



RESEARCH ARTICLE

RELATIVE STRENGTH INDEX AS INVESTMENT STRATEGY IN INDIAN STOCK MARKET

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ABSTRACT

This paper examines the use of RSI as an investment strategies in Indian stock market on the basis of a data of 18 major indices over a period of 10 years. The analysis and findings reveal that investors use both fundamental as well as technical analysis while investing in Indian stock market. This paper examines that RSI can be used as the effective investment strategy to get high returns and outperform the market. Five most widely used investment strategies in Indian equity market are size based strategies, momentum strategies, following FIIs investment behaviour, buying stocks on the basis of 30 days moving average and buying stocks on the basis of relative strength index. There has been substantial change in investment strategies used by active investors in Indian stock market over the past few years.

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INTRODUCTION

Momentum and value strategies underlie much of active management. Momentum strategies extrapolate recent trends, buying assets whose price has increased in the recent past and selling assets whose price has decreased. Value strategies exploit differences between price and measures of fundamental value, e.g. earnings or book equity, buying assets whose price is low relative to fundamental value and selling assets whose price is high. A large empirical literature documents that momentum and value strategies are profitable.

We show that the Sharpe ratio of a strategy depends on how it loads on a time-varying premium of a risk factor associated with fund flows. We also compute the optimal strategy, and use it as a benchmark to evaluate momentum and value strategies and their combinations. We further decompose the Sharpe ratios of momentum and value strategies into intuitive components, whose relative importance we measure in our calibration. We calibrate the model using evidence on fund flows and returns from a recent empirical literature. The calibration is as in VW, and yields static Sharpe ratios of 40% for momentum and 26% for value. We show additionally the following main results:

Value strategies are less sensitive to implementation than momentum strategies. In particular, the quality of forecast of fundamental value has only a small effect on the Sharpe ratio of a value strategy. The correlation between momentum and value returns is slightly negative, equal to minus 3%. Thus, combining momentum and value strategies yields significant diversification benefits, as shown empirically by Asness,

Moskowitz, and Pedersen (2009). The Sharpe ratio of the optimal combination is 48%.

The Sharpe ratio of the optimal combination of momentum and value strategies is significantly smaller than of the overall optimal strategy, which is 61%. Thus, momentum and value strategies can be improved. This can be done by using information on fund flows.

Returns of momentum strategies are positively auto-correlated over lags shorter than one year, and the autocorrelation over longer lags drops to zero. Returns of value strategies are also positively auto-correlated over lags shorter than one year, but the autocorrelation over longer lags is negative. Thus, over intervals longer than one year, momentum is a series of i.i.d. bets, but value exhibits mean reversion.

The dynamic Sharpe ratio of momentum strategies decreases with the investment horizon when the horizon is short, and becomes essentially flat after a one-year horizon. The dynamic Sharpe ratio of value strategies, decreases with the investment horizon when the horizon is short. As the horizon increases, however, it increases and eventually overtakes the Sharpe ratio of momentum strategies.

In momentum trading, traders focus on stocks that are moving significantly in one direction on high volume. Momentum traders may hold their positions for a few minutes, a couple of hours or even the entire length of the trading day, depending on how quickly the stock moves and when it changes direction. Here we'll look at momentum trading and examine a typical day in the life of this type of active trader.

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Momentum is the tendency of recent price changes in an investment or asset class to persist for some time into the future. The evidence for momentum is pervasive, supported by academic and practitioner research and more than 300 published papers over the past decades. I won't attempt to summarize the momentum literature, but encourage investors to learn more about it.

Momentum can be used to create a disciplined, systematic investing style that applies across asset classes. Momentum based strategies have been successfully used by investors for over a century.

Relative Strength Strategy

As long as financial markets have existed, investors have been interested in predicting stock market price movements. Prior to a 1967 study done by Robert Levy, scholarly sources strongly believed that technical analysis of stock prices was "no more useful in predicting future price movements than throwing a dart at the list of stocks in a daily newspaper". Contemporary statistical analyses showed, time and time again, that successive changes in a stock's price were statistically independent. As a result, stock price movements had always been viewed as mere 'random walks'.

