Are Indian Investors Return Chasers? An Anatomy of their Trading Behavior

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Abstract

Momentum has remained an unanswered anomaly in finance literature. Researchers have pointed out two arguments, whether the source of prior return anomalies are rational or behavioral. In this paper, we examined return chasing tendency investors and the profitability of probable price momentum strategy in Indian equity market using the monthly return data of equities represented in BSE-500 index encompassing the time period from July 2004 to Jun 2014. Study is an attempt to analyze momentum effect before, during and after the financial crisis of 2007–2009 to check whether investors continue to follow the same strategy during crisis or their behavior undergoes any change. Also study examined the adequacy of rational CAPM models to explain momentum profits. The result evidenced a strong presence of economically and statistically significant momentum profit in Indian stock market equity returns. Therefore return chasing tendency of Indian investors is found to be persistent in the intermediate horizon in Indian context. Closer observation of the results reveals that, Indian investors are winners chasers rather than investor in past losers. Study also confirmed that investor's sentiments are volatile according to general market environment and inadequacy of rationalist equilibrium model to explain momentum profits.

Keywords: Behavioral Finance, Price Momentum Strategies, Abnormal Return, Indian Equity Market, CAPM

1. Introduction

Over the past decades, *investor's irrationality* has been one of the most dominant themes of debate in financial market research. Researchers argue that *investor's irrationality* is an inevitable reality in equity market which has time and again been proved in different markets. They claim that the most active and smart investors keep looking for an opportunity to earn abnormal return from the equity investment, capitalizing the irrational or uninformed behavior of the market participants. On the other hand, a large body of finance literature assumes that investors are rational agents, who attempt to maximize their wealth with minimum risk. These agents carefully assess the risk and return of all possible investment options to arrive at an investment portfolio that suits their level of risk aversion. Efficient Market Hypothesis says that even though investors are irrational at times, most of the times market is informationally efficient. Advocates of EMH argue that there is no question of abnormal return from the market, why because; competition among investors seeking abnormal returns drive equity prices back to their fundamental values. Behavioral finance says that investors are not calculative utility maximizing machines; they may make systematic mistakes or cognitive errors in the way they think, that opens a scope for smart participants to earn abnormal return in the market.

Behaviorists opine that investor's irrationalism may be due to lack of self-control, overconfidence about their abilities, miscalibrating the information, overreaction or tendency of following the crowd without thinking. These psychological or emotional traits of investors may create variety of effects in equity markets like '*Day Effect' "Month Effect', 'Holiday Effect'* and '*Event Effe*ct' '*Momentum Effect', 'Contrarian Effect'* etc. which are otherwise named as '*Market Anomalies'*[1]. A lot of empirical researches confirmed existence of investors' trading strategies based on behaviorally modified

[1] *Anything inconsistent with theories of asset pricing behavior and indicate market inefficiency or inadequacies in the asset pricing model are named as 'Anomalies' in finance literature.*

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portfolio, offering abnormal return from market, in turn, refuting market efficiency.

Rationalists and mathematicians supporting classical financial theory have attempted to explain abnormalities in equity markets. Rationalists argue that, unseen risk associated with such trading strategies may be the reason of abnormal return. Mathematicians believe that, stock prices are random, however, occasional occurrence of non-randomness may also happen in a data series, so also in stock prices which are supposed to be random. Such non randomness may be the possible explanation of abnormalities in the market. Whereas behavioral protagonists suggest that, abnormalities in equity markets are because of people and their investing behavior. Behaviorists recognize investors psychological or emotional traits are the root cause of anomalies.

Among the different anomalies, the most robust and hotly debated theme in financial market literature is return chasing behavior of investors. Basically there are two contradictory phenomena noticed by researchers in people's investing behavior i.e. return continuation tendency and return reversal tendency resulting in momentum effect and contrarian effect in equity market respectively. Return followers (momentum traders) believe that strong performing stocks tend to continue to perform well for a period of time hence worth buying, while weak performing stocks tend to continue to under perform for a period of time. Return reversals (contrarian traders) think that stocks that have performed poorly over the past periods possibly tend to reverse to high performance for a period of time, thus can be purchased. For the first time DeBondt and Thaler (1985) documented return reversal from US stock market over a long horizon of three to five years. Jegadeesh (1990) analyzed the US stock market data and provided evidence for very short-term (one week to a month) price reversal. Later, Jegadeesh and Titman (1993) analyzed US market data and documented that for medium term holding period (3 to 12 months) momentum strategy gives abnormal return to investors.

