

# MOMENTUM AND CONTRARIAN EFFECT ON INVESTMENT DECISION: A STUDY ON BOMBAY STOCK EXCHANGE

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## ABSTRACT

*The Indian Stock market has witnessed a major transformation and structural change for the past two decades, which resulted in a major reformation of economic and financial sector as initiated by the government of India since 1991. Among these measures, lifting of barriers and opening up the doors for FIIs investors have played major role in the development of Indian markets with other foreign markets, especially with other emerging countries. In this report the researcher has worked on the Effect of Momentum and Contrarian investing strategy with respect to BSE. Researchers have checked the investing strategy on sectoral index of BSE sensx. The study includes the 8 years data. Researchers have calculated annual returns, beta value and t-test for these strategies to know in which sector who is the winner and who is a loser in long and short period of span. It also gives an Idea to the investors where they have to invest along with for how much period and duration.*

**Keywords:** *Contrarian, Debt Instruments, Equity, Government Securities, Momentum*

## INTRODUCTION

The Bombay Stock Exchange (BSE) is that the first and largest securities exchange market in India. It got established in 1875 in Mumbai, India as the Native Share and Stock Brokers' Association. In the BSE a list close up to 6,000 companies and is one among the most important exchanges in the world, along with the Japan Exchange Group, Shanghai Stock Exchange (China), New York Stock Exchange (NYSE), London Stock Exchange Group. The Bombay Stock Exchange has helped the country to develop and grow the Indian Security markets with the retail sector debt market, and the corporate sector.

In the year 1995, the BSE should switched from an open-floor of trading system to an electronic medium because there are many types of electronic exchanges in the U.S. along with the New York Stock Exchange (NYSE) and National Association of Securities Dealers Automated Quotations being the most famous and widely known in the countries.

Now a day electronic systems should be dominate the overall monetary industry with offering few errors, quicker execution, and the higher efficiency than older version of open and manual trading systems. Securities that the BSE should lists including with the stocks –( option and future) and with the index – (futures ,options and weekly). The overall performance of the BSE is measured by the Sensex, come with the degree of a sector of thirty of the BSE's largest stocks covering twelve sectors. Trading should be done in the BSE through a brokerage agency, without the stipulated Charge. However, the direct investment access is given to bind advantageous to investors for creating the giant transaction within the BSE. BOLT (Bombay Online system trading), this platform should used by

this security exchange for the purpose of efficient trading .Transactions created in BSE through online medium are done through T+2 rolling settlement, whereby all transactions measure the processed inside within of 2 days. Securities and Exchange Board of India (SEBI) is accountable for the regulation of this stock exchange and continue the updates regarding the rules for its smooth operation.

## ASSORTED INVESTMENT METHOD

Trading of securities of a company who are listed in Bombay stock market will be done either directly or indirectly, depending upon the quantity of transactions undertaken. Primary trading should be done only through the brokerage agencies who are registered and institutional investors who making the bulk transactions in BSE. Retail customers, on the opposite hand, don't must access to direct investment schemes and must make transactions through an authorized stockbroker or a stock investing platform. this is often referred to as secondary trading mechanism, regulated by the Financial Industry administrative unit (FINRA). For secondary trading, a private must hold a DEMAT account, through which the financial transactions occur. Virtual ownership of all stocks will be gained through the account itself.

## Chief Investment Segments

All companies listed under BSE can use the subsequent financial instruments to boost funds for his or her business:

### i) Equity

Equity instruments primarily consist of shares issued by a company to raise adequate paid-up capital for its smooth

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operations. Huge amount of equity is raised during an initial public offering of a start-up company from the primary capital market. However researcher, new issuance of shares is subject to strict regulations under SEBI, due to volatility of prices at this stage.

Equity already issued are often traded amongst retail customers within the secondary market through a stockbroker.

ii) Debt Instruments and government securities –

These securities are issued by a company to raise finances without giving ownership to investors. Relatively risk-free in nature, trading in debt instruments are often wiped out both primary and secondary market, depending upon its nature. Various government securities such as zero coupon bonds, floating rate bonds and capital indexed bonds are traded in BSE.

### ADVANTAGES OF LISTING

A company listed under Bombay stock market can enjoy several benefits, such as:

#### Hassle-free capital generation

Listed companies enjoy the trust from all the types of investors present within the market. It spreads market knowledge regarding a young business, allowing individuals to carefully analyze the approaching condition of such companies and invest accordingly. Paid up capital for any business can only be raised effectively if a corporation is listed with a prevalent stock market during a country. Market securities are often readily sold during a financial market if it's listed in Bombay stock market, thereby sufficing the liquidity needs of both businesses and individual investors. Funds requirement of a company can be obtained through the issuance of debt and equity securities, which investors purchase for the purpose of wealth creation. Securities purchased are often readily sold through the electronic trading settlement of BSE, thereby allowing investors to effectively encash their investment as and when the necessity arises.

a) Legal Monitoring :

Investors can analyse through fraudulent companies if they choose to invest in organizations listed with BSE. Several rules and regulations are compulsory by SEBI monitoring the actions of registered companies, minimizing the chances of investors incurring a loss due to illegal activities of a business.

b) Timely information display

Proper amount of information about total revenue generation and reinvestment pattern need to be published annually by all companies who are listed under the BSE stock market. Total dividend distributed, bonus and transfer issues, book-to-closure facility etc. has to be displayed and provided as per the SEBI regulations.

c) Adequate pricing rules

Price of securities trading in BSE share market is decided through demand and provide of an equivalent currently prevailing. This reflects the real value of a share, affecting a company's market capitalisation and ease of procurement of funds.

#### Collateral guarantee

At the time of acquiring loan, Securities issued by a company acts as a collateral guarantee. Most of the financial institutions accept equity shares listed in BSE as leverage against which funds are often derived

#### Interdependency of Indian Stock Market with other Emerging Market

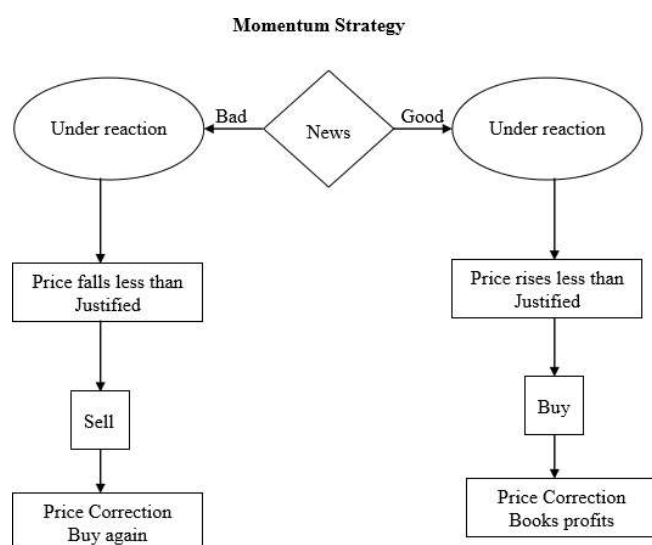
In the recent years due to globalization, deregulation and integration between countries the interdependency among major world stock markets has increased. Often responses from the equity movements of other markets all over the world and The Indian Stock market has witnessed a major transformation and structural change for 10 to 15 years as a result of the economic and financial sector reforms initiated by the government of India since 1991. Out of these measures, Privatization and Liberalization of foreign investors investment have promoted cordial relationships of Indian markets with other foreign markets, especially with other emerging countries.

An international investor who are willing to make portfolio investments in other financial markets would be interested to know if he or she can achieve desired results by going for diversification. The interdependency of financial markets had been at the focus of interest of academicians even from 1960s. The majority of studies in that early period reach have concluded that the degree of interdependency of markets is quite low, as the prime factors in the development of financial markets are of domestic nature. Even in those years some studies that research published supported the existence of limited interdependency these markets. Agmon (1972), establishes some degree of interdependency stretches the markets of the US, UK, Germany and Japan during 1961 until 1966. Integration is the process by which segmented markets become open and unified so that participants enjoy unimpeded access to international trade and finance (Nalini Prava, 2005). Integration of financial markets will encourage flow of funds from markets having lesser returns to the one which offers higher returns. It can be assumed that financing and investing decisions by investors across the globe are greatly influenced by the perseverance degree of market integration. From an investment point, if stock markets move together then diversification of portfolio would not generate any return. On the other hand, if two markets are independent, investors can do effective portfolio diversification by investing in these markets. Therefore, a comprehensive study on stock market interdependency will carry a lot of importance for the Indian investors engaged in such portfolio diversification. The present study which is included in this chapter had been conducted by

the researcher with the objective of analyzing whether Indian equity market is integrated with that of the rest of the world, especially among different Asian markets. Researcher tested interdependency of Nifty Index movements with Shanghai Composite Index, Hangseng index and Nikkei Index from 2006-2009 using simple correlation technique.

Shanghai Composite Index is a capitalization-weighted index. The index tracks the daily price performance of all A-shares and B-shares listed on the Shanghai Stock Exchange. The index was developed on December 19, 1990 with a base value of 100.

### Momentum Investing Strategy



Momentum investing is an investment strategy which aims to purchasing securities that have been showing an upward price trend of securities or short-selling securities that have been showing a downward trend. The main rationale behind momentum investing is that when a trend is researchesll-established, it likely to continue.

#### a) Characteristics of Momentum Investing

Momentum investing is strictly a technical trading strategy. Unlike fundamental or value investors, momentum investors aren't concerned with a company's operational performance. Momentum investors apply technical indicators to the analysis of a security to spot trends and measure the strength of the trend – in other words, to work out the level of price momentum in the market. Momentum investors also look to analyze, understand, and, if possible, to study the behavior of other investors in the market. The conscious Awareness of behavioral biases and investor emotions can significantly enhance the effectiveness of a momentum in investing strategy.

#### b) Technical Analysis Tools used in Momentum Trading

Technical analysis is that the primary point of reference for momentum investors. As traders spend a large amount of time in trying to work out the strength of trends in asset prices,

knowledge of key technical indicators are crucial to the successful execution of a momentum trading strategy.

Following are some of the technical indicators that are most commonly used in momentum trading:

#### i. Trend lines

Trend lines are tools of technical analysis tool for monitoring price movements. A trend line is drawn between two successive points on a price chart. If the resulting line is sloping upward, then it indicates that there is a positive, bullish trend, and an investor may buy shares. If the resulting line is downs loping, then the trend is negative or bearish and selling short is indicated as the most likely profitable position to adopt.

#### ii. Moving averages

A moving average line enables traders to identify the prevailing trend while eliminating much of the market noise that comes from small, insignificant price fluctuations. When a security's price consistently remains at or above a moving average, it indicates the existence of an uptrend. A downtrend are usually reflected on a chart by price maintaining a position at or below a chosen moving average.

#### iii. Stochastic oscillator

The stochastic oscillator compares an asset's most recent closing price to the prices over a specified period of time. When the closing price is near the high of the price range for the time period, the trend is positive. When the closing price is near the low, it indicates a downward trend. Stochastic oscillator values range from 0 to 100. Higher numbers above 50 indicate a strengthening uptrend. Lower numbers, below 50, indicate a downtrend that is gaining momentum. However, an oscillator reading below 20 indicates oversold conditions in a market that may lead to a market reversal to the upside. Likewise, readings above 80 indicate overbought conditions and the potential for a bearish reversal.

