Review of the Anomalies in the Indian Equity Market

Dr. Renu Isidore. R[1] and Dr. P. Christie[2]

[1](Research Associate, Loyola Institute of Business Administration, Loyola College, Chennai, Tamil Nadu, India)
[2](Director, Loyola Institute of Business Administration, Loyola College, Chennai, Tamil Nadu, India)

Abstract: *Irrational patterns in the stock market which need illogical assumptions to explain are the so called anomalies or anomalous behaviour of the stock market. This paper brings to light the anomalies witnessed by the Indian stock market. The three types of anomalies called fundamental anomalies, technical anomalies and calendar anomalies are explained in the paper. The Indian stock market has recorded some major anomalies which have been explained in this paper under the categories of index dropping in a single day, bull rallies, undiversified portfolios, earnings announcement anomaly, bonus announcement anomaly, short term momentum and long term reversal, presence of behavioral biases and seasonal anomalies.*

Keywords: *Anomaly, Indian stock market, Fundamental anomaly, Technical anomaly, Calendar anomaly.*

I. INTRODUCTION

The Indian equity market is the oldest markets in Asia comprising organized stock exchanges which facilitated the trading of the existing instruments. Majority of the trade happened in the National stock exchange (NSE) or the Bombay stock exchange (BSE) (Chakrabarti & De, 2010; Pathak, 2014). According to SEBI-NCAER surveys, the number of Indian households with investments in equity was 3.8 million in the year 1990, 12.10 million during the year 1998-99, and 6.54 million during the year 2000-01. The number of investors with investments in equity was 9 million in the year 1990, 17.95 million during the year 1998-99, and 9.73 million during the year 2000-01 (Chakrabarti & De, 2010). BSE Sensex and NSE Nifty are the two major benchmark indices of the Indian secondary equity market. The indexes were calculated using the market value of the shares of the listed companies weighted based on their market value (free-float market-weighted). They had been very volatile lately, owing to several international and local factors; and they went from a three year high (21,108.64; 6,338.80) on November 5th 2010 to a three year low (8,047.17; 2,539.45) on March 6th 2009 (Ansari, 2012). According to the SEBI bulletin (2016), in June 2016, the number of companies listed in the BSE was 5948 and the number of companies traded was 2714. As on 31st March 2016, the total market capitalization in the BSE was Rs. 94,75,328 crore. The turnover in the BSE was Rs.7,40,089 crore. As on 31st March 2016, the number of trades was 4117 lakhs, the quantity traded was 7,62,545 lakhs and the average traded size was Rs. 17,977 in the BSE. Similarly, the number of companies listed in the NSE was 1811 and the number of companies traded was 1566. As on 31st March 2016, the total market capitalization in the NSE was Rs.93,10,471 crore. The turnover in the NSE was Rs. 42,36,983 crore. In the NSE, as on 31st March 2016, the number of trades was 18,518 lakhs, the quantity traded was 22,01,771 lakhs and the average traded size was Rs. 22,881. During 2015, the net investment in the equity market by foreign portfolio investors was Rs.8300.12 crore and by the mutual funds was Rs. 51040 crore. The total volume of shares traded in BSE was 236,500,000 (Shenai, 2015).

The Indian stock market is characterized by high volatility. Volatility measured in terms of standard deviation of the daily returns was 0.9 in Sensex and in S&P CNX Nifty during the year 2014-15. During 2008-09, the highest volatility of 2.8 was recorded in Sensex and 2.66 in S&P CNX Nifty owing to the dollar depreciation, increase in crude oil prices and the global financial meltdown (Pathak, 2014).

