to some shocks. This suggests that investor response can depend on the type of information and the market segment (Maheshwari & Dhankar, 2017; Ramasamy & Yeung, 2003; Ramesh & Devi, 2022).

The present study examines this issue using a winner–loser framework. It starts with 15 selected companies. The five companies with the highest cumulative abnormal returns are classified as winners. The five companies with the lowest cumulative abnormal returns are classified as losers. The remaining five companies are not included in the winner–loser portfolio analysis (Iihara et al., 2004).

The study uses weekly closing prices and the BSE Sensex as the market benchmark. It examines five formation and testing configurations. These represent short, medium and long-term horizons. Abnormal returns are calculated using the market-adjusted approach. AAR and CAAR are then used to measure portfolio performance.

The main purpose is to determine whether prior winners subsequently underperform prior losers. The study also asks whether this pattern is stable across different horizons. Finally, statistical tests are used to distinguish directional reversal from statistically significant reversal.

## 2. REVIEW OF LITERATURE

De Bondt and Thaler (1985) established the classical winner–loser approach. Their study found that stocks with poor past performance later outperformed stocks with strong past performance. They interpreted this as evidence that investors may overreact to information. The study became one of the main foundations of behavioural explanations for long-term reversal.

Later research showed that reversal needs careful interpretation. Some studies linked contrarian profits to size, risk, price pressure or trading effects. Jegadeesh (1990) and Lehmann (1990) found short-term return reversals. Grinblatt & Han (2002) argued that cross-security effects can also contribute to contrarian returns. These findings suggest that a negative winner–loser return does not automatically prove investor overreaction.

Behavioural models offer another explanation. Barberis et al. (1998) proposed a model in which investor beliefs can produce both underreaction and overreaction. Daniel et al. (1998) linked return patterns with overconfidence and self-attribution. These models help explain why continuation and reversal may occur at different points in time.

The evidence from international markets is mixed. Some studies report long-term reversal. Others find short-term continuation or momentum. Glaser & Weber (2007), for example, examined overreaction and underreaction in the Portuguese market and used portfolio-based tests to separate the two effects. Reviews of the literature also show that the strength of reversal differs across countries and holding periods (Arugaslan et al., 2007).

Indian evidence is similarly mixed. Chowdhury et al. (2015) report short-term contrarian profits and momentum over some longer horizons. Their results also vary across firm size and trading volume. This indicates that market characteristics can affect the observed anomaly (Hobbs et al., 2012).

Tripathi & Aggarwal (2009) examined the overreaction effect in the Indian stock market. Their work provides evidence that the effect can be asymmetric. Other Indian studies have reported long-term reversal after controlling for short-term effects. At the same time, momentum-based studies have found that past winners can continue to outperform in some periods (Ajayi et al., 2006).

Mohapatra & Misra (2020) examined momentum returns using Indian winner and loser portfolios. Their work highlights the importance of formation and holding periods. It also shows why continuation and reversal should be examined across more than one horizon (Beer & Zouaoui, 2011).

Maher and Parikh (2011) provide another useful Indian perspective. They studied reactions to information shocks and found evidence of underreaction in some market segments. Their results suggest that investor response is not always immediate. The response may differ between large, medium and small companies (Conrad et al., 1994).

Overall, the literature does not provide one consistent conclusion. Some studies find reversal. Others find momentum. Some show that the effect depends on size, liquidity, trading volume or investment horizon. This mixed evidence makes a multi-horizon design useful (Alwathnani et al., 2017; Ansari & Khan, 2012; Anufriev et al., 2022; Malkiel, 2003).

A gap remains in the integrated use of short, medium and long-term weekly formation and testing periods within the same winner–loser framework for selected Indian equities. Much of the Indian literature uses monthly data or longer horizons. Some studies focus mainly on momentum (Al-Awadhi et al., 2020; Arnott & Asness, 2003). The present study adds to this literature by using weekly market-adjusted abnormal returns and by comparing five different formation–testing configurations.

The study also separates economic evidence from statistical evidence. A negative Winner–Loser CAAR shows the direction of reversal. It does not by itself prove that the effect is statistically significant. This distinction is important for a careful interpretation of investor overreaction.

### 3. RESEARCH METHODOLOGY

#### 3.1. Research Design

The study uses a quantitative empirical research design. It examines whether stocks with extreme prior performance show reversal in the following period. The approach follows the winner–loser framework associated with De Bondt and Thaler (1985).

#### 3.2. Sample Selection

The initial universe consists of 15 selected Indian companies. The companies were selected for the study dataset before the winner and loser portfolios were formed. The selection procedure then used Cumulative Abnormal Return (CAR) during the formation period (Goodell et al., 2021).

