A Multi-Factor and Portfolio-Based Approach of Momentum Anomaly and Risk Premium in the Indian Stock Market

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ARTICLE INFO	ABSTRACT
	The study investigates the persistence and nature of the momentum effect in the Indian stock market, with the objective of determining whether it represents an exploitable anomaly or a systematic risk factor. Using a dataset of 232 continuously traded firms listed on the Nifty 500 index over the period July 2015 to June 2024, momentum portfolios were constructed following the Jegadeesh and Titman (1993) methodology across multiple formation and holding horizons. The performance of Winner, Loser, and Winner–Loser (WML) portfolios was evaluated using Sharpe ratios, Jensen's alpha, and Newey–West robust tests. Results demonstrate that Winner portfolios consistently deliver positive and significant returns, Loser portfolios persistently underperform, and the resulting WML portfolios generate large and highly significant abnormal profits, with momentum strength increasing at longer horizons.
	To examine whether momentum returns can be explained by risk factors, the study employs the Capital Asset Pricing Model (CAPM), the Fama–French three-factor model, and the Carhart four-factor model. Both the CAPM and three-factor models fail to account for the profitability of momentum strategies, as WML portfolios produce large and significant alphas across horizons. However, once the momentum factor is incorporated into the Carhart specification, abnormal returns largely disappear, suggesting that the momentum premium in India is not spurious but represents a distinct and priced risk factor.
	Overall, the findings provide robust evidence of momentum in India and highlight its dual interpretation: as a persistent anomaly under conventional models and as a systematic risk factor within extended asset-pricing frameworks. The study contributes to the literature by offering comprehensive evidence on momentum in an emerging market, demonstrating its persistence across time horizons, and underscoring the inadequacy of traditional models in capturing its dynamics.
	Keywords: Momentum effect, Jegadeesh and Titman, CAPM, Indian Stock Market and NSE

1. Introduction

The Efficient Market Hypothesis (EMH), as postulated by Fama in 1970, has long been regarded as the cornerstone of modern finance. It asserts that it is impossible for the investors to systematically earn abnormal returns through strategies based on historical price patterns or publicly available information. However, over the past few decades, a growing body of empirical research has challenged this proposition by documenting persistent and repeatable deviations from EMH, which are commonly known as stock market anomalies. Among these, the most widely recognized and extensively studied anomaly is the momentum effect. Within finance, momentum denotes the observed propensity for upward moving asset prices with a persistent behaviour, and the trend in declining prices is found. (Jegadeesh and Titman, 1993) asserted that momentum refers to the empirical tendency of stocks that have performed well in the recent past (winners) to continue outperforming in the near future, while those that have underperformed (losers) to continue lagging. It is typically observed over short-to-medium horizons ranging from three to twelve months and has been confirmed across a wide range of asset classes, geographical markets and time periods. The persistence and

robustness of this anomaly make it one of the most provocative challenges to EMH, raising fundamental questions about the rationality of investors, the adequacy of existing asset-pricing models, and the mechanisms driving asset returns.

Over the years several explanations have been advanced to account for the momentum effect. The Risk-based theories argue that momentum profits may represent compensation for bearing certain forms of systematic risk not captured by conventional models such as the Capital Asset Pricing Model (CAPM) or the Fama–French three-factor framework. Additionally, market frictions—such as transaction costs, liquidity constraints, and institutional trading practices—are often cited as factors influencing the magnitude and persistence of momentum. Despite this rich theoretical backdrop, no single explanation has been universally accepted, and the debate surrounding the sources of momentum remains one of the most active in empirical finance.

At the global level, momentum strategies have been shown to yield significant excess returns in developed markets such as the United States and United Kingdom (Siganos, 2013); (Zakamulin & Giner, 2022), as well as in several emerging markets including China, Singapore, and Tunisia ((Su, 2011); (Ali, 2022); (Boussaidi & Dridi, 2020)). Yet, the strength and consistency of these strategies vary considerably across contexts.

The Indian stock market provides a particularly compelling setting for momentum research. As one of the largest and fastest-growing emerging economies, it combines modern trading infrastructure and increasing global integration with evolving regulatory frameworks and a diverse investor base. Empirical evidence consistently documents momentum profitability in India across different sample periods, portfolio formation strategies, and industry segments ((Ansari & Khan, 2012); (Garg & Varshney, 2015); (Maheshwari & Dhankar, 2017b)). Studies suggests that momentum in India may operate independently of other well-known anomalies, thereby offering unique insights into asset pricing dynamics in emerging markets. More recently, the COVID-19 pandemic has provided another natural experiment for testing the resilience of momentum strategies under extreme market stress. Despite such episodes of vulnerability, momentum continues to be regarded as one of the most robust and exploitable anomalies in the Indian market, with implications for both academic research and investment practice.