Momentum and contrarian effect are the prominent asset pricing anomalies that could not be explained by Fama and French (1993, 1996) three factor models. Momentum can be defined as the strategy that buys past winners and sells past losers, which earns abnormal returns for a period of three months to one year after the execution of the strategy. The opposite strategy is termed as contrarian strategy i.e. for very short and long horizon holding periods the strategy is to buy past losers and sell past winners to get abnormal return. Momentum/contrarian emphasizes the persistence of winning and losing stocks in equity market. Research in momentum phenomenon/ contrarian effect in equity market has gained substantial interest in the finance literature and has been evidenced in several equity markets across the globe.

The main purpose of this article is to analyze the investing behavior of Indian equity investors. More specifically an attempt has been made to analyze whether the return chasing behavior or otherwise of Indian investors is exhibited in cross-sectional average monthly returns of Indian equities. This study also attempted to evaluate the same before, during and after the financial crisis of 2007–2009 to check whether investors continue to follow the same strategy during crisis or their behavior undergoes any change. The rest of the paper is structured in seven sections consisting of literature review, objectives, sample data, empirical method, empirical evidences & discussions and concluding remarks.

2. Review of Literature

Several studies in financial market academia reported that prior return can explain the cross-sectional behavior of succeeding security return. This phenomenon in equity market is termed as *Prior Return-Effect*. Researchers often reported two basic types of phenomenon regarding the return predictability on the basis of prior returns data*: the return continuation and return reversal*. In order to get complete knowledge about prior-return effect we have to go all the way back to 1985. The pivotal study of De Bondt and Thaler (1985) from US equity market reported the return reversal (contrarian effect) over long horizon holding portfolios. Contrarian strategy implies that past poor performing stocks (losers) significantly outperform past high performing stocks (winners) over long horizon holding period. They substantiated their results documenting investor overreaction hypothesis i.e. overreaction of investors to new piece of information and their subsequent correction to normal level over long horizon. In a subsequent work De Bondt and Thaler (1987) found supportive evidences to their earlier findings, that the past loser firms significantly outperform past winner firms in their performance in the market and this result was supportive of the investor overreaction hypothesis.

Following these evidences, Jegadeesh (1990) and Lo and Mackinlay (1990) evidenced successful contrarian strategies (retune reversal) for very short horizon portfolios i.e. a week to three months period. Following these path breaking evidences, Jegadeesh and Titman (1993) analyzed US market data and documented clear presentation of *momentum*' and '*contrarian* investment strategy. Explicitly, for medium term holding period (3 to 12 months) *momentum* strategy gives abnormal return and for long horizon holding portfolios (1 to 3 years) *contrarian* strategy provides more return to investors.

Many empirical studies have reported that both momentum and contrarian investment strategy provide abnormal return to investors. Followed by Jegadeesh and Titman (1993) early US study, Cornard and Kaul (1998) also examined the NYSE and AMEX stocks and found medium term price continuation. Recent US study by Wang and Wu (2011) reported significant momentum profit over a medium-term horizon, supporting the earlier findings. The reported evidences of momentum profit have not been confined to US stock market only. Rouwenhorst(1998), Doukas and McKnight (2005) examined a number of European markets and documented similar findings. Griffin et al. (2003), Hameed and Kusandi (2002) analyzedAsian stock markets, Richards (1997), Chan et al. (2000), Balvers and Wu (2006) examined wide range of global markets and all found significant momentum and contrarian profit over the medium to long term horizon. Later Demir et al. (2004), Naughton (2008) found strong evidences of momentum return from Australian and Chinese markets respectively. Moreover in Indian context, Sehgal and Balakrishnan(2002), Rastogi et al. (2009), Joshipura (2011), Sehgal and Jain (2011), Ansari et al. (2012) Balakrishnan (2012) Bernard and Deo (2015) also have investigated momentum phenomenon and reported presence of strong momentum return in Indian market.

There are many academic studies that have assessed "why momentum/contrarian may exist in security markets"? The explanation can be broadly grouped in two groups, i.e. risk-based and behavioral based explanations. Chan (1988), Ball and Kothari (1989) and Conard and Kaul (1998) Hong et al. (2003) documented risk associated with securities in momentum/contrarian portfolios is the major determinant of above average returns of these portfolios. Fama and French (1996) documented a three factor model in order to capture abnormal return of these portfolios, but the model failed to capture medium-term continuation of price. In sum, rationalist failed to explain what exactly is the risk associated with investing in stocks with positive momentum/contrarian effect. Moreover, Jegadeesh and Titman (2001, 2002) provided evidences contradicting Cornard and Kaul (1998) hypothesis and documented the robustness of various price momentum strategies.