#### iv. The Average Directional Index (ADX)

The Average Directional Index (ADX) is a very popular momentum indicator and one that is generally considered less effected to producing false signals than the stochastic oscillator. The ADX is used to determine the existence of a trend and the strength of a trend. It is performed by calculating the expansion (or contraction) of a security's price range over a specified time period. ADX values range from 0 to 100. Values below 25 (some traders use 20 rather than 25) indicate a ranging, or directionless, market in which no clear trend exists.

Reading above 25 indicates the existence of a trend, and higher readings beyond the level of indication are a stronger trend. In other words, an ADX reading of 40 indicates a stronger trend than an ADX reading of 30.

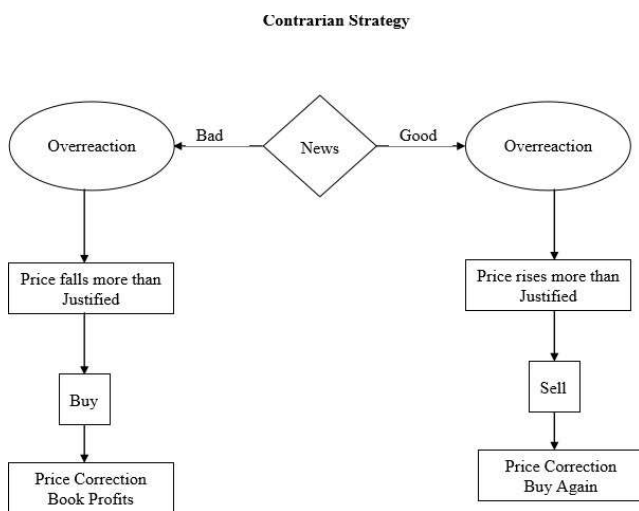
#### c) How Momentum Investing Works

##### i. Traders employing a momentum investing strategy

look to profit from either buying or selling short securities when they are strongly trending, when price action momentum is high. High momentum is an evident by price advancing or declining over a wide range in a relatively short period of time. Markets with high levels of momentum typically show increased volatility.

- ii. Momentum investing is typically short-term investing, as traders are merely looking to capture part of the price movement in a trend.
- iii. A trader uses various technical indicators such as trend lines, method of moving averages, and specific momentum indicators such as the ADX to identify the existence of a trend.
- iv. As the trend gains momentum its strengthens the trader to takes a market position in the direction of the trend (buying an uptrend; selling a downtrend). When the momentum of the trend shows signs of hope such as a divergence price of action and the movement of momentum indicators such as the MACD or RSI, the trader looks to exit their position (hopefully at a profit), before any actual trend reversal.

### Contrarian Investing Strategy



Contrarian investing is a style of investment in which investors purposefully go against prevailing market trends by selling when others are buying, and buying trend start when most investors are selling. Contrarian investors believe that folks who say the market goes up do so only they're fully invested and haven't any further purchasing power. At now, the market is at a peak. So, when people predict a downturn, they need already sold out, and therefore the market can only go up at now . The value premium will be positive as long as the value strategy yields a higher return than the growth strategy over a given period of time.

- a) To sum up:

Value Strategy: to buy value or loser stocks. Growth Strategy: to buy growth or winner stocks.

Contrarian strategy: value strategy minus growth strategy.

Value premium: payoff on a contrarian strategy.

#### b) Two Types of Contrarian Investment Strategies

First type of contrarian investment strategy is the prior returns strategy. This strategy assumes that extreme stock price movements in one direction will be followed by subsequent extreme movements in the opposite direction. Past losers are believed to become future winners and vice versa. This type of contrarian investment strategy requires that the stock market overreacts . The reason for an overreaction in the stock market can differ, but regardless of the reasons, some investors have a tendency to become exceptionally excited about stocks that have performed well in the past and thus bid their prices up, so that these winner stocks become overpriced in the market. Similarly, investors overreact to stocks that have performed poorly in the past and therefore oversell these loser stocks so they become underpriced in the market.

Second type of contrarian investment strategy is best classified as a valuation measures strategy. Different ratios that include share price or book –and market value are expected to proxy for past performance or alternatively, to disclose information about the market expectations for future performance. The most common and therefore most thoroughly used valuation measures are the Price-Earnings ratio (P/E), the Price-to-Book-Value (P/BV), the past Growth sales (GS), or the Book-to-Market ratio (B/M). It is possible to use several other valuation measures as there exist a number of different composition possibilities but the basic idea is still the same. Value stocks are chosen on criteria such as poor past performance, low growth sale and a market value close to their book value and growth stocks vice versa.

#### c) How the typical tools use

A contrarian trader can use either fundamental or technical analysis, or both, to determine when to enter and exit the market. In a contrarian approach, the technical trader will typically use a technical indicator to signal when to start or end a trade. Contrarian technical analysis employs the same tools as traditional technical analysis, such as price action analysis, forex oscillators, moving averages, sentiment analysis, and/or any other combination of technical studies suitable for predicting market reversals. On the other hand, a contrarian trader uses fundamental information in their trade analysis that might use the release of a major economic indicator, such as GDP, bank interest rate decision as a contrarian indicator

### OBJECTIVES OF THE STUDY

The objectives of the study are as follows:

To check the existence of contrarian and momentum effect in

Indian Stock Market with respect to BSE.

To analyze the impact of both the strategies (contrarian and momentum) on stock return in connection with various sector in the short term and long term period.

## SCOPE OF THE STUDY

The study is focus on assess the investment opportunities in S&P BSE Sensex Next 50. Ten sectoral indices have been considered for testing the presence of momentum and contrarian strategies which is as follow – S&P BSE Sensex Next 50, Finance, FMCG, Oil & Gas, Capital goods, Consumer Durable, Metal, Poresearchers and Health care and Telecom based on the variation in their return of sectoral index of BSE.

### 1.3 METHODOLOGY OF THE STUDY

#### 1.3.1 Data Collection

The study involved in this project report, the required data collected from secondary source such as official researchers site of Bombay Stock Exchange. The study should be divided in to two time horizon that is - long term investment of six years from 01/0/2014 to 31/12/2019 and the short term investment for two year dating from 01/01/2018 to 31/12/2019. This research covers the monthly returns of the 10 sectors over a period of six years. A period of 250 days was set for analyzing short-term investment trend. Data of returns for the year 2018-19 (1st Jan 2018 to 31 Dec 2019) has been considered. In other words, the year 2018 has been considered as the formation period while the year 2019 has been considered as the test period. Likewise the portfolio performance from 2014-16 (formation period) to 2017-19 (testing period) has been assessed for recognizing long term return trend. Here, monthly return data of 740 days was considered for formation and testing purposes.

#### 1.3.2 Data Analysis

The data was collected and analyze by using t-test. This test has been employed to compute the level of significance of average abnormal returns. It was to find out whether (contrarian and momentum) strategies give significant positive returns when compared with the bench mark (S&P BSE SENSEX NEXT 50).

Data will analyze through the medium of Excel and SPSS.

### 1.19 HYPOTHESIS

The following hypothesis are used to achieve the desired objectives in the study :

H01: Momentum investment strategy does not provide proper return to investor in long and short period .

Ha1 : Momentum investment strategy provide significant proper return to investor in long and short period .

H02: Contrarian investment strategy does not provide proper

return to investor in long and short period .

Ha2: Contrarian investment strategy provide significant proper return to investor in long and short period .

## LITERATURE REVIEW

Thomas and Kumar conducted research work on Momentum And Contrarian Strategies In The Indian Stock Market - An Evaluative Study. The focus of the study was on contrarian investment strategies which means to work or invest in the market according to the existing old market trends present in the market. The investors in such strategies focus mostly on investments which are already prevailing in the market for a long time or those who are able to grab media attention. There is lot of irrationality in the market which leads to fluctuations on daily, researcherseklly and short run basis. In case of momentum investment strategy investors just follow the crowd, and thus end up investing there, where most of the people would have invested. The study in this research was conducted with the motive of understanding how both of these strategies will work in Indian stock markets. As part of that, researcher started by testing the market efficiency of those investments in the Indian stock market. It was found that, contrarian and momentum strategies didn't provide great results for the Indian investors, one of the main reason was of inter dependency of Indian markets with other major markets present all over the world. A whole separate test was conducted by the researcher in order to know the efficiency rate of these tools and methods in Indian stock market when they are hit down by global financial crisis and thus helping the investors in making better investment decisions.

Sehagal and Balakrishnan (2002) conducted a study on Contrarian and Momentum Strategies in the Indian Capital Market. The study attempts to measure if there are any systematic patterns available returns for the Indian market. The factual data admit that there is a reversal in long-term returns and the short-term momentum effect has been controlled by maintaining a gap of 1 year between portfolio creation period and the portfolio ownership period. A contrarian strategy supported long-term past returns provides moderately positive returns. Further, there is a continuation in short-term returns and a momentum investing strategy supported, it provides naturally specific payoffs. The success of both the contrarian and momentum strategies, supported by empirical literature, that are clashing in nature poses an analytical problem. Single action is that the irregular returns realized by these trading strategies are spurious. Investment strategies involving portfolio formation period of but a month, between 3 to 12 months, and between 13 to 60 months are generally mentioned as very short-term, and long-term strategies respectively. The empirical evidence on investment strategies has been mainly targeting matured capital markets.. Another possibility is that the discrepancy is due to the difference in the time horizons used in the trading rules. The period of time classification within the investment strategy literature has been defined on the idea

of the length of the portfolio formation periods. This has a direct implication for the state of efficiency of a given stock market. The empirical findings suggest that there is risk reversal of long-term past returns in the Indian equity market, while the short-term past returns tend to exhibit a strong continuation pattern. Moreover, time-specific investment strategies supported such patterns within the stock returns do provide extra-normal returns need for an out of sample evidence especially relating to emerging stock markets.

Singh (2018) investigates the connection between Contrarian and Momentum Investment strategies –A study from NSE India. The aim of this paper is to check the impact of momentum and contrarian form of stock investing for various sectors within the Indian securities market.

The study has been branched into short term and long-term periods. Each portion of time has been further divided into creation and test periods. The thought of market adequacy seems to be deeply based into all studies of financial market investments. The fact that financial markets are efficient and stock prices flash all possible information into the prices is widely acceptable and most of the academicians are a disciple of this proposition. Having said so, the subsequent implication which pulls from the speculation is that individual, financial or non-financial institution cannot systematically obtain positive excess profits by trading securities. In other words, it's futile to spend time and money in investment research because it's almost impossible to urge quite average market returns. Going by this investing in an open-end fund seems to be the right approach. Both these views somehow seem very perfect when studied independently but still perplex an investor when view together. While some strategies are suitable for long run, others might fit into the short term and still others within the medium term. Similarly, some strategies outplay the others in say, Sector A but yield poor leads to Sector B. Over a period of some time the markets are visiting be stable and efficient. However, there'll be intermittent inefficiencies and price deviations from intrinsic values. The abnormal returns (gain and loss) bring out by past winners and past losers within the holding period was observed. The tendency from positive to negative or negative to positive suggested a contrarian style. The continuation of formation period trend (positive or negative) within the following holding period warned a momentum effect.