**Table 3.1. Initial Set of Companies and Portfolio Classification**

| Category                                           | Companies                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Initial 15-company set                             | A banking company; an FMCG company; an IT company; a telecom company; an automobile company; an FMCG company; a banking company; an automobile company; an IT company; an ecommerce company; a conglomerate; a pharma company; an IT company; a metal company; a consumer durable company |
| Excluded from winner–loser portfolios based on CAR | An FMCG company; an IT company; an automobile company; an ecommerce company; an IT company                                                                                                                                                                                                |

Source: Authors' calculation based on the study data.

Following the study of Iihara et al. (2004), the top one-third of the 15 companies, equal to five companies, are classified as winners. The bottom one-third, also equal to five companies, are classified as losers. The middle five companies are excluded from the winner–loser comparison. This approach creates two equal portfolios and reduces the influence of middle-ranked firms.

### 3.3. Study Period and Formation–Testing Design

Weekly closing prices are used for the study. The analysis begins with the weekly observation required to calculate the first return and covers the study period starting from 3<sup>rd</sup> January 2025 to 26<sup>th</sup> December 2025. Five formation–testing configurations are examined.

**Table 3.2. Formation and Testing Periods**

| Observation | Horizon     | Formation Period   | Testing Period     | Formation Weeks | Testing Weeks |
|-------------|-------------|--------------------|--------------------|-----------------|---------------|
| OB1         | Short term  | 03 Jan–24 Jan 2025 | 31 Jan–21 Feb 2025 | 4               | 4             |
| OB2         | Medium term | 03 Jan–21 Feb 2025 | 28 Feb–18 Apr 2025 | 8               | 8             |
| OB3         | Long term   | 03 Jan–21 Mar 2025 | 28 Mar–13 Jun 2025 | 12              | 12            |
| OB4         | Medium term | 20 Jun–08 Aug 2025 | 15 Aug–03 Oct 2025 | 8               | 8             |
| OB5         | Short term  | 07 Nov–28 Nov 2025 | 05 Dec–26 Dec 2025 | 4               | 4             |

Source: Authors' calculation based on the study data.

The design follows the pattern Short → Medium → Long → Medium → Short. This allows the study to compare reversal across different investment horizons.

### 3.4. Data Source and Market Benchmark

The dataset contains weekly closing prices for the 15 selected companies and the BSE Sensex. The Sensex is used as the market benchmark. The benchmark controls for broad market movements when abnormal returns are estimated.

### 3.5. Weekly Return

The weekly stock return is calculated as:

$$R_{it} = [(P_{it} - P_{i,t-1}) / P_{i,t-1}] \times 100$$

The same procedure is used for the Sensex to obtain the weekly market return.

### 3.6. Expected and Abnormal Return

The study uses the market-adjusted return model. The expected return is represented by the market return:

$$E(R_{it}) = R_{mt}$$

Abnormal return is then calculated as:

$$AR_{it} = R_{it} - R_{mt}$$

This method is simple and transparent. It measures the return of each stock after removing the contemporaneous market movement.

### 3.7. Average Abnormal Return

For each week, abnormal returns are averaged across the five winner stocks and five loser stocks:

$$AARW_{,t} = (1/5) \sum ARW_{,it}$$

$$AARL_{,t} = (1/5) \sum ARL_{,it}$$

The relative weekly performance is:

$$AARW - L_{,t} = AARW_{,t} - AARL_{,t}$$

### 3.8. Cumulative Average Abnormal Return (CAAR)

CAAR is obtained by summing the weekly AAR over the relevant period:

$$CAAR = \sum AAR_t$$

The Winner-Loser CAAR is calculated as the winner portfolio CAAR minus the loser portfolio CAAR. A negative value during testing indicates that prior winners underperformed prior losers.

### 3.9. Price Reversal Measure

The main reversal measure is the testing-period Winner-Loser CAAR. The change from formation to testing is also examined:

$$\Delta CAARW - L = \text{Testing CAARW} - L - \text{Formation CAARW} - L$$

A movement from a positive formation-period differential to a negative testing-period differential is treated as a clear reversal. A negative testing differential when formation performance was already negative is interpreted more cautiously.

### 3.10. Hypotheses

H0<sub>1</sub>: There is no significant difference between the subsequent abnormal returns of winner and loser portfolios.

H1<sub>1</sub>: Prior winners significantly underperform prior losers during the testing period.

H0<sub>2</sub>: The testing-period Winner-Loser CAAR is not significantly different from zero.

H1<sub>2</sub>: The testing-period Winner-Loser CAAR is significantly negative.

### 3.11. Statistical Tests

A one-sample t-test is applied to weekly Winner-Loser AAR against zero. A paired-sample t-test compares winner and loser AAR because both portfolios are observed over the same weeks. The Wilcoxon signed-rank test is used as a non-parametric robustness check. Shapiro-Wilk testing is used to examine normality.