Several behavioral theories have been advanced by researchers to explain the existence of momentum/ contrarian phenomenon in stock market. Daniel, Hirshleifer, and Subrahmanyam (1997) indicate *Cognitive bias of investors* i.e. overconfidence and self-attribution - leads to momentum from overreaction that subsequently corrects, resulting in reversal. In other words, investors might overreact to new informations, such overreaction leads to medium-term horizons price continuation. Subsequent correction of the overreaction leads to poor performance following good performance and vice versa. The corrections mean that a run of positive returns eventually will tend to be followed by negative returns over longer horizons. Barberis, Shleifer and Vishny (1998) assume *conservatism and extrapolation* on the part of investors and show that will lead to continuation in the intermediate term and reversal in the long run. Hong and Stein (1999) opine *slow information diffusion and positive feedback trading*, lead to momentum and subsequent reversal. Later, Lee and Swaminathan (2000), Jegadeesh and Titman (2001), Griffin et al. (2003) emphasized the significance of behavioral models in momentum phenomenon.

Another behavioral explanation of momentum/contrarian hypothesis is based on theory of two great philosophers in the nascent filed of behavioral finance, Hersh Shefrin and Meir Statman, in 1985 they put forward *disposition effect*, that investor have the tendency to sell winning investments too soon and hold losing investments too long. They substantiated their arguments based on the emotional feelings of investors; because people want to feel good about them, therefore investors are quick to sell winning stocks to achieve their gains, and at the same time they hesitate to sell a loss stock to avoid a feeling of failure in the hope that the stock would recover its loses and become a winner in the future. Disposition tendency of investors delays a stock to reach its true intrinsic value after announcing good or bad news regarding that particular stock. After thirteen years Odean (1998) proved on average more than 50% of investors are likely to sell

a winning investment than a losing investment. Grinblatt and Han (2002, 2005) Shumway and Wu (2005) argued that disposition may be cause of momentum and reversal effect and often remains in the market for a year.

Likewise behaviorist pointed out *herding behavior* of individuals is other possible reason of existence of momentum/contrarian in equity market. Herding means following the crowd's sentiment in making ones personal investment decisions rather individual preferences. Chen et al. (2015) point out that degree of herding behavior is positively correlated with the profits of contrarian trading strategies. Lu et al. (2009) found that momentum/ contrarian may develop in whatever area of market and happens to catch the herd's attention.

The information gathered from the earlier studies conveys that an ample body of finance literatures has confirmed the existence and stability of momentum profitability in most of developed or matured capital markets. It is also found from the literature that the profitability of momentum strategies is week or even nonexistent in many of the emerging markets; especially capital markets in Asian region (see, e.g., Rouwenhorst, 1999; Griffin et al., 2003; Chui et al., 2010;Fama and French, 2012).Since the momentum effect in emerging markets is one of the controversial issues in existing finance research, analysts have been re-examining time and again the emerging markets by using alternative portfolio construction methodology. Existing studies mostly applied Jegadeesh and Titman (1993) methodology for constructing and analyzing momentum portfolios. Recently Pan et al. (2013) examined profitability of momentum strategies in Chinese markets (which is a market that existing momentum literature does not find existence of stable momentum return) and validated an alternative momentum portfolio construction method. They found that momentum portfolios constructed that were based on return interval ranking strategy did produce significant positive profit. They applied same return interval ranking strategy to explore the success of the methodology to other Asian markets and found significant and positive momentum profit in Hong Kong, Taiwan, Korea, Thailand, and Indonesia.

In the present study, we investigate the presence of momentum return in Indian equity market, one of the fastest growing developing capital markets in the world. This study aims at analyzing the presence return chasing behavior of investors in cross-sectional data of Indian equities by using alternative portfolio construction method. As per Tripathi and Aggarwal (2015) Indian equity market is divergent from other developed and emerging security markets in terms of institutional structures, cultural backgrounds, attitude of people towards stock market etc. and this uniqueness of Indian equity market may possibly influence the patterns in security return. In addition, to our knowledge, there are no previous studies in Indian context that have used this new methodology suggested by Pan et al. (2013). This is the first study exploring momentum effect in Indian context by using return interval ranking method, which makes this study different from earlier studies in this line. In turn, the study has indirectly checked the validation of weak form of market efficiency in the Indian security market

3. Objectives

The purpose of this study is sought to be achieved through the following specific objectives;

- To test the presence of medium-term return chasing behavior of investors in cross-sectional average monthly returns of Indian equities.
- To evaluate the momentum effect before, during and after the financial crisis of 2007-2009 and to check whether investors continue to follow the same strategy during crisis or their behavior undergoes any change.
- To analyze whether rational CAPM models could explain the momentum profit if any in Indian market?