After examining 68 different trading rules in his dissertation, Levy came to the conclusion that "a trading rule that buys stocks with current prices that are substantially higher than their average prices over the past 27 weeks realizes significant abnormal returns".

This strategy got to be known as Levy's trading rule. Initially, this trading rule elicited much skepticism among other scholars. One famous criticism was made by Jensen and Bennington (1970), who analyzed Levy's trading rule over a longer time period and found that the trading rule does not outperform a buy and hold strategy. They attributed Levy's results to a selection bias.

The relative strength index (RSI) is a technical indicator used in the analysis of financial markets. It is intended to chart the current and historical strength or weakness of a stock or market based on the closing prices of a recent trading period. The indicator should not be confused with relative strength.

The relative strength index (RSI) is one of the principal momentum indicators used when analyzing charts. Studies in the past showed that momentum strategies could yield raw returns of more than 25% annually for long-only portfolios and returns of up to 17% for zero-cost portfolios which buy past winners and short past losers. This renders stock price momentum a very interesting topic for investors and academics alike. Since Levy (1967), a number of other academics have researched the topic, yielding amongst other things several distinct methods for selecting 'winner stocks' as well as some suggested causes of stock price momentum. Most causes suggested are behavioral in nature, and usually also provide some legitimacy for strategies opposite of relative strength, i.e. relative weakness: the so-called contrarian strategies, where past losers are supposedly undervalued and have a potential for large abnormal returns as a result. An influential paper in that field is De Bondt and Thaler (1985), which showed that past loser actually earned about 25% more than past winners over

the period of 36 months after portfolio formation. Despite the supposed causal similarities between contrarian and momentum strategies, this thesis will focus solely on momentum strategies. These momentum strategies usually exhibit return reversals for selected stocks sometime after portfolio formation (arguably when stock prices finally converge to their fundamental values), which is in accordance with criticisms made by Jensen and Bennington (1970). The next page describes the goals of this paper by introducing a proper problem formulation, as well as a description of content.

Relative Strength Index

Determining the true value of an oscillator depends on the understanding of overbought or oversold positions. There has always been a little confusion over the difference between relative strength, which measures two separate and different entities by means of a ratio line, and the RSI, which indicates to the investor whether an issue's price action is created by those overbuying or overselling it. The formula for the RSI is as follows:

$$\begin{aligned} \text{RSI} &= 100 - 100 / (1 + \text{RS}) \\ \text{Average gain} &= (\text{Total gains} / n) \\ \text{Average loss} &= (\text{Total loss} / n) \\ \text{Relative Strength} &= \text{Average gain} / \text{Average loss} \\ \text{Relative Strength Index} &= 100 - 100 / (1 + \text{RS}) \\ N &= \text{number of RSI periods.} \end{aligned}$$

At the bottom of the chart below, the RSI, on a scale of 0-100, indicates that the overbought position is at 70 and the oversold position is at 30. An investor may choose to reset the indicators' parameters to 80 and 20. This helps the investor be sure when making the decision to buy or sell an issue, and not "pull the trigger" too fast.

LITERATURE REVIEW

Besides literature that aims to fundamentally explain the phenomena associated with stock price momentum, other works set out to research actual momentum investment strategies. In that regard, one of the most influential articles since Levy (1967) is Jegadeesh and Titman (1993), in which the authors rank stocks each month based on their individual returns in the last J months and construct equally weighed portfolios based on the top and bottom deciles of the ranking, the winner and loser or buy and sell portfolios respectively, which are then held for K months. For their data, all 16 analyzed zero-cost strategies yielded positive returns that are significant with the exception of only one. Their most successful zero-cost strategy has a formation period of 12 months (over which stock returns are analyzed and winners picked) and a holding period of 3 months. Such strategies can be denoted as (J, K) strategies. The previously mentioned (12, 3) strategy yielded a monthly zero-cost return of 1.31% or 16.9% annually. Possibly a legacy of Levy's trading rule, the focus of most authors is usually on (6, 6) strategies, however. Jegadeesh and Titman (1993) claim the returns of their (6, 6) momentum strategy are representative of the returns to the other (J,K) momentum strategies and perform many of their additional analyses solely on this (6,6) strategy. Besides stock selection based on past returns, other criteria for stock selection have been postulated as well. Moskowitz and Grinblatt (1999) argue for example, that stock price momentum