In several stock markets around the world, the stock prices do not follow the rules of EMH. The deviations from the EMH were referred to as anomalies and hence anomalies were the indicators of inefficient market (Latif et al., 2011). "An empirical result is anomalous if it is difficult to 'rationalize' or if implausible assumptions are necessary to explain it within the paradigm", (Thaler, 1987, p.198). Hence, market anomalies were irrational deviations from norms which could be explained only using unreasonable assumptions. The stock market had several financial anomalies which led to certain stocks being undervalued or overvalued. Several researchers had empirically questioned the rationality assumption of traditional finance theories for the past three decades. The patterns found in the stock prices like momentum in the short term period, reversals in the long term period, value premium, etc., questioned the efficient market theory (Wouters, 2006). Naseer and Tariq (2015) pointed out several anomalies like short term momentum, long term reversal, calendar effects and expected patterns of ratios like P/E and B/MV as proof against the efficient market hypothesis (EMH). Some prominent financial anomalies included the excessive volatility of the stock prices which could not be explained by the rational model, which stated that the prices should be expected net present value of future dividends. The stock prices varied way beyond what can be justified by the rational models (Shiller, 1981). The efficient market theory was also challenged when the stock prices reacted to non-information as well. There had been sharp

changes in the stock market prices even when there was no prominent news. Mere changes in fundamental data were insufficient to explain the volatility in the stock market (Ray, 2008). The efficient market theory was also challenged by the drifts in stock prices post corporate announcements like dividend announcements or earnings or bonus issues, etc. There seemed to be a delay in the absorption of the announcements causing the impact on the share prices to stay for a longer time. Ball (1978) and Bernard and Thomas (1989) explored the drift in stock prices post the earnings announcements. Market inefficiency was also proved by some researchers who showed that stock specific financial ratios could be indicative of the stock returns (Basu, 1977; Fama & French, 1992; Lakonishok et al., 1994). Using value strategies they exploited the irrational behavior of the investor to earn higher returns. Latif et al. (2011) categorized anomalies into fundamental anomalies, technical anomalies and calendar anomalies.

Fundamental anomalies

The fundamental anomalies included those anomalies wherein the stock prices were not a complete reflection of the intrinsic value of the stock. These anomalies included low price to sales anomaly, price to earnings ratio anomaly, overreaction anomaly, dividend yield anomaly and value versus growth anomaly.

- Value versus growth anomaly: Value strategies were those that involve buying of stocks which had lower prices in comparison to earnings, book assets, dividends or other measures of fundamental value. Lakonishok et al. (1994) provided evidence to show that value strategies enjoyed higher returns as they take advantage of the suboptimal behavior of the average investor and not because of the riskiness of the value strategies. In spite of the high returns of the value stocks, investors might still opt for growth stocks due to judgment errors and anticipated the same growth rates of the past into the future for the growth stocks. Due to these high expectations and high weightage on the past, the growth stocks were not able to meet them. Moreover value stocks took a longer time to reap benefits and as investors mostly look at short term investments they tended to overlook the value stocks. Value stocks also had a poor history of being financially distressed in the past when compared to the growth stocks which had done very well in the past. Chan and Lakonishok (2004) also supported the argument that the huge returns of the value stocks were not due to the high fundamental risk but due to the characteristics of investor behavior. They showed that in a down market, the value stocks suffered less when compared to the growth stocks hence their superior performance cannot be due to risk. The investor behavior of overvaluing the prices of the growth stocks and undervaluing the prices of the value stocks was the reason for the value premium.

- Price to earnings ratio anomaly: This anomaly was a proof against the semi-strong form of EMH, where the investors earned abnormal returns by investing in low P/E stocks in comparison to the high P/E stocks which were overvalued. The low P/E stocks on the other hand were undervalued owing to the pessimism surrounding them due to the history of bad earnings. The P/E information, which was publicly accessible was used to beat the market and hence was not completely adjusted in the stock prices (Bondt & Thaler, 1985). Basu (1977) provided empirical evidence for the presence of the P/E anomaly. Campbell and Shiller (1988) also showed that the P/E ratio was a powerful predictor of abnormal returns.

- Dividend yield anomaly: This was another anomaly which was a proof against the semi-strong form of EMH, where the investors earned huge returns by investing in stocks with high dividend yield which beat the stocks with low dividend yield. The publicly available dividend information was not fully adjusted in the stock prices (Latif et al., 2011). Fama and French (1988) provided empirical evidence for the presence of this dividend yield anomaly.

- Overreaction anomaly: This was an anomaly wherein the reaction of the investors to unexpected events created a disturbance in the stock prices. The investors overreacted to the underperformance of the losing stocks and pushed the prices much below their intrinsic value and hence in the long run these undervalued stocks outperformed the winning stocks. Bondt and Thaler (1985) showed empirically that the portfolios of the prior losers eventually beat the portfolios of the prior winners.