4. Sample Data

For the purpose of investigating momentum effect we are focusing companies listed on the Bombay Stock Exchange (BSE), which is oldest stock exchange in Asia comprising of more than 5500 companies listed in it and it was setup way back in 1875. The monthly adjusted closing prices of companies included in BSE-500 index over a period of ten years starting from July 2004 till June 2014 have been used for this analysis. The return on BSE Sensex and the implicit yield on the 91-day treasury bills over the same period are used as proxy for return on market portfolio and risk-free rate respectively. All constituent stocks with

non-missing data for the entire study period were included in the analysis. Since study is investigating medium-term price momentum effect in Indian market it required only actively traded shares. The stocks were chosen from this index for convenience. It also helped us to avoid small and illiquid companies from the samples. The data have been obtained from CMIE- Prowess (Centre for Monitoring of India Economy) and RBI database source.

5. Empirical Method

Conventionally momentum researchers constructed Jegadeesh and Titman (1993) quintiles or deciles portfolios to discover the presence of momentum phenomenon in equity market, where in portfolios were created using JxK strategy. A JxK strategy is to rank securities based on the performance of past J (formation) period, arrange securities into different quintiles or deciles portfolios based on their ranks, take long positions in best performing (winners stock) portfolio, short sell the worst performing (losers stock) portfolio, and hold the zero-cost portfolio or hedge portfolio (i.e. winners – losers) for the next K (holding) period. Recently Pan et al. (2013) developed an alternative momentum strategy which groups securities into return interval rather than quintiles or deciles. The present research effort is aimed at examining the existence of momentum in Indian market, following return interval ranking momentum strategy to construct winners, losers and hedge portfolios.

5.1 Return Interval Ranking Method

It is a portfolio construction method developed by Pan et al. (2013). In this model sample stocks are grouped into different return intervals based on their formation period return. In order to create return intervals, first of all stocks are arranged in ascending order based on their formation period return and then the distance between the best and worst performing stocks in the formation period is calculated, later the distance is equally divided into various return intervals, and the stocks are grouped into these intervals according to past returns. Because the stock returns are clustered around the median, this method facilitates investors to pick fewer stocks that are really profitable to construct the hedge portfolio, also it leads to large winner-loser differences and enhances the magnitude of momentum profit. In fact this method helps investors to limit their higher level of trading cost associated with momentum trading.

In the present study, twenty five momentum trading strategies were tried using various combinations of formation and holding months. These strategies were created using one, three, six, nine and twelve months intervals for every formation and testing period strategies. Brief discussions of important steps carried out for the formation and holding period are explained below.

5.2 Formation Period

At the end of every month we ranked sample securities in ascending order based on their past formation months market adjusted abnormal return. After that, we calculated the return distance between stocks in the top and bottom edge, equally split the distance in ten intervals and assigned stocks into these intervals based on their formation period average return. The first and last portfolios (intervals) were termed as the Winners (R_{10}) and Losers (R_1) portfolios respectively. Winners and losers portfolios were held for testing (K= 1,3,6,9 and 12 months) period.

Another important point to be noted about this study is the use of overlapping portfolios. Overlapping portfolios means this portfolio construction exercise was repeated at the end of every month during the study period. Hence, in any given month, the constituents of portfolios selected are securities of the current month as well as of the previous J-1 months, where J is the formation period. These overlapping portfolios help us to reduce the effects of bid-ask bounce effect and improve the power of test.

5.3 Holding or Testing Period

In post formation period, the abnormal performance of securities in the Winners (R_{10}) and Losers (R_1) portfolios were measured. In the first step of the testing period, study estimated the monthly Average Abnormal Returns (AAR_S) by taking the mean of monthly abnormal returns of portfolio stocks. This step was repeated for each iteration over the study period. In the next step, the Mean Average Abnormal Return values were estimated; MAARs was calculated by averaging the Average Abnormal Return of 'm' iterations. AARs and MAARs for different portfolios were estimated by using the following formula,

$$AAR_{W,t} = \frac{1}{n}\sum_{i=1}^{n} AR_{it} \quad AAR_{L,t} = \frac{1}{n}\sum_{i=1}^{n} AR_{it}$$

$$MAAR_{W,t} = \frac{1}{m}\sum AAR_{w,t}$$

$$MAAR_{L,t} = \frac{1}{m}\sum_{i=1}^{m} AAR_{L,t}$$

Where n= no. of stocks in each portfolio,

t = holding period

m = number of iterations

MAAR test helps to identify the performance of portfolios over the entire study period as well as measures the independent contributions made by winners and losers to momentum return. It helps to identify the return direction of momentum portfolios (that is continuation and reversal). In order to measure the momentum return the present study followed an arbitrage strategy (zero-cost strategy), that is simultaneous buying of winner stocks and selling of loser stocks. So price momentum return is equal to return of winner stocks minus return of loser stocks (symbolically $MAAR_{R10-R1}$). After estimating the return of above mentioned portfolios, in order to check statistical significance, simple t-test was applied.