is driven by momentum in the industries to which these stocks' firms belong. Their stock selection model is thus based on industry momentum: past performance is measured as the value-weighted industry return over the past 6 months, of the industry to which each stock belongs. Then, stocks are ranked monthly, in ascending order according to their industries' past performance. Based on these rankings, three portfolios are formed: stocks ranked in the top 30% of industries constitute the winner portfolio, stocks in bottom 30% constitute the loser portfolio, and the remaining stocks constitute the middle portfolio. All of these portfolios are equally weighted. The strategy is to hold a zero-cost portfolio that is long the winner and short the loser portfolios, for 6 months. In contrast to individual stock momentum, industry momentum appears to be most profitable in the very short term (one month). For their data, top strategies were (1, 1) and (12, 1), where the (12, 1) strategy yielded a raw return of 27.1% annually and 10.7% of zero-cost return, whereas the (1, 1) strategy yielded 25.8% raw returns annually and zero-cost returns of 13.4%.

The stock selection of both Moskowitz and Grinblatt (1999) and Jegadeesh and Titman (1993) use a measure of past performance that is seems to be relevant to the continuance of stock returns. George and Hwang (2004) on the other hand, propose a measure which is based on how near a stock's current price is to its highest price in the preceding 52 weeks. Although this does measure past performance relative to the 52-week high, it is not strictly a measure of overall past performance. Rather, this measure was chosen, because the authors believe that momentum returns can be explained by a behavioural model which incorporates an anchor-and-adjust bias, where the 52-week high is the anchor. The exact measure used by George and Hwang (2004) is the ratio of a stock's current price to its 52-week high. Their winner portfolio is an equally weighted portfolio which consists of the 30% of stocks with the highest ratio, whereas their loser portfolio is a similar portfolio with stocks that have the lowest ratio. Applying this stock selection model to their sample, George and Hwang (2004) showed raw returns of 19.7% and zero-cost returns of 5.5% annually were achievable. Despite seemingly inferior returns, pairwise comparison and regression analysis in their article showed the 52-week high strategy is in fact superior to both the strategy of Jegadeesh and Titman (1993) and the industry momentum strategy of Moskowitz and Grinblatt (1999). They also concluded that combining their method with the method proposed by Moskowitz and Grinblatt results in a statistically significant increase in profit from momentum investing.

Besides their stock selection method, George and Hwang (2004) also provide some criticism on existing theories based on over- and/or under reaction by the securities market. They state that their pairwise comparisons and regressions suggest that some price level relative to an anchor could better explain observed momentum than previous work. Furthermore, the results of their model suggest that after an initial price deviation, traders ultimately correct their bias and no longer over- or under correct. Grinblatt and Han (2004) however, suggest the acquisition price of a stock is an investor's anchor. George and Hwang (2004) argue in turn, that if acquisition price is indeed a significant anchor for investors, a 52-week

low strategy should be profitable. Research shows however, that despite significant regression coefficients for the 52-week low variable, achieved returns for this strategy are not significant and are dwarfed by the returns to Jegadeesh & Titman strategies. All momentum strategies that were discussed in this subsection are based on U.S. stocks though, leaving the question whether stock price momentum as a phenomenon is only present in the American securities market, or whether it occurs outside the U.S. as well. The next subsection attempts to answer this question, by discussing some research that was based on European data.