All tests use a 5% significance level. Statistical significance is considered together with the direction and size of the reversal. A negative result without statistical significance is described as directional evidence rather than conclusive evidence of overreaction.

### 3.12. Methodological Limitations

The study uses five securities in each portfolio and five formation-testing configurations. This creates a relatively small empirical base. The market-adjusted model also does not control separately for firm beta, size, value, momentum or liquidity. These issues limit the generalisation of the findings.

## 4. DATA ANALYSIS AND EMPIRICAL RESULTS

### 4.1. Descriptive Statistics of Stock Returns

**Table 4.1. Descriptive Statistics of Weekly Stock Returns**

| Stock                          | Mean Return (%) | SD (%) | Minimum (%) | Maximum (%) |
|--------------------------------|-----------------|--------|-------------|-------------|
| Winner Company 1               | 0.2116          | 2.0101 | -5.2672     | 5.5330      |
| Winner Company 2               | 0.2572          | 2.7937 | -6.6399     | 7.1807      |
| Winner Company 3               | -0.3524         | 3.0204 | -8.5099     | 4.4984      |
| Winner Company 4               | 0.0169          | 2.6420 | -4.3559     | 7.7055      |
| Winner Company 5               | 0.4057          | 3.0121 | -8.8814     | 5.1607      |
| Loser Company 1                | 0.5576          | 2.6741 | -4.7362     | 7.5058      |
| Loser Company 2                | -0.2008         | 1.8500 | -4.7227     | 2.9911      |
| Loser Company 3                | 0.3924          | 2.4919 | -6.3453     | 6.4657      |
| Loser Company 4                | -0.1257         | 2.4862 | -4.5878     | 5.9417      |
| Loser Company 5                | 0.4507          | 3.8520 | -8.9465     | 10.4592     |
| Sensex Benchmark closing price | 0.1607          | 1.6098 | -2.8056     | 4.5184      |

*Source: Author's calculation based on the study data.*

The selected securities show differences in average return and volatility. This variation is relevant because the winner and loser portfolios are based on relative performance. It also affects the variability of portfolio abnormal returns.

### 4.2. Descriptive Statistics of Abnormal Returns

**Table 4.2. Descriptive Statistics of Market-Adjusted Abnormal Returns**

| Stock            | Mean AR (%) | SD AR (%) | Minimum AR (%) | Maximum AR (%) |
|------------------|-------------|-----------|----------------|----------------|
| Winner Company 1 | 0.0510      | 1.5219    | -3.9611        | 5.1431         |
| Winner Company 2 | 0.0965      | 2.2639    | -6.8991        | 5.3084         |
| Winner Company 3 | -0.5131     | 2.5161    | -5.8476        | 6.3847         |
| Winner Company 4 | -0.1438     | 2.7660    | -4.8130        | 8.8231         |
| Winner Company 5 | 0.2450      | 2.6272    | -7.7638        | 6.4355         |
| Loser Company 1  | 0.3970      | 2.2135    | -5.4540        | 4.8126         |
| Loser Company 2  | -0.3615     | 2.0109    | -5.6362        | 4.7161         |
| Loser Company 3  | 0.2317      | 2.0218    | -5.1201        | 4.9158         |
| Loser Company 4  | -0.2864     | 2.0131    | -6.0517        | 5.2710         |
| Loser Company 5  | 0.2900      | 3.2768    | -6.2981        | 8.9093         |

*Source: Author's calculation based on the study data.*

The abnormal-return statistics show how individual securities performed relative to the Sensex. These abnormal returns are the basis for the portfolio AAR and CAAR calculations.

### 4.3. Formation-Period Results

**Table 4.3. Formation-Period Winner and Loser Portfolio Performance**

| Observation | Horizon     | Weeks | Winner AAR (%) | Loser AAR (%) | W-L AAR (%) | Winner CAAR (%) | Loser CAAR (%) | W-L CAAR (%) |
|-------------|-------------|-------|----------------|---------------|-------------|-----------------|----------------|--------------|
| OB1         | Short term  | 4     | 0.5374         | 0.0300        | 0.5073      | 2.1495          | 0.1201         | 2.0294       |
| OB2         | Medium term | 8     | -0.1437        | -0.2087       | 0.0650      | -1.1495         | -1.6699        | 0.5204       |
| OB3         | Long term   | 12    | -0.2316        | 0.2050        | -0.4365     | -2.7787         | 2.4596         | -5.2383      |
| OB4         | Medium term | 8     | 0.2131         | 0.2191        | -0.0060     | 1.7050          | 1.7531         | -0.0480      |
| OB5         | Short term  | 4     | -0.0214        | -0.3826       | 0.3612      | -0.0857         | -1.5305        | 1.4448       |

Source: Author's calculation based on the study data.