5.4 Estimation of CAPM

CAPM is used to seek the explanation of momentum profits through risk-based model. Through CAPM, whether momentum profits have been properly explained by CAPM or not were examined. CAPM regression is run in the following manner to achieve the purpose.

$$Rp - Rf = \alpha p + \beta p(Rm - Rf) + \varepsilon,$$

Where: Rp = Monthly portfolio return;

Rf = risk free rate;

Rm =Stock index return;

Rp – Rf = excess return on the portfolio;

Rm – Rf = the risk premium;

βp = Portfolio Beta

6. Empirical Evidence and Discussions

This section describes the empirical results of different momentum strategies implemented on the Indian stock returns over the period 2004 through 2014. This section confirms the strong presence of momentum behavior in Indian stock returns.

6.1 Monthly Momentum

Table 1 summarizes the empirical results for all twenty five price momentum strategies based on return interval ranking sorted portfolios. At the end of each month over the period of 2004 to 2014, securities were ranked and grouped into intervals on the basis of their average return over the previous one, three, six, nine and twelve months. Consequently, there were ten portfolios ranging from extreme losers to top winners, every month, during the study period. This subsection reports Mean Average Abnormal Returns for the extreme Winners (W), Losers (L), in each month, by being long on the winners portfolio and short on the losers portfolio and the return of hedge portfolios (zero cost portfolios) are shown as W-L. The rows represent the ranking periods (J=1, 3, 6, 9 and 12 months) and the columns represent the holding periods (J=1, 3, 6, 9 and 12 months). Simple t-test values are also provided in the parenthesis.

Results presented in table 1 reveal several interesting findings i.e. a clear and consistent appearance of price momentum profits in Indian equity returns, most of observed momentum profits (W-L) being statically as well as economically significant. Our findings were in consonance with the findings of Griffin *et al.* (2003), Sehgal and Balakrishnan (2002, 2008), Rastogi *et al.* (2009), Joshipura (2011), Sehgal and Jain (2011), Ansari *et al.* (2012), Balakrishnan (2012) and Bernard and Deo (2015). From all these twenty five combinations, the reported momentum profit ranged from a low 0.37% per month for one month formation and twelve months holding period to the high of 4.17 % per month for nine month formation and one month holding period.

A closer examination of results suggests that all the formation periods show highest momentum profit in their initial two holding periods (i.e. 1 and 3 months), while moving towards the rest of the higher order holding period the strength of the momentum profit decreased steadily. The reported price momentum profit is found longer lasting and strategy's profitability fluctuates with the number of formation periods. W-L column of table 1 disclose that momentum phenomenon exists in Indian equity market up to one year.

It is observed that *MAAR* value of winners' portfolio showed a reversal tendency at 1x3 months formation and holding period. But as expected, the winner portfolio outperformed loser portfolio, therefore hedge portfolio showed a profitable strategy. Additionally it may be noted that out of five formation periods when J=1 return of holding period portfolios are relatively lesser. In other words less momentum return is identified when ranking and portfolio creation is based on securities of one month return.

Table 1: MAAR Values of Winners, Losers and Momentum Portfolios

J	*Portfolios*	*K=1*	*K=3*	*K=6*	*K=9*	*K12*
1	W	3.53 (2.65)*	-0.61 (-0.22)	1.38 (2.49)*	1.59 (3.36)*	1.14 (2.57)*
	L	0.82 (0.91)	-3.02 (-1.19)	0.73 (0.94)	0.61 (1.17)	0.77 (1.96)*
	W-L	2.71 (1.66)**	2.42 (3.58)*	0.66 (0.91)	0.98 (1.49)**	0.37 (0.62)
3	W	5.12 (4.29)*	3.58 (4.44)*	2.57 (3.70)*	2.33 (4.82)*	1.78 (3.54)*
	L	1.07 (1.18)	0.22 (0.24)	-0.04 (-0.07)	-0.41 (-0.97)	-0.59 (-1.85)*
	W-L	4.05 (2.63)*	3.36 (5.55)*	2.61 (3.34)*	2.74 (4.81)*	2.37 (4.22)*
6	W	4.63 (3.61)*	4.23 (12.03)*	3.32 (5.82)*	2.56 (5.12)*	1.93 (3.50)*
	L	1.06 (1.00)	0.18 (0.32)	0.15 (0.48)	-0.26 (-0.87)	-0.38 (-2.05)*
	W-L	3.56 (2.18)*	4.05 (11.01)*	3.17 (4.91)*	2.83 (4.92)*	2.30 (3.99)*
9	W	5.19 (4.41)	3.57 (4.06)*	2.50 (3.46)*	1.67 (2.72)*	0.97 (1.65)**
	L	1.02 (1.11)	0.37 (1.02)	0.26 (1.24)	-0.26 (-0.81)	-0.18 (-1.13)
	W-L	4.17 (2.86)*	3.20 (4.24)*	2.24 (3.11)*	1.87 (3.24)*	1.14 (1.81)*
12	W	3.11 (3.06)*	2.48 (3.58)*	0.88 (1.79)**	0.92 (0.09)	0.79 (2.43)*
	L	1.09 (1.25)	0.03 (0.05)	-0.29 (-1.06)	-0.73 (-0.09)	-0.53 (-1.99)*
	W-L	2.02 (1.44)	2.44 (9.47)*	1.17 (2.05)**	1.65 (0.09)	1.32 (3.11)*