Since Levy (1967), substantial evidence has been found in support of his contention of the non-randomness of stock price movements. Nowadays, there is not much controversy about the existence of momentum in stock returns; however, it is much less clear what causes the phenomenon (Hong and Stein, 2000). Traditional asset-pricing models – such as the CAPM, APT or ICAPM – have a hard time explaining observed stock price momentum. All predictable asset returns in these models are ultimately attributed to economic principles, e.g. risk. However, Hong and Stein (1991) argue that there is currently not much evidence to suggest that momentum returns can in fact be attributed to such economic factors. Therefore, many scholars have turned to 'behavioural' models in order to explain the existence of stock price momentum. These behavioural models depart from classical assumptions, e.g. full rationality, and introduce psychological and behavioural concepts to model and explain some irrational behaviour on the part of investors, which is then assumed to be the cause of persisting momentum in stock prices. Hong and Stein (1991) aptly comment about a clear disadvantage of such non-classical models: when departing from a set theoretical framework, such as that of classical economics, a virtually unlimited amount of deviations from that framework are possible. Any selection of non-classical assumptions that together form a model, might then inevitably be perceived as arbitrary. Despite such criticisms, some behavioural models that have been constructed in an attempt to explain asset return patterns have been highly influential. The main academic contributions were made by the models of Barberis, Shleifer, and Vishny (1998), Daniel, Hirshleifer, and Subrahmanyam (1999), DeLong, Shleifer, Summers, and Waldmann (1990), and Hong and Stein (1999).

The first model to be discussed is Barberis, Shleifer, and Vishny (1998), which is a model in which the earnings of an asset follow a random walk, but an investor does not know this. The investor's behavior is governed by two psychological phenomena: conservatism and the representativeness heuristic, given the conviction that the asset price is either trending (i.e. likely to rise further after an increase) or mean-reverting. Conservatism means that individuals change their beliefs only slowly in the face of new evidence, which is consistent with observed market underreactions. The representativeness heuristic can be explained as "the tendency of experimental subjects to view events as typical or representative of some specific class and to ignore the laws of probability in the process" (Barberis, Shleifer and Vishny, 1998). A good example in the stock market are so-called growth stocks, which are viewed as such based on consistent earnings growth in the past. However, investors tend to ignore the fact that there are very

few companies that just keep growing and hence ignore the probability that the returns on a growth stock will stagnate. In other words, the representativeness heuristic can lead people to believe they see patterns where none truly exist. Having incorporated conservatism and the representativeness heuristic in their model, Barberis, Shleifer and Vishny show that for plausible parameters values, their model is able to predict stock price momentum as it is observed in their data. Based on their research, the authors state that over horizons of one to twelve months, security prices are often positively auto-correlated and that over longer horizons of perhaps 3 to 5 years they, on average, return to the mean.

This short-term positive autocorrelation and long-term negative autocorrelation was also found by Daniel, Hirshleifer, and Subrahmanyam (1999), who developed their own theoretical model of stock price momentum, based on two other well-known psychological biases: investor overconfidence about the precision of private information and biased self-attribution. The first bias is self-explanatory and the latter simply means that positive investment returns to an individual often lead to an inappropriately large increase of that person's confidence in their own capabilities. Conversely, negative returns decrease confidence, but to a much lesser extent. In fact, investors often blame their portfolio's underperformance solely on externalities. Similar to the previously discussed model, the agents' psychology leads to under- and overreactions in the securities market, which manifest in the occurrence of such phenomena like stock price momentum. According to the authors, investor overconfidence results in negative long-term return autocorrelations (i.e. return reversals), whereas biased self-attribution results in positive short-term return autocorrelations (i.e. securities' price momentum), but also enlarges the return reversal effect. Furthermore, given the biases, public signals on average strengthen investors' beliefs based on private information, which means that public information can further increase overreaction in the securities market. The model shows how continuing overreaction could lead to stock price momentum, as well as how this momentum is reversed in the long run due to further public information that draws prices back to fundamental values. Thus, according to this model, overconfidence and biased self-attribution could explain short-run momentum and long-term return reversals, because these biases are perfectly able to cause the observed market over- and underreactions.