The formation-period results vary across the five configurations. Positive Winner–Loser CAARs occur in OB1, OB2 and OB5. Negative formation differentials occur in OB3 and OB4. The formation results therefore create different starting conditions for the testing-period reversal analysis.

### 4.4. Testing-Period Results

**Table 4.4. Testing-Period Winner and Loser Portfolio Performance**

| Observation | Horizon     | Weeks | Winner AAR (%) | Loser AAR (%) | W-L AAR (%) | Winner CAAR (%) | Loser CAAR (%) | W-L CAAR (%) |
|-------------|-------------|-------|----------------|---------------|-------------|-----------------|----------------|--------------|
| OB1         | Short term  | 4     | -0.8248        | -0.4475       | -0.3773     | -3.2990         | -1.7900        | -1.5090      |
| OB2         | Medium term | 8     | -0.3343        | 0.3740        | -0.7082     | -2.6740         | 2.9917         | -5.6658      |
| OB3         | Long term   | 12    | -0.0893        | -0.3414       | 0.2522      | -1.0710         | -4.0971        | 3.0261       |
| OB4         | Medium term | 8     | -0.2322        | 0.2894        | -0.5216     | -1.8577         | 2.3152         | -4.1729      |
| OB5         | Short term  | 4     | 0.1259         | -0.1319       | 0.2579      | 0.5037          | -0.5278        | 1.0315       |

Source: Author's calculation based on the study data.

The Winner–Loser AAR is negative in OB1, OB2 and OB4. The strongest negative weekly differential occurs in OB2 at  $-0.7082\%$ . OB4 records  $-0.5216\%$ , while OB1 records  $-0.3773\%$ . These results are in the direction predicted by the overreaction hypothesis.

OB3 and OB5 show positive Winner–Loser AARs. Their values are  $0.2522\%$  and  $0.2579\%$ . In these periods, prior winners outperform prior losers. Therefore, the reversal pattern is not consistent across all horizons.

#### 4.5. Winner–Loser Price Reversal

**Table 4.5. Formation-to-Testing Change in Winner–Loser Relative Performance**

| Observation | Horizon     | Formation W-L CAAR (%) | Testing W-L CAAR (%) | Change in W-L CAAR (%) | Reversal |
|-------------|-------------|------------------------|----------------------|------------------------|----------|
| OB1         | Short term  | 2.0294                 | -1.5090              | -3.5384                | Yes      |
| OB2         | Medium term | 0.5204                 | -5.6658              | -6.1861                | Yes      |
| OB3         | Long term   | -5.2383                | 3.0261               | 8.2643                 | No       |
| OB4         | Medium term | -0.0480                | -4.1729              | -4.1249                | Partial  |
| OB5         | Short term  | 1.4448                 | 1.0315               | -0.4133                | No       |

*Source: Author's calculation based on the study data.*

OB1 shows a clear change from positive formation performance to negative testing performance. The Winner–Loser CAAR changes from 2.0294% to -1.5090%. The change is -3.5384 percentage points.

OB2 provides the strongest reversal. Its Winner–Loser CAAR changes from 0.5204% during formation to -5.6658% during testing. The change is -6.1862 percentage points.

OB3 does not support reversal. Its relative CAAR changes from -5.2383% to +3.0261%. OB4 has negative testing performance, but its formation differential was already slightly negative. It is therefore better described as continued relative underperformance. OB5 remains positive during testing.

#### 4.6. Statistical Significance

**Table 4.6. One-Sample and Wilcoxon Tests of Testing-Period Winner–Loser AAR**

| OB  | Horizon     | N Weeks | Mean W-L AAR (%) | SD     | t-statistic | t p-value | Wilcoxon p-value |
|-----|-------------|---------|------------------|--------|-------------|-----------|------------------|
| OB1 | Short term  | 4       | -0.3773          | 1.6593 | -0.4547     | 0.6802    | 0.8750           |
| OB2 | Medium term | 8       | -0.7082          | 1.8634 | -1.0750     | 0.3180    | 0.4609           |
| OB3 | Long term   | 12      | 0.2522           | 1.3057 | 0.6690      | 0.5173    | 0.8501           |
| OB4 | Medium term | 8       | -0.5216          | 1.3294 | -1.1098     | 0.3037    | 0.3125           |
| OB5 | Short term  | 4       | 0.2579           | 0.6192 | 0.8329      | 0.4660    | 0.6250           |

*Source: Author's calculation based on the study data.*

None of the five testing configurations is statistically significant at the 5% level. The smallest t-test p-value is 0.3037 in OB4. OB2 follows with a p-value of 0.3180. The Wilcoxon results also fail to reject the null hypothesis.