Against this backdrop, the present study seeks to undertake a comprehensive examination of momentum profitability in India. Specifically, it aims to analyse the persistence of momentum anomaly in the Indian stock market. By employing both multi-factor asset pricing models and portfolio-based trading strategies, this study not only contributes to the literature on asset pricing anomalies in emerging markets but also provides practical insights for investors, fund managers, and policymakers seeking to design robust and adaptive investment strategies in India.

2. Literature Review

Momentum has emerged as one of the most robust and controversial market anomalies in global financial research. The seminal work of Jegadeesh and Titman (1993) established that stocks exhibiting high returns over the past 3–12 months tend to outperform in subsequent periods, while past losers continue to underperform. This finding directly contradicts the weak-form Efficient Market Hypothesis (EMH), which asserts that historical price information cannot be exploited to generate abnormal returns. Over the years multiple studies have confirmed the persistence of momentum profits in developed markets such as the United States and the United Kingdom, with explanations ranging from investor underreaction and delayed price adjustment to firm-specific characteristics like profitability and growth signals ((Siganos, 2013) & (Zakamulin & Giner, 2022)). European evidence highlights both the strength and the context-dependence of momentum effects. (Apergis et al., 2022) report that momentum and reversal patterns are particularly strong among low-capitalized firms, with momentum persisting over longer horizons while reversals remain short-lived. In contrast, results from smaller markets such as Ireland and New Zealand are less conclusive. (O'Donnell & Baur, 2009) find that momentum remains profitable in Ireland once heteroscedasticity is controlled, whereas (Trethewey & Crack, 2010) show that transaction costs effectively eliminate momentum profits in New Zealand. Similarly, (Novak & Novak, 2010) demonstrates the weak or absent nature of momentum in Sweden, pointing to market microstructure and liquidity as crucial determinants of the anomaly's manifestation.

Evidence from emerging markets presents a more complex picture. (Hanauer & Linhart, 2015) and (Cakici et al., 2013) suggest that momentum effects are weaker and less consistent in emerging economies compared to developed ones, though the value premium appears stronger. At the same time, country-specific studies often highlight the role of behavioural biases in sustaining momentum. For example, (Boussaidi & Dridi, 2020) attribute momentum in Tunisia to investor underreaction to earnings information, while (Lin et al., 2016) link momentum in Taiwan to overconfidence among retail investors, conditional on market stability. (Su, 2011) documents strong industry-level momentum in China, while (Shi & Zhou, 2017) observe short-run momentum and long-run reversals, reinforcing the idea that time horizon plays an important role.

Studies over the years have expanded the concept of momentum beyond traditional price-based strategies. (Tan et al., 2022) and (Ma et al., 2024) propose fundamental and factor momentum strategies, which outperform simple past-return-based strategies by incorporating firm fundamentals and factor performance trends. In South Korea, momentum is found to be unstable: (Eom & Park, 2021) identify negative momentum among high-attention stocks due to firm-specific reversals, whereas (Kang et al., 2025) show that reversals dominate at the stock level, with momentum being largely sector-specific. In Singapore, (Ali, 2022) reports

strong short-run momentum but no evidence of long-term reversals, with profits concentrated among smaller, more volatile firms. At a broader level, (Zaremba, 2018) documents country-level momentum across 78 markets, suggesting that past country performance predicts future returns, while (Zakamulin & Giner, 2022) develop autoregressive models of returns to provide a theoretical basis for short-term momentum. These international findings collectively establish that the momentum anomaly is not universally robust and its manifestation is often context-dependent, shaped by factors like liquidity constraints and behavioural biases. In contrast to many of these varying international findings, India consistently demonstrates a healthy and persistent momentum effect. Unlike many emerging markets where momentum is weak or absent, India consistently demonstrates momentum profits across time periods, industries, and trading strategies. Given its size, rapid growth, and evolving market structures, the Indian stock market offers a unique environment to study momentum anomalies. Early evidence from India aligns with international findings, indicating that momentum strategies generate significant excess returns. (Ansari & Khan, 2012) analysing the period 1995–2006, report strong momentum profits that could not be explained by standard asset-pricing models such as the CAPM or the Fama–French three-factor model. Instead, their findings suggest that idiosyncratic risk is positively associated with momentum, lending support to behavioural finance explanations over risk-based interpretations. Subsequent studies have strengthened the case for momentum in India. (Garg & Varshney, 2015), using data from 2000–2013, find robust momentum profits both at the aggregate and sectoral levels, thereby rejecting the weak-form EMH in the Indian context. Similarly, (Maheshwari & Dhankar, 2017a) document significant momentum returns from 1997–2013 using a large sample of BSE-listed firms. Importantly, they observe that momentum profits in India are largely driven by long positions in past winners rather than shorting losers, a pattern distinct from some developed markets. Their findings remain significant even after controlling for size, value, and liquidity, suggesting that momentum in India operates independently of these factors.(Maheshwari & Dhankar, 2017b) while studying the relationship between momentum and market conditions stated that while momentum strategies are profitable in stable periods, they collapse during crises such as the 2008 global financial crisis, only to rebound in the recovery phase. This cyclical behaviour underscores the vulnerability of momentum in times of systemic shocks. To address this, (Singh et al., 2022) propose a risk-managed momentum strategy, which enhances risk-adjusted performance by reducing downside risk and increasing the Sharpe ratio, making momentum more resilient across varying market conditions. (Banerjee et al., 2018) find that momentum, along with the value effect and risk premium, significantly predicts Indian stock returns, supporting the behavioural finance perspective. In contrast, Sehgal's findings suggest that momentum in India can be partially explained within the Fama–French three-factor model, pointing to rational sources linked to size and book-to-market characteristics. (Saeed et al., 2014) differentiate between contrarian and momentum strategies, noting that contrarian profits dominate in the short term, particularly among small and medium-sized firms, while momentum dominates in the medium term. (Garg & Varshney, 2015) observe sector-level momentum effects, implying that industry dynamics contribute to anomaly persistence. (Chui et al., 2023) link momentum to liquidity, finding stronger profits among highly liquid stocks, while (Mehta & Sharma, 2017) demonstrate that both momentum and contrarian strategies coexist under different market conditions using NSE data. (Sharma et al., 2024) further strengthen the evidence by applying the Fama–French–Carhart framework over the period 2005–2022, showing that momentum consistently outperforms both size and value effects, thereby reinforcing its role as the most persistent anomaly in the Indian market.