Kaur (2014) study investigates the relationship between Contrarian/ Momentum effects and industry type in Indian stock market. The purpose of this study is based upon a sample selected from 500 companies forming part of S&P CNX 500 index. The final sample consists of 367 Companies. The data consists of month wise closing share price of the sample companies. The study covers a time duration from 1 April 2005 to 31 March 2010, a total time length of 5 years. To analyze the existence of industry effect, the aggregate sample has been split into two industries, namely service and manufacturing. The findings indicate that investors can earn abnormal returns

by formulating contrarian strategy among both manufacturing and service industry in the Indian stock market. Higher contrarian gain can be acquire in manufacturing rather than in service industry. Service comprise of financial and non financial service firms. Aggregation of financial and non financial services has been performed to ensure sufficient number of firms in service sector. Finally, manufacturing sector consists of 255 firms and service sector includes 112 firms that is 67 non financial services and 45 financial services firms. There are only a less studies testing industry side effect in contrarian and momentum returns in an Indian and international framework . Therefore, an attempt has been made in this study to examine the relationship between contrarian/ momentum effect in stock returns and type of industry in the Indian stock market. The significance of these events is that investors can gain exceptional returns by formulating contrarian strategies among service and manufacturing industry in the Indian stock market. However, higher profits can be earned by them in manufacturing industry. They can earn superior returns by formulating contrarian strategies based on short to medium term formation and holding period (i.e. three to twelve months period). It has been found that investors can earn abnormal returns by formulating contrarian strategy among both manufacturing and service industry in the Indian stock market. However, higher contrarian profits can be earned in manufacturing than in service industry.

Bernard and Deo (2015) conducted a study on An Analysis of Momentum Strategies in Indian Stock Returns. The study reveals a strong presence of momentum pattern in Indian stock return and finds the main determinant of momentum profit to be the winner's securities as the contribution of winner's portfolios are found to be more for hedge portfolio as compared to loser's portfolios. Furthermore, the study certify that within the Indian context, past trading volume has no appearance in increasing the return of momentum strategy. The present study attempted to investigate the momentum trading in India by examining the link between trading volume and momentum profits. Many empirical studies have reported that both momentum and contrarian investment strategies provide abnormal return to investors. Another interesting area among financial-market researchers happens to be the investigation on how momentum and contrarian strategies relate to other fundamental factors of a security. Researchers estimated the Mean Average Abnormal Returns values of winner, loser and momentum portfolios and found economically and statistically significant abnormal return from momentum strategies indicating strong presence of momentum pattern in security returns in Indian equity marketplace for a medium-term holding period. However when compared to the contribution of winners and losers, it was observed that winners are contributing more to momentum portfolio. These empirical findings lead to two inferences for Indian equity market scenario: first, winners' portfolio mostly contribute to momentum return, and the second, small and illiquid stocks may prove to be the most driver of returns generated by losers' portfolio.

Su-sheng and Zhi-chao (2013) conducted research on Momentum and Contrarian Strategies of Related Industries in the Bull and Bear Markets. Momentum and contrarian effects are financial anomalies and have been found on firm level that is in the bull and bear markets based on data of Chinese stock market. Firstly, researchers made returns of customer and supplier of industries by using the information from Input and Output accounts and therefore the Chinese stock data from (2000 to 2009). In second part of the paper defines the bull and bear markets in two ways and in last researchers test momentum and contrarian effects of related industries within the bull and bear markets with different types of market definition. Researchers find that momentum and contrarian effects are consistent in several market states. The portfolio sorted by customer industries mainly exhibits momentum effects and therefore the portfolio sorted by supplier industries exhibits contrarian effects. The paper constructs returns of supplier and customer of industries by using the Input- Output accounts. Because of circulated stock value is more realistic to China, the difference is that researchers select circulated stock value instead of market capitalization. Researchers construct trading strategies by industries portfolios. At the beginning of each month  $t$ , industries portfolios are divided into five quintile portfolios based on the lagged month returns (in month  $t-1$ ) of related industries. Self-financing trading strategies are constructed by buying the winner portfolio and selling the loser portfolio. Then, researchers examine portfolios with different formation and holding periods. The results show that momentum and contrarian effects are consistent in different market states. Momentum and contrarian effects are similar in the bull and bear markets. The portfolio sorted by customer industries mainly display momentum effects and the portfolio sorted by supplier industries display contrarian effects. But in bull market, the effects are more significant.

Maheshwari and Dhankar (2017) conducted research on A Study of Contrarian and Momentum Profits in Indian Stock Market. The study presented an analysis of both momentum and contrarian strategies to see the robustness of the US findings to data snooping bias by using the monthly return data of Indian stocks. This paper will re-examine the presence of momentum and overreaction phenomenon in Indian stock market which is one of the leading emerging market of the world by using several different testing methodologies to gauge the robustness of the results that controls for size and value effect. The paper further examines the findings supported the predictions of varied behavioral models that are proposed to elucidate momentum and overreaction effect. The motivation for studying the Indian market is that the Indian economy is one among the fastest growing economies of the planet. The findings of our study provide useful evidences, impacting the various trading strategies on Indian stock market. These findings provide strong suggestion for investment companies, mutual fund managers and even for small investors who could improve their investment strategies by using momentum strategies in short period and contrarian strategies in long term.

Arvind (2016) conducted a research on Contrarian and Momentum Strategies: An Investigation with reference to Sectoral Portfolios in NSE. In this study, the short term and long term return trends of eleven sectors examined and investment strategies employed in the said sectors from 1st April 2009 to 31st March 2015 researchers analyzed. According to various theories, several factors influence an investor when he has got to make a choice. While fundamental analysis is a combination of economy industry-company factors, which decide the merit of a stock, technical analysis focuses on demand and supply factors to determine worthiness of a stock. The above arguments are somewhat true within the investment scenario. At an equivalent time, a good mixture of the spread of data across the market also can play a serious role in influencing investment decisions. The approaches of investors are going to be the most important aspect in selection of an investment choice. If an investor is planning to select a stock by determining its intrinsic value based on current and future earning capacity of the company, researchers can say that he is relying on the theory of fundamental analysis. If the choice of investment is based on historical

## DATA PRESENTATION AND DATA ANALYSIS

Raw data (secondary) collected must be reduced to standard formats such as tables, charts, graphs, diagrams etc and is to be presented in this chapter for each attribute/parameter under investigation. The tool for data presentation should be suitably selected so that interpretation and inferences could be drawn easily and become self explanatory.

### Computation of Returns :

The monthly return data of S&P BSE SENSEX NEXT 50 index as researched as all constituent 10 stocks researched computed by using formula.

$$R_p = \frac{(P_1 - P_0)}{P_0} * 100 \quad R_p = \frac{(P_1 - P_0)}{P_0} - 1$$

In the above equation,  $P_1$  denotes closing price of the month and  $P_0$  stands for previous month close price.  $R_p$  stands for return and using the above equation, monthly return of stocks as well as S&P BSE SENSEX NEXT 50 index are computed for a period of 6 years from 1st January 2014 – 31st December 2019 for long run and period of 2 years from 1st January 2018- 31st December 2019 for short run. Total 8 years are computed for the analysis.

### Computation of the Beta:

Beta is a statistical measure of the volatility of a stock versus the overall market. It's generally used as both a measure of systematic risk and a performance measure. The market is described as having a beta of 1. The beta for a stock describes how much the stock's price moves in relation to the market. Beta measures stock return sensitivity as compared to overall market returns. If a stock has a beta above 1, it's more volatile than the overall market. Beta values for all 10 stocks are computed using the following formula.

$$\hat{\alpha} = \{(\sum_{i=1}^n \hat{O}_{xy}) - (\hat{O}_x \cdot \hat{O}_y)\} / \{\sum_{i=1}^n \hat{O}_x - (\hat{O}_x)^2\}$$

In the above equation,  $\bar{n}$  stands for number of observations,  $\bar{x}$  denotes independent value which is BSE SENSEX NEXT 50 index returns and  $\bar{y}$  denotes dependent variables which is returns of constituent stocks. Beta values are computed from the time series returns data for varying time horizons (short term and long term).

$$\hat{\alpha} = \text{Covariance}(R_p, R_m) / \text{Variance}(R_m)$$

In the above equation,  $R_p$  stands for return of the stocks and  $R_m$  stands for return of market. Covariance= how changes in a stock's returns are related to changes in the market's returns.

Variance=how far the market's data points spread out from their average value trend, the theory of technical analysis has been used for investment preference. Most importantly investors expect a competitive risk adjusted return on their investment. Two common investment strategies to address such volatile situations are Contrarian strategies and Momentum strategies. According to the contrarian investment strategy, changes available prices are thanks to over- reaction to information, while consistent with the momentum strategy, investors react slowly to plug information. Because, the presence of contrarian effect can bring volatility in stock prices and an up-trend can become a down-trend within a short span of time. The short term momentum effect signals lesser instability of returns within the said sectors. Such directions are really helpful for an investor to shape his decisions.

Chowdhury, Sharmin and Rahman (2014) conducted research on Presence and Sources of Contrarian and Momentum Profits in Bangladeshi Stock Market Returns. This paper studies the presence and sources of contrarian and momentum profits within the Bangladeshi stock exchange for the amount January 2002 through August 2013. Contrarian and momentum profits are the two well known return regularities. In This paper, using date wise data for investigates the presence of both momentum and contrarian profits and their sources in the Bangladeshi stock market. The methodology should be followed for their research of Lo and MacKinlay (1990) to form portfolios with in sighted relative strength scheme and use the methodology of Jegadeesh and Titman (1995) for to spoil the momentum and contrarian profits into 3 elements: compensation for cross-sectional risk, lead-lag effect in statistic with reference to the common divisor, and time pattern of stock returns. Results give the evidence of serious contrarian profits for the holding period of 1 through eight weeks during the entire period. During the sub-period 2002-2008, there also are contrarian profits for one through eight week holding period strategies.

Yet contrarian profits only occur for holding period of eight weeks during 2008-2013. Time series pattern is found to be the most sources of contrarian profits. This suggests that idiosyncratic (firm-specific) information is the main contributor of contrarian profit. This could happen thanks to dominant involvement of uninformed individual investors or their

tendency for noise trade.

Li, Qu and Wu (2010) wrote research paper on Momentum and Seasonality in Chinese Stock Market. This study states that the finance literature continues to debate whether the market is efficient. Market efficiency is of three types: strong-form efficient, semi-strong form efficient and weak-form efficient. While in the testing the week-form efficiency, researchers examine whether the market fully reflects information contained in the past. Up to date, there's no overwhelming consensus on this issue. There are countless irregularity should be identified in historical stock returns such as the momentum effect, which has caught much attention in the finance research. If there are short-term autocorrelations in stock returns, researchers may find some profitable strategies by selecting stocks based on their past returns and forming portfolios and holding these portfolios for some period. The momentum or reversal pattern may be due to the fact that firms with similar risk selected into the same portfolio and the risk factor(s) determines the cross-sectional difference of these portfolios, thus explaining the pattern. In light of this, researchers consider the risk-adjusted stock returns. In the Capital asset pricing model (CAPM) framework, the market risk premium is the only factor in explaining stock returns. By contrast, researchers find some reversal effects where the past winners become losers and past losers become winners afterward. The contrarian profit is statistically significant for the strategies using short formation and holding periods, especially for the formation period of 1 to 3 months and the holding periods of 1 to 3 months. The contrarian strategies can generate about 12% once a year on the average.