This result is important. The data show negative reversal in several periods, but the statistical evidence is not strong enough to claim systematic overreaction.

#### 4.7. Paired Comparison

**Table 4.7. Paired Comparison of Winner and Loser Testing-Period AAR**

| Observation | Horizon     | N weeks | Winner mean AAR (%) | Loser mean AAR (%) | W-L mean AAR (%) | Paired t | p-value | Wilcoxon p-value |
|-------------|-------------|---------|---------------------|--------------------|------------------|----------|---------|------------------|
| OB1         | Short term  | 4       | -0.8248             | -0.4475            | -0.3773          | -0.4547  | 0.6802  | 0.8750           |
| OB2         | Medium term | 8       | -0.3343             | 0.3740             | -0.7082          | -1.0750  | 0.3180  | 0.4609           |
| OB3         | Long term   | 12      | -0.0893             | -0.3414            | 0.2522           | 0.6690   | 0.5173  | 0.8501           |
| OB4         | Medium term | 8       | -0.2322             | 0.2894             | -0.5216          | -1.1098  | 0.3037  | 0.3125           |
| OB5         | Short term  | 4       | 0.1259              | -0.1319            | 0.2579           | 0.8329   | 0.4660  | 0.6250           |

Source: Author's calculation based on the study data.

The paired tests show the same general pattern. OB1, OB2 and OB4 have negative winner–loser differences.

#### 4.8. Normality Assessment

**Table 4.8. Shapiro–Wilk Normality Test**

| Observation | Horizon     | N weeks | Shapiro-Wilk W | p-value | Normality at 5% |
|-------------|-------------|---------|----------------|---------|-----------------|
| OB1         | Short term  | 4       | 0.9774         | 0.8864  | Yes             |
| OB2         | Medium term | 8       | 0.9504         | 0.7148  | Yes             |
| OB3         | Long term   | 12      | 0.9151         | 0.2480  | Yes             |
| OB4         | Medium term | 8       | 0.9097         | 0.3518  | Yes             |
| OB5         | Short term  | 4       | 0.9211         | 0.5430  | Yes             |

Source: Author's calculation based on the study data.

The normality results are reported as a diagnostic. The small number of weekly observations limits the strength of normality testing. The Wilcoxon test is therefore useful as a non-parametric check.

#### 4.9. Horizon-wise Comparison

**Table 4.9. Comparative Evidence of Reversal across Investment Horizons**

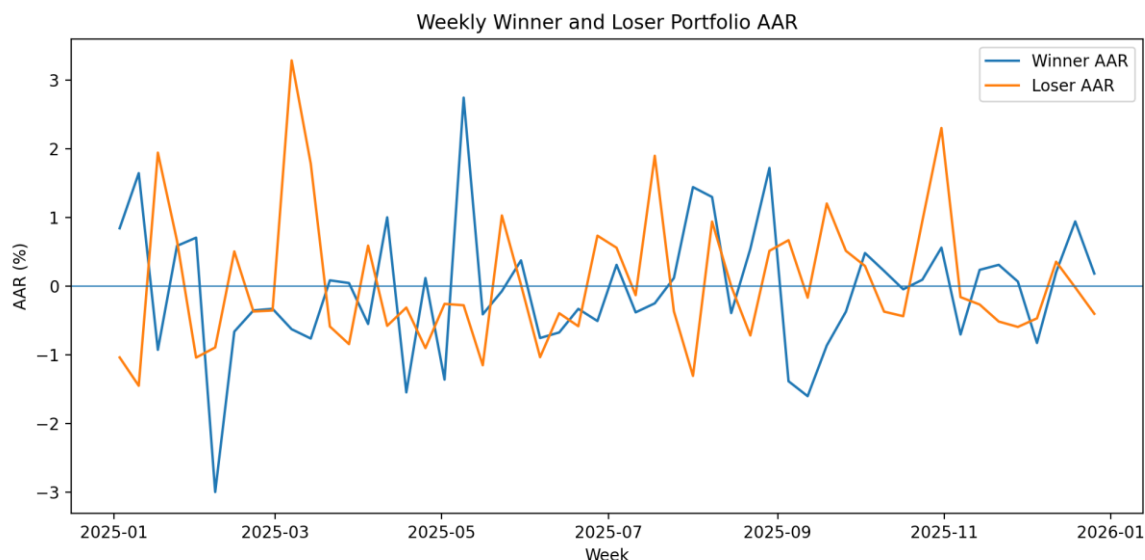
| Horizon     | Observations | Negative Testing W–L CAAR | Positive Testing W–L CAAR | Overall Evidence                |
|-------------|--------------|---------------------------|---------------------------|---------------------------------|
| Short term  | OB1, OB5     | OB1                       | OB5                       | Mixed                           |
| Medium term | OB2, OB4     | OB2, OB4                  | None                      | Consistent directional reversal |
| Long term   | OB3          | None                      | OB3                       | No reversal                     |

Source: Author's calculation based on the study data.