Overall, both international and Indian evidence collectively establishes momentum as one of the most enduring anomalies in financial markets, yet its drivers and stability remain contested. International studies show that while momentum is consistently profitable in developed markets, its strength in emerging and smaller markets is more variable, often shaped by liquidity constraints, behavioural biases, and market frictions. Whereas, India consistently demonstrates a healthy and persistent momentum effect. The Indian stock market provides a compelling setting for this research due to its status as a large, fast-growing emerging economy with evolving regulatory frameworks and a diverse investor base. Early and subsequent evidence from India confirms that momentum strategies generate significant excess returns that cannot be explained by standard asset-pricing models like the CAPM or the Fama-French three-factor model. This profitability is largely driven by long positions in past winners rather than shorting losers, a pattern distinct from some developed markets. Critically, momentum in India appears to operate independently of other well-known anomalies like size and value, representing a unique and persistent dimension of returns. This divergence from the mixed results seen elsewhere highlights India as a market where the momentum anomaly is particularly strong and exploitable, reinforcing the need for this comprehensive study

3. Data and Methodology

3.1. Data
The dataset comprises of 232 actively traded companies which were continuously a part of NIFTY500 index and are listed on the National Stock Exchange (NSE). The companies were selected on the basis of continuous data availability during the sample period to ensure robustness in portfolio construction and rebalancing and factor estimation. The study spans over a period of 10 years from July 2015 to June 2024, that encapsulates

diverse phases of the Indian stock market, including periods of stable growth, the COVID-19 pandemic-induced disruption, and the subsequent recovery.

The Market return (R_{mt}) was proxied by the Nifty 500 index, which provides a broad representation of the Indian equity market. The monthly closing price of the companies and NIFTY500 were obtained from the ACE Equity and NSE databases. Based upon the prior literature, to capture the Risk-free rate ($R_{f,t}$), the yield on 91-day Treasury Bills was employed, which was obtained from RBI database.

Monthly returns were calculated as:

$R_t = \ln(P_t / P_{t-1})$

Where R_t stands for stock return for time t, ln in natural logarithm, P_t stands for current month's stock price of the security and P_{t-1} represents previous month's stock price.

Excess monthly returns were then calculated as:

$RE_t = (R_t - R_{ft})$

Where RE_t stands for excess return on the stock, R_t is the return on the stock and R_{ft} is the risk-free rate.

In addition, firm-level characteristics such as market capitalization and Book-to-Market (B/M) ratio were also collected from the Ace Equity database to construct the size and value factors. Which enabled the integration of momentum into multi-factor asset pricing models alongside traditional anomalies.

3.2.   Methodological Framework

The methodology is two-pronged, combining portfolio-based momentum strategies and factor model estimation. This dual framework provides a comprehensive assessment of whether momentum in India should be understood as a priced risk factor or as a behavioural anomaly capable of generating exploitable trading profits.

3.2.1.   Momentum Trading Strategy

To compute momentum profits, the study implements the Jegadeesh and Titman, 1993 momentum strategy. We use 'J' months for formation period and 'K' months for holding period (J×K strategy). For the purpose of the study, we use various combinations of J & K using values 3, 6, 9 and 12 months, which gave rise to a total of 16 combinations. First the stocks were ranked at the end of each month based on their cumulative past returns over past 'J' months (J = 3, 6, 9, and 12). The stocks were then divided into two portfolios, Winner Portfolio (W) included top 25 Stocks of past performers and Loser Portfolio (L) included bottom 25 Stocks of past performers. These portfolios are then held for 'K' months (K = 3, 6, 9, and 12) giving rise to 'K' overlapping portfolios for each month. Finally, monthly equally weighted arithmetic mean of the portfolios was calculated to get Winners and Losers for each J×K strategy, which allowed the examination of momentum profitability across different investment horizons.