Figures in brackets are the simple t- statistics of winners, losers and momentum portfolios

*Significant at 5% level, **Significant at 10% level

It is identified from the analysis that in the Indian context the main determinant of momentum profit is winner securities. Results reported reveal that contribution of winners portfolios are found to be more for hedge portfolio than losers portfolios. Moreover decreasing tendency of winner portfolios while moving forward to higher order holding periods is more noticeable in winners portfolios. This confirms that in the Indian context main driving force

of momentum profit is winner securities. Two assumptions can be observed from this finding, first, Indian investors are winner's chasers rather than investor in past losers for a short-term period. Second, decreasing tendency of winners when moving to higher order holding period indicate the tendency of investors to sell their gaining investment to lock up their gains. However, as the higher order holding period is also showing positive return, we can assume that all the investors are not likely to sell their winning investment immediately (results is supporting Odean (1998) approach), this may be a possible reason for existence of momentum in Indian context up to one year.

Results also indicate that losers portfolios do not contribute to zero-cost hedge portfolios rather they reduce the return of hedge portfolios and most of the losers portfolios' returns are statistically insignificant. However while moving forward to rest of the higher order holding period most of the losers portfolios are showing negative return. So we can conclude that Indian investors are holding their loosing investment for a short-term period and whenever it is in gain side investors are capitalizing their opportunity. This observation suggests that disposition effect may be existing in Indian equity market and attribute the possible source of momentum profits to be the disposition effect. Further research in these lines can be done to find out source of momentum profit in Indian context.

Figure 1: Momentum Returns

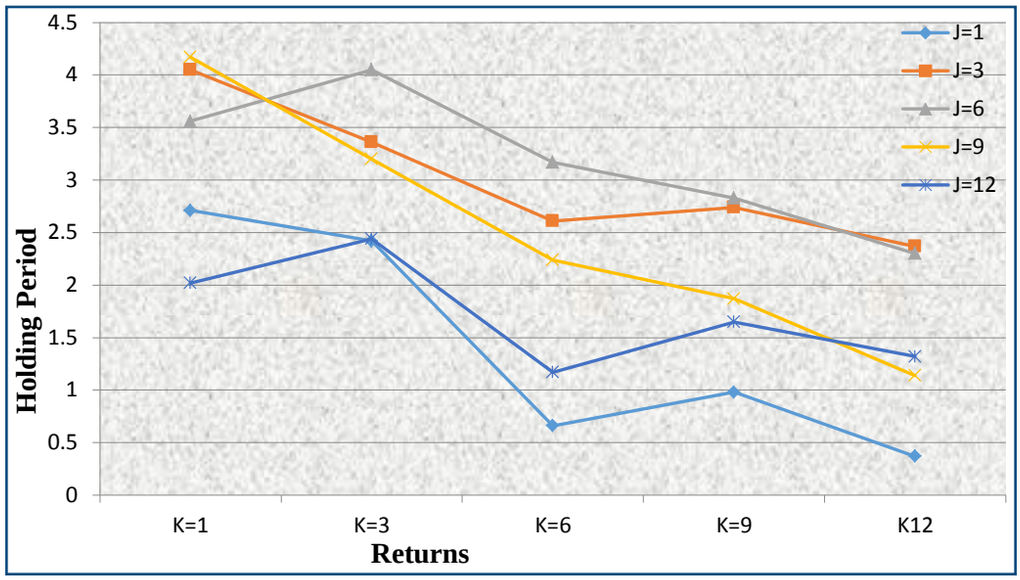

Figure 1 presents the graphical depiction of the *MAARs* for all twenty five hedge portfolios. It is clear from the figure 1 that all the formation (J months) periods indicate highest *MAAR* value in their respective low order holding months which is followed by a steady decline throughout, for rest of the higher order holding periods. It is further observed that nine month formation period showed highest return when K=1, at the same time the more downward sloping trend from left to right was also observed in this formation period.