In contrast with the previous model, as well as with the model that was discussed first, DeLong, Shleifer, Summers, and Waldmann (1990) proposed a model that was not based on the assumption that all investors act irrationally. Instead, their model is based on the presence of so-called 'positive feedback investors' in the financial markets. Simply put, positive feedback investors buy securities when their prices rise and sell when these prices fall. Positive feedback trading can result from trend chasing, but also from a stop-loss order, which is common instrument that enables investors to automatically sell an equity position when its price drops below a certain level. Based on the model they propose, the authors claim that a market in which positive feedback traders are active, speculation can destabilize the market, even if the speculation is rational. The destabilization occurs when rational speculators

recognize that an initial price increase, justified by available information, will stimulate buying by positive feedback traders in the near future. In anticipation of these purchases, rational speculators at large buy more of the trending stock early in time, which quickly drives its price up beyond fundamental value. When positive feedback traders start buying the stock, they keep prices above fundamental value. Rational speculators in turn start selling the stock, the combined effect of which is stabilizing prices; above fundamental value. Although the price rise is partly rational, it is also partly based on speculation and positive feedback trading. In this model, trading by rational speculators has a destabilizing effect on prices because it triggers positive feedback trading, the effects of which are similar to market overreaction in other models. Furthermore, the authors claim their model is consistent with empirical observations of the overreaction of prices to news and price bubbles. Price bubbles, or in this model: positive-feedback bubbles, essentially manifest themselves as upward asset price momentum, which, combined with the return reversals associated with the burst of a bubble, makes the above model particularly useful in our discussion of momentum investing. Another model that is based on the interaction between two distinct groups of investors, is the one proposed by Hong and Stein (1999). The authors termed these investor groups: 'momentum traders' and 'newswatchers'.

Both types are not fully rational, but boundedly rational instead: agents are not able to process all available public information, rather the two types of agents are able to process a specific subset of public information each. The newswatchers forecast using signals about future fundamentals they privately observe, however, they do not incorporate current or past prices in their forecasts. Momentum traders in contrast, do incorporate past prices in their forecasts, but are limited to simpler functions of these prices while doing so. An important underlying assumption of the model is that "private information diffuses gradually across the news-watcher population". The model then attempts to unify underreaction and overreaction, by incorporating a tendency for the newswatchers to underreact to private information (underreaction follows naturally from combining gradual information diffusion with the assumption that newswatchers do not extract information from prices) and introducing momentum traders that try to exploit the underreaction using simple arbitrage strategies. The 'early' momentum traders only partially eliminate the market underreaction and in doing so, create an opportunity for 'later' momentum traders (at time $t+1$) to engage in further arbitrage. The model shows that when momentum traders are limited to simple strategies, prices do not stabilize at fundamental value, instead, the attempts of momentum traders to profit from the underreaction creates an eventual overreaction. This overreaction is consistent with the return reversals that momentum strategies typically exhibit. Having discussed the models that attempt to explain and model the specifics of momentum, several actual momentum strategies and their returns are discussed in the next subsection.

In the previous subsections it was proven that none of the zero-cost JT momentum strategies yielded significant positive excess returns and that these strategies neither outperformed the chosen European market index, nor the proxy of a simple