The medium-term horizon gives the clearest directional evidence. Both medium-term configurations produce negative testing-period Winner–Loser CAARs. The short-term evidence is mixed. The long-term result does not support reversal.

#### 4.10. Graphical Results

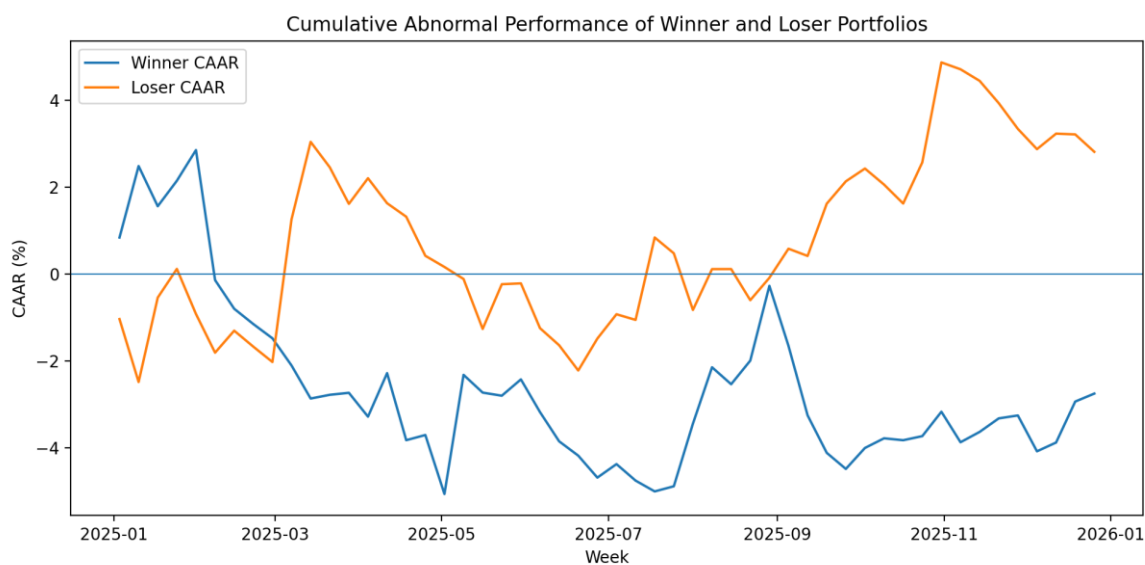
**Figure 4.1. Weekly Winner and Loser Portfolio Average Abnormal Return**



*Source: Author's calculation based on the study data.*

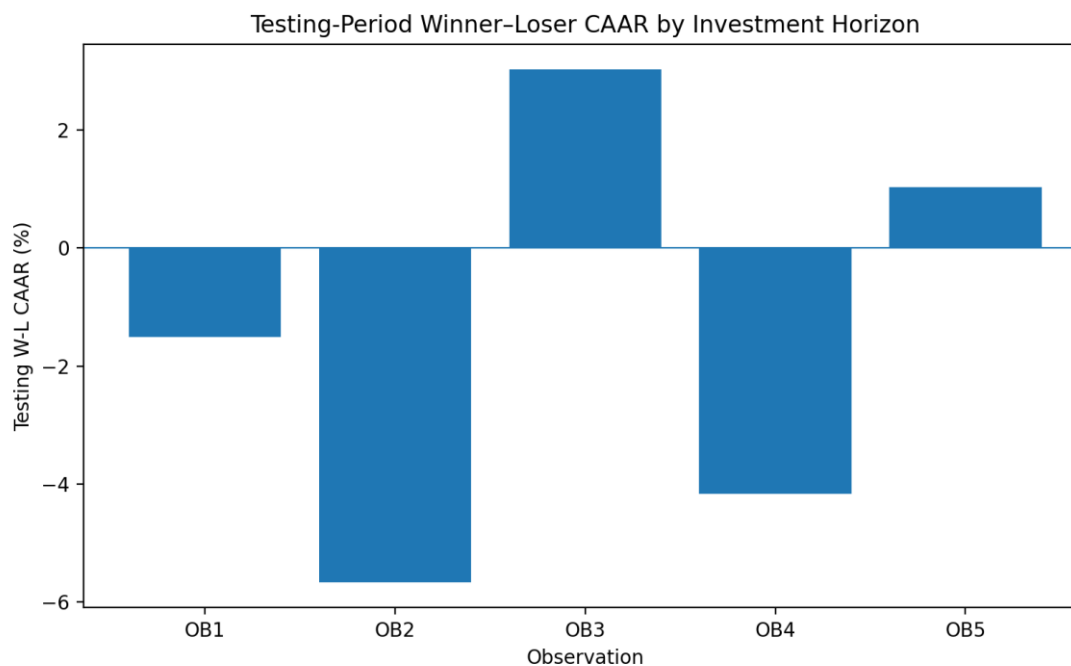
The weekly series shows how winner and loser abnormal returns move relative to each other. Periods where the winner series falls below the loser series correspond to negative Winner–Loser AARs.