However there's no evidence of the strategies using longer formation and holding periods. Numbers of analyses are done attempting to elucidate the momentum effects. Given these possible and diverse explanations, the cause of the reversal in Chinese stock returns is still an open question which remains to one of the future works.

Prabhakar, et al (2018) conducted research on Momentum And Contrarian Strategies in BOMBAY STOCK EXCHANGE (BSE). This study is basically done on Indian Stock market with respect of two strategies are momentum and contrarian by using daily adjusted closing prices of 10 sectoral indices of Bombay Stock Exchange (BSE) for a duration of six financial years. The study has been divided into short and long-term periods and every period has been additionally isolated into formation and trial periods. The variation of the typical abnormal returns of winner and loser portfolio has been examined. Over the year, the return information of BSE in the Indian stock market majority of the sectoral portfolios follows the contrarian investment movement because of week form of Efficient Market Hypothesis. The investigation is valuable to investors who have pre-determined investment horizons. The findings also have real ramifications for portfolio management strategies. Two common investment strategies to address such volatile situations are Momentum strategies and Contrarian

strategies. The momentum-based portfolio exchanging technique is all the while purchasing stocks with high past returns (winners) and offering stocks with low past returns (washouts). Hence, it are often inferred that there's no significant difference between the strategies to be used for obtaining superior returns. However selection of an investment strategy is only hooked in to the danger tolerance level of an investor and his investment goals. If the investor is just too risk averse, he can maintain a strategic distance from segments where contrarian impact exists.

### Computation of Abnormal Returns

An abnormal return is a term used to describe the returns generated by a given security or portfolio over a period that is different from the expected rate of return. The expected rate of return is the estimated return based on an asset pricing model, using a long run historical average. Normally a broad-based index is used as a benchmark to determine expected return on a security or a portfolio. In other words, abnormal returns are a security's or portfolio's risk- adjusted performance when compared to the overall market. Simply put, it can be viewed as the difference between actual returns and expected returns.

Abnormal gains/losses of all stocks as compared to the S&P BSE SENSEX NEXT 50 index were computed from the following equation

$$\hat{a}p = R_p - (\hat{a} * R_m)$$

Here,  $\hat{a}p$  denotes abnormal gains or losses,  $R_p$  denotes stock return and  $R_m$  represents market return.

If the loss or the gain in a process is different to what researchers are expecting, then researchers have an abnormal loss or an abnormal gain in the process. If losses are greater than expected return, the extra loss is abnormal loss. If losses are less than expected return, the difference is known as abnormal gain

The general performances of BSE for the concerned periods are assessed as the benchmarking performance and the abnormal gain or loss of each sector in connection with BSE was observed. Those sectoral indices that offered an abnormal gain over BSE during the formation period are considered as winner portfolios while the sectoral indices that offered an abnormal loss over BSE during the formation period are categorized as loser portfolios.

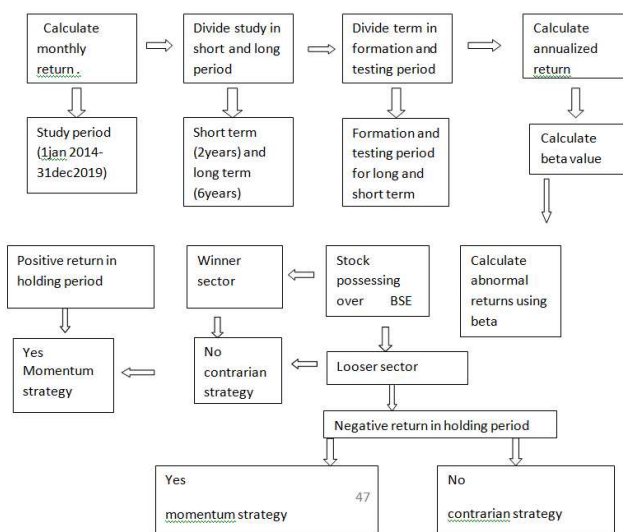


Figure 1: Systematic investigation into returns to arrive at strategies

### 3.2 Data Analysis

While performing analysis, those sectoral indices possessing lower average return to the benchmarking index (BSE SENSEX NEXT 50) during the formation period are categorized as the loser portfolio and the sectoral indices having a higher average return during the formation period are considered as the winner portfolio. This model closely resembles the model proposed by Jagadeesh and Titman (1993). After this classification, the abnormal returns of these portfolios are assessed for the testing period. If the winner portfolio had a significant positive return and the loser portfolio a significant negative return during the testing period, then the momentum strategy was considered to be more effective. On the other hand, if the winner portfolio had a significant negative return and the loser portfolio had a significant positive return during the testing period, then the contrarian strategy would generate maximum return to the investors.

#### Analysis on Short term return trend

The annualized daily return of sectoral portfolios for a period of 250 days was taken for analyzing the investor's response towards short-term trend. The formation covers the period ranging from January 2018 to December 2018. Initially the individual returns of sectoral indices are assessed separately and the same are compared with the benchmarking index to identify abnormal return trend. The sectoral indices that gave positive abnormal returns to the benchmarking index are categorized as winner portfolios and rest are classified as loser portfolios. Subsequently the abnormal return statuses of these sectoral indices are assessed for the test period (1 January 2019-31 December 2019). The table below provides a better representation on the short term return trend of sectoral indices.

**Table 3: Short term trends(abnormal gain and loss)**

Sector / Indices	Annualized return		Abnormal gain/loss		Investment strategy
	Formation	testing	Formation	Testing	
	01/01/2018 - 31/12/2018	01/01/2019 - 31/12-2019	01/01/2018- 31/12/2018	01/01/2019- 31/12/2019	
<b>S&amp;P BSE CAPITAL GOODS</b>	-6%	0%	1%	-1%	Contrarian winner
<b>S&amp;P BSE FMCG</b>	12%	-1%	19%	-1.52%	Contrarian winner
<b>S&amp;P BSE OIL AND GAS</b>	-16%	10%	-13%	8.53%	Contrarian loser
<b>S&amp;P BSE METAL</b>	-24%	-2%	-20%	-2.95%	Momentum loser
<b>S&amp; P BSE FINANCE</b>	-2%	20%	4%	18.80%	Momentum winner
<b>S&amp;P BSE CONSUMER DURABLE</b>	-6%	19%	0%	17.55%	Momentum winner
<b>S&amp;P BSE TELECOM</b>	-39%	17%	-35%	16.20%	Contrarian loser
<b>S&amp;P BSE PORESEARCHERSR</b>	-13%	4%	-7%	3.01%	Contrarian loser
<b>S&amp;P BSE HEALTH CARE</b>	-2%	-3%	3%	-3.32%	Contrarian winner

Note : S& P SENSEX NEXT 50 short term annualized : (-7%) during formation period and (1%) during holding /testing period respectively.

Formula :  $\hat{\alpha}p = R_p - (\hat{\alpha} * R_m)$   
 $R_p$  = stock return  
 $R_m$  = market return  
 $\hat{\alpha}$  = beta value

Table 3 represents:

Interpretation :A period of 250 days approx. has been considered for analyzing the short-term trends. After computing the abnormal returns in the formation period, it was found that a total of 5 index are winner stocks and 4 are loser index.

In the short term return analysis, the sectoral portfolios created with FMCG, Capital Goods, Finance, Consumer Durable and Health Care generated a high abnormal return to the benchmarking index during the formation period as they obtained  $\hat{\alpha}p$  of 19% , 1% ,4% ,0% and 3% respectively. So they are categorized as winner portfolios and other sectors possessing a negative abnormal return over the index are categorized as loser portfolios. The return trend for the test

period (2019) was computed subsequently. The general assumption is that the past trend will repeat in future also. If so, momentum strategies are considered to be ideal. During the test period, from the winner portfolios, Finance and Consumer Durable sectors maintained the momentum as they continued with positive abnormal returns. With respect to the FMCG, Capital Goods and Health Care sector, contrarian effect was found in the short term perspective as a subsequent fall of -1.52%, -1%, -3.32% was witnessed. As far as loser portfolios are concerned, one sector only Metal sectors continuously generated - 20% negative abnormal returns of formation period and -2.95% in testing period and show momentum effect respectively. Other than these sectors are Power, Telecom and Oil& Gas are loser portfolios generated a positive abnormal return during the testing period strongly signal the contrarian attitude of investors.

To conclude, out of the 9 samples, five of the sectoral indices exhibit contrarian behaviour during the test period. This strongly signals volatility of the concerned stocks for the short term scenario.

#### **Analysis on Long Term return Trend**

Long term return trend is studied using the annualized returns

obtained from daily prices of 740 days over a period of 6 years. This data is divided into two time horizons, formation period and holding period. The formation period analysis consists of annualized returns of price observations for a period of three years from 1 January 2014 to 31 December, 2016. The holding period analysis consists of annualized returns of price observations for a period of three years from 1 January 2017 to 31 December 2019. The monthly price observations considered are adjusted closing prices for the day.

The mechanism used for classifying winner and loser portfolios is as follows:

The individual annualized returns of all 9 sectorial portfolios are computed along with that of benchmark index using daily

adjusted closing prices. These individual annualized returns for each sectorial portfolio and the benchmark index are computed separately for formation period and holding period.

Subsequently abnormal returns for these winner and loser stocks are computed in the holding/ testing period. If winner stocks continued to generate positive return in the testing period and loser stocks continued to generate negative return in the testing period, momentum strategy was

observed. However if winner stocks generated negative return in the testing period and loser stocks generated positive return in the testing period, contrarian strategy was observed.

**Table 4 :Long term trends(abnormal gain and loss)**

Sector / Indices	Annualized return		Abnormal gain/loss		Investment strategy
	Formation	Testing	Formation	testing	
	01/01/2018 - 31/12/2018	01/01/2019 - 31/12-2019	01/01/2018- 31/12/2018	01/01/2019- 31/12/2019	
<b>S&amp;P BSE CAPITAL GOODS</b>	47%	20%	-24%	8%	Contrarian loser
<b>S&amp;P BSE FMCG</b>	25%	32%	3%	25%	Momentum winner
<b>S&amp;P BSE OIL AND GAS</b>	42%	20%	-5%	9%	Contrarian loser
<b>S&amp;P BSE METAL</b>	20%	-5%	-39%	-14%	Momentum loser
<b>S&amp; P BSE FINANCE</b>	62%	51%	7%	41%	Momentum winner
<b>S&amp;P BSE CONSUMER DURABLE</b>	77%	76%	36%	65%	Momentum winner
<b>S&amp;P BSE TELECOM</b>	0%	-2%	-34%	-14%	Momentum loser
<b>S&amp;P BSE PORESEARCHERSR</b>	36%	-8%	-31%	-19%	Momentum loser
<b>S&amp;P BSE HEALTH CARE</b>	43%	-5%	37%	-13%	Contrarian winner

Note : S& P SENSEX NEXT 50 long term annualized : (57%) during formation period and (12%) during holding /testing period reasepectively.