The zero-investment momentum portfolio was then created constructed as:

$WML_t = RW_t - RL_t$

To examine whether the Winner-Minus-Loser (WML) portfolios constructed under the Jegadeesh and Titman (J&T) methodology exhibit evidence of a momentum effect, we employed a combination of risk-adjusted performance and econometric tests. First, the Sharpe ratio was computed to assess the risk-return trade-off of winner, loser, and WML portfolios, thereby providing a comparative measure of performance relative to portfolio volatility. To account for potential autocorrelation and heteroskedasticity in the time-series data, we applied the Newey-West adjusted t-statistics, which yield robust significance levels for mean returns. Additionally, we estimated Jensen's alpha under the Capital Asset Pricing Model (CAPM) framework to determine whether the abnormal returns of WML portfolios persist after controlling for systematic risk.

Sharpe Ratio = $\frac{R_{pt}}{\sigma}$

Jensen's Alpha is calculated using the following model.

$(R_{pt} - R_{ft}) = \alpha_i + \beta_i (R_{mt} - R_{ft}) + \epsilon_i$

3.2.2.   Factor Models

To evaluate whether momentum is a systematic risk premium in the Indian stock market, the study employs a sequence of established asset-pricing models using SMB (Small minus Big), HML (High minus Low) and WML (Winner minus Loser) to account for risk factors. First, at the end of June of each year, we rank firms based on market capitalization (the end of June stock price times shares outstanding) and form two groups: the first group, S, comprises the smallest firms and the second, B, comprises the biggest ones. We also form two groups of firms based on the book-to-market (B/M) Ratio, where L is the group of firms with the lowest B/M ratio and H those with the highest B/M ratio. To calculate WML for 4 factor model, the portfolios where rebalanced annually on the basis of the returns of the component companies. The top companies where termed as Winner and Bottom companies were taken as losers.

The following asset pricing models were used to test if momentum is a systemic risk:

Capital Asset Pricing Model (CAPM):
$$RE_{pt} = \alpha_i + \beta_i (R_{mt} - R_{ft}) + \epsilon_i$$

Fama–French Three-Factor Model (1993):
$$RE_{pt} = \alpha_i + \beta_i (R_{mt} - R_{ft}) + s_i\, SMB_t + h_i\, HML_t + \epsilon_i,$$

Carhart Four-Factor Model (1997):
$$RE_{pt} = \alpha_i + \beta_i (R_{mt} - R_{ft}) + s_i\, SMB_t + h_i\, HML_t + m_i\, WML_t + \epsilon_i,$$

Here, SMB (Small Minus Big) captures the size effect, HML (High Minus Low) captures the value effect, and WML (Winners Minus Losers) represents the momentum premium, constructed as the return differential between past winner and loser portfolios. The statistical significance of the intercept term (α_i, Jensen's alpha) is used to test for abnormal returns unexplained by risk factors.

By combining factor model analysis with portfolio-based trading strategies, this study adopts a comparative approach. The factor models test whether momentum is priced as a systematic risk factor, while the trading strategies assess whether it represents an exploitable anomaly capable of generating abnormal returns. This dual framework provides deeper insights into the nature of momentum in the Indian stock market, its persistence across different horizons, and its interaction with other known anomalies such as size and value.

4. Analysis and Discussion

Table 1. Sharpe Ratio of portfolio returns over various formation and holding (J×K) windows

Window	Sharpe Ratio	Window	Sharpe Ratio	Window	Sharpe Ratio
winner3x3	2.0414	loser3x3	-3.1534	WML3X3	6.2149
winner3x6	2.6879	loser3x6	-3.6498	WML3X6	7.0645
winner3x9	3.0292	loser3x9	-3.9541	WML3X9	7.6468
winner3x12	3.2988	loser3x12	-4.1699	WML3X12	8.0621
winner6x3	2.6895	loser6x3	-1.7026	WML6X3	6.7110
winner6x6	2.9148	loser6x6	-1.9280	WML6X6	7.5626
winner6x9	3.1156	loser6x9	-2.1115	WML6X9	8.3101
winner6x12	3.3499	loser6x12	-2.3393	WML6X12	8.7750
winner9x3	2.5592	loser9x3	-1.5337	WML9X3	7.0498
winner9x6	2.6563	loser9x6	-1.6057	WML9X6	7.5044
winner9x9	2.8252	loser9x9	-1.7408	WML9X9	7.9424
winner9x12	3.0464	loser9x12	-1.9436	WML9X12	8.2909
winner12x3	2.4553	loser12x3	-1.3910	WML12X3	6.9945
winner12x6	2.5862	loser12x6	-1.4836	WML12X6	7.4804
winner12x9	2.7524	loser12x9	-1.6126	WML12X9	7.8984
winner12x12	2.9393	loser12x12	-1.7624	WML12X12	8.3147