**Figure 4.2. Cumulative Abnormal Performance of Winner and Loser Portfolios**



*Source: Author's calculation based on the study data.*

The cumulative paths show the development of relative portfolio performance. The figure helps identify periods in which the loser portfolio catches up with or exceeds the winner portfolio.

**Figure 4.3. Testing-Period Winner–Loser CAAR by Observation**

*Source: Author's calculation based on the study data.*

The negative values for OB1, OB2 and OB4 show the direction of reversal. OB2 has the largest negative value. OB3 and OB5 are positive and do not support reversal.

#### 4.11. Summary of Empirical Findings

- i. Winner–Loser testing performance is negative in OB1, OB2 and OB4.
- ii. OB2 has the strongest reversal, with a testing-period Winner–Loser CAAR of  $-5.6658\%$ .
- iii. OB4 has a Winner–Loser CAAR of  $-4.1729\%$ .
- iv. OB1 has a Winner–Loser CAAR of  $-1.5090\%$ .
- v. OB3 has a positive Winner–Loser CAAR of  $3.0261\%$ .
- vi. OB5 has a positive Winner–Loser CAAR of  $1.0315\%$ .
- vii. Both medium-term configurations show negative testing-period Winner–Loser CAARs.
- viii. None of the five testing-period AAR differences is statistically significant at 5%.
- ix. The Wilcoxon results also fail to establish significance.
- x. The evidence is therefore partial and horizon-dependent rather than statistically conclusive.

## 5. FINDINGS AND DISCUSSION

### 5.1. Evidence of Reversal

The main finding is that three of the five testing configurations show reversal. Prior winners underperform prior losers in OB1, OB2 and OB4. This is consistent with the direction expected under the overreaction hypothesis (De Bondt & Thaler, 1985).

However, the result is not uniform. OB3 and OB5 show positive Winner–Loser CAARs. This means that prior winners continue to outperform prior losers in these periods. The study therefore does not provide evidence of a persistent reversal across every horizon (C. Chen et al., 2012).

### 5.2. Medium-Term Reversal

The medium-term results are the most interesting. Both OB2 and OB4 show negative testing-period Winner–Loser CAARs. OB2 has the strongest result at  $-5.6658\%$ . OB4 follows at  $-4.1729\%$ .

This pattern may suggest that reversal is stronger at an intermediate horizon. It is possible that an initial overreaction needs time to correct. A very short window may not provide enough time for the correction. A longer window may include changes in firm fundamentals that weaken the original reversal (Shie, 2019).

This explanation is only tentative. There are only two medium-term observations. More formation dates are needed before a stable horizon effect can be claimed (Hsu et al., 2021; Ichsani & Suhardi, 2015).

### 5.3. Long-Term Result

The long-term result does not support the overreaction hypothesis. OB3 records a positive Winner–Loser CAAR of 3.0261%. Prior winners therefore outperform prior losers during the testing period.

This result differs from the classical long-run reversal evidence of De Bondt and Thaler (1985). The difference may be due to the shorter study period, the selected companies, market conditions or the small portfolio size. The present data cannot identify the exact reason.

### 5.4. Short-Term Result

The short-term results are mixed. OB1 shows reversal, while OB5 does not. This suggests that short-term reversal is not stable across the two periods examined (Sandhu, 2022).

This result is consistent with the broader literature, where continuation and reversal have been found at different horizons. It also supports the need to test more than one period instead of drawing conclusions from a single event window (Pattnaik et al., 2020).

### 5.5. Economic and Statistical Evidence

The study makes an important distinction between economic and statistical evidence. OB2 has a large negative Winner–Loser CAAR. The result is economically visible. Yet the statistical test is not significant. A negative CAAR therefore cannot be treated as proof of systematic overreaction (De Bondt & Thaler, 1987; Donthu et al., 2021).

This distinction makes the findings more cautious. The study identifies periods in which reversal occurred in the sample. It does not claim that the Indian market as a whole shows statistically proven overreaction (Baker et al., 2020).