Formula :  $\hat{a}p = R_p - (\hat{a} * R_m)$

$R_p$  = stock return

$R_m$  = market return

$\hat{a}$  = beta value

Table 4 Represents:

Interpretation :The market adjusted returns i.e. the abnormal return of sectoral portfolio return over benchmark index is computed. During the formation period, the sectoral portfolios which gave positive abnormal returns over and above benchmark index are classified as winner portfolios and the sectoral portfolios which underperformed benchmark index are classified as loser portfolios.

The same mechanism as discussed in short-term trend was employed for classifying winner and loser portfolios. While examining the long term return trends for formation period, four sectoral portfolios out of nine exhibits a positive return to the benchmarking portfolio. They are classified as winner portfolios and the rest are considered as loser portfolios. Subsequently, the abnormal returns of these sectoral portfolios over BSE SENSEX NEXT 50 are computed for the test period. The result shows that from winner portfolios, except Health Care sector, all other sectors successfully maintained the momentum. From loser portfolios, only the Capital Goods and Oil & Gas sector reported abnormal returns of 8% and 9%. The most interesting thing which can be observed from the long term return analysis is that majority of the sectoral indices maintained the same momentum. This result strongly signals

that from the long term perspective, the return trend was less volatile.

From the above analysis, researchers can easily arrive at the conclusion that from the short term investment perspective, contrarian effect is prominent and it is advised to do careful analysis before making investment decisions. But for long term investment, the momentum effect is evident and historical return data can be used for arriving at a decision as our study shows that majority of the sectors demonstrated an unwavering behaviour.

#### Testing the variation in return trends based on time

The results of above analysis do not provide a clear picture as against which strategy to be followed. Different sectors suggest different strategies to be followed among both in long term and short term horizons in each of the respective winner and loser portfolios. So, to arrive at a common strategy to be adopted for winner and loser portfolios, independent t- test is performed against abnormal returns of respective portfolios for which momentum and contrarian strategies are suggested during both short term and long term. The independent variable for this purpose is the benchmark index's return during both short and long term horizons.

Table 5: Short term period

sector /indices	Annualized return	Abnormal returns	Annualized return	Abnormal returns	Investmentstrategy
	(formation)		(testing)		
	Momentum strategy				
<b>S&amp; P BSE FINANCE</b>	-2%	4%	20%	18.80%	Momentum winner
<b>S&amp;P BSE CONSUMER DURABLE</b>	-6%	0%	19%	17.55%	Momentum winner
<b>S&amp;P BSE Metal</b>	-24%	-20%	-2%	-2.95%	Momentum loser
	Contrarian strategy				
<b>S&amp;P BSECAPITAL GOODS</b>	-6%	1%	0%	-1%	Contrarian winner
<b>S&amp;P BSE FMCG</b>	12%	0%	-1%	-1.52%	Contrarian winner
<b>S&amp;P BSE HEALTH CARE</b>	-2%	3%	-3%	-3.32%	Contrarian winner
<b>S&amp;P BSE OIL AND GAS</b>	-16%	-13%	10%	8.53%	Contrarian loser
<b>S&amp;P BSE TELECOM</b>	-39%	-35%	17%	16.20%	Contrarian loser
<b>S&amp;P BSE PORESEARCHERSR</b>	-13%	-7%	4%	3.01%	Contrarian loser

**Table 6 : Long term period**

sector /indices	Annualized return	Abnormal returns	Annualized return	Abnormal returns	Investmentstrategy
	(formation)		(testing)		
	Contrarian strategy				
<b>S&amp; P BSE Health care</b>	43%	37%	-5%	-13%	Contrarian winner
<b>S&amp;P BSE oil and gas</b>	42%	-5%	20%	9%	Contrarian loser
<b>S&amp;P BSE Capital goods</b>	47%	-24%	20%	8%	Contrarian loser
	Momentum strategy				
<b>S&amp;P BSE Finance</b>	62	7	5	41	Momentum winner
<b>S&amp;P BSE FMCG</b>	25	3	32	25	Momentum winner
<b>S&amp;P BSE Metal</b>	20	-39	-5	-14	Momentum loser
<b>S&amp;P BSE Consumerdurable</b>	77	36	76	65	Momentum winner
<b>S&amp;P BSE TELECOM</b>	0	-34	-2	-14	Momentum loser
<b>S&amp;P BSE PORESEARCHERSR</b>	36	-3	-8	-19	Momentum loser

T-test has been employed to compute the level of significance of average abnormal returns. It was to find out whether momentum and contrarian strategies yield significant positive returns when compared with the bench mark, i.e. index return. Many sectors have exhibited mixed results for various time horizons. While one strategy works in the short term the other is prevalent in the long term. There are few sectors where a clear-cut indication is not available with respect to use of a particular strategy. So, it is desirable to test the variability within the returns of both the time periods. In our analysis, researchers could not find a common consensus among the portfolios of different sectors as some sectors suggested that taking a contrarian stand will generate maximum profit in the short term scenario while other portfolios favour a momentum position.

In long term horizon also, such divergence is prevalent. So it is desirous to test whether this model can be generalized by bringing the results across various sectors on a common platform. In view of the above, 't' test was performed across average abnormal returns generated by various sectors in two testing periods.

The results of the t- test table are as follows:

Measure	Short term		Long term	
	Winner	Looser	Winner	Looser
Average abnormal return ( testing period)	6%	4.55%	30%	-6%
t- test	0.203	0.035	0.343	0.072

During the test period, if the difference between average abnormal returns of the winner portfolio and loser portfolio is a positive figure, it signals the presence of momentum effect. This can be mathematically expressed as;

$W[R_{pt} - (\hat{\alpha} * R_{mt})] - L[R_{tp} - (\hat{\alpha} * R_{mt})] > 0$  signals momentum effect  
 $W[R_{pt} - (\hat{\alpha} * R_{mt})] - L[R_{tp} - (\hat{\alpha} * R_{mt})] < 0$  signals contrarian effect

For the above equations, denotes portfolio returns  $R_{pt}$  during the test period denotes index return for  $R_{mt}$  the test period, W stands for winner portfolios and L stands for loser portfolios.

From this analysis, values of 1.05% and 36 % . are the differences between winner and loser portfolio's average abnormal returns, for long term and short term respectively,

which hints the momentum effect during the long term and short period.

But the Capital Goods and Oil and Gas sector which forms part of the loser portfolio offered an abnormal return of 8% and 9% during the test period. This produces strong evidence of contrarian effect in this sector and stocks from the these sector can be selected only after in depth analysis. While generalizing the results across various sectors over different time horizons, there is an indication of strong existence of momentum effect in the Indian stock market. And the 't' test results also provide evidence that the 'past winners' outperform the 'past losers'.

However selection of an investment strategy is purely dependent on the risk tolerance level of an investor and his investment goals. If the investor is too risk averse, he can maintain a strategic distance from segments where contrarian impact exists. If the speculator is keen on taking risk, he can utilize contrarian venture procedures by picking segments which report abnormal loss in the past.

#### **FINDINGS/RESULTS OF THE STUDY**

The investigation focuses on the investment strategies to be adopted in the short term and long term with respect to various sectors of BSE. The abnormal returns generated by the past winners and past losers in the holding period has been examined. A pattern inversion (from positive to negative or negative to positive) recommended a contrarian style. The continuation of formation period trend (positive or negative) in the subsequent holding period flagged a momentum effect.

More closely Capital Goods, FMCG and Health care sectors generate positive abnormal returns (1%, 0%, 3%) while compared with benchmark index during 2018. Subsequently, these sectors produced negative abnormal returns of (-1%, -1.52%, -3.32%,) respectively during the test period 2019. This signals the presence of a contrarian impact showing that speculators can make profit only if they are willing to invest with 'past losers' or disposing 'past winners'. Both these techniques appear to work for a few segments where mixed results are obtained.

This study has examined the presence of contrarian and momentum effect of 9 indices that are a part of the BSE Sensex Next 50 index of BSE, India. A period of 8 years (1st Jan 2014-31st Dec 2019) has been considered for the same. The abnormal returns (gains/losses) generated by past winners and past losers in the holding period was observed.

From the long term perspective, the result shows that momentum strategies have great potential to generate maximum positive return. These findings will not agree with the study of Forner (2003) as he affirms that momentum strategies will produce best return for the short-time horizon.

#### **LIMITATIONS:**

- a) The present study covers only the monthly close price

movements of indices included in the formation of BSE Index due to the voluminous nature of the topic. However data on a monthly basis had been taken to achieve the best possible result.

- b) Conclusions and recommendations are based on the results got during the study period Investors will have to incorporate further changes in the market conditions before taking decisions on the basis of the recommendations of the study.
- c) However this research done tried to overcome this difficulty by conducting a separate study during the time period of 2014 to 2019 with long and short term period i.e. the time period in which researchers take the returns of the sectoral indices and the market Index of BSE Sensex of Indian markets
- d) All the inherent limitations and drawbacks of a study based on secondary data are applicable to the present study also even though the research and tried to minimize such errors as far as possible.
- e) Despite of these limitations, the study would be very useful to investors of Indian stock market and to other practitioners and academicians interested in studying about capital markets in India and those in other emerging nations.

#### **SUGGESTIONS & SCOPE FOR FURTHER STUDY**

- a) Market efficiency as a research topic deserves a continuous study to reach an ultimate conclusion about the level of efficiency of emerging markets like India market. The sample selected for this study was those companies involved in the construction of BSE Sensex. These firms are automatically subjected to greater attention by the investors in the market.

So the chances of publicly available information or fundamental information getting incorporated in to these share prices very quickly are high. The results could be different for smaller or non popular companies. Separate studies on market efficiency by considering characteristics of each industry and taking care of market capitalisation of different companies under study (like classifying them in to large cap, mid cap, small cap) would be advancement in the current topic under discussion.

- b) The present study finds no evidence of gaining superior returns by using momentum and contrarian strategies in the Indian Market. However there are many questions still remained to be ensured for Indian market. These include 'Is there any difference in momentum return patterns for different sectors in the country', 'Is there any difference in contrarian return patterns for different sectors in the country'. Studies conducted in similar area can give further evidence to the efficiency of these two

technical analysis tools in the Indian market. BSE sectoral indices can be used for such studies.

- c) There are many studies which are conducted in different markets for analysing the factors which can improve market efficiency. However attempts made in Indian context are very few in number. Separate studies taking in to account the economic and financial conditions of the respective country only can give constructive suggestions and recommendations for the policy formulators of the country. So the present study identifies this area as a future endeavor for researchers interested in this field.
- d) Growing globalization and liberalization in the country, would promote greater integration between world markets in the coming years. So further research can be taken up for evolving policy prescriptions needed to protect the country from external crisis being inculcated in to the domestic market.