- Low price to sales anomaly: This was another anomaly which was a proof against the semi-strong form of EMH where the investors earned huge returns by investing in low Price/Sales stocks in comparison to the high Price/Sales stocks. A fall in sales was a more serious problem when compared to a fall in earnings. A rise in sales will eventually lead to an increase in earnings and hence a rise in stock prices (Latif et al., 2011).

Technical anomalies

These anomalies were a proof against the weak form EMH as they employed tools of technical analysis which used the past prices of stocks to form trends to beat the market. The technical tools employed included the momentum effect which involved buying the previous winners and selling the previous losers. Short term momentum which implied many repetitive moves in the same trend went against the random walk nature of the efficient market, (Lo & MacKinlay, 2011). Further, Lo, Mamaysky and Wang (2000) showed how technical tools like head and shoulders, triangle top, triangle bottom, broadening top, broadening bottom and other

technical indicators had predicting abilities in the stock market. By comparing the random price distribution to the distribution conditioned using technical indicators, the technical indicators helped to forecast the price changes. This thereby challenged the concept of efficient market where prices cannot be predicted in a rational world.

De Bondt and Thaler (1985) showed the long term reversal of returns confirming the overreaction hypothesis where investors tended to overreact to unexpected and dramatic new events. In the long run, losing stocks were found to exceed the winning stocks. Jegadeesh and Titman (1993) also showed empirical evidence of overreaction and underreaction of the stock market investors in the short term thereby proving inefficiency of the market. Similar allegation against the efficient market theory was the evidence of long term return reversals which indicated that in the long term, stock price could be predicted. Poterba and Summers (1988) also proved empirically that stock prices could be predicted using positive auto-correlations in the short term (momentum) and negative auto-correlations in the long term (reversal). Fama and French (1988) showed that the changes in stock prices were predictable for long holding periods of more than one year due to mean reversion and the predictable variation was nearly 40% for large firms. All these allegations again proved that the stock prices were predictable. Campbell and Shiller (1988) showed that the return on the stock could be predicted by dividing the long moving average of real earnings by the present stock price. The earnings variable could also be used to predict dividends. These predictability results also challenged the efficient market theory. Other trading strategies included moving averages where buying and selling stocks was based on short term moving averages and long term moving averages of past prices. Buy signal was generated when the short term moving average moved above the long term moving average and sell signal when the short term moving average moved below the long term moving average. The trading break range which involved resistance and support levels was another technical tool employed to beat the market where there was a buy signal when the stock prices rose above last peak and a sell signal when the prices fell below last trough (Latif et al., 2011).

Calendar anomalies

The calendar anomalies were a proof against the weak form EMH because calendar anomalies tried to predict the market based on the seasonality pattern in the past prices. Agrawal and Tandon (1994) explored five calendar anomalies namely: end-of-December, January effect, weekend effect, Friday-the-thirteenth effect and turn-of-the-month effects in the stock markets of eighteen countries in comparison to that in the US. They found that all the countries recorded a daily seasonal and the weekend effect was recorded in around nine countries. The last trading day of the month recorded huge returns in most countries and the January effect was also recorded in most countries. Yakob et al. (2005) found evidence for seasonality effects like month-of-the-year, monthly, day-of-the-week and holiday effects in ten Asian countries including India. The holiday effect was recorded in four countries, month-of-the-year effect was recorded in eight countries, day-of-the-week effect was documented in five countries and the monthly effect was documented in six countries. Keong et al. (2010) examined the month-of-the-year effect in eleven Asian countries, including India. They documented that except for countries namely: China, Korea, Japan and Hong 10

Kong, the majority of the countries reported positive December effect. Some of the countries also recorded positive January, April and May effects. Boudreaux (1995) investigated the presence of the monthly effect in seven countries and found that in the Norwegian, German and Danish markets, the end-of-the-month effect was recorded and an inverted effect was documented in the Pacific basin market of Singapore/Malaysia. Cadsby and Ratner (1992) examined the turn-of-month and pre-holiday effects in several international markets. They found distinct turn-of-the-month effects in countries namely: West Germany, Switzerland, Australia, Great Britain and Canada and pre-holiday effects in countries namely: Australia, Hong Kong, Japan and Canada. Thus calendar anomalies which disproved the weak form EMH had been recorded in several international markets.