Table 1 presents the Sharpe ratios of winner portfolios, loser portfolios and the corresponding winner-minus-loser (WML) momentum portfolios across different formation and holding period combinations. A clear and consistent pattern emerges across the results. The winner portfolios demonstrate positive and improving Sharpe ratios across all windows. The positive trend implies that past winners consistently outperform the market on a risk-adjusted basis, and the performance strengthens with longer formation and holding horizons. The monotonic increase in Sharpe ratios highlights the robustness of the momentum effect among winners. On the other hand, the loser portfolios exhibit persistently negative Sharpe ratios across all horizons, ranging from −1.39 to −4.17. Moreover, the magnitude of underperformance deepens as the formation and holding periods are extended. This indicates that stocks that performed poorly in the past continue to deliver inferior risk-adjusted returns in subsequent periods, thereby confirming the persistence of poor performance among losers. Most importantly, the WML portfolios yield strongly positive and economically significant Sharpe ratios, ranging between 6.21 (3x3) and 8.78 (6x12). The gains from momentum strategies are not only consistently positive but also improve steadily with the extension of the formation and holding periods. The highest Sharpe ratios are observed at longer windows (9x12 and 12x12), indicating that strategies based on extended horizons capture stronger momentum effects.

Overall, the evidence suggests that the momentum anomaly is strongly present in the examined dataset. The persistent underperformance of losers combined with the consistent outperformance of winners leads to highly profitable momentum strategies. These findings align with prior international and Indian evidence on momentum (Jegadeesh and Titman, 1993; Rouwenhorst, 1998; Sehgal and Balakrishnan, 2002) and reinforce the argument that momentum represents a systematic and exploitable risk factor in the Indian stock market.

The results of Newey–West test for various formation and holding windows represented in Table 2 show that Winner portfolios consistently generated positive and highly significant mean returns, with alphas strengthening with longer horizons. Winner portfolios in short term earn positive returns in the range of 0.18 to 0.43, with strong Newey–West t-statistics. However, the magnitude of profitability is relatively modest compared to longer horizons where the mean returns are substantially higher and highly significant reaching around 0.70. This indicates that momentum effects strengthen with longer formation and holding horizons. This indicates that stocks which have performed well in the recent past continue to earn superior returns in subsequent months, supporting the presence of return continuation among winners.

Table 2. Newey West robust error test (J&T portfolio)

	Winner (W)			Loser (L)			WML (W-L)		
Window	alpha	t stat	prob	alpha	t stat	prob	alpha	t stat	prob
3X3	0.1858	13.1350	0.0000	-0.2561	-18.7021	0.0000	0.4419	34.9978	0.0000
3X6	0.1850	14.4636	0.0000	-0.2578	-19.3085	0.0000	0.4428	36.6266	0.0000
3X9	0.1851	15.7830	0.0000	-0.2576	-20.3514	0.0000	0.4427	38.6661	0.0000
3X12	0.1852	17.0917	0.0000	-0.2578	-21.3641	0.0000	0.4430	40.4713	0.0000
6X3	0.4334	14.5112	0.0000	-0.2744	-9.4773	0.0000	0.7078	36.7826	0.0000
6X6	0.4336	15.0863	0.0000	-0.2736	-10.0726	0.0000	0.7072	39.2041	0.0000
6X9	0.4331	15.9064	0.0000	-0.2735	-10.8116	0.0000	0.7066	41.9111	0.0000
6X12	0.4317	16.9905	0.0000	-0.2757	-11.9515	0.0000	0.7074	43.9888	0.0000
9X3	0.5765	13.2574	0.0000	-0.3335	-7.9635	0.0000	0.9099	36.7375	0.0000
9X6	0.5772	13.6035	0.0000	-0.3327	-8.2092	0.0000	0.9098	38.1596	0.0000
9X9	0.5749	14.3579	0.0000	-0.3352	-8.8501	0.0000	0.9101	39.9022	0.0000
9X12	0.5722	15.3659	0.0000	-0.3399	-9.8318	0.0000	0.9121	41.4375	0.0000
12X3	0.7035	12.7161	0.0000	-0.3859	-7.2231	0.0000	1.0894	36.4367	0.0000
12X6	0.7007	13.1881	0.0000	-0.3878	-7.5508	0.0000	1.0885	37.9503	0.0000
12X9	0.6965	13.9249	0.0000	-0.3927	-8.1629	0.0000	1.0893	39.6773	0.0000
12X12	0.6952	14.8072	0.0000	-0.3962	-8.8965	0.0000	1.0914	41.4933	0.0000

By contrast, Loser portfolios show strongly negative and statistically significant mean returns. Loser portfolios in shorter horizons show consistent negative returns, with highly significant Newey–West t-stats. Similarly, the magnitude of losses deepens in longer horizons, with returns around −0.40. This implies that the underperformance of Losers is not only persistent but tends to intensify over longer windows. This suggests that stocks with poor past performance continue to underperform in subsequent periods. The persistence of negative returns for Losers provides strong evidence against market efficiency, as investors could systematically avoid such stocks to reduce losses.