6.2 Monthly Momentum Returns Before, During and After the Financial Crisis

This subsection presents the results of price momentum strategies based on return interval ranking method implemented on the Indian equity market before, during and after the financial crisis of 2007–09. In order to examine performance of momentum portfolios during the sub periods study has used all holding periods portfolios when J=6.

Table 2: MAAR Values of Winners, Losers and Momentum Portfolios

Panel-A		*July 2004 to July 2007*				
J	*Portfolios*	*K=1*	*K=3*	*K=6*	*K=9*	*K12*
6	W	14.70 (4.08)*	13.67 (9.45)*	10.07 (4.26)*	7.92 (3.49)*	6.79 (3.27)*
	L	1.95 (0.99)	0.09 (0.09)	0.16 (0.34)	0.12 (0.30)	-0.07 (-0.14)
	W-L	12.74 (3.17)*	13.58 (25.78)*	9.90 (4.29)*	7.80 (3.56)*	6.86 (3.59)*
Panel-B Aug 2007 to Jun 2009						
J	Portfolios	K=1	K=3	K=6	K=9	K12
6	W	-1.03 (-0.42)	-2.67 (-3.48)*	-4.58 (-3.38)*	-5.75 (-5.09)*	-6.05 (-4.77)*
	L	-1.87 (-0.60)	-0.41 (-0.23)	-1.27 (-1.39)	-2.63 (-4.80)*	-2.99 (-3.77)*
	W-L	0.84 (0.22)	-2.26 (-0.92)	-3.31 (-1.50)**	-3.12 (-2.21)*	-3.06 (-1.85)*
Panel-C July 2009 to Jun 2014						
J	Portfolios	K=1	K=3	K=6	K=9	K12
6	W	1.59 (1.55)	2.15 (21.77)*	3.02 (7.94)*	2.85 (7.79)*	2.40 (2.67)*
	L	1.72 (1.34)	0.16 (0.19)	0.10 (0.22)	-0.29 (-0.64)	-0.45 (-1.22)
	W-L	-0.13 (-0.08)	1.99 (2.22)**	2.92 (7.44)*	3.14 (8.89)*	2.85 (2.75)*

Figures in brackets are the simple t- statistics of winners, losers and momentum portfolios

*Significant at 5% level, **Significant at 10% level

In the 2004–2007 subsamples, (Panel A) there existed some superior quantity of momentum profit in equity market. However more careful examination reveals that winners portfolio is the main source and driving force of momentum profit. It is a documented fact of the Indian economy that India registered economic growth during the periods of 2003–04 to 2007–08. So that was the period of economic stability and development. Our analysis confirmed that when market is stable Indian investors are winners' chasers and they are holding their portfolios up to one year holding period. While looking into the second subsection (Panel B), which is the crisis period, the losers securities are outperforming winners stocks. One possible explanation is, that more short positions are taken by with winning securities by the investor during the crisis period. During the recession period, Investors are likely to lock gain immediately after they have recognized the trend. However, as the data used is of monthly basis this behavior of investor does not get fully explained. Therefore, future research can be focused on more high frequency data. However our evidence provides a clue with regard to a possible behavior of investor during recession.

In addition, Panel C observed that after crisis period momentum portfolios have still existed in Indian equity returns. But the magnitude of profit was not as much as in pre-crisis period. This reflects a change in the sentiments of investor. To get exact trait this study suggests that more behavioral based studies are required in the Indian context to find out psychological and emotional feeling that affects the Indian investors.

Though the momentum profit has been clearly identified there is a need to know whether these profits can be rationally explained by a rationalist equilibrium model. To test this, CAPM model has been used where beta of the portfolios express the risk factor which should justifiably

explain the excess return from a portfolio (momentum return).

6.3 Asset Pricing Test

Hong et al. (2003) wrote that price moment investment strategy will result in higher returns as it comes with a potential risk. There are many authors who have explained profit of different price momentum strategies through risk based models like CAPM but most of them state that CAPM has not been able to explain the medium-term momentum return. Therefore in this subsection of study it has been organized to analyze whether momentum profits of Indian stocks have been explained by risk based model of CAPM or not? In order to examine adequacy of CAPM to explain momentum return all holding periods portfolios when J=6 have been used.