### RECOMMENDATIONS

- a) Researchers-form market inefficiency in India is most likely to be caused by inappropriate policy choices. Regulators have to take in a long run vision while formulating and implementing policies and programmes for Indian capital market.
- b) Indian markets can reduce exploitation of the profitable trading rules by increasing the number of listed stocks and trading volume.
- c) Opening up of markets to more foreign investors can bring more efficiency in the market. It can also bring down the cost of capital.
- d) Considering the current growth of Indian stock market, the country would need larger and specialized investment institutions to handle and organize complex financial information.
- e) Indian market requires more financial products to attract investments in to stock markets.
- f) Investor educational programmers have to be given more importance in order to attract potential investors in to stock market. Currently less than 5 percent of Indian population is only engaged in capital market activities.
- g) India's regulators have been active in seeking ways to develop the country's financial markets, and a in introducing greater risk management. However persistent reforms in the sector only can support India's already impressive growth trend in the coming years.
- h) An important objective of reforms in India has to be integrating the various segments of the financial market for bringing about a transformation in the structure of markets,

- i) Regulators should ensure stability and integrity in the market. Prompt actions have to be taken in cases of severe volatility in the market. This would boost the investor confidence in the Indian stock market.
- j) Market should have better operational and informational transparency.
- k) Investors are recommended to make systematic study before going for investments in stock market. They should never let greed control their investment decisions.
- l) Credit rating has to be made mandatory for all capital market instruments.

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APPENDICES

(a) Monthly Closing data of indices :

Month	S&P BSE SENSEX NEXT 50	S&P BSE CAPITAL GOODS	S&P BSE FMCG	S&P BSE OIL AND GAS	S&P BSE METAL	S&P BSE FINANCE	S&P BSE CONSUMI	S&P BSE TELECOM	S&P BSE POWER	S&P BSE HEALTH CARE
Jan-14	15893.95	9486.63	6517.93	8453.06	9151.57	2343.65	5548.18	1195.53	1525.34	10839.95
Feb-14	16019.15	10375.6	6483.96	8425.99	8660.83	2428.85	5951.36	1104.14	1528.54	10083.63
Mar-14	17848.8	12011.23	6971.02	9485.72	10059.1	2815.07	6526.14	1218.71	1724.5	10757.33
Apr-14	18011.89	12118.32	6763.06	9548.47	9981.03	2853.89	6517.26	1237.27	1686.54	10315.41
May-14	21556.69	14716.81	6864.13	10854.09	12292.69	3248.59	7713.46	1331.43	2166.65	11462.23
Jun-14	22994.65	16200.21	6676.19	11150.89	13099.95	3430.07	8870.04	1358.79	2318.72	12341.28
Jul-14	22383.18	14651.63	7169.75	10749.83	13064.27	3437.45	8556.87	1435.87	2133.55	13356.87
Aug-14	22820.2	14913.18	7401.78	11184.9	12252.68	3491.24	9180.82	1416.34	2041.75	14352.3
Sep-14	22632.17	14267.74	7630.97	10728.88	11409.4	3426.53	9850.75	1500.78	1978.06	14354.01
Oct-14	23409.77	15924.51	7497.07	11160.18	11849.95	3736.05	9875.1	1498.02	2166.41	14956.57
Nov-14	24317.22	16371.64	7733.68	10914.3	11306.25	4029.58	9646.51	1467.36	2166.14	14692.95
Dec-14	24051.72	15442.24	7766.57	9895.21	10752.69	4057.22	9673.67	1388.34	2092.51	15666.51
Jan-15	25084.79	17095.72	8275.45	10143.2	10190.2	4297.22	10655.36	1440.72	2224.52	15854.6
Feb-15	25301.73	17779.48	8222.38	9685.68	10569.66	4315	10388.14	1391.7	2269.06	17284.94
Mar-15	25089.25	17293	7773.44	9311.95	9465.65	4043.61	10417.87	1506.91	2127.41	16186.51
Apr-15	24879.18	16519	7607.39	9203.45	9800.97	3972.55	10377.63	1482.54	2095.16	16900.3
May-15	25484.05	16802.01	7847.38	9643.21	9728.35	4056.78	10666.11	1625.93	2069.81	16564.32
Jun-15	25139.66	17517.9	7789.06	9859.23	9335.29	4017.11	10745.62	1589.55	2022.14	17047.69
Jul-15	26347.42	18081.31	8133.5	9902.17	8668.37	4136.72	11086.48	1602.36	2064.56	17961.78
Aug-15	25368.48	16149.96	7787.92	8878	7446.07	3772.27	11048.26	1389.6	1834.4	17779.17
Sep-15	24566.42	15111.41	7751.72	8694.68	6833.72	3814.36	10809.61	1331.6	1841.7	18066.44
Oct-15	24623.61	14946.11	7847.07	9065.9	7307.74	3856.96	11872.63	1376.68	1917.11	16298.41
Nov-15	24294.26	14587.44	7912	9328.39	7118.4	3840.63	12466.01	1357.37	1901.85	16905.2
Dec-15	24605.82	14128.32	7871.83	9555.61	7397.96	3803.5	11997.51	1424.88	1957.68	16304.98
Jan-16	22360.47	12368.05	7438.52	9258.06	6894.01	3493.94	12183.02	1170.38	1838.42	15207.69
Feb-16	20725.03	11239.38	7114.45	8214.24	6759.24	3144.1	11054.04	1192.18	1582.48	15149.25
Mar-16	23193.54	12861.33	7692.32	9161.61	7540.75	3549.11	11480.5	1290.42	1775.73	15582.33
Apr-16	24059.94	13202.64	7697.38	9356.16	7958.93	3663.32	11787.17	1337.31	1846.34	15246.16
May-16	24662.11	14464.97	8045.03	9321.96	7950.38	3896.59	11761.37	1297.46	1871.71	15493
Jun-16	25579.59	14874.79	8452.76	9720.95	8519.69	3992.72	11973.11	1301.77	1996.05	16299.15
Jul-16	27855.67	15477.94	8725.38	10595.23	9406.16	4300.46	12404.71	1326.78	2076.58	16161.74
Aug-16	28796.94	15212.25	8822.47	11072.71	9939.73	4488.25	12485.32	1226.1	2098.41	16181.12
Sep-16	28590.84	14581.77	8461.02	11377.55	9763.66	4424.31	12548.56	1175.63	1989.59	16471.99
Oct-16	29252.49	14920.82	8510.52	12316.81	10317.55	4496.17	12927.42	1178.98	2006.11	15734.32
Nov-16	27720.89	14044.51	8070.77	11964.32	10666.3	4197.79	11278.54	1193.64	2028.73	14727.59
Dec-16	26567.2	13664.5	8130.87	12151.64	10109.34	4068.97	11237.12	1120.64	1987.58	14797.01
Jan-17	28950.31	14783.32	8567.58	12838.16	11672.32	4394.86	12625.91	1243.71	2167.72	15384.97
Feb-17	30246.2	15333.49	8799.89	13534.47	11893.05	4631.8	13778.67	1291.87	2195.78	15312.4
Mar-17	31080.64	16446.03	9270.25	13563.63	11804.46	4885.69	15257.34	1240.67	2274.42	15019.4
Apr-17	32562.31	17865.77	9412.29	14455.03	11303.38	5120.91	15474.66	1277.72	2329.75	13563.8
May-17	31854.4	17596.08	10106.15	14247.08	11247.61	5270.63	15400.15	1278.56	2220.59	14190.58
Jun-17	31682.87	17075.94	10428.17	13202.65	11374.12	5280.94	16012.71	1305.01	2225.54	14195.4
Jul-17	33769.41	17972.61	10093.85	14189.96	12425.99	5721.18	16466.93	1443.64	2323.61	13149.26
Aug-17	33854.31	17330.85	10174.12	15177.26	13284.05	5638.95	17700.91	1434.79	2261.46	13487.76
Sep-17	33265.88	17172.12	9772.71	14842.54	13563.9	5561.17	17554.86	1363.93	2206.23	14281.6
Oct-17	35907.74	18423.27	10263.72	16552.4	14730.27	5743.75	18465.61	1630.42	2349.2	13990.28
Nov-17	35474.14	18455.38	10321.18	15927.91	13902.3	5755.61	21460.61	1565.91	2320.68	14799.42
Dec-17	36849.38	19133.76	10695.18	16283.26	14939.28	5813.73	22689.46	1675.03	2381.69	14559.39

	A	B	C	D	E	F	G	H	I	J	K
51	Jan-18	35813.62	20363.58	10711.47	16368.16	15427.36	6157.81	22476.79	1478.2	2319.48	14113.01
52	Feb-18	33891.1	19075.79	10506.36	15505.76	15173.8	5707.46	21187.21	1434.66	2223.14	13157.62
53	Mar-18	32800.38	18476.73	10290.14	14614.42	13322.03	5570.09	22261.9	1321.9	2125.83	14153.59
54	Apr-18	34880.47	19543.29	11305.73	14429.52	14276.91	5879.99	22379.9	1298.08	2238.15	13002.72
55	May-18	32929.81	18821.62	11291.45	14429.44	13612.08	6002.58	20670.27	1206.09	2129.3	14003.64
56	Jun-18	31941.51	17488.15	11213.28	13659.5	13064.49	5890.24	20206.69	1185.39	1946.64	14205.73
57	Jul-18	33688.25	18295.56	12012.67	15023.57	12659.62	6245.18	20902.46	1189.78	1975.25	15945.17
58	Aug-18	35656.74	18996.76	12771.69	15079.04	13821.31	6269.94	21696.4	1179.55	2140.72	15025.34
59	Sep-18	31774.14	17108.89	11502.75	14855.41	13278.79	5464.3	19134.28	1021.75	1929.43	14726.58
60	Oct-18	31314.23	17488.58	11127.84	13246.92	12524.55	5449.05	19142.33	979.83	1958.13	14332.65
61	Nov-18	32233.63	18639.37	11647.29	13246.2	11831.86	5807.71	20526.45	991.82	1911.27	13923.37
62	Dec-18	32995.21	18821.04	11829.07	13748.57	11839.59	5928.97	20694.63	988.38	1999.18	13881.35
63	Jan-19	31508.98	17311.11	11615.86	13612.32	10958.6	5806.28	21255.75	976.71	1880.88	13760.65
64	Feb-19	31250.55	17087.68	11353.74	13802.15	10766.55	5711.84	21410.25	987.23	1828.66	14407.89
65	Mar-19	33809.78	18471.99	11741.51	15269.7	11355.12	6432.87	23856.65	1027.28	2034.41	14367.02
66	Apr-19	32615.75	18030.56	11764.37	15357.85	11513.24	6319.39	23873.81	976.36	1969.54	13305.06
67	May-19	33018.49	19939.33	11518.09	15734.43	10756.4	6711.9	24700.46	1016.53	2010.12	12889.34
68	Jun-19	32374.94	19855.41	11361.92	14803.26	11107.22	6661.83	26128	989.22	2093.86	12704.38
69	Jul-19	29966.61	17555.91	11062.33	13236.95	9685.46	6194	22342.3	912.98	1966.31	12875.4
70	Aug-19	29791.76	16941.77	11077.23	13163.72	8524.28	6036.67	23420.17	911.48	1887.96	12493.53
71	Sep-19	30953.1	18695.27	11766.98	14642.13	9085.65	6259.35	25872.79	968.4	1934.4	13229.05
72	Oct-19	31737.03	18823.14	12245.94	15734.75	9305.46	6509.64	26893.46	903.81	1986.56	13603.33
73	Nov-19	31825.59	17384.46	11723.58	15155.61	9778.97	6887.05	24872.7	1116.22	1924.8	13429.11
74	Dec-19	31514.74	16943.93	11405.88	14744.76	10428.2	6996.14	25011.55	1115.96	1926.25	13957.01
75	Jan-20	31835.12	17462.11	11641.54	13923.67	9494.1	6846.92	26147.11	1178.61	1899.25	13480.1