The WML portfolios, constructed as the difference between Winner and Loser returns, deliver consistently positive and highly significant mean returns across all strategies. WML portfolios constructed with short formation and holding periods earn returns of about 0.44. Although these are statistically significant, the economic magnitude is lower compared to longer horizons where Momentum profits increased rapidly, reaching 0.90 to 1.09. These findings support the presence of momentum effect in Indian stock market. Momentum strategies in the Indian market yield substantial abnormal profits after accounting for autocorrelation and heteroskedasticity.

Table 3. Alpha Value of Risk Adjusted Returns Regressed with Risk Adjusted Market Return (J&T portfolio)

WML (W-L)					
alpha	t stat	prob	mkt	t stat	prob
0.437	34.218	0.000	0.122	0.330	0.742
0.438	36.165	0.000	0.358	0.987	0.326
0.438	38.162	0.000	0.139	0.899	0.371
0.438	39.979	0.000	0.309	1.036	0.303
0.703	36.570	0.000	0.476	1.024	0.308
0.702	39.036	0.000	0.492	1.086	0.280
0.702	41.623	0.000	0.405	0.908	0.366
0.702	43.740	0.000	0.411	1.087	0.279
0.905	36.336	0.000	0.206	0.325	0.746
0.905	37.779	0.000	0.292	0.494	0.623
0.905	39.541	0.000	0.345	0.622	0.535
0.907	41.126	0.000	0.381	0.760	0.449
1.084	36.060	0.000	0.058	0.082	0.935
1.083	37.559	0.000	0.186	0.288	0.774
1.084	39.270	0.000	0.201	0.314	0.754
1.086	41.111	0.000	0.282	0.483	0.630

Window	Winner (W)						Loser (L)					
	alpha	t stat	prob	mkt	t stat	prob	alpha	t stat	prob	mkt	t stat	prob
3X3	0.181	13.477	0.000	-0.810	-2.317	0.022	-0.261	-20.874	0.000	-0.925	-3.614	0.000
3X6	0.180	14.255	0.000	-0.350	-1.069	0.287	-0.263	-20.891	0.000	-0.702	-2.303	0.023
3X9	0.180	15.501	0.000	-0.384	-1.196	0.234	-0.262	-21.908	0.000	-0.696	-2.956	0.004
3X12	0.180	16.543	0.000	-0.186	-0.605	0.546	-0.263	-22.462	0.000	-0.488	-2.301	0.023
6X3	0.428	14.923	0.000	1.251	2.014	0.046	-0.280	-9.861	0.000	0.782	1.120	0.265
6X6	0.428	15.406	0.000	1.213	2.029	0.045	-0.279	-10.427	0.000	0.727	1.115	0.267
6X9	0.428	16.055	0.000	0.997	1.969	0.051	-0.279	-11.133	0.000	0.599	0.930	0.354
6X12	0.427	16.909	0.000	0.585	1.192	0.236	-0.281	-12.199	0.000	0.181	0.302	0.763
9X3	0.571	13.588	0.000	1.893	2.287	0.024	-0.339	-8.330	0.000	1.694	1.790	0.076
9X6	0.572	13.728	0.000	1.446	1.805	0.074	-0.338	-8.452	0.000	1.161	1.184	0.239
9X9	0.570	0.983	0.000	0.983	1.273	0.206	-0.340	-9.018	0.000	0.644	0.647	0.519
9X12	0.567	15.205	0.000	0.381	0.495	0.622	-0.345	-9.970	0.000	0.007	0.007	0.995
12X3	0.698	12.810	0.000	1.669	1.582	0.116	-0.391	-7.445	0.000	1.618	1.268	0.207
12X6	0.696	13.136	0.000	1.009	0.967	0.336	-0.393	-7.679	0.000	0.829	0.644	0.521
12X9	0.692	13.786	0.000	0.387	0.371	0.711	-0.398	-8.257	0.000	0.193	0.146	0.885
12X12	0.690	14.652	0.000	-0.239	-0.220	0.826	-0.401	-9.013	0.000	-0.513	-0.396	0.693

Table 3 provides results of CAPM based on Risk Adjusted (J&T) Portfolio Returns Regressed with Risk Adjusted Market Return. It provides strong evidence that momentum strategies in the Indian equity market generate significant abnormal returns that cannot be explained by market risk alone. Winner portfolios across all formation and holding combinations display positive and statistically significant alphas, indicating the persistence of return continuation. Even though the Winner portfolios in short horizon earn modest excess returns, they are characterized by negative and sometimes significant market betas, suggesting a defensive profile relative to the market. By contrast Winner portfolios in the longer horizon, exhibit substantially higher abnormal returns, with strongly positive market betas, implying greater sensitivity to market fluctuations and a more pro-cyclical behaviour.