Anomalous Behavior in the Indian Secondary Equity Market

With the rising influence of India in the international financial sector, investors all over the world were looking to invest in India and increase the share of the Indian stock market in their portfolio. But, the Indian stock market is a lot riskier and immature compared to the other developed stock markets of the world. Analyzing the anomalies in the Indian stock market and identifying the underlying risks would help both international and local investors formulate better investment strategies (Lao & Singh, 2011). The anomalies of the Indian equity market listed here include:

- Index drops in a single day
- Bull rallies
- Undiversified portfolios
- Earnings announcement anomaly
- Bonus announcement anomaly
- Short term momentum and long term reversal
- Presence of behavioral biases
- Seasonal anomalies

The BSE Sensex had had anomalous behavior with **huge drops in a single day** like: falling 570 points on April 28th, 1992 and falling 333 points on May 12th, 1992; falling 327 points on May 9th, 1992; declining 303 points on March 31st, 1997; a drop of 246 points on April 17th, 1999; 361 points fell on April 4th, 2000; 894.31 points fell on May 17th, 2004; 1070 points fell on a single day, October 24th, 2008; dropped by 749.05 points on January 7th 2009; declined by 1,624.51 points on 24 August 2015 (Bemoneyaware, 2015; Moneycontrol, 2010; Pathak, 2014; Reuters India, 2015). The most recent single drop in a day was on 24th August 2015 when the Sensex fell 5.94% which was a fall of 16.06% from the recorded high of 30,024.74 on 4th March 2015.The Sensex further declined 7.9% and settled at 25,201.90 in the fortnight ended 4th September 2015. The BSE Small-Cap index fell 8.65% which was a higher loss when compared to the Sensex. The Nifty on the other hand declined 7.76% and closed at 7655.05. India's gross domestic product (GDP) rose 7% in the first quarter of June 2015 which was slower than the 7.5% expansion in the fourth quarter of March 2015 according to the report released by the government on 31st August 2015. Also there was a decline in the core sector growth from 3% in June 2015 to 1.1% in July 2015 (Shenai, 2015). The BSE Sensex had also had major **bull rallies** and jumped to new highs: reached the 2000 mark on January 15th 1992; crossed the 5000 mark on October 11th 1999; rallied past the 6000 mark on February 11th 2000; crossed the 24,000 mark on 13th May 2014; breached the 30,000 mark on 4th March 2015 (Bemoneyaware, 2015 ; Moneycontrol, 2010). Vaidyanathan (1995) indicated that the Indian investors held **undiversified portfolios** with very few stocks in their portfolio. This led to a drift in the expectation of the CAPM model where investors were supposed to hold well diversified portfolios of risk free assets and market portfolio. This again led to a drift from market efficiency. He also indicated that the Indian stock market lacked breadth and depth and low liquidity which in turn could lead to inefficient pricing of stocks. Bhat and Pandey (1987) surveyed nearly 600 people in India who prepared or used the accounting information which included investors and brokers; charted accountants; chief financial executives and academicians in order to examine if they understood that the Indian market was efficient and accepted it. It was found that the majority of the respondents belonging to the various categories perceived that the Indian capital market was inefficient in any of the three forms. Mallikarjunappa and Dsouza (2014) also proved that the Indian stock market was inefficient owing to the **earnings announcement anomaly**. By studying the BSE-200 index based stocks listed on the BSE and analyzing the quarterly earnings announcements, they proved that predictability of stock prices was possible and abnormal returns could be earned. Obaidullah (1991) using the investment performance of 118 Indian companies proved empirically that the adjustments of the stock prices to earnings information was not right and hence biased. This showed that the stock performance did not match the price earnings ratio. Khatua and Pradhan (2014) found proof for abnormal stock price reaction to quarterly news followed by a reversal in the opposite direction indicating an overreaction in the Indian stock market. They found that the impact of overreaction varied with respect to the size of the firm, the informational content of the news and also the volatility of the stock return. The Indian market was also found to have informational asymmetry as overreaction was more to any bad news than to any good news.