### 5.6. Comparison with Earlier Studies

The findings partly agree with De Bondt and Thaler (1985) because prior winners underperform prior losers in some testing periods. They also fit the broader behavioural view that investor expectations can move away from fundamental values.

At the same time, the findings differ from studies that report strong long-term reversal like Ariffin & Power (1996); Chawla (2014); Chung et al. (2015); Singh (2012). The long-term configuration in the present study produces continuation instead. The results are closer to Indian studies that report mixed momentum and contrarian effects across different horizons (Klavans & Boyack, 2010; Kumar et al., 2021).

The findings also support the argument that investor response can differ across market conditions and market segments. Maher and Parikh (2011) reported different responses to information shocks across Indian market-capitalisation groups. The present study similarly finds that the reversal pattern is not stable across horizons (P.-C. Chen et al., 2020; Chopra, 1998).

### 5.7. Possible Explanations

Several explanations are possible. Investors may overreact to recent performance and correct their expectations later. Liquidity and price pressure may also create short-term reversal (Alexander et al., 1998). Changes in firm fundamentals may affect longer testing periods. Market conditions may also influence the strength of the effect (Andersen, 2021).

These explanations cannot be separated with the present dataset. They should therefore be treated as possible interpretations rather than tested conclusions.

### 5.8. Implications for Market Efficiency

If reversal were strong, persistent and statistically significant, it could challenge a strict weak-form efficiency interpretation. The present findings are not strong enough for such a conclusion (Abebe Assefa et al., 2014). The effect is inconsistent across horizons and statistically insignificant.

The safer conclusion is that the selected sample contains some evidence of reversal. This evidence is not sufficient to claim a broad market inefficiency.

### 5.9. Research and Practical Implications

For researchers, the results show the value of examining several horizons. A single holding period may miss an effect that appears at another horizon. Future studies should use more securities and more independent formation dates.

For investors, the medium-term reversal is interesting but not enough to support a trading strategy. Transaction costs, liquidity, taxes and risk would need to be considered. The statistical weakness of the current result is also important.

### 5.10. Limitations and Future Research

The main limitation is the small sample. Only five winner and five loser companies are used. There are also only five formation–testing configurations. This limits statistical power.

The market-adjusted model is another limitation. It removes broad market movement but does not separately control for beta, size, value, momentum or liquidity. Future research can use a market model or multifactor model.

Future studies can also use a larger universe of Indian stocks. More years and more formation dates would provide more independent observations. The effect can then be tested across sectors, firm sizes, liquidity groups and different market conditions.

## 6. CONCLUSION AND IMPLICATIONS

This study examined whether selected Indian equities show winner–loser price reversal after periods of extreme performance. The study used 15 selected companies. Five were classified as winners and five as losers based on formation-period cumulative abnormal returns. Five middle-ranked companies were excluded from the portfolio comparison.

The study used weekly closing prices and the Sensex as the market benchmark. Market-adjusted abnormal returns were calculated. AAR and CAAR were then used to measure portfolio performance. Five formation–testing configurations were examined.

The results provide mixed evidence. Three configurations show negative Winner–Loser CAARs. OB1 records  $-1.5090\%$ . OB2 records  $-5.6658\%$ . OB4 records  $-4.1729\%$ . These results indicate subsequent underperformance of prior winners in those periods.

Two configurations do not show reversal. OB3 records  $+3.0261\%$  and OB5 records  $+1.0315\%$ . The long-term and one short-term configuration therefore show continuation rather than reversal.

The medium-term results are the strongest directional evidence. Both medium-term configurations produce negative Winner–Loser CAARs. However, none of the five testing-period differences is statistically significant at the 5% level. The Wilcoxon results lead to the same conclusion.

The study therefore concludes that the selected sample shows partial and horizon-dependent evidence of winner–loser reversal. The evidence is economically visible in some periods. It is not statistically strong enough to confirm systematic investor overreaction.

The findings contribute to behavioural finance research by showing why investment horizon matters. They also show the importance of separating economic magnitude from statistical significance. Future studies with larger samples can test whether the medium-term pattern found here remains stable.

### 6.1 Theoretical Implications

The study provides qualified support for the behavioural view of price reversal. Some prior winners later underperform. However, the lack of statistical significance prevents a strong claim of systematic overreaction. The results therefore support further investigation rather than a final rejection of market efficiency.

### 6.2 Practical Implications

Investors should not assume that past winners will always continue to outperform. The medium-term results may be useful for researchers studying contrarian strategies. However, the current evidence is not strong enough to recommend a trading strategy.

### 6.3 Future Research

Future research should use a larger number of Indian companies and more independent formation dates. Alternative expected-return models should also be tested. Researchers can further examine size, liquidity, sector and market-regime effects. These extensions can show whether the reversal observed in the present study is a broader market phenomenon.

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