Loser portfolios consistently underperform, with negative and significant alphas in both the short and long horizons, and this underperformance intensifies at longer horizons, where returns fall to approximately −0.35 to −0.40. This persistent underperformance underscores the continuation of poor returns among past losers and highlights the asymmetric nature of momentum profits.

The long–short WML portfolios, constructed as the return differential between Winners and Losers, deliver robust and economically meaningful alphas across all horizons. In shorter horizons, WML strategies generate alphas of about 0.43 with near-zero market exposure, while in longer horizons, WML profits increase sharply to around 0.90 to 1.08, with only modest market betas. The strength and consistency of WML alphas confirm that momentum is a powerful and pervasive anomaly in the Indian stock market, and the CAPM is inadequate in capturing these excess returns even after correcting for autocorrelation and heteroskedasticity through the Newey–West procedure.

Table 4 reports the results of the multi-factor regressions. The results provide further insights into the sources of momentum profits and test the robustness of the anomaly beyond the single-factor CAPM. The regression results confirm the persistence of abnormal returns in momentum strategies. Winner portfolios generate

positive and highly significant alphas of approximately 0.052, while Loser portfolios record negative alphas of around −0.037. The Winner–Loser portfolios, which capture the net momentum effect, yield strong abnormal returns of about 0.084, significant at the 1% level. These findings are consistent with earlier CAPM results in Table 3 and reinforce that momentum profits are not explained by market risk alone.

Table 4. Alpha Value of Returns based on factor models (Annually balanced portfolios)

Model		Winner (W)	Loser (L)	WML (W-L)
R_t	Alpha	0.0570	-0.0321	0.0889
	t stat	9.7369	-3.8840	13.1570
	prob	0.0000	0.0002	0.0000
$R_t - R_{ft}$	Alpha	0.0519	-0.0370	0.0840
	t stat	8.8664	-4.4798	12.4227
	prob	0.0000	0.0000	0.0000
CAPM	Alpha	0.0515	-0.0376	0.0842
	t stat	13.2302	-7.8962	13.2442
	prob	0.0000	0.0000	0.0000
3 Factor	Alpha	0.0530	-0.0347	0.0827
	t stat	14.5777	-9.5616	12.9564
	prob	0.0000	0.0000	0.0000
4 Factor	Alpha	0.0091	0.0091	--
	t stat	3.2179	3.2179	--
	prob	0.0017	0.0017	--

When extended to the Fama–French three-factor model, the results remain broadly similar. Winners continue to display significant positive alphas, and Losers show negative alphas, with both magnitudes nearly identical to the CAPM specification. The WML portfolios also earn significant abnormal returns of around 0.084, indicating that the momentum effect cannot be accounted for by size or value factors. This robustness across two specifications suggests that momentum represents an additional dimension of returns that standard three-factor models fail to capture.

The results from the Carhart four-factor model reveal that once the momentum factor is incorporated, the abnormal returns associated with winner and loser portfolios largely disappear. This indicates that the momentum premium in the Indian stock market can be represented as a systematic risk factor that requires explicit inclusion in asset-pricing models.

Comparison of Portfolio-Based and Model-Based Results
The empirical findings derived from portfolio-based tests and asset-pricing models collectively establish the persistence of the momentum effect in the Indian equity market, though the explanatory power varies across approaches. The portfolio-based evidence provides the most direct confirmation of momentum profitability. Winner portfolios consistently generate positive and increasing Sharpe ratios, while loser portfolios exhibit negative and declining risk-adjusted performance across all horizons. The resulting WML portfolios yield large and economically significant Sharpe ratios, peaking at values above eight in longer formation–holding combinations, thereby demonstrating the strong economic viability of momentum strategies.

The results from the CAPM regression framework reinforce this evidence by showing that momentum portfolios earn substantial and statistically significant abnormal returns unexplained by market risk. The alphas of WML portfolios increase systematically with longer horizons, rising from approximately 0.43 in short-term strategies to above 1.0 in extended horizons. This indicates that momentum profits are persistent and asymmetric, with past winners generating sustained excess returns while past losers continue to underperform. The CAPM framework, therefore, proves inadequate in accounting for the anomaly, as it fails to capture the systematic return continuation embedded in momentum portfolios.

The multi-factor models provide further nuance to these findings. The Fama–French three-factor model, which incorporates size and value effects, does not materially reduce the abnormal returns of momentum portfolios; both winners and losers continue to exhibit significant alphas, and WML portfolios deliver strong excess returns of around 0.084. This suggests that momentum in India is independent of size and value effects, representing an additional return dimension.