b) Calculated monthly Return Long Term

	A	B	C	D	E	F	G	H	I	J	K	L	M	
1	Table 1 : Repest Returns													
2	Time Horizon : Formation Period Testing Period													
3	short term	01/01/2018 - 31/12/2018		01/01/2019 - 31/12/2019										
4	long term	01/01/2014 - 31/12/2016		01/01/2017 - 31/12/2019										
5		Long term												
6		Formation period:- 2014-2016												
8	Months	S&P BSE SENSEX NEXT 50		S&P BSE CAPITAL GOODS		S&P BSE FMCG		S&P BSE OIL AND GAS		S&P BSE METAL		S&P BSE FINANCE		S&P BSE C
9		CLOSE PRICE	returns	CLOSE PRICE	returns	close price	returns	Close price	returns	Close price	returns	close price	returns	close price
10	Jan-14	15893.95		9486.63		6517.93		8453.06		9151.57		2343.65		
11	Feb-14	16019.15	1%	10375.6	9%	6483.96	-1%	8425.99	0%	8660.83	-5%	2428.85	4%	
12	Mar-14	17848.8	11%	12011.23	16%	6971.02	8%	9485.72	13%	10059.1	16%	2815.07	16%	
13	Apr-14	18011.89	1%	12118.32	1%	6763.06	-3%	9548.47	1%	9981.03	-1%	2853.89	1%	
14	May-14	21556.69	20%	14716.81	21%	6864.13	1%	10854.09	14%	12292.69	23%	3248.59	14%	
15	Jun-14	22994.65	7%	16200.21	10%	6676.19	-3%	11150.89	3%	13099.95	7%	3430.07	6%	
16	Jul-14	22383.18	-3%	14651.63	-10%	7169.75	7%	10749.83	-4%	13064.27	0%	3437.45	0%	
17	Aug-14	22820.2	2%	14913.18	2%	7401.78	3%	11184.9	4%	12252.68	-6%	3491.24	2%	
18	Sep-14	22632.17	-1%	14267.74	-4%	7630.97	3%	10728.88	-4%	11409.4	-7%	3426.53	-2%	
19	Oct-14	23409.77	3%	15924.51	12%	7497.07	-2%	11160.18	4%	11849.95	4%	3736.05	9%	
20	Nov-14	24317.22	4%	16371.64	3%	7733.68	3%	10914.3	-2%	11306.25	-5%	4029.58	8%	
21	Dec-14	24051.72	-1%	15442.24	-6%	7766.57	0%	9895.21	-9%	10752.69	-5%	4057.22	1%	
22	Jan-15	25084.79	4%	17095.72	11%	8275.45	7%	10143.2	3%	10190.2	-5%	4297.22	6%	
23	Feb-15	25301.73	1%	17779.48	4%	8222.38	-1%	9685.68	-5%	10569.66	4%	4315	0%	
24	Mar-15	25089.25	-1%	17293	-3%	7773.44	-5%	9311.95	-4%	9465.65	-10%	4043.61	-6%	
25	Apr-15	24879.18	-1%	16519	-4%	7607.39	-2%	9203.45	-1%	9800.97	4%	3972.55	-2%	

	L	M	N	O	P	Q	R	S	T	U
1										
2										
3										
4										
5										
6										
7										
8	<b>S&amp;P BSE FINANCE</b>		<b>S&amp;P BSE CONSUMER DURABLE</b>		<b>S&amp;P BSE TELECOM</b>		<b>S&amp;P BSE POWER</b>		<b>S&amp;P BSE HEALTH CARE</b>	
9	close price	returns	close price	returns	close price	returns	close price	returns	close price	returns
10	2343.65		5548.18		1195.53		1525.34		10109.76	
11	2428.85	4%	5951.36	7%	1104.14	-8%	1528.54	0%	10839.95	7%
12	2815.07	16%	6526.14	10%	1218.71	10%	1724.5	13%	10083.63	-7%
13	2853.89	1%	6517.26	0%	1237.27	2%	1686.54	-2%	10757.33	7%
14	3248.59	14%	7713.46	18%	1331.43	8%	2166.65	28%	10315.41	-4%
15	3430.07	6%	8870.04	15%	1358.79	2%	2318.72	7%	11462.23	11%
16	3437.45	0%	8556.87	-4%	1435.87	6%	2133.55	-8%	12341.28	8%
17	3491.24	2%	9180.82	7%	1416.34	-1%	2041.75	-4%	13356.87	8%
18	3426.53	-2%	9850.75	7%	1500.78	6%	1978.06	-3%	14352.3	7%
19	3736.05	9%	9875.1	0%	1498.02	0%	2166.41	10%	14354.01	0%
20	4029.58	8%	9646.51	-2%	1467.36	-2%	2166.14	0%	14956.57	4%
21	4057.22	1%	9673.67	0%	1388.34	-5%	2092.51	-3%	14692.95	-2%
22	4297.22	6%	10655.36	10%	1440.72	4%	2224.52	6%	15666.51	7%
23	4315	0%	10388.14	-3%	1391.7	-3%	2269.06	2%	15854.6	1%
24	4043.61	-6%	10417.87	0%	1506.91	8%	2127.41	-6%	17284.94	9%
25	3972.55	-2%	10377.63	0%	1482.54	-2%	2095.16	-2%	16186.51	-6%

S&P BSE DATA WITH RETURNS - Microsoft Excel

Home Insert Page Layout Formulas Data Review View

Clipboard Font Alignment Number Styles Cells Editing

	A	B	C	D	E	F	G	H	I	J	K	L	M
26	May-15	25484.05	2%	16802.01	2%	7847.38	3%	9643.21	5%	9728.35	-1%	4056.78	2%
27	Jun-15	25139.66	-1%	17517.9	4%	7789.06	-1%	9859.23	2%	9335.29	-4%	4017.11	-1%
28	Jul-15	26347.42	5%	18081.31	3%	8133.5	4%	9902.17	0%	8668.37	-7%	4136.72	3%
29	Aug-15	25368.48	-4%	16149.96	-11%	7787.92	-4%	8878	-10%	7446.07	-14%	3772.27	-9%
30	Sep-15	24566.42	-3%	15111.41	-6%	7751.72	0%	8694.68	-2%	6833.72	-8%	3814.36	1%
31	Oct-15	24623.61	0%	14946.11	-1%	7847.07	1%	9065.9	4%	7307.74	7%	3856.96	1%
32	Nov-15	24294.26	-1%	14587.44	-2%	7912	1%	9328.39	3%	7118.4	-3%	3840.63	0%
33	Dec-15	24605.82	1%	14128.32	-3%	7871.83	-1%	9555.61	2%	7397.96	4%	3803.5	-1%
34	Jan-16	22360.47	-9%	12368.05	-12%	7438.52	-6%	9258.06	-3%	6894.01	-7%	3493.94	-8%
35	Feb-16	20725.03	-7%	11239.38	-9%	7114.45	-4%	8214.24	-11%	6759.24	-2%	3144.1	-10%
36	Mar-16	23193.54	12%	12861.33	14%	7692.32	8%	9161.61	12%	7540.75	12%	3549.11	13%
37	Apr-16	24059.94	4%	13202.64	3%	7697.38	0%	9356.16	2%	7958.93	6%	3663.32	3%
38	May-16	24662.11	3%	14464.97	10%	8045.03	5%	9321.96	0%	7950.38	0%	3896.59	6%
39	Jun-16	25579.59	4%	14874.79	3%	8452.76	5%	9720.95	4%	8519.69	7%	3992.72	2%
40	Jul-16	27855.67	9%	15477.94	4%	8725.38	3%	10595.23	9%	9406.16	10%	4300.46	8%
41	Aug-16	28796.94	3%	15212.25	-2%	8822.47	1%	11072.71	5%	9939.73	6%	4488.25	4%
42	Sep-16	28590.84	-1%	14581.77	-4%	8461.02	-4%	11377.55	3%	9763.66	-2%	4424.31	-1%
43	Oct-16	29252.49	2%	14920.82	2%	8510.52	1%	12316.81	8%	10317.55	6%	4496.17	2%
44	Nov-16	27720.89	-5%	14044.51	-6%	8070.77	-5%	11964.32	-3%	10666.3	3%	4197.79	-7%
45	Dec-16	26567.2	-4%	13664.5	-3%	8130.87	1%	12151.64	2%	10109.34	-5%	4068.97	-3%
46	annual return		57%		47%		25%		42%		20%		62%
47	beta value				1.24		0.38		0.82		1.03		0.97

AB46									
	N	O	P	Q	R	S	T	U	V
26	10666.11	3%	1625.93	10%	2069.81	-1%	16900.3	4%	
27	10745.62	1%	1589.55	-2%	2022.14	-2%	16564.32	-2%	
28	11086.48	3%	1602.36	1%	2064.56	2%	17047.69	3%	
29	11048.26	0%	1389.6	-13%	1834.4	-11%	17961.78	5%	
30	10809.61	-2%	1331.6	-4%	1841.7	0%	17779.17	-1%	
31	11872.63	10%	1376.68	3%	1917.11	4%	18066.44	2%	
32	12466.01	5%	1357.37	-1%	1901.85	-1%	16298.41	-10%	
33	11997.51	-4%	1424.88	5%	1957.68	3%	16905.2	4%	
34	12183.02	2%	1170.38	-18%	1838.42	-6%	16304.98	-4%	
35	11054.04	-9%	1192.18	2%	1582.48	-14%	15207.69	-7%	
36	11480.5	4%	1290.42	8%	1775.73	12%	15149.25	0%	
37	11787.17	3%	1337.31	4%	1846.34	4%	15582.33	3%	
38	11761.37	0%	1297.46	-3%	1871.71	1%	15246.16	-2%	
39	11973.11	2%	1301.77	0%	1996.05	7%	15493	2%	
40	12404.71	4%	1326.78	2%	2076.58	4%	16299.15	5%	
41	12485.32	1%	1226.1	-8%	2098.41	1%	16161.74	-1%	
42	12548.56	1%	1175.63	-4%	1989.59	-5%	16181.12	0%	
43	12927.42	3%	1178.98	0%	2006.11	1%	16471.99	2%	
44	11278.54	-13%	1193.64	1%	2028.73	1%	15734.32	-4%	
45	11237.12	0%	1120.64	-6%	1987.58	-2%	14727.59	-6%	
46		<b>77%</b>		<b>0%</b>		<b>36%</b>		<b>43%</b>	
47		<b>0.72</b>		<b>0.60</b>		<b>1.18</b>		<b>0.10</b>	
48									