To examine the relationship between momentum profits and CAPM, the analysis of β (beta) is required beta (β) is a risk factor which measures the responsiveness of the stock to the market and it is a potential risk factor that a portfolio bears. First column shows the list portfolios. Second column indicates the coefficients of Beta for each portfolio. Third and fourth columns demonstrate the values of t-test and fifth and sixth columns indicate p-value respectively. T-stat and p- value indicate the statistical significance of Beta coefficient. R^2 shows the strength of relationship

Table 3: Excess Returns Stylized Momentum Portfolios Regressed on the Excess Return on the Market Factor

R_{Pt}-R_{Ft}=$a + b\ R_{Mt} - R_{Ft} + e_t$							
6x1 Momentum Strategy and CAPM							
Portfolio	**a**	**b**	**t(a)**	**t(b)**	**P(a)**	**P(b)**	**R^2**
W	0.038	0.368	2.116	1.483	0.037	0.141	0.019
L	0.002	0.542	0.108	2.687	0.914	0.008	0.061
W-L	0.031	-0.168	1.330	-0.528	0.186	0.599	0.002
6x3 Momentum Strategy and CAPM							
Portfolio	**a**	**b**	**t(a)**	**t(b)**	**P(a)**	**P(b)**	**R^2**
W	0.034	0.410	3.277	2.850	0.001	0.005	0.069
L	-0.005	0.270	-0.804	2.965	0.423	0.004	0.074
W-L	0.034	0.145	2.671	0.830	0.009	0.408	0.006
6x6 Momentum Strategy and CAPM							
Portfolio	a	b	t(a)	**t(b)**	**P(a)**	**P(b)**	**R^2**
W	0.026	0.250	3.693	2.589	0.000	0.011	0.059
L	-0.005	0.159	-0.878	2.097	0.382	0.038	0.039
W-L	0.026	0.096	2.720	0.755	0.008	0.452	0.005
6x9 Momentum Strategy and CAPM							
Portfolio	**a**	**b**	**t(a)**	**t(b)**	**P(a)**	**P(b)**	**R^2**
W	0.019	0.190	3.196	2.392	0.002	0.019	0.052
L	-0.009	0.095	-1.976	1.592	0.051	0.114	0.024
W-L	0.022	0.101	2.996	1.019	0.003	0.311	0.010
6x12 Momentum Strategy and CAPM							
Portfolio	**a**	**b**	**t(a)**	**t(b)**	**P(a)**	**P(b)**	**R^2**
W	0.013	0.203	2.523	3.028	0.013	0.003	0.083
L	-0.010	0.112	-2.617	2.230	0.010	0.028	0.047
W-L	0.017	0.096	2.707	1.146	0.008	0.255	0.013

It is clear from Table 3, that CAPM has been unable to explain the medium-term momentum profits in the Indian context. The beta coefficients of all the W-L portfolios are not statistically significant. 'P' value is also greater than 5% which confirms that CAPM cannot explain medium-term momentum profits. 'P' value of winners and losers portfolios are less than 5% in majority of cases. R^2 indicates extent of variance explained by the independent variable. It is clear from the result that the values of $R^2$are very low for all the portfolios and indicates that strength of relationship is very weak, which further reaffirms that risk-based model cannot explain medium-term profit of price momentum investment strategy. This finding suggests that source of momentum profits is not the risk. The origins of momentum profits are still not known. Short term momentum effect does exist and it gives above average abnormal return to the investor but the source of momentum profits is not identified. Future search should be focused on finding the source of momentum profits.

7. Concluding Remarks

In this paper, we investigated the presence intermediate horizon return chasing behavior of Indian investors by applying an unconventional portfolio construction technique for equities listed on the Bombay Stock Exchange. In order to assess return chasing behavior of investors exhibited in cross-sectional data the study used momentum strategies. Consistent with earlier studies, our empirical results reported substantial momentum profit during the period 2004 to 2014. It was found that momentum strategies based on alternative momentum portfolio construction method provide more economically and statistically significant profits to investors compared to other methods like deciles or quintiles portfolios. The momentum profit was found strong in first two holding months, followed by a steady decline. However, long lasting existence of momentum profit up to one year was evidenced from the Indian equity market. This study has also attempted to explain the behavior of momentum investors before, during and after the financial crisis. Study split the analysis period into three and found out that investor's sentiments are volatile according to the condition of market. Also our analysis identified that rationalist equilibrium models like CAPM does not have the power to explain excess return of momentum portfolios in the Indian context.

These findings have interesting implications; first study found that momentum profits are persistent in Indian market. Study indicated that Indian investors are having return chasing tendency. Hence investors can earn abnormal return from equity market by observing past pattern in price movements. It corroborates Indian equity market's inefficiency in the sense of information processing and incorporating new information to fundamental value of equities. Therefore this study provides justification to adopt appropriate measures to make Indian stock market structurally efficient. Secondly, from the investor's point of view, this study guides investors to make appropriate investment strategies to earn extra profit from equity market. Thirdly, from an academic perspective, this study proved that price momentum is pervasive in the Indian equity market, it is volatile with the market conditions, and also sources of momentum profits are not rational and its sources remain unanswered. This study provides a clue to future researchers that psychological and emotional feeling may be the possible reason of momentum profit. More behavioral based studies are required in this field of research to answer such questions.

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