However, the results change markedly under the Carhart four-factor specification, where the inclusion of the momentum factor reduces the alphas of both winner and loser portfolios to near zero. This outcome indicates that the momentum premium is not a statistical artefact but rather a distinct and priced risk factor that requires

explicit recognition in asset-pricing models. This is our most significant contribution. It fundamentally shifts the perspective on momentum from an exploitable inefficiency to a systematic return driver, similar to market, size, and value factors.

Altogether, our analysis reveals a consistent narrative. Portfolio evidence proves the economic viability of momentum strategies, as the factor models provide insight into its nature. Momentum in India is an anomaly that traditional models fail to capture but can be incorporated into a more comprehensive asset-pricing framework as a different, systematic risk factor.

Momentum as a Priced Risk Factor

Although both the CAPM and the Fama-French models failed to explain the profitability of the momentum strategy, once the Carhart four-factor model is applied, the alpha values and t statistics of winner and loser portfolios decline substantially. This result is fundamental as it suggests that the momentum premium in the Indian stock market is not spurious but represents a distinct systematic risk factor. This re-frame the core discussion around the momentum study. Instead of solely being a behavioural anomaly arising from investor biases, our analysis suggests it may be a systematic source of risk that is rewarded with a premium, much like the market, size, and value factors. Thus, even though momentum in India can be viewed as an anomaly under traditional models and it can be incorporated into asset-pricing framework as a priced risk factor. This finding provides a valuable contribution to the existing literature on the Indian market and challenges the notion that momentum is merely an exploitable arbitrage opportunity. As an alternative, it positions momentum as a fundamental driver of asset returns that should be accounted for in comprehensive asset pricing models.

Conclusion

The objective of the study was to investigate the existence and persistence of the momentum anomaly in the Indian stock market. Using data on 232 companies over a ten-year period, portfolios were constructed on the basis of past returns, and their performance was evaluated under multiple horizons using the Jegadeesh–Titman methodology and tested through factor models. The findings provide strong evidence of momentum in India. Winner portfolios consistently deliver positive and statistically significant returns, whereas Loser portfolios exhibit persistent underperformance. The resulting Winner–Loser (WML) portfolios generate robust and highly significant momentum profits, with the magnitude of returns increasing with longer formation and holding periods, peaking at the 9×9 and 12×12 strategies. These results echo prior international evidence, while confirming recent studies in the Indian context that report significant momentum premiums. Regression analysis using asset pricing models further reinforces these results. Under the CAPM, WML portfolios produce large and significant alphas across horizons, demonstrating that momentum cannot be explained by market risk alone. The persistence of abnormal returns under the Fama–French three-factor model similarly indicates that momentum represents a distinct return dimension beyond size and value. In this sense, momentum appears as a persistent anomaly that challenges the Efficient Market Hypothesis. On the other hand the abnormal performance of WML portfolios diminishes on the introduction of momentum factor into the model, indicating that the factor absorbs the excess returns. This sharp reduction in alphas confirms that the momentum premium in India is not spurious but rather a pervasive feature of stock returns that requires explicit recognition in asset pricing frameworks.

The study provides comprehensive evidence on the existence of momentum in the Indian market using both traditional portfolio-based tests and multi-factor asset pricing models. Further, it demonstrates that momentum profits are stronger and more persistent over longer horizons, adding new insights into the temporal dynamics of the anomaly in an emerging market. Also, by implementing the CAPM, Fama–French three-factor, and Carhart four-factor models, the study highlights the dual interpretation of momentum: as an anomaly unexplained by conventional models, and as a systematic risk factor when explicitly incorporated into asset-pricing frameworks. It highlights the inadequacy of traditional models in capturing the anomaly and reinforces the importance of momentum as a distinct risk factor in asset pricing. Nevertheless, the study is not without limitations. The analysis is conducted using monthly data, which may obscure finer patterns of short-term return dynamics. The use of higher-frequency data could provide additional insights into short-horizon momentum and reversal effects. Moreover, the study relies exclusively on price-based measures of momentum; incorporating fundamental dimensions such as earnings or cash-flow momentum may offer a richer understanding of return predictability in the Indian context. Finally, while this study confirms the persistence of momentum profits in the Indian stock market over short- to medium-term horizons, the findings also raise questions about their sustainability in the long run. Prior literature suggests that momentum strategies may eventually give way to reversal patterns at extended horizons, as past winners underperform and past losers recover. Although the present analysis does not explicitly test for long-term reversals, the consistent strengthening of momentum over longer formation and holding windows indicates that the reversal effect may lie beyond the horizon examined in this study. Future research should therefore examine longer periods to assess whether momentum in India ultimately converges into reversal, thereby providing a more comprehensive understanding of return dynamics across multiple time frames.

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