| Month/yr | Index | Return | BSE 500 Close | Month/yr | Index | Return | BSE 500 Close |
|----------|---------------------|---------|---------------|----------|-------------------|---------|---------------|
| Apr-06 | BSE METAL | 21.33 | 4829.73 | Jan-11 | BSE IT | 2.3445 | 7128.29 |
| May-06 | BSE REALTY | 17 | 4157.93 | Feb-11 | BSEER TECK | -1.137 | 6850.4 |
| Jun-06 | BSE REALTY | -8.40 | 4029.97 | Mar-11 | 0 | 0 | 7437.26 |
| Jul-06 | BSE OIL & GAS | -4.601 | 4029.43 | Apr-11 | BSE BANKEX | 2.932 | 7427.14 |
| Aug-06 | BSE I T | 8.485 | 4423.88 | May-11 | BSE FMCG | 3.97804 | 7233.85 |
| Sep-06 | BSE Energy | 3.01 | 4739.67 | Jun-11 | BSE CD | 2.1653 | 7265.32 |
| Oct-06 | BSE Realty | 19.363 | 4957.37 | Jul-11 | BSE FMCG | 2.9252 | 7111.31 |
| Nov-06 | BSE Realty | 20.517 | 5227.73 | Aug-11 | BSE Telecom | 1.4242 | 6487.22 |
| Dec-06 | BSE Realty | -4.81 | 5270.76 | Sep-11 | BSE Telecom | -1.529 | 6385.76 |
| Jan-07 | BSE CD | 6.3399 | 5408.71 | Oct-11 | 0 | 0 | 6763.26 |
| Feb-07 | BSE Telecom | -2.238 | 4938.08 | Nov-11 | BSE AUTO | 0.5768 | 6117 |
| Mar-07 | | 0 | 4955.39 | Dec-11 | BSE IT | 3.1445 | 5778.68 |
| Apr-07 | BSE Telecom | 9.2658 | 5311.03 | Jan-12 | BSE TECK | -0.406 | 6549.31 |
| May-07 | BSE METAL | 5.7979 | 5646.9 | Feb-12 | BSE HEALTH | 1.6274 | 6857.28 |
| Jun-07 | BSE CD | 1.3246 | 5781.37 | Mar-12 | BSE REALTY | 9.840 | 6759.63 |
| Jul-07 | BSE CG | 8.3127 | 6063.2 | Apr-12 | BSE REALTY | 0.2030 | 6698.51 |
| Aug-07 | BSE UTILITIES | -2.2833 | 5950.11 | May-12 | BSE AUTO INDEX | -3.402 | 6280.04 |
| Sep-07 | BSE Power | 8.4771 | 6773.54 | Jun-12 | BSE FMCG | 3.7322 | 6682.47 |
| Oct-07 | BSE UTILITIES | 28.419 | 7785.22 | Jul-12 | BSE FMCG | 2.0196 | 6605.7 |
| Nov-07 | BSE Power | -0.099 | 7865.98 | Aug-12 | BSE FMCG | 5.4503 | 6632.34 |
| Dec-07 | BSE Energy | 7.1608 | 8592.43 | Sep-12 | BSE FMCG | 3.3502 | 7206.51 |
| Jan-08 | BSE UTILITIES | 0.0862 | 7160.03 | Oct-12 | BSE CD | 3.4265 | 7118.77 |
| Feb-08 | BSE CD | -1.6369 | 7108.12 | Nov-12 | BSE REALTY | 10.320 | 7472.45 |
| Mar-08 | BSE Health | -3.8248 | 6157.27 | Dec-12 | BSE REALTY | 4.7812 | 7581.57 |
| Apr-08 | BSE FMCG | 7.4805 | 6885.03 | Jan-13 | BSE TELECOM | 8.4795 | 7665.74 |
| May-08 | BSE IT | 8.9597 | 6474.97 | Feb-13 | BSE TELECOM | -0.815 | 7163.69 |
| Jun-08 | BSE HEALTH | -5.2698 | 5215.37 | Mar-13 | BSE TECK | 4.5017 | 7084.96 |
| Jul-08 | BSE TECK | -4.374 | 5525.77 | Apr-13 | BSE IT | -3.164 | 7385.25 |
| Aug-08 | BSE UTILITIES | 0.8472 | 5631.51 | May-13 | BSE FMCG | 6.1527 | 7441.89 |
| Sep-08 | BSE AUTO | -8.1537 | 4897.59 | Jun-13 | BSE HEALTH | 3.4343 | 7164.06 |
| Oct-08 | 0 | 0 | 3570.07 | Jul-13 | BSE TELECOM | 4.5629 | 6985.56 |
| Nov-08 | 0 | 0 | 3295.6 | Aug-13 | BSE TECK | 7.5883 | 6673.96 |
| Dec-08 | BSE FMCG | 2.6221 | 3596.85 | Sep-13 | BSE IT | 8.1740 | 7019.96 |
| Jan-09 | BSE BASIC MATERIALS | -1.4963 | 3426.76 | Oct-13 | BSE TECK | 3.9444 | 7656.62 |
| Feb-09 | BSE Energy | -3.040 | 3232.11 | Nov-13 | BSE METAL | 6.5684 | 7598.21 |
| Mar-09 | BSE UTILITIES | 0.4946 | 3523.53 | Dec-13 | BSE CAPITAL GOODS | 10.192 | 7828.34 |
| Apr-09 | BSE AUTO | 11.894 | 4140.42 | Jan-14 | BSE CG | 1.4154 | 7499.02 |
| May-09 | BSE AUTO | 20.063 | 5520.25 | Feb-14 | BSE TECK | 3.5696 | 7709.75 |
| Jun-09 | BSE REALTY | 33.251 | 5492.03 | Mar-14 | BSE HEALTH | 0.5617 | 8295.26 |
| Jul-09 | BSE REALTY | 28.379 | 5940.38 | Apr-14 | BSE INDUSTRIALS | 7.9258 | 8342.15 |
| Aug-09 | BSE Realty | 6.2501 | 6044.61 | May-14 | BSE CG | 12.699 | 9206.01 |
| Sep-09 | BSE IT | 11.796 | 6552.75 | Jun-14 | BSE REALTY | 13.464 | 9791.34 |
| Oct-09 | BSE AUTO INDEX | 3.6313 | 6142.43 | Jul-14 | BSE UTILITIES | 8.9772 | 9831.51 |
| Nov-09 | BSE Health | 7.067 | 6584.98 | Aug-14 | BSE METAL | 0.0274 | 10096.0 |
| Dec-09 | BSE Health | 4.5211 | 6842.25 | Sep-14 | BSE Health | 7.7836 | 10173.2 |
| Jan-10 | BSE METAL | 5.1356 | 6509.9 | Oct-14 | BSE Health | 5.2312 | 10594.8 |
| Feb-10 | BSE BASIC MATERIALS | 1.6080 | 6518.38 | Nov-14 | BSE AUTO INDEX | 3.5866 | 10956.1 |
| Mar-10 | BSE CD | 3.7225 | 6919.55 | Dec-14 | BSE BANKEX | 6.8794 | 10721.6 |
| Apr-10 | BSE CD | 6.9537 | 7042.68 | Jan-15 | BSE BANKEX | 5.2569 | 11346.2 |
| May-10 | BSE CD | 4.0559 | 6782.37 | Feb-15 | BSE REALTY | 3.1531 | 11454.3 |
| Jun-10 | BSE CD | 4.6348 | 7092.2 | Mar-15 | BSE REALTY | 2.8080 | 11048.7 |
| Jul-10 | BSE FMCG | 3.9791 | 7205.22 | Apr-15 | BSE HEALTH | 1.2891 | 10696.8 |
| Aug-10 | BSE CD | 8.0218 | 7289.74 | May-15 | BSE HEALTH | 2.3588 | 11023.7 |
| Sep-10 | BSE CD | 9.9613 | 7984.45 | Jun-15 | BSE TELECOM | 1.9390 | 10903.5 |
| Oct-10 | BSE CD | 7.3590 | 8036.88 | Jul-15 | BSE ENERGY | 3.8274 | 11233.4 |
| Nov-10 | BSE CD | 4.4388 | 7722.05 | Aug-15 | BSE CD | -0.037 | 10536.3 |
| Dec-10 | BSE Health | 3.9739 | 7961.06 | Sep-15 | BSE HEALTH | 2.4211 | 10498.2 |
| | | | | Oct-15 | BSE TECK | -0.536 | 10671.5 |
| | | | | Nov-15 | BSE CD | 4.2239 | 10580.8 |
| | | | | Dec-15 | BSE CD | 3.6912 | 10634.2 |
| | | | | Jan-16 | BSE UTILITIES | 2.0183 | 10014.0 |
| | | | | Feb-16 | BSE UTILITIES | -3.533 | 9206.02 |
| | | | | Mar-16 | 0 | 0 | 10185.1 |

value-weighted long position in the sampled stocks. Despite these results, none of the performed analyses have rendered the zero-cost momentum strategies strictly inferior either, because none of the relevant results have been statistically significant. The topic of this subsection is risk compensation, which is one dimension of the momentum strategies' performance that has not been properly analysed. The common measure for this risk compensation is the financial notion of alpha

According to Achelis "Technical analysis is the process of analysing a security's historical prices in an effort to determine probable future prices."

According to Edwards, Magee and Bassetti "It refers to the study of the action of the market itself as opposed to the study of the goods in which the market deals. Technical Analysis is the science of recording, usually in graphic form, the actual history of trading (price changes, volume of transactions, etc.) in a certain stock or in "the Averages" and then deducing from that pictured history the probable future trend."

According to Murphy "Technical analysis is the study of market action, primarily through the use of charts, for the purpose of forecasting future price trends. The term "market action" includes the three principal sources of information available to the technician—price, volume, and open interest."

According to Pring "The art of technical analysis, for it is an art, is to identify a trend reversal at a relatively early stage and ride on that trend until the weight of the evidence shows or proves that the trend has reversed. Therefore, technical analysis is based on the assumption that people will continue to make the same mistakes they have made in the past."

METHODOLOGY

This paper involves the analysis of financial stability and overall performance of various indices in general. It also focuses to forecast the indices returns using Relative Strength Index Strategy (RSI).

The scope of this study involves the secondary data for the period from 1st April, 2006 to 31st March, 2016 for various indices such as BSE Auto Index, S&P BSE BANKEX, S&P BSE Basic Materials, S&P BSE Capital Goods, S&P BSE Consumer Discretionary Goods & Services, S&P BSE Consumer Durables, S&P BSE Energy, S&P BSE Fast Moving Consumer Goods, S&P BSE Finance, S&P BSE Healthcare, S&P BSE Industrials, S&P BSE Information Technology, S&P BSE Metal, S&P BSE Oil & Gas, S&P BSE Power, S&P BSE Realty, S&P BSE Tech., S&P BSE Telecom, S&P BSE Utilities. BSE 500 has been taken as the benchmark index for comparison of performance. For the sample data monthly returns were calculated using the last working day of each month.

RESULTS

Hypothesis

H₀: The return of momentum strategy and benchmark are same

H₁: The return of momentum strategy and benchmark are different.

As the significance F value is less than 0.05, H₀ is not accepted. Therefore, it can be interpreted that the return as per the momentum strategy using RSI is different from the benchmark index.

CONCLUSION

Buying and selling of stock is not an easy task if you want to make money doing it. Millions of investors have lost the money in past trying guessing stock price movements. In order to consistently make money in the stock market, investors have to be right over 70% of the time.

Technical analysis is the art and science of chart patterns in order to better analyse and predict prices of a given security. It is also becoming popular with the younger generation. But further research has to be conducted to know whether the technical analysis alone will guarantee profits to the investors.

Summary Output

| Regression Statistics | | | | | | | | | |
|-----------------------|--------------|----------------|---------|----------|----------------|------------------|-------------|-------------|--|
| Multiple R | 0.439 | | | | | | | | |
| R Square | 0.192 | | | | | | | | |
| Adjusted R Square | 0.185 | | | | | | | | |
| Standard Error | 6.118 | | | | | | | | |
| Observations | 119 | | | | | | | | |
| ANOVA | | | | | | | | | |
| | df | SS | MS | F | Significance F | | | | |
| Regression | 1 | 1045.972 | 1045 | 27.94 | 5.8E-07 | 0.0000005 | | | |
| Residual | 117 | 4379.837 | 37.4345 | | | | | | |
| Total | 118 | 5425.809 | | | | | | | |
| | Coefficients | Standard Error | t Stat | P-value | Lower 95% | Upper 95% | Lower 95.0% | Upper 95.0% | |
| Intercept | 4.22387 | 0.564738 | 7.479 | 1.5E-11 | 3.105 | 5.342 | 3.105437 | 5.342305 | |
| X Variable 1 | 0.39428 | 0.07459 | 5.285 | 5.88E-07 | 0.246 | 0.542 | 0.246558 | 0.542001 | |

The methodology involves monthly roll over investment pattern in a particular index on the basis of the performance of the last month. It means the performance of various indices will be compared and the index which had performed best in the previous month will be used for investment in the current month and then returns will be calculated. The results show that investors can earn abnormal returns using RSI strategy and the returns are significantly high.

Knowledge of the stock markets is the key to the success and emphasis should be on managing trading risk while technical analysis can help you to control them.

An investor can use various momentum strategies to predict the stock prices and indices. It was found in Indian indices that the prediction as per the momentum strategies have a very good accuracy level and outperform the market.

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