Raja and Sudhahar (2010) studied the reaction of the Indian stock market to **bonus announcements** by the IT companies. It was found that the Indian market was quick to react to this information from day -5 to day -1 and this reaction was extended up to +15 days. This informational inefficiency in the Indian stock market could be used by used to earn abnormal profits. Sehgal and Balakrishnan (2002) showed empirically that the Indian stock market was also characterized by **short term momentum and long term reversal** like other capital markets. They found that after a year between the portfolio formation and portfolio holding period, the short-term momentum was taken over by the long-term reversal. The short-term momentum patterns were found to produce higher returns for the Indian market indicating a stronger continuation pattern and a weaker reversal pattern. Momentum anomaly was also captured in the Indian stock market by Ansari and Khan (2012). Mishra et al. (2012) proved empirically that the Indian stock market did not follow a random walk model, that is the stocks did not have independence in stock returns. Hence, they found that investors could tap this potential and devise profitable trading strategies based on past prices. They proved market inefficiency with 100 most actively traded stocks of National Stock exchange (NSE). Srinivasan (2010) also proved that in the Indian stock market, the stock prices did not follow a random walk by analyzing the indices S&P CNX Nifty and Sensex in the period July 1997 to August 2010.

Several **seasonal anomalies** were also identified in the Indian stock market. Pandey (2002) studied the monthly returns of BSE's Sensitivity Index during the period April 1991 to March 2002. The study found seasonality in the stock return patterns and also proof for the tax-loss selling hypothesis in the Indian stock market. That is, the month of March, which was the end of the tax year was found to have the lowest negative average return with statistical significance. Sarma (2004) also found evidence for seasonality in the Indian stock market, the day-of-the-week effect in this case. The daily returns of three prominent BSE indices: Sensex, BSE200 and NATEX during the period 1st January 1996 to 10th August 2002 was considered for the study. It was found that a highest positive deviation was found in the Monday-Friday set mainly for the Sensex. Hence the study suggested a profitable trading strategy of buying on Mondays and selling on Fridays in order to earn abnormal profits. Singhal and Bahure (2009) also proved the weekend effect in the Indian stock market by

analyzing returns of the indices: BSE Sensex, S&P Nifty and BSE200 for the period April 2003 to April 2008. Garg et al. (2010) found evidence for the seasonal anomalies: Monday effect (lowest negative returns on Monday), semi-monthly effect (returns of the first half-month is higher than that of the second half-month) and turn of the month effect (returns of the last few days of the previous month is different from that of the first few days in the current month) in the Indian stock market for the period: January 1998 to December 2007. Dash et al. (2011) also proved empirically the presence of month-of-the-year effect in the Indian stock market by analyzing the BSE Sensex between April 1997 and March 2007. They found positive returns during the end of the year (August, November and December) owing to reasons like Diwali, winter crop and monsoon crop harvest. They also found negative returns in March confirming the tax-loss-selling. Siddiqui and Narula (2013) also found that the Indian stock market was inefficient owing to seasonality anomalies by analyzing the S&P CNX Nifty during 2000-2011.They also found positive returns in the months of November and December owing to Diwali and Christmas. They found volatility clustering on Novembers and Fridays, negative Januaries and Tuesdays, positive Decembers and highly volatile Mondays. Kaur (2004) when examining the indices, Sensex and Nifty, showcased the extreme volatility conditions in the Indian stock market during the months of February and March (presentation of the Union Budget) along with high returns. The study also found huge positive returns during December without being accompanied by high volatility. Also, the month of September during the announcements of the third quarter corporate results, volatility was higher but returns were lower.

II. CONCLUSION

This paper has brought to light the anomalies recorded in the Indian stock market and has also explained the different types of anomalies in the market. Having known the anomalies in the stock market the investors could now be aware of them and recognize those patterns which deviate from rationality. The anomalies are due to the emotions and anxiety expressed by the players of the market. These emotions lead to behavioral biases which collectively lead to anomalies in the stock market. Several researchers have also explained the behavioral biases which lead to specific anomalies in the market. Hence having known the different types of anomalies recorded in the stock market, investing would become less challenging.

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