A48													
	A	B	C	D	E	F	G	H	I	J	K	L	M
48		Testing period :- 2017-2019											
49	month	close price	returns	close price	returns	close price	returns	close price	returns	close price	returns	close price	returns
50		28950.31		14783.32		8567.58		12838.16		11672.32		4394.86	
51	Feb-17	30246.2	4%	15333.49	4%	8799.89	3%	13534.47	5%	11893.05	2%	4631.8	5%
52	Mar-17	31080.64	3%	16446.03	7%	9270.25	5%	13563.63	0%	11804.46	-1%	4885.69	5%
53	Apr-17	32562.31	5%	17865.77	9%	9412.29	2%	14455.03	7%	11303.38	-4%	5120.91	5%
54	May-17	31854.4	-2%	17596.08	-2%	10106.15	7%	14247.08	-1%	11247.61	0%	5270.63	3%
55	Jun-17	31682.87	-1%	17075.94	-3%	10428.17	3%	13202.65	-7%	11374.12	1%	5280.94	0%
56	Jul-17	33769.41	7%	17972.61	5%	10093.85	-3%	14189.96	7%	12425.99	9%	5721.18	8%
57	Aug-17	33854.31	0%	17330.85	-4%	10174.12	1%	15177.26	7%	13284.05	7%	5638.95	-1%
58	Sep-17	33265.88	-2%	17172.12	-1%	9772.71	-4%	14842.54	-2%	13563.9	2%	5561.17	-1%
59	Oct-17	35907.74	8%	18423.27	7%	10263.72	5%	16552.4	12%	14730.27	9%	5743.75	3%
60	Nov-17	35474.14	-1%	18455.38	0%	10321.18	1%	15927.91	-4%	13902.3	-6%	5755.61	0%
61	Dec-17	36849.38	4%	19133.76	4%	10695.18	4%	16283.26	2%	14939.28	7%	5813.73	1%
62	Jan-18	35813.62	-3%	20363.58	6%	10711.47	0%	16368.16	1%	15427.36	3%	6157.81	6%
63	Feb-18	33891.1	-5%	19075.79	-6%	10506.36	-2%	15505.76	-5%	15173.8	-2%	5707.46	-7%
64	Mar-18	32800.38	-3%	18476.73	-3%	10290.14	-2%	14614.42	-6%	13322.03	-12%	5570.09	-2%
65	Apr-18	34880.47	6%	19543.29	6%	11305.73	10%	14429.52	-1%	14276.91	7%	5879.99	6%
66	May-18	32929.81	-6%	18821.62	-4%	11291.45	0%	14429.44	0%	13612.08	-5%	6002.58	2%
67	Jun-18	31941.51	-3%	17488.15	-7%	11213.28	-1%	13659.5	-5%	13064.49	-4%	5890.24	-2%
68	Jul-18	33688.25	5%	18295.56	5%	12012.67	7%	15023.57	10%	12659.62	-3%	6245.18	6%
69	Aug-18	35656.74	6%	18996.76	4%	12771.69	6%	15079.04	0%	13821.31	9%	6269.94	0%
70	Sep-18	31774.14	-11%	17108.89	-10%	11502.75	-10%	14855.41	-1%	13278.79	-4%	5464.3	-13%
71	Oct-18	31314.23	-1%	17488.58	2%	11127.84	-3%	13246.92	-11%	12524.55	-6%	5449.05	0%
72	Nov-18	32233.63	3%	18639.37	7%	11647.29	5%	13246.2	0%	11831.86	-6%	5807.71	7%

	J	K	L	M	N	O	P	Q	R	S	T	U
48												
49	close price	returns	close price	returns	close price	returns	close price	returns	close price	returns	close price	returns
50	11672.32		4394.86		12625.91		1243.71		2167.72		14797.01	
51	11893.05	2%	4631.8	5%	13778.67	9%	1291.87	4%	2195.78	1%	15384.97	4%
52	11804.46	-1%	4885.69	5%	15257.34	11%	1240.67	-4%	2274.42	4%	15312.4	0%
53	11303.38	-4%	5120.91	5%	15474.66	1%	1277.72	3%	2329.75	2%	15019.4	-2%
54	11247.61	0%	5270.63	3%	15400.15	0%	1278.56	0%	2220.59	-5%	13563.8	-10%
55	11374.12	1%	5280.94	0%	16012.71	4%	1305.01	2%	2225.54	0%	14190.58	5%
56	12425.99	9%	5721.18	8%	16466.93	3%	1443.64	11%	2323.61	4%	14195.4	0%
57	13284.05	7%	5638.95	-1%	17700.91	7%	1434.79	-1%	2261.46	-3%	13149.26	-7%
58	13563.9	2%	5561.17	-1%	17554.86	-1%	1363.93	-5%	2206.23	-2%	13487.76	3%
59	14730.27	9%	5743.75	3%	18465.61	5%	1630.42	20%	2349.2	6%	14281.6	6%
60	13902.3	-6%	5755.61	0%	21460.61	16%	1565.91	-4%	2320.68	-1%	13990.28	-2%
61	14939.28	7%	5813.73	1%	22689.46	6%	1675.03	7%	2381.69	3%	14799.42	6%
62	15427.36	3%	6157.81	6%	22476.79	-1%	1478.2	-12%	2319.48	-3%	14559.39	-2%
63	15173.8	-2%	5707.46	-7%	21187.21	-6%	1434.66	-3%	2223.14	-4%	14113.01	-3%
64	13322.03	-12%	5570.09	-2%	22261.9	5%	1321.9	-8%	2125.83	-4%	13157.62	-7%
65	14276.91	7%	5879.99	6%	22379.9	1%	1298.08	-2%	2238.15	5%	14153.59	8%
66	13612.08	-5%	6002.58	2%	20670.27	-8%	1206.09	-7%	2129.3	-5%	13002.72	-8%
67	13064.49	-4%	5890.24	-2%	20206.69	-2%	1185.39	-2%	1946.64	-9%	14003.64	8%
68	12659.62	-3%	6245.18	6%	20902.46	3%	1189.78	0%	1975.25	1%	14205.73	1%
69	13821.31	9%	6269.94	0%	21696.4	4%	1179.55	-1%	2140.72	8%	15945.17	12%
70	13278.79	-4%	5464.3	-13%	19134.28	-12%	1021.75	-13%	1929.43	-10%	15025.34	-6%
71	12524.55	-6%	5449.05	0%	19142.33	0%	979.83	-4%	1958.13	1%	14726.58	-2%
72	11831.86	-6%	5807.71	7%	20526.45	7%	991.82	1%	1911.27	-2%	14332.65	-3%

	A	B	C	D	E	F	G	H	I	J	K	L	M
73	Dec-18	32995.21	2%	18821.04	1%	11829.07	2%	13748.57	4%	11839.59	0%	5928.97	2%
74	Jan-19	31508.98	-5%	17311.11	-8%	11615.86	-2%	13612.32	-1%	10958.6	-7%	5806.28	-2%
75	Feb-19	31250.55	-1%	17087.68	-1%	11353.74	-2%	13802.15	1%	10766.55	-2%	5711.84	-2%
76	Mar-19	33809.78	8%	18471.99	8%	11741.51	3%	15269.7	11%	11355.12	5%	6432.87	13%
77	Apr-19	32615.75	-4%	18030.56	-2%	11764.37	0%	15357.85	1%	11513.24	1%	6319.39	-2%
78	May-19	33018.49	1%	19939.33	11%	11518.09	-2%	15734.43	2%	10756.4	-7%	6711.9	6%
79	Jun-19	32374.94	-2%	19855.41	0%	11361.92	-1%	14803.26	-6%	11107.22	3%	6661.83	-1%
80	Jul-19	29966.61	-7%	17555.91	-12%	11062.33	-3%	13236.95	-11%	9685.46	-13%	6194	-7%
81	Aug-19	29791.76	-1%	16941.77	-3%	11077.23	0%	13163.72	-1%	8524.28	-12%	6036.67	-3%
82	Sep-19	30953.1	4%	18695.27	10%	11766.98	6%	14642.13	11%	9085.65	7%	6259.35	4%
83	Oct-19	31737.03	3%	18823.14	1%	12245.94	4%	15734.75	7%	9305.46	2%	6509.64	4%
84	Nov-19	31825.59	0%	17384.46	-8%	11723.58	-4%	15155.61	-4%	9778.97	5%	6887.05	6%
85	Dec-19	31514.74	-1%	16943.93	-3%	11405.88	-3%	14744.76	-3%	10428.2	7%	6996.14	2%
86	annual return		12%		20%		32%		20%		-5%		51%
87	beta value				1.04		0.62		0.89		0.78		0.86
88													

	N	O	P	Q	R	S	T	U
73	20694.63	1%	988.38	0%	1999.18	5%	13923.37	-3%
74	21255.75	3%	976.71	-1%	1880.88	-6%	13881.35	0%
75	21410.25	1%	987.23	1%	1828.66	-3%	13760.65	-1%
76	23856.65	11%	1027.28	4%	2034.41	11%	14407.89	5%
77	23873.81	0%	976.36	-5%	1969.54	-3%	14367.02	0%
78	24700.46	3%	1016.53	4%	2010.12	2%	13305.06	-7%
79	26128	6%	989.22	-3%	2093.86	4%	12889.34	-3%
80	22342.3	-14%	912.98	-8%	1966.31	-6%	12704.38	-1%
81	23420.17	5%	911.48	0%	1887.96	-4%	12875.4	1%
82	25872.79	10%	968.4	6%	1934.4	2%	12493.53	-3%
83	26893.46	4%	903.81	-7%	1986.56	3%	13229.05	6%
84	24872.7	-8%	1116.22	24%	1924.8	-3%	13603.33	3%
85	25011.55	1%	1115.96	0%	1926.25	0%	13429.11	-1%
86		76%		-2%		-8%		-5%
87		0.88		0.99		0.90		0.57
88								
89								
90								
91								
92								
93								



20								
21	close price	return	close price	return	close price	return	close price	return
22	21255.75		976.71		1880.88		13881.35	
23	21410.25	1%	987.23	1%	1828.66	-3%	13760.65	-1%
24	23856.65	11%	1027.28	4%	2034.41	11%	14407.89	5%
25	23873.81	0%	976.36	-5%	1969.54	-3%	14367.02	0%
26	24700.46	3%	1016.53	4%	2010.12	2%	13305.06	-7%
27	26128	6%	989.22	-3%	2093.86	4%	12889.34	-3%
28	22342.3	-14%	912.98	-8%	1966.31	-6%	12704.38	-1%
29	23420.17	5%	911.48	0%	1887.96	-4%	12875.4	1%
30	25872.79	10%	968.4	6%	1934.4	2%	12493.53	-3%
31	26893.46	4%	903.81	-7%	1986.56	3%	13229.05	6%
32	24872.7	-8%	1116.22	24%	1924.8	-3%	13603.33	3%
33	25011.55	1%	1115.96	0%	1926.25	0%	13429.11	-1%
34		<b>19%</b>		<b>17%</b>		<b>4%</b>		<b>-3%</b>
35		<b>1.45</b>		<b>0.80</b>		<b>0.99</b>		<b>0.32</b>
36								
37								
38								
39								