Overreaction and Availability Bias: Analysis of Real Estate Sector's Stock Prices and Investors' Reaction during Demonetisation in India

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The stock market is full of events that affect the sensitivity reaction of investors at a large scale. Individual investor sentiment is just like his/her personal feeling depending upon their nature, risk appetite, and market scenario. This research study investigates the investors' reaction in the stock market for the real estate segment during the massive market crisis in developing countries. Demonetisation of 2016 in India has been taken with the purpose of implementing a pilot study to analyse the overreaction and availability bias. The primary focus was on analysing how the investors react on the information of demonetisation and their pattern of investment in the stock market with a special emphasis on real estate sector where the effect of the event had dramatically changed the stock prices. Therefore, a pre- and post- analysis had been conducted to gauge the prices, sensitivity, and reaction of investors in the stock market. The reaction of the citizens after these events was found to be drastically affected. Five real estate companies had been focused upon in this study to examine the impact of investors' overreaction owing to the demonetisation and their investment pattern for stocks during pre- and post- demonetisation period at that timeframe. The analysis was done on a shorter period of time so that the impact of overreaction and availability bias can be critically analysed. The paper thus exhibits how investor sentiments and reaction for stock preference had changed over time through statistical study.

Keywords: investor sentiment, stock market, demonetisation, overreaction, availability bias

Introduction

An efficient financial market is considered to reflect the correct information among the public with respect to the stock prices. The efficiency of a market is directly related to the price of the security in the market. This is because any new information about security affects the price of that security. Any transitory deviation in stock price is thus due to some unpredictable events in the market that is occurring globally. A major finding in behavioural finance has been found that positive news about any sector or company also increases the price of the stock of that company and vice versa. Nowadays, every individual wants to save or earn more money for their future expenses and so they are more attracted to the stock market. Investing in stock will provide advantages to an investor in terms of dividend, diversification, tax savings, etc. whereas stock market is a place

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where any noisy information will create a change in the price of stock in the market. This “noisy information” can either be positive or negative for the market. Often investor confidence towards the market generally leads to overvaluation of prices in comparison to a good market condition which follows good condition only or vice versa. Thus, a major happening which drastically affected the market was taken into consideration for this research study. The event is Demonetisation of 2016 in India. India is a developing country and is considered to be one of the major economies in the world. The research objective was to analyze the impact of demonetisation on the stock prices of real estate sector companies. The timeframe for analysis was taken from October 2016 to December 2016 because the primary factors which were to be analyzed were the overreaction and availability bias among the stock market investors. Overreaction is the immediate emotional reaction or response to a latest news or information about a security or stock. When the investors overreact to any news or information, it results in over buying or over selling of the stock or security. Therefore, the investors are prone to emotional or cognitive bias. This results in overreaction and availability bias. Several investors and analyst implement various behavioural finance strategies to resolve these biases in their portfolio management with special emphasis on small cap stocks. Availability bias is the phenomenon in which the investors' sentiments and tendency gets strongly influenced by most recent, traumatic, and relevant events. Investors seeking advantage of overreaction tend to invest in companies whose stock or share prices have come down due to bad news but the prices are temporarily low as per the investors' predictive and research analysis. The research has analysed the sentiment of the investors by extracting the stock prices of the real estate sector companies. These are the main inputs and ingredients of the research study.

The crisis which is taken into consideration for the study is demonetisation in India. Demonetisation is basically the process or phenomenon of removing currency from general usage and circulation. On the night of 8th November 2016, the Indian government announced this historic measure. The government demonetized two denomination notes. To be precise, INR 500 and INR 1000 notes were demonetized with immediate effect. Such notes valued around INR 15.4 trillion constituting 86.9% of the value of cash in circulation which were rendered invalid. The notes demonetized were to be deposited to the banks till 30th December 2016 for exchanging with the new set of notes. Restrictions were also placed on cash withdrawals, convertibility of domestic money, and bank deposits. Due to demonetisation, people were heavily affected because banks and ATMs across the country faced severe cash shortages. Moreover, after the demonetisation decision, it was analyzed and seen that the Indian stock market, i.e., Bombay Stock Exchange (BSE) SENSEX and NIFTY 50 stock indices fell drastically for the next couple of days. Most of the people relied on cash transactions, especially in the real estate sector where people invested their money on real estate and property. The 2016 Demonetisation had led to a lot of commentary on the impacts of the recent policy on formal as well as informal media because people tried to make sense of this huge deliberate monetary shock to the economy of India. But it improved the tax revenue and fiscal deficit management of the government. Therefore, the major consequences and reaction of the stock market investors were judged and analyzed. Overreaction and availability bias are the primary elements analyzed in the study. The research study had collected data before and after the event from various websites, like Nseindia.com, moneycontrol.com, in.finance.yahoo.com, and some social networking websites, like Twitter, Facebook, Reddit, and Youtube. Then, the collected data were compared for the two periods. Hence, the study had considered the analysis of the impact of the crisis into the stock market with special emphasis on the real estate sector.

Literature Review

The event taken into the study had a major impact on the stock market and economic system. The substantial literature review related to the primary events taken into the research study was collected from various sources. It was found that stock market traders and investors often overreact to new information. In 1985, a famous study analyzed the market overreaction based on the returns of the New York Stock Exchange (De Bondt & Thaler, 1985). The study tracked portfolio performance with a representative market index and found that the cumulative difference between the winner and loser portfolios were nearly 25%. This happened because of overreaction and availability bias. Pessimism for negative news and optimism for positive news resulted in overreaction. Availability bias occurred because investors' sentiments tend to give more weight age to decisions based on recent information. This resulted in a drastic impact on the real estate sector.

The government had implemented a major change in the Indian economy on 8th November 2016 by demonetizing high-value currency notes—Denomination of INR 500 and INR 1000. People were given time to exchange the notes held by them up to 30th December 2016. The SENSEX fell by 6% or even more during the demonetisation announcement. The stock market was one of the major areas where the announcement created a mammoth impact. The effect of demonetisation in India was felt across the world especially in the BRICS nations just like China's stock market turbulence on 2015-2016 affected the entire world economy. The reactions of the citizens after demonetisation were mixed. The decision had a drastic impact on Indian politics, economy, social, technology, natural environment, and the legal environment. An important consequence of demonetisation had been the rise in the use of digital transactions. 2016 Demonetisation was basically a masterstroke plan for controlling corruption, counterfeit currency, terrorism, and black money. Evaluation of the impact of recent demonetisation in India in various spheres of human life can be assessed only in the coming years and continuous observation with rigorous analysis is required. This will help in generating the analysis of achievements of 2016 Demonetisation because statistics are the primary ingredient for such judgements. Henceforth for digitalization and betterment of economy, every citizen of India must join hands to make it a success for an economically stronger and prosperous India. The overall demand for real estate property, consumer goods, gold, automobiles, luxury goods, etc. has been drastically affected. As directed by the Government, the old notes (INR 500 and INR 1000) are to be exchanged or deposited in banks. This will automatically lead to more accumulation of money due to deposits in current and savings account of banks. It is estimated that Indian banks have received nearly Rs. 2 lakh crore and counting as deposits after demonetisation. Therefore, this will strengthen and enhance the liquidity position of the banks. The growth rate fell to 4.9% in November as compared with 6.6% in October 2016 in the eight core sectors namely crude oil, fertilizers, electricity, cement, steel, and refinery products, which comprised of around 38% of the IIP (Index of Industrial Production). In many Indian major cities, like Ahmedabad, Delhi, Kolkata, etc., gold sales rose suddenly on 9 November 2016. The real estate sector stock prices were drastically affected. These were the consequences of availability bias and overreaction. Some of the primary categories of availability bias correlated with the research study to characterize the investors are categorization, narrow range of experience, and resonance. Overreaction and availability bias may contradict the efficient market hypothesis. Based on various reviews of research articles and literature, it was found that the remedial measure for controlling overreaction and availability bias is that stock market investors should strategize based on statistics and market research without being emotional.

Various social media websites, like Facebook, Twitter, Reddit, WhatsApp, and Youtube posted various comments and posts regarding the events. The entire nation was commenting about the event. Each and every news channel covered the event consequences and repercussions. Therefore, it created a huge impact on the stock market and investor sentiments. The real estate sector was drastically affected due to the demonetisation. The entire nation was in shock and turmoil. This gave rise in overreaction among the stock market investors. The overreaction resulted in availability bias which remained into the market from three to seven months.

Methodology

The research study was based on the framework designed by the research strategy. The analysis was primarily based on secondary data. The data were collected from various websites (Nseindia.com, moneycontrol.com, in.finance.yahoo.com, and Sharekhan.com) and some social networking websites, like Twitter, Facebook, Reddit, and Youtube. The data related to real estate sector companies' stock market were primarily based on secondary sources which were collected from the websites named above. The data related to investor sentiments were collected with the help of social networking websites and its Application Programme Interfaces (API) or social media tools. The main sources for data collection were Nseindia (<https://www.nseindia.com>) and Sharekhan (<https://www.sharekhan.com/>) websites.

The sampling frame of the real estate sector companies was based on judgments and Delphi method. The mechanism was primarily based on expert surveys. It was used while selecting the five companies from the real estate sector for analysis in the research study. The data collected were primarily based on the stock prices of five companies listed in the National Stock Exchange (NSE). The five companies were Unitech Limited, DLF Limited, Indiabulls Real Estate Limited, Simplex Infrastructure Limited, and Lanco Infratech Limited. The stock market data were collected for the period of a month (October 2016) before the event and a month (December 2016) after the event. Daily stock prices of the companies were recorded. Therefore, the stock market data were considered for 30 days before and 30 days after the event of demonetisation. The month of the occurrence of the event was also taken into consideration. To be precise, the duration of the period taken in the study was starting from 2nd October 2016 to 15th December 2016. The shorter time frame was taken because the primary objective of the research is to analyze the overreaction and availability bias in investors' sentiment. The stock prices data extracted from the websites were in a tabular form which was taken as an input for the software (Microsoft-Excel). The analysis was done and the formulae were implemented on the data. The statistical tools used for the research and analysis of the stock market data collected from the NSE website are researched upon in the study. It was collected for the rigorous analysis of the data. The statistical tools are explained as follows:

- Return: The return is the expected profit or loss expected from the previous day to investor. Therefore, the return of each and every stock prices were calculated by the following Formula (1):

$$\text{Stock Return (R)} = (C/P) - 1 \quad (1)$$

Where C is the current stock price; P is the previous day stock price.

- Standard deviation: Standard deviation is one of the statistical tools used by portfolio analyst, financial advisor, or wealth manager to calculate the risk of the stock in the market. The greater the risk of the stock is, the greater will be the standard deviation of the stock. It was calculated by using the following Formula (2):

$$\sigma_s = \sqrt{(\sum(R_s - \bar{R}_s))/(n - 1)} \quad (2)$$

Where σ_s is the standard deviation of stock; R_s is the return of the stock price; $\bar{R}_s$ is the average of stock price; n is the number of days taken.

The statistical tools were implemented on the collected data from “Nseindia” website and then the results were compiled in a table to analyze the research. The calculated data were converted into percentage for better understanding and analysis. Moreover, to substantiate the analysis, companies' stock price charts based on the recommended timeframe were analyzed with the help of interactive charts procured from “Sharekhan” website. The analysis of the table and charts clearly reflected the impact of demonetisation on the stock prices of real estate sector companies.

Analysis and Findings

The data were collected from “Nseindia” website (<https://nseindia.com>) and stored in Microsoft-Excel. The data were then analyzed, processed, and computed in Microsoft-Excel with the help of the statistical tools explained. The analysis of the five companies taken into the study was carried out in two folds based on the occurrence of the event. Two aspects precisely pre- and post- demonetisation were taken into analysis. Then, Table 1 was formed based on self compilation. Table 1 comprises of the real estate sector companies data regarding stock prices returns and standard deviation. The results were computed and written in a tabular form for the ease of understanding. Table 1 provides the analysis of the impact of demonetisation on stock prices of real estate sector companies, namely, Unitech Limited, DLF Limited, Indiabulls Real Estate Limited, Simplex Infrastructure Limited, and Lanco Infratech Limited. These five real estate sector companies were selected based on expert surveys and Delphi method.

Table 1

Results of Real Estate Sector Companies' Stock Prices During 2016 Demonetisation

Name of company from real estate sector	Particulars (stock prices)	Pre-demonetisation (%)	Post-demonetisation (%)
Unitech Limited	Returns	-0.002	-0.01
	Standard deviation	2.46	3.52
DLF Limited	Returns	-0.002	-0.001
	Standard deviation	2.07	3.34
Indiabulls Real Estate Limited	Returns	-0.006	0.36
	Standard deviation	2.51	4.01
Simplex Infrastructure Limited	Returns	-0.1919	-0.41
	Standard deviation	1.3	2.51
Lanco Infratech Limited	Returns	-0.20	-0.23
	Standard deviation	1.01	2.49

Note. Authors' self-compilation.

- From Table 1, it can be analyzed and said that there was a change in stock prices of Unitech Limited because of the demonetisation in India. A significant variation in total traded quantity of Unitech Limited stocks was also found between pre- and post- demonetisation.
- From Table 1, it can be analyzed and said that there was a change in stock prices of DLF Limited because of the demonetisation in India. A significant variation in total traded quantity of DLF Limited stocks was also found between pre- and post- demonetisation.

- From Table 1, it can be analyzed and said that there was a significant change in stock prices of Indiabulls Real Estate Limited because of the demonetisation in India. A significant variation in total traded quantity of Indiabulls Real Estate Limited stocks was also found between pre- and post- demonetisation.
- From Table 1, it can be analyzed and said that there was a change in stock prices of Simplex Infrastructure Limited because of the demonetisation in India. A significant variation in total traded quantity of Simplex Infrastructure Limited stocks was also found between pre- and post- demonetisation.
- From Table 1, it can be analyzed and said that there was a slight change in stock prices of Lanco Infratech Limited because of the demonetisation in India. A significant variation in total traded quantity of Lanco Infratech Limited stocks was also found between pre- and post- demonetisation.

From the analysis, it was observed that after demonetisation, stocks of real estate, such as Unitech Limited, DLF Limited, Indiabulls Real Estate Limited, Lanco Infratech Limited, and especially Simplex Infrastructure Limited showed negative returns. The standard deviations of the stocks also increased after these two crises. There are some stocks, like Simplex Infrastructure Limited which got adversely affected. It is also observed that the trading volume of the stock also got drastically reduced due to these events. The stock prices were drastically affected because of the effect of overreaction and availability bias on the stock market investors. This was the gradual consequence of the demonetisation event on 8th November 2016.

The real estate sector companies' stock price charts based on NSE data was analyzed. The stock prices were analyzed on the given timeframe with the help of interactive charts taken from the "Sharekhan" website (<https://sharekhan.com>).

Figure 1. Unitech Limited Stock Price movements, October to December 2016 (Sharekhan).

From Figure 1, it can be analyzed and concluded that demonetisation had a drastic impact on the fall of stock prices in Unitech Limited. After the first week of November 2016, it can be seen that there was a notable change in the movement of the stock prices.

Figure 2. DLF Limited Stock Price movements, October to December 2016 (Sharekhan).

From Figure 2, it can be analyzed and concluded that demonetisation had a substantial impact on the fall of stock prices in DLF Limited.

Figure 3. Indiabulls Real Estate Limited Stock Price movements, October to December 2016 (Sharekhan).

From Figure 3, it can be analyzed and concluded that demonetisation had a huge impact on the fall of stock prices in Indiabulls Real Estate Limited.

Figure 4. Simplex Infrastructure Limited Stock Price movements, October to December 2016 (Sharekhan).

From Figure 4, it can be analyzed and concluded that demonetisation had a huge impact on the fall of stock prices in Simplex Infrastructure Limited. The company Lanco Infratech Limited data analysis of stock price movements could not be procured because of some unavoidable circumstances. The NSE and the BSE have suspended the trading of equity shares of Lanco Infratech Limited from September 2018 due to liquidation proceedings. The social media posts also affected the sentiment of the investors. Social media sentiment analysis proved that social networking websites, like Facebook, Twitter, WhatsApp, Reddit, etc. played a major role in the formation of overreaction and availability bias. It also generated negative sentiments among the investors.

Therefore, the research study finds that the 2016 Demonetisation in India had a huge impact on the real estate sectors' stock market. The stock market movements can be analyzed and derived that after the demonetisation announcement there was a sudden change in the patterns of stock prices. The real estate sector companies, like Unitech Limited, DLF Limited, Indiabulls Real Estate Limited, Simplex Infrastructure Limited, and Lanco Infratech Limited were drastically affected. The overreaction and availability bias created due to the demonetisation announcement had a huge effect on the stock market investors' sentiments.

Conclusion

Availability bias and overreaction can be avoided by various remedial strategies, like working on long-term perspectives, efficient market research, and optimized stock management analysis, and never be emotional while trading. It is easy to get carried away by latest news but short-term investments rarely yield fruitful results. It is better to implement a strategic approach by thoroughly researching the investments by doing an extensive and rigorous market analysis. It helps in accurately assessing the impact of daily stock market news and implementing appropriate strategic plans for avoiding overreaction and availability bias. This will help in generating optimized investments in the correct stocks which will provide an efficient and high return on investments. Substantial research in behavioural finance and psychology has suggested that most of the investors overreact to dramatic and unexpected news, like demonetisation. This type of behaviour affects the market in a drastic way by the formation of availability bias due to overreaction. Both the classes of behaviour (market behaviour and the psychology of individual decision making) can be characterized as a

display of overreaction. The social media data set was not substantial to generate a concrete conclusion on sentiment analysis. Therefore, for future scope of research, a huge cluster of social networking data set for stock market is required for efficient sentiment analysis with the help of optimized natural language processing algorithms.

The effect on the stock market is temporary in nature, i.e., the price of stocks keep on changing on a bi-monthly or monthly basis after the release of the events. Real estate is the sector where all black money was easily considered to be shelved for conversion into legal money. That is why the effect of the demonetisation on real estate sector was in larger amounts. The returns of major stocks in the real estate sector had decreased and very few of them were able to hold at that time and exhibit constant returns. Due to which, the standard deviation of the stocks also got increased which meant investing in these stocks were riskier in nature. It was also forecasted by the stock market analysts and investors that there has been a great impact on the stock market of real estate sectors. This occurred because of overreaction and availability bias. The demonetisation event created a mammoth and radical impact on the stock market of the real estate sector companies. Therefore, it generated a significant influence on the sentiments of the stock market investors.

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