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Style Investment In India: A Study of Momentum Strategies

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Abstract

The main objective of the current study is to study the market efficiency of Indian stock market through style investment strategy of investors. In particular, the present study has examined the momentum strategies of investors in post financial crisis era. It elaborates whether the momentum strategies result into significant abnormal profits to investors or not. The present study has taken monthly data of CNX 500 index components and sorted the equity stocks on the basis of their residual returns and then winner and loser portfolios are compared to examine the persistence of momentum strategies in the post financial crisis era. Various momentum strategies are made on 3 months, 6 months, 9 months and 12 months holding period basis. The findings of the study have evidenced in favor of momentum anomaly in Indian stock market.

Keywords: *Style Investment, Indian Stock Market, Momentum Anomaly, Residual Returns, Winner-Loser Portfolios.*

Introduction and Background of Study

The anomalous patterns in the stock prices were started documented in 1970s and in 1980s; the researchers started talking about various forms of stock market efficiency. The investors always look at stock market for significant abnormal returns which are difficult to obtain from tradition investment avenues like bank deposits or port office saving schemes. In the earlier studies by Jegadeesh (1990) and Lehmann (1990), evidences were obtained for short term reversals in stock prices. Their study documented that the stocks that yield positive returns in recent past (a week or a month) of trading were giving significant above average returns in their future. But their study explained the reason of such behavior by lack of liquidity and short term price movement of the stocks and not the overreaction of the investors. Lo and MacKinlay (1990) confirmed the existence of results provided by the Jegadeesh (1990) and Lehmann (1990) that abnormal returns were the results of the late reaction of the stock to other factors and it was not the overreaction which caused the abnormal returns. Further Jegadeesh and Titman (1991) sustained these interpretations by providing evidences of the association between short term reversals and bid-ask spread. In their study's authors had argued that regardless of the significance of the momentum strategies most mutual fund managers still used old strategies i.e. they invested in such stocks that performed well in the past quarter.

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Generally investors apply a variety of investment strategies and techniques by selecting their own suitable interest of different time horizons, some probably focused on short term gain while others may be interested in long term investment alternatives. Recent analysis and research in the areas of stock market efficiency divulge that stock market returns are predictable in some degree and this is against the well-established concept of efficient market hypothesis (EMH). EMH has been one of the most overriding themes in the financial market research which achieved extensive interest of financial economists in the area of stock market efficiency. But now the concept of EMH is being critically questioned and this is mainly due to the cumulating evidences on the reversal behavior of stock prices. In last two decades investment strategies have gained attention from the academician world over. Momentum investment strategy means buying stocks that have performed sound in the past and selling stocks that have performed badly in the past with an objective to generate significant returns over holding period. Many professional fund management companies in US have successfully employed momentum investment strategy and initiated momentum based fund schemes. The weak form of EMH states that abnormal returns cannot be earned by considering historical data based investment strategies. Investors can just earn more return by taking more risk. Nevertheless, near zero beta portfolios have been formed to earn abnormal return much higher than risk free rate of return. So momentum profits works as anomaly in the markets and provides fund managers an opportunity to form beta neutral and superior return portfolios. In recent years, many practitioners and academicians have found that by adopting some simple strategies based on past cross-sectional stock returns investors can earn significant abnormal returns. One of these strategies is momentum portfolio strategy, in which investors can earn abnormal return in medium term of three to twelve months, if they have long positions in past best performing stocks (winners) and short position in past worst performing stocks (losers). Opposite to this strategy, a systematic reversal effect is found when a longer holding period of more than three years is considered and reversing the momentum strategy (buying past losers and selling past winners which are known as contrarian strategy) results in profits.

When a new anomaly is documented in the stock market a major concern always rose in the literature. The reason for these concerns occurs because there is no clear explanation as to why momentum returns present greater returns than a largely diversified portfolio. In other words, why some investors are able to make greater returns than the market returns by applying predefined investment strategies. These important and empirical findings are originally reported in two articles by De Bondt and Thaler (1985) and Jegadeesh and Titman (1993). After these finding, a decisive considerate of these twin anomalies has become more urgent and academicians took two main directions related to these anomalies to the EMH. De Bondt and Thaler (1985) studied long term return reversals in the US stock market and interpreted their outcome as a result of irrational behavior of investors. They pointed out the failure of EMH and documented that investors can earn abnormal profits in the stock market by transecting on the basis of past stock prices using contrarian strategy. They recognized this phenomenon (long term reversal) to the presence of Overreaction Effect in the stock market. In a following study in 1987 De Bondt and Thaler examined the risk and size characteristics of the winning or losing firms and concluded that neither risk nor size had any role to play in explaining the momentum strategy.

Likewise, Jegadeesh and Titman (1993) studied the impact of short term momentum effect on

the stock markets. They calculated returns from the two stock markets of US: NYSE and AMEX and collected returns for a period 1965-1989. They documented momentum strategies in which a system of investing in portfolios of shares in a manner that is more profitable than holding a largely diversified portfolio of shares involving no additional risk. They adopted strategy in which they bought such stocks that performed very well in the past and sold those stocks that performed worst in the past. They reached to a conclusion that if such stocks were held for the period of 3 to 12 months, they produced positive returns. Nevertheless, they found that profitability is not the result of systematic risk but it was due to response of stock prices to ordinary factors. In 1999 Schiereck, DeBondt and Weber have examined on a larger sample of stocks and their paper shows that the profitability of momentum strategy is significantly related on the duration of the ranking period. Schmitz et al. (1994-1995) exposed the existence of momentum strategy in market regarding Canadian stocks data for the duration of 1978-1993 and this study presents yet stronger results of the momentum strategy. Rouwenhorst (1998) conducted a study on European markets and concluded that the momentum profits documented by the Jegadeesh and Titman for the US market were true for the European markets too. Daniel, Hirshleifer and Subrahmanyam (1998) endorsed the momentum phenomenon to two biases of informed investors- overconfidence and biased self-attribution. Here, overconfidence persuades investors to have an inflated outlook on the accuracy of their secretive signals about a stock's value, leading them to react excessively to such signals. Whereas, biased self-attribution causes well-informed investors to underrate public signals about value, particularly when the public signals oppose their secretive signals. But this overreaction last for short run only.

In another study conducted by Chui, Titman and Wei (2000) momentum strategy were found true in the Asian markets too with the exception of Japan and Korea. Griffin, Ji, and Martin (2002) performed study on momentum on forty (40) stock exchanges which belong to Africa, America, Asia and Europe. Their research validated that momentum effect is present in approximately all stock exchanges from around the world but in various countries it is weak and in some countries it is strong. Fama and French (1996) and Grundy and Martin (2001) examined this argument using the three factor model developed by Fama and French but interestingly they found the presence of momentum even after exerting control on expected return. Jegadeesh and Titman (2001) rejected the approach of usage of model in determining expected return but they took an assumption that returns were different across different stocks. But, there was one similarity between returns from standard asset pricing model and returns from short-term momentum effect i.e. returns from both sources did not hold the quality of time variation. Naughton, Truong and Veeraraghavan (2008) documented a substantial momentum profits during the period 1995 to 2005. They found significant momentum profits in the Chinese A-shares market by using different period combinations. More recently, Leippold and Lohre (2011) concluded the momentum effect in US market. Joshipura (2011) investigated the National Stock Exchange (NSE) in India between 200-2009 and reported consistent results to Jegadeesh and Titman (1993) that there was significant momentum return evident for the post-formation period ranging between three to twelve months based upon the CRSP US stock data.

Foltice, B. & Langer, T. (2015) studied momentum investment strategy by using data o New York Stock Exchange from July 1991 to December 2010. They found that increasing the trading

frequency initially increases risk-adjusted returns of portfolios up to an optimal point and after that point transaction cost play role in returns.

Considering various evidences discussed above, the momentum strategies have been found a noteworthy investment style of the investment managers across the world markets. Therefore there is a need to examine this anomalous pattern in Indian equity market too. The present study is destined to study the market efficiency of Indian stock market through momentum style investment strategy of investors. In particular, the present study has examined the momentum strategies of investors in post financial crisis era.

Data and Research Methodology

The present study has taken data from January 2009 to June 2015. The consistency and persistence of momentum strategies as a style of investment managers have been less explored in post financial crisis era particularly in Indian scenario. Moreover the post financial crisis era has destabilized many of the emerging and fastest growing stock markets of the world. Therefore the present study has examined the significance of momentum strategies after 2008 financial crisis. For the formation of various winner and losers portfolios, the components of CNX 500 index were taken. The CNX index represents approximately 95.7% of free float market capitalization of equity stocks listed on National Stock Exchange. Hence the components of CNX 500 are considered to be good market proxy for Indian bourse. The monthly data of CNX 500 components was obtained from Capitaline database. The criteria for inclusion of a stock in the present study must be traded constantly (at least once) for 12 months prior to the formation period. The final sample consisted to 469 stocks (considering above criterion and index switching of stocks).

Then the stocks were categorized into winners and losers groups. The stocks which performed the most positive residual returns were grouped into winners stock and stocks performing least or negative residual returns were grouped into losers stock. For this, all stocks were categorized into ten percentile portfolios. The winner portfolio consisted of stocks in first percentile, i.e., P1 and loser portfolio consisted to stocks in tenth percentile, i.e., P10. To calculate the residual returns, S&P CNX Nifty was used to calculate market adjusted returns. For the formation of portfolios on January 2009, the 12 months holding period returns were used to calculate residual returns. The stocks which performed extreme positive or extreme negative returns were grouped into two portfolios and the stocks having extreme positive residual returns for 12 months holding period were grouped in winner portfolio and stocks having extreme negative residual returns for 12 months holding period were grouped in loser portfolio. Then performance of these two portfolios was examined for the following t months holding period, i.e., 3, 6, 9, and 12 months holding period.

The formation of portfolios was done on January 2009. First of all monthly returns on stocks were calculated by using following formula.

$$\frac{MCP_t - MCP_{t-1}}{MCP_{t-1}}$$

Where, MCP is the monthly closing prices of stocks. Afterward cumulative market adjusted returns were calculated as under.

$$CU_j = \sum_{t=-12}^{0} (R_{j,t} - R_{M,t})$$

Where CUj = cumulative market-adjusted return on the stock j, Rj,t = the return on the stock j for the month t, RM,t = the market-index returns. S&P CNX Nifty has been used as a market proxy to calculated market adjusted returns.

The above equation has used simply cumulated AR through time. But in order to avoid bid-ask bias effect, the present study has taken buy and holding period returns for various time periods. For this, the following equation has been used.

$$CU_j^{B\&H} = \left[\prod_{t=-12}^{0}(1+R_{jt}) - 1\right] - \left[\prod_{t=-12}^{0}(1+R_{Mt}) - 1\right]$$

After this, the stocks were classified into winner (W) and loser (L) Portfolios. The final data was left for 469 companies considering various constraints (viz., consistency of data for past 12 months before 2009, switching of some companies into index etc.). The top 47 stocks were included in winner portfolio and lowest 47 stocks were included in loser portfolio. Subsequently CAR for both the portfolios, i.e., Winner and Loser is calculated for 3, 6, 9 and 12 months holding period by using the following formula.

$$CAR_{p,t}^{B\&H} = \frac{1}{n}\sum_{j=1}^{n}\left[\prod_{T=1}^{t}(1+R_{jT}) - 1\right] - \left[\prod_{T=1}^{t}(1+R_{Mt})\right.$$

(For t = 3, 6, 9, 12 and p = W and L, i.e., Winner and Loser and ? sign multiplies all the numbers given as arguments and returns the product)

Results and Findings

Before testing the null hypothesis, the present study has applied descriptive statistics to both Winner (W) and Loser (L) portfolios. Table I has reported the results of descriptive statistics. Table I has shown the summary of descriptive statistics for both winner and loser portfolio.

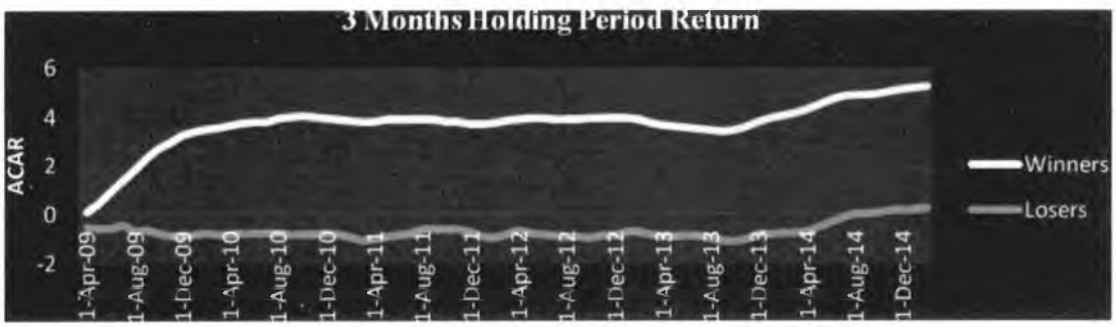
Table I Summary of Descriptive Statistics

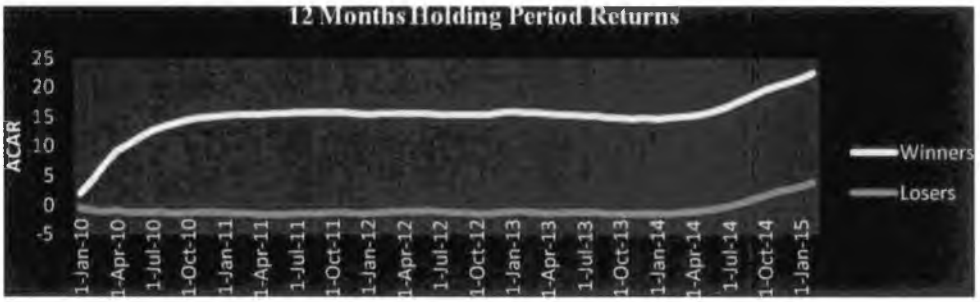
Descriptive/ Statistics	*Monthly*	*3 Months Holding Period*	*6 Months Holding Period*	*9 Months Holding Period*	*12 Months Holding Period*
Winner (W) Portfolio					
Mean	0.036	0.120	0.254	0.383	0.487
Median	0.035	0.090	0.167	0.147	0.164
Maximum	0.414	0.919	1.945	2.735	2.954
Minimum	-0.138	-0.161	-0.258	-0.267	-0.328
Std. Dev.	0.088	0.222	0.445	0.645	0.779

Descriptive/ Statistics	*Monthly*	*3 Months Holding Period*	*6 Months Holding Period*	*9 Months Holding Period*	*12 Months Holding Period*
Skewness	1.062	1.574	1.989	1.994	1.708
Kurtosis	6.445	6.029	7.326	7.201	5.576
Jarque-Bera	49.817	56.480	97.843	90.861	47.268
Probability	0.000	0.000	0.000	0.000	0.000
Loser (L) Portfolio					
Mean	0.015	0.048	0.092	0.141	0.189
Median	0.019	0.046	0.041	0.071	0.070
Maximum	0.222	0.348	0.555	0.794	1.009
Minimum	-0.116	-0.161	-0.165	-0.134	-0.207
Std. Dev.	0.061	0.113	0.173	0.252	0.323
Skewness	0.446	0.691	0.949	1.323	1.488
Kurtosis	4.166	3.573	3.332	3.716	4.065
Jarque-Bera	6.563	6.617	10.526	20.341	25.801
Probability	0.038	0.037	0.005	0.000	0.000

As depicted above, in case of winner portfolio, the highest mean returns were reported by a 12 month holding period strategy and minimum mean returns were reported when portfolio return is calculated on the basis of one month holding period. The volatility is also flowing with the holding period of stocks in the portfolio. The longest is the holding period, the highest is the volatility. The Jarque-Bera statistic has shown that the winner portfolio returns follow non-normal distribution for various holding periods. Further, the evidences obtained for loser portfolio are similar to winner portfolio on the basis of holding period. The highest mean returns were reported when the stocks in the loser portfolio are kept for 12 months time period with highest volatility too. The distribution of holding period returns was also found following non-normal distribution at 5 percent level of significance. The distribution of ACAR of winners and losers portfolios can be observed through following diagrams.

Distribution of Returns of Winner and Loser Portfolios





The presence of significant momentum strategy in the Indian stock market will prove an inefficient market prevails and if no such evidences are identified then it will be an indicator of efficiency of Indian stock market in its weak form because the whole analysis is based upon the historical information of the stock prices. Hence the statement of null and alternative hypothesis is as under.

H0: Momentum Strategy does not exist. ----------> Market is Efficient

H1: Momentum strategy exists. ----------> Market is Inefficient

The t-test has been applied to examine whether the difference between winner and loser portfolio is due to chance or accident or it is significant enough to result in abnormal returns to the investors using momentum strategies. All results are tested at 5 percent level of significance. Table II has shown the results of t-test. As reported in Table II, the t-coefficient is found positive and significant at 5 percent level of significance. It indicates that the abnormal returns obtained from winner (W) portfolio is more than loser (L) portfolio and the difference in the abnormal returns of W and L portfolio is significant also.

Table II Results of T-test

Return	*n- Months*	*Mean*		*Variance*		*t-coefficient*	*p-value*
Criterion		*Winners*	*Losers*	*Winners*	*Losers*	*Winners-Losers*	
ACAR	3-Month	3.7092	-0.6911	0.8724	0.1021	37.559	0
	6-Month	8.3731	-0.9693	3.441	0.4029	39.2945	0
	9-Month	12.6729	-1.1814	7.1929	0.933	39.1836	0
	12-Month	15.0903	-0.8659	10.5061	1.4064	36.4018	0
AAR	3-Month	0.0735	0.0036	0.0193	0.0122	3.3178	0.0012
	6-Month	0.1724	0.0169	0.1015	0.0194	3.6894	0.0004
	9-Month	0.2804	0.0379	0.2752	0.0412	3.475	0.0008
	12-Month	0.3615	0.0631	0.407	0.0576	3.4462	0.0009
N Months	3-Month	0.1201	0.0479	0.0492	0.0127	2.4484	0.016
Holding Period	6-Month	0.2544	0.0918	0.1977	0.03	2.8105	0.0061
Returns	9-Month	0.3831	0.1406	0.4166	0.0633	2.8216	0.006
	12-Month	0.4872	0.1888	0.6071	0.1041	2.7855	0.0067

The significant difference in W and L portfolio is identified at all holding periods (3 months, 6 months, 9 months and 12 months) indicating the momentum strategy works in case of Indian stock market. Both average abnormal returns and cumulative abnormal returns have indicated that momentum strategies as a style investment works well for the investors. Even the simple average holding period return criterion also support the statement of alternative hypothesis. The null hypothesis is rejected under various holding period returns.

Conclusion

The outcome of present study gives a signal to investors that a better understanding of momentum strategy may result into significant abnormal returns to them. There is no divergence in the statistical significance of results obtained through AAR and ACAR for all time-horizons of holding winner portfolio. The momentum strategy as a style of investment managers may affected by difference in holding period. But the evidences obtained in the present study have shown significant positive abnormal returns to investors for 3-months, 6-months, 9-months and 12-months holding period. The evidence of the present study supports the existence of anomaly in the Indian stock market and indicates inefficiency in weak form. Further research can be conducted for other financial instruments too and a sector specific study can also be useful for the investment managers.

References

Chui A.C.W., Titman S., and Wei K.C.J. (2000), "Momentum, Legal Systems and Ownership Structure: an Analysis of Asian Stock Markets", Working paper, Hong Kong University of Science and Technology.

Daniel, K., Hirshleifer, D. and Subrahmanyam, A. (1998), "Investor psychology and security market under- and overreaction", Journal of Finance, 53, 1839-1886.

De Bondt, W. and Thaler, R (1985), "Does the Stock Market Overact?" Journal of Finance, 40, 793-808.

De Bondt, W., and Thaler, R. (1987), "Further evidence on investor overreaction and stock market seasonality," Journal of Finance, 42, 557-581.

Fama E. and French K. (1996), "Multifactor Explanations of Asset Pricing Anomalies." Journal of Finance, 51, pp. 55-84.

Griffin, J. M., Ji, X. and Spencer, J.M. (2002), "Momentum investing and business cycle risk: Evidence from pole to pole", Working paper, Arizona State University.

Grundy B. and Spencer M. (2001). "Understanding the Nature of the Risks and the Source of the Rewards to Momentum Investing", Review of Financial Studies, 14, pp. 29-78.

Jegadeesh, N. (1990), "Evidence of predictable behavior of security returns." Journal of Finance, 45, 881-898.

Jegadeesh, N. and Titman, S. (1991), "Returns of Buying Winners and Selling Losers: Implications for Stock Market Efficiency", Journal of Finance, 48, 65-91.

Jegadeesh, N., and Titman, S. (1993),"Return to buy winners and selling losers: Implications for stock market efficiency," Journal of Finance, 48, 1, 65-91.

Jegadeesh, N. and Titman, S. (2001), "Profitability of Momentum Strategies: An Evaluation of Alternative Explanations", The Journal of Finance, Volume 56, Issue 2, April 2001, pp 699-720.

Joshipura, M. (2011), "Test of Momentum Investment Strategy: Evidence from Indian Stock Market", Journal of International Finance & Economics, 11(2), 105-114.

Lehmann, B.N. (1990), "Fads, martingales, and market efficiency", Quarterly Journal of Economics, 105(1), pp.1-28.

Leippold, M., & Lohre, H. (2011), "International price and earnings momentum", The European Journal of Finance, 18(6), 535-573.

Lo, A.W. and MacKinlay, A.C. (1990a), "When are contrarian profits due to stock market overreaction?", Review of Financial Studies, 3(2), pp.175-205.

Lo, A.W. and MacKinlay, A.C. (1990b), "An econometric analysis of nonsynchronous trading", Journal of Econometrics, 45(1-2), pp.181-211.

Naughton, T., Truong, C., & Veeraraghavan, M. (2008), "Momentum strategies and stock returns: Chinese evidence", Pacific-Basin Finance Journal, 16(4), 476-492.

Rouwenhorst, K. G. (1998), "International momentum strategies", Journal of Finance, 53, 267-284.

Schiereck, D., De Bondt, W. and Weber, M. (1999), "Contrarian and momentum strategies in Germany", Financial Analysts Journal, 55, 104-116

Schimitz, J. Foerster, S., Prihar, A., (1994/1995), "Back to the future", Canadian Investment Review, 7, pp